2166-03828

SFUND RECORDS CTR
88133249
ITX 2166-03828

PHASE 3 GROUNDWATER SAMPLING

LOCKHEED AERONAUTICAL SYSTEMS COMPANY

Burbank, California

October, 1988
Part I of III

Prepared by:

The MARK Group, Engineers & Geologists, Inc.
Santa Ana, California

88-03128.18

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

SFUND RECORDS CTR
2166-03828

PROFESSIONAL CERTIFICATION

REPORT
PHASE 3 GROUNDWATER SAMPLING
Lockheed Aeronautical Systems
Burbank, California
88-03128.18
March 14, 1989

This report has been prepared by the staff of The MARK Group, Engineers & Geologists, Inc. under the professional supervision of the Principal whose seal and signature appear hereon.

The findings, recommendations, specifications or professional opinions are presented, within the limits prescribed by the client, after being prepared in accordance with generally accepted professional engineering and geologic practice. There is no other warranty, either express or implied.

CERTIFIED ENGINEERING GEOLOGIST
RAYMOND L. MORESCO
459
expires 6/90
STATE OF CALIFORNIA

REGISTERED GEOLOGIST
GARY J. HALBERT
NO. 1318
CERTIFIED ENGINEERING GEOLOGIST
expires 6/90
STATE OF CALIFORNIA

Raymond L. Moresco, C.E.G.
Director of Operations

Gary J. Halbert, C.E.G.
Senior Geologist

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

TABLE OF CONTENTS
LOCKHEED AERONAUTICAL SYSTEMS
Phase 3 Groundwater Sampling
Part I of III

Page

1.0 INTRODUCTION 1-1

2.0 BACKGROUND 2-1
2.1 General 2-1
2.2 Multiple-Screen Wells 2-1
2.3 Cluster Wells 2-2

3.0 SCOPE OF WORK 3-1
3.1 Objective 3-1
3.2 Sampling Procedures 3-1

4.0 LABORATORY ANALYSIS 4-1

5.0 RESULTS 5-1
5.1 Summary of Field Observations and Unique Conditions 5-1
5.2 Summary of Chemical Results 5-4

List of Tables

Table 1: Site Plan and Well Locations
Table 2: Cluster-Well Sample Intervals
Table 3: Summary of Field Data, PCE/TCE, and TDS Results

List of Drawings

Drawing 1: Site Plan and Well Locations
Drawing 2: PCE/TCE Distribution in Cluster Wells

Appendices

A - Sampling Plan
B1 - Daily Field Notes, Crew No. 1

Part II of III

Appendices: (continued)

B2 - Daily Field Notes, Crew No. 2
C - Calibration Logs, Crew No. 1 (Crew No. 2 in App. B-2)
D1 - Well Purging and Sampling, Multiple-Screen Wells
D2 - Well Purging and Sampling, Cluster Wells
E - Sample Transfer Chain of Custody

Appendices: (continued)

F1 - LASC Water Quality Data Base
F2 - Analytical Technologies Inc. Laboratory Reports
G - Report of Groundwater Sample Analysis of A1 - CW3, by URS Consultants Inc., October 22, 1988

INTRODUCTION

This report describes Phase 3 groundwater sampling performed by The MARK Group Engineers and Geologists, Inc. (MARK) at Lockheed Aeronautical Systems Company (LASC), Burbank, California. The work described in this report was authorized by MARK under LASC P.O. No. ALU3C0180-E, dated July 12, 1988. Phase 3 groundwater sampling consisted of collecting a total of 140 groundwater samples from 16 multiple-screen wells, 24 single-screen wells (eight 3-well clusters), and including quality assurance/quality control duplicate and blank samples. Samples were analyzed by an independent laboratory under direct contract to LASC. Sampling procedures, field records, and analytical results are summarized in this report with copies of field documents and laboratory reports included as Appendices.

2.0 BACKGROUND

2.1 General

Lockheed Corporation maintains several LASC facilities at various locations around Burbank-Glendale-Pasadena Airport in Burbank, California (Drawing No. 1). The airport area lies in the eastern portion of the San Fernando Valley. The eastern San Fernando Valley contains an alluvial aquifer that is a major component of overall water resources management in southern California. During the early 1980's, groundwater in the San Fernando Valley aquifer was found to contain dissolved volatile organic compounds (VOC) at concentrations above California Department of Health Services state action levels. In cooperation with state and local agencies and other private industries in the area, LASC has undertaken a groundwater investigation program to help evaluate groundwater quality in the area.

During 1986 through 1988, at least forty groundwater monitoring wells have been installed within, or adjacent to, current Lockheed Corporation Burbank facilities in the airport area. Well locations are on the Site Plan, Drawing No. 1. Details of well construction are in previous reports prepared by parties other than MARK who were responsible for well construction.

Depth to the unconfined water table in the area ranges from approximately 100 to 240 feet below ground surface, with the depth to groundwater decreasing from west to east.

2.2 Multiple-Screened Wells

Sixteen of the groundwater monitoring wells have been constructed as "multiple-screen" wells. Each well is constructed of 5-inch-diameter steel casing with at least five and as many as fourteen screened sections, with each

screened interval separated by blank casing spaced at varied depth intervals throughout the groundwater portion of each well. Screened interval depths and approximate depths to groundwater for each multiple-screen well are on Table 1.

2.3 Cluster Wells

Twenty four of the monitoring wells at the site consist of eight 3-well "cluster wells". Each individual well is a single-screened-interval well that is part of a three-well system in 8 different locations designed to monitor 3 groundwater zones (upper, intermediate and lower). Each well was installed independently a few feet away from the other 2 wells in each of the 8 cluster areas. Each cluster well was constructed with 5-inch-diameter steel casing with a 10-or-20-foot long screened interval at the bottom. Cluster well depth intervals and approximate groundwater depths are on Table 2.

3.0 SCOPE OF WORK

3.1 Objective

Phase 3 groundwater sampling was contracted by LASC to obtain data to assess groundwater quality beneath the site area. Groundwater samples were to be collected from each screened interval in all of the monitoring wells and submitted to a laboratory for chemical analysis.

Sampling was conducted under stringent quality assurance/quality control (QA/AC) procedures to maintain maximum integrity of each sample from the point of sampling until turned over to the analytical laboratory. The laboratory for the project, Associated Laboratories, Orange, California was under direct contract to LASC and therefore not responsible to MARK for laboratory QA/QC.

3.2 Sampling Procedure

A Sampling Plan written for Phase 3 groundwater sampling at LASC is in Appendix A. Field sampling and QA/QC procedures were performed according to the plan. Sampling was completed during the period August 15 through October 21, 1988. Two crews participated in sampling. Each crew consisted of a MARK scientist, a pump-rig operator (MARK subcontractor), and Health and Safety Coordinator (URS Consultants Inc.). The pump rigs and operators were provided by Howard Pump, Inc., Barstow, Calfiornia. One crew, designated as Crew No. 1 in the appendices, worked throughout the sampling period. The second crew, Crew No. 2, supplemented the sampling effort during the final 4 weeks of sampling.

Sampling data is summarized in Table 3. Copies of field records are included in the Appendices of this report as follows:

Appendix B-1	Daily Field Record, Crew No. 1
Appendix B-2	Daily Field Record, Crew No. 2

Crew No. 2 are included in Appendix B-2)

Appendix D-1 Well Purging and Sampling Data, Crew No. 1

Appendix D-2 Well Purging and Sampling Data, Crew No. 2

Appendix E Sample Transfer Chain of Custody Records

Generally, sampling was completed by the following steps:

- Wells were purged and sampled using a positive displacement piston pump. The pump apparatus that comes into contact with sample water is constructed of stainless steel and PTFE (Teflon, R) materials. The pump is manufactured specifically for groundwater monitoring and has been tested and shown effective for monitoring well sampling, including sampling for VOC analysis.

- Rubber well seals were used above and below each sample interval in the multiple-screened wells to isolate the interval. A seal was used at the top of the screened interval in the cluster wells to maximize sample integrity and minimize wastewater volume.

- Wells were purged of 3 or more volumes of water for each isolated sample interval (including filter sand void space). Discharge flow rate was monitored and the water was contained for later disposal by LASC.

- Water levels were measured and recorded prior to and during purging.

- During purging, discharge water was monitored with a flow-through instrument for pH, conductivity, temperature and oxidation-reduction potential (redox, or Eh). Field monitoring data is in Appendix D. The instruments were calibrated on a daily basis (Appendix C).

- Water samples were taken only after at least three well volumes were removed and field monitoring parameters stabilized. The final field measurements for each sample are summarized on Table 3.

- Sample blanks and duplicates were prepared along with specific groundwater samples for laboratory QA/QC according to a predetermined, randomized schedule that was approved by LASC representatives. Table 3 shows the QA/QC sample distribution. Additional QA/QC information is in Appendix A.

- Samples were collected in prepared containers provided by the laboratory and stored in refrigerated coolers until picked up at the site by a laboratory representative.

- All samples were transferred directly from sampling personnel to laboratory representatives using chain-of-custody procedures. Copies of consecutively numbered chain-of-custody documents are in Appendix E.

- All sampling equipment used in a well or that came into contact with groundwater was decontaminated between use in each well by steam cleaning, tap water rinse, and distilled water rinse. Decontamination was done in a single, designated area and waste materials were contained for disposal by LASC.

4.0 LABORATORY ANALYSIS

All of the samples collected during LASC Phase 3 groundwater sampling were analyzed by Associated Laboratories, Orange, California. As directed by LASC, samples were analyzed for a suite of inorganic parameters and organic priority pollutant compounds. Inorganic parameters consisted of:

Total Dissolved Solids (TDS)
Sulfate
Alkalinity ($CaCO_3$)
Chloride
Fluoride
Electrical Conductivity
Bromide
Nitrate
Sulfide
Phosphate, Total (P)
Iron
Manganese
Sodium
Calcium
Potassium
Magnesium

Organic compounds were analyzed for purgeable VOC's by EPA Methods 601/602 or 624, and for semivolatiles by EPA Method 625. A list of the organic compounds tested and copies of the laboratory reports are in Appendix F.

The compounds of primary concern, TCE and PCE, are included in Table 3 for easy comparison. The laboratory TDS results are also included in Table 3 for a general comparison of inorganic constituents.

	B1-CW2	No unique conditions observed.
	B1-CW3	No unique conditions observed.
AREA 2	A1-CW1	Water a greenish-grey color. pH relatively high, 8.22 at sampling. Conductivity relatively low, 380 umhos at sampling. "Chemical odors" observed by sampling team when well opened. (10/6/88)
	A1-CW2	No unique conditions observed.
	A1-CW3	Well could not be sampled using MARK methods. Groundwater level was only 7 feet above the bottom of the well screen, and pumping emptied the casing immediately. (10/6/88). Well was subsequently sampled by bailing, on October 22, 1988, as described in Appendix G.
AREA 3	B6-CW1	Very strong hydrocarbon odor reported. Floating non-aqueous phase sheen on top of water, black globules of unknown composition in sample water. Conductivity relatively low, 330 umhos at sampling. pH relatively high, 8.91 at sampling. (10/3/88)
	B6-CW2	Hydrocarbon odor reported. Oily-appearing sheen on water surface, small black particles of unknown composition in suspension in sample water. (10/3/88)
	B6-CW3	Oily-appearing sheen on sample water surface. (10/3/88)
AREA 4	B6-CW4	Very strong hydrocarbon odor, possible crude oil or diesel, reported. Oily-appearing sheen on sample water surface. pH relatively high, 8.17 at sampling. (9/29/88)
	B6-CW5	Oily-appearing sheen on water surface, hydrocarbon odor observed throughout pumping. (9/28/88)
	B6-CW6	No unique conditions observed.
AREA 5	B6-CW7	Water sample PID headspace reading of 170 units reported by URS. Water green to greenish grey in color, sometimes somewhat foamy on surface. pH very high, 10.10 at sampling. (10/4/88)

	B6-CW8	No unique conditions observed.
	B6-CW9	No unique conditions observed.
AREA 6	B5-CW1	Water olive in color.
	B5-CW2	No unique conditions observed.
	B5-CW3	No unique conditions observed.
AREA 7	C1-CW1	First 50 gallons discharged distinctly green in color, changing to light brown. Eh values as low as -229 recorded during purging. (9/23/88)
	C1-CW2	No unique conditions observed.
	C1-CW3	No unique conditions observed.
AREA 8	No unique conditions observed.	

5.2 Chemical Results

The distribution of PCE/TCE concentrations, based on chemical analysis of cluster well results, are illustrated on Drawing No. 2. Multiple-screened well results are not included on Drawing No. 2 because the cluster well results are considered more definitive due to the isolation of a single screened interval within each of the cluster wells compared to the communicating intervals within the multiple-screened wells. In fact, the multiple-screened wells appear to be ineffective for vertical profiling of groundwater constituents and these wells should be modified to prevent communication between intervals.

The results illustrated on Drawing No. 2 indicate the following general trends:

1. TCE/PCE concentrations are relatively low or non-existent in the western (C-1) areas of the facilities.
2. TCE/PCE concentrations are relatively higher in the northern (B-6) and southeastern (B-1) areas.
3. Relative TCE/PCE concentrations tend to decrease with depth.

TABLE 1
MULTIPLE SCREENED SCREENED INTERVALS

Monitoring Well	Completion Depth ft.	No. of Screened Intervals	Screen Locations Top-Bottom ft. below surface	Fall 1988 Approximate Depth to Groundwater ft.
A-1-MW1	502	6	153-193 235-255 297-317 338-378 441-461 482-502	184
A-1-MW2	504	5	158-198 270-290 352-392 428-448 460-480	191
A-1-MW3	503	7	168-208 219-239 263-283 294-314 362-402 426-446 470-490	190
A-1-MW4	1201	14	144-184 208-228 276-296 320-340 364-384 432-452 476-496 520-540 600-620 692-712 808-828 949-969 1017-1037 1157-1177	174

88128-18.TBL

TABLE 1
(continued)

Monitoring Well ft.	Completion Depth ft.	No. of Screened Intervals	Screen Locations Top-Bottom ft. below surface	Fall 1988 Approximate Depth to Groundwater
B-1-MW1	482	6	112-152 194-214 235-275 338-358 400-420 441-461	151
B-1-MW2	462	6	100-140 150-170 229-249 318-338 380-400 421-441	146
B-1-MW3	454	6	102-142 174-194 236-256 298-318 339-359 422-442	128
B-1-MW4	452	5	80-120 162-182 214-234 297-317 411-431	117
B-1-MW5	452	6	96-136 160-180 252-272 296-316 354-374 422-442	135
B-1-MW6	442	5	82-122 160-180 286-306 354-374 398-418	112

88128-18.TBL

TABLE 1
(continued)

Monitoring Well	Completion Depth ft.	No. of Screened Intervals	Screen Locations Top-Bottom ft. below surface	Fall 1988 Approximate Depth to Groundwater ft.
B-1-MW7	451	6	101-141 162-182 234-254 307-327 337-357 410-430	124
B-1-MW8	452	6	95-135 156-176 218-238 290-310 363-383 404-424	113
B-1-MW9	542	6	138-178 264-284 332-352 386-406 454-474 498-518	172
B-6-MW1	665	7	220-240 272-292 334-354 364-384 479-499 520-540 624-644	240
B-6-MW2	522	7	174-214 235-255 276-296 338-358 379-399 441-461 470-490	204
C-1-MW1	554	7	198-238 262-302 350-390 402-422 470-490 502-522 534-554	230

88128-18.TBL

TABLE 2
CLUSTER WELL SCREENED INTERNALS

Monitoring Well	Approximate Completion Depth ft.	Approximate Screen Locations Top-Bottom ft.	Fall 1988 Approximate Depth to Groundwater ft.
Area 1			
B-1-CW1	615	590-600	158
B-1-CW2	268	250-260	155
B-1-CW3	167	150-160	154
Area 2			
A-1-CW1	605	560-570	196
A-1-CW2	362	350-360	189
A-1-CW3	200	175-195	189
Area 3			
B-6-CW1	610	580-590	186
B-6-CW2	348	330-340	198
B-6-CW3	220	195-215	199
Area 4			
B-6-CW4	584	510-520	220
B-6-CW5	355	345-355	221
B-6-CW6	235	215-235	221
Area 5			
B-6-CW7	575	492-502	226
B-6-CW8	374	361-371	224
B-6-CW9	263	242-262	223
Area 6			
B-5-CW1	576	542-552	212
B-5-CW2	354	339-349	204
B-5-CW3	234	209-229	204
Area 7			
C-1-CW1	575	481-491	240
C-1-CW2	394	382-392	237
C-1-CW3	284	259-280	238
Area 8			
C-1-CW4	665	652-662	231
C-1-CW5	391	376-386	229
C-1-CW6	253	232-252	226

88128-18.TBL

TABLE 3
SHEET 1 OF 5

LOCKHEED AERONAUTICAL SYSTEMS COMPANY - BURBANK FACILITIES, AUG-OCT 1988 SAMPLING DATA

Sample Location	Sample No.	Sample Area	Sample Date	Time	Comments	Chain of Custody No.	Ground Elev.	Screen Top Depth	Screen Bot. Depth	Top Screen Elev.	Ground-water Depth	Ground-water Elev.	Temp., Cent.	Sp. Cond. umhos	pH	Eh, mV	Sample Appearance	Tot. Dsch. gal	Well Vol. Purged	PCE ug/l	TCE ug/l	Total Dissolv. Solids mg/l
A1-MW1	A1-MW1-01		10/18/88	10:00	Equipment Blank	L00055	674.93													ND	ND	ND
A1-MW1-01	A1-MW1-02		10/18/88	12:00		L00055	674.93	153	193	521.93	184.40	490.53	19.4	704	7.36	124	lt.cloudy	135	4.0	4.604	2.520	486
A1-MW1-02	A1-MW1-03		10/18/88	14:00		L00057	674.93	235	255	439.93	184.40	490.53	19.0	739	7.40	123	lt.cloudy	215	3.9	0.857	0.550	478
A1-MW1-03	A1-MW1-04		10/18/88	16:00		L00057	674.93	297	317	377.93	184.40	490.53	19.1	731	7.35	118	cloudy	200	3.6	0.826	0.539	466
A1-MW1-04	A1-MW1-05		10/18/88	18:00		L00057	674.93	338	378	336.93	184.40	490.53	18.6	730	7.36	114	clear	220	4.0	0.371	0.256	468
A1-MW1-05	A1-MW1-06		10/18/88	20:00		L00056	674.93	441	461	233.93	184.40	490.53	18.5	730	7.39	116	lt.cloudy	180	3.0	1.169	0.730	468
A1-MW1-06	A1-MW1-07		10/18/88	21:00		L00056	674.93	482	502	192.93	184.40	490.53	18.5	726	7.39	96	near clear	200	3.6	0.826	0.551	478
	A1-MW1-08		10/17/88	13:00	Trip Blank	L00054														ND	ND	
A1-MW2	0201		08/22/88	09:30	Equipment Blank	L00005	685.32													ND	ND	27
A1-MW2-01	0202		08/23/88	16:00		L00006	685.32	158	198	527.32	190.73	494.59	20.8	740	6.91	54	clear	270	13.0	0.585	0.313	482
A1-MW2-02	0203		08/23/88	18:30		L00006	685.32	270	290	415.32	190.73	494.59	21.0	598	7.33	66	clear	250	5.0	0.498	0.158	482
A1-MW2-03	0204		08/23/88	20:30		L00006	685.32	352	392	333.32	190.73	494.59	21.1	598	7.44	36	lt.cloudy	186	3.5	0.523	0.229	412
A1-MW2-04			08/23/88		Sample not obtainable		685.32	428	448	257.32	190.73	494.59										
A1-MW2-05			08/22/88		Sample not obtainable		685.32	460	480	225.32	190.73	494.59										
A1-MW3-01	A1-MW3-01		10/15/88	17:00		L00051	681.14	168	208	513.14	189.40	491.74	18.9	711	7.18	101	near clear	250	4.1	0.158	0.338	456
A1-MW3-01	A1-MW3-02		10/15/88	19:00	Dup of A1-MW3-01	L00051	681.14	168	208	513.14	189.40	491.74	18.9	711	7.18	101	near clear	250	4.1	0.148	0.284	467
A1-MW3-02	A1-MW3-03		10/15/88	20:00		L00052	681.14	219	239	462.14	189.40	491.74	18.6	689	7.24	104	v.lt y-brn	200	3.7	0.335	0.419	442
A1-MW3-03	A1-MW3-04		10/16/88	12:00		L00053	681.14	263	283	418.14	189.52	491.62	19.7	679	7.16	104	near clear	190	3.5	1.103	0.602	444
A1-MW3-04	A1-MW3-05		10/16/88	15:30		L00053	681.14	294	314	387.14	189.52	491.62	19.1	634	7.25	89	near clear	195	3.6	0.506	0.300	398
A1-MW3-05	A1-MW3-06		10/16/88	17:30		L00053	681.14	362	402	319.14	189.52	491.62	19.0	673	7.22	74	lt.cloudy	185	3.4	0.626	0.429	418
A1-MW3-06	A1-MW3-07		10/17/88	10:00		L00054	681.14	426	446	255.14	189.81	491.33	19.3	681	7.30	137	clear	210	3.8	0.623	0.472	414
A1-MW3-07					Sample not obtainable		681.14	470	490	211.14	189.81	491.33										
A1-MW3	A1-MW3-08				Trip Blank															ND	ND	ND
A1-MW4-01	A1-MW4-01		10/18/88	11:00		L00058	662.54	144	184	518.54	174.55	487.99	19.3	545	7.48	167	clear	185	5.6	0.406	0.418	425
A1-MW4	A1-MW4-02		10/18/88	13:00	Equipment Blank	L00058	662.54													ND	ND	
A1-MW4-02	A1-MW4-03		10/18/88	16:00		L00058	662.54	208	228	454.54	174.55	487.99	18.4	521	7.52	116	clear	200	3.7	0.535	0.354	428
A1-MW4-03	A1-MW4-04		10/19/88	10:00		L00059	662.54	276	296	386.54	172.61	489.93	18.4	593	7.63	14	v.lt. y-br	230	4.2	0.411	0.274	418
A1-MW4-04	A1-MW4-05		10/19/88	12:00		L00059	662.54	320	340	342.54	172.60	489.94	19.3	587	7.59	11	v.lt. y-br	276	5.1	0.353	0.234	384
A1-MW4-05	A1-MW4-06		10/19/88	13:30		L00059	662.54	364	384	298.54	172.60	489.94	19.2	613	7.44	-69	v.lt gr-br	216	4.3	0.230	0.167	380
A1-MW4-06	A1-MW4-07		10/19/88	16:00		L00061	662.54	432	452	230.54	172.60	489.94	19.0	603	7.44	-54	clear	220	4.0	0.289	0.147	368
A1-MW4-07	A1-MW4-08		10/19/88	18:00		L00061	662.54	476	496	186.54	172.60	489.94	18.7	1235	7.58	-67	murky	200	3.7	0.097	[illegible]	690
A1-MW4-08	A1-MW4-09		10/19/88	20:00		L00061	662.54	520	540	142.54	172.60	489.94	18.7	1377	7.90	-29	near clear	255	4.7	ND	ND	[illegible]
A1-MW4-09	A1-MW4-10		10/19/88	22:00		L00060	662.54	600	620	62.54	172.60	489.94	18.5	1395	7.64	7	murky	230	4.2	0.017	0.009	750
A1-MW4-10	A1-MW4-11		10/20/88	11:00		L00060	662.54	692	712	-29.46	173.83	488.71	18.7	1395	7.92	5	murky	210	3.9	0.016	ND	766
A1-MW4-11	A1-MW4-12		10/20/88	20:00		L00062	662.54	808	828	-145.46	173.88	488.66	18.7	606	7.42	34	lt. mocha	236	4.0	0.280	0.188	394
A1-MW4-12					Sample not obtainable		662.54	949	969	-286.46	173.88	488.66										
A1-MW4-13					Sample not obtainable		662.54	1017	1037	-354.46	173.88	488.66										
A1-MW4-14					Sample not obtainable		662.54	1157	1177	-494.46	173.88	488.66										

TABLE 3
SHEET 2 OF 5

LOCKHEED AERONAUTICAL SYSTEMS COMPANY - BURBANK FACILITIES, AUG-OCT 1988 SAMPLING DATA

Sample Location	Sample No.	Sample Area	Sample Date	Time	Comments	Chain of Custody No.	Ground Elev.	Screen Top Depth	Screen Bot. Depth	Top Screen Elev.	Ground-water Depth	Ground-water Elev.	Temp., Cent.	Sp. Cond. umhos	pH	Eh, mV	Sample Appearance	Tot. Dsch. gal	Well Vol. Purged	PCE mg/l	TCE mg/l	Total Dissolv. Solids mg/l
B1-MW1-01			08/29/88		Sample not obtainable		644.04	112	152	532.04	151.60	492.44										
B1-MW1-02	B1-MW1-01		08/29/88	20:30		L00007	644.04	194	214	450.04	151.60	492.44	19.8	814	7.14	109	clear	180	3.5	2.354	1.130	494
B1-MW1-03	B1-MW1-02		08/30/88	08:30		L00008	644.04	235	275	409.04	151.40	492.64	19.9	813	7.31	120	clear	170	3.0	2.295	0.579	538
B1-MW1-04	B1-MW1-03		08/30/88	10:00		L00008	644.04	338	358	306.04	151.40	492.64	20.2	817	7.27	96	clear	190	3.0	2.242	0.471	596
B1-MW1-05	B1-MW1-04		08/30/88	12:00		L00008	644.04	400	420	244.04	151.40	492.64	23.6	815	7.24	53	clear	170	3.0	2.122	0.432	536
B1-MW1-05	B1-MW1-05		08/30/88	13:00	Dup of B1-MW1-04	L00009	644.04	400	420	244.04	151.40	492.64	23.6	815	7.24	53	clear	170	3.0	1.648	0.522	536
B1-MW1-06	B1-MW1-06		08/30/88	16:30		L00009	644.04	441	461	203.04	151.40	492.64	20.3	813	7.10	70	clear	180	3.0	1.835	0.382	546
B1-MW2-01			09/07/88		Sample not obtainable		637.40	100	140	537.40	145.56	491.84										
B1-MW2-02	B1-MW2-01		09/07/88	17:00		L00015	637.40	150	170	487.40	145.56	491.84	20.5	894	7.09	147	clear	190	3.0	9.578	2.880	590
B1-MW2-02	B1-MW2-02		09/07/88	18:30	Dup of B1-MW2-01	L00015	637.40	150	170	487.40	145.56	491.84	20.5	894	7.09	147	clear	190	3.0	9.564	3.142	526
B1-MW2-03	B1-MW2-03		09/07/88	20:00		L00015	637.40	229	249	408.40	145.56	491.84	20.1	854	7.21	133	clear	185	3.0	7.726	2.100	548
B1-MW2-04	B1-MW2-04		09/08/88	09:00		L00016	637.40	318	338	319.40	145.67	491.73	20.8	855	7.24	108	clear	210	4.0	6.933	1.896	582
B1-MW2-05	B1-MW2-05		09/08/88	12:00		L00016	637.40	380	400	257.40	145.67	491.73	20.8	864	7.23	104	clear	220	4.0	7.944	2.146	533
B1-MW2-06	B1-MW2-06		09/08/88	15:00		L00016	637.40	421	441	216.40	145.67	491.73	20.8	870	7.24	35	lt.cloudy	200	4.0	9.500	2.832	554
B1-MW3	B1-MW3-01		09/13/88	11:30	Equipment Blank	L00021	618.34													ND	ND	ND
B1-MW3-01	B1-MW3-02		09/13/88	14:30		L00021	618.34	102	142	516.34	127.60	490.74	20.0	823	7.25	114	near clear	220	4.0	0.887	0.470	512
B1-MW3-02	B1-MW3-03		09/13/88	20:30		L00021	618.34	174	194	444.34	127.60	490.74	19.8	816	7.25	88	near clear	260	5.0	0.896	0.438	506
B1-MW3-03	B1-MW3-04		09/14/88	08:00		L00022	618.34	236	256	382.34	127.60	490.74	19.2	787	7.34	96	murky	240	4.0	0.413	0.027	494
B1-MW3-04	B1-MW3-05		09/14/88	10:30		L00022	618.34	298	318	320.34	127.60	490.74	19.7	784	7.37	67	lt. mocha	200	3.5	0.402	0.094	490
B1-MW3-05	B1-MW3-06		09/14/88	12:30		L00022	618.34	339	359	279.34	127.60	490.74	20.7	781	7.15	73	near clear	200	3.5	0.390	0.103	486
B1-MW3-06	B1-MW3-07		09/14/88	16:00		L00023	618.34	422	442	196.34	127.60	490.74	20.5	786	7.22	73	cloudy	220	5.0	0.480	0.141	512
B1-MW4-01			09/11/88		Sample not obtainable		605.60	80	120	525.60	113.75	491.85										
B1-MW4-02	B1-MW4-01		09/11/88	19:00		L00019	605.60	162	182	443.60	113.75	491.85	20.4	722	7.31	139	lt. cloudy	180	3.0	0.098	0.181	498
B1-MW4-03	B1-MW4-02		09/12/88	09:00		L00019	605.60	214	234	391.60	116.54	489.06	19.9	619	7.51	111	lt. cloudy	225	4.0	0.016	0.055	380
B1-MW4-04	B1-MW4-03		09/12/88	10:00		L00019	605.60	297	317	308.60	116.54	489.06	20.1	618	7.55	-14	cloudy	300	5.5	0.008	ND	388
B1-MW4-04	B1-MW4-04		09/12/88	11:00	Dup of B1-MW4-03	L00020	605.60	297	317	308.60	116.54	489.06	20.1	618	7.55	-14	cloudy	300	5.5	0.009	0.006	336
B1-MW4-05	B1-MW4-05		09/12/88	13:30		L00020	605.60	411	431	194.60	116.54	489.06	20.8	651	7.52	6	lt. cloudy	200	3.5	0.017	0.029	430
B1-MW5	B1-MW5-01		09/09/88	15:00	Equipment Blank	L00017														ND	ND	4
B1-MW5-01			09/09/88		Sample not obtainable		627.34	96	136	531.34	135.21	492.13										
B1-MW5-02	B1-MW5-02		09/09/88	19:00		L00017	627.34	160	180	467.34	135.21	492.13	19.9	764	7.37	136	clear	180	3.5	0.131	0.078	510
B1-MW5-03	B1-MW5-03		09/10/88	10:30		L00017	627.34	252	272	375.34	134.58	492.76	20.1	758	7.37	202	near clear	180	3.3	0.132	0.082	508
B1-MW5-04	B1-MW5-04		09/10/88	12:00		L00018	627.34	296	316	331.34	134.58	492.76	20.4	721	7.45	199	lt. cloudy	240	4.0	0.174	0.053	480
B1-MW5-05	B1-MW5-05		09/10/88	14:30		L00018	627.34	354	374	273.34	134.58	492.76	20.6	745	7.39	159	cloudy	200	3.5	0.114	0.069	464
B1-MW5-06	B1-MW6-06		09/10/88	16:30		L00018	627.34	422	442	205.34	134.58	492.76	20.5	736	7.39	155	lt. cloudy	180	3.0	0.151	0.084	452

TABLE 3
SHEET 3 OF 5

LOCKHEED AERONAUTICAL SYSTEMS COMPANY - BURBANK FACILITIES, AUG-OCT 1988 SAMPLING DATA

Sample Location	Sample No.	Sample Area	Sample Date	Time	Comments	Chain of Custody No.	Ground Elev.	Screen Top Depth	Screen Bot. Depth	Top Screen Elev.	Ground-water Depth	Ground-water Elev.	Temp., Cent.	Sp. Cond. umhos	pH	Eh, mV	Sample Appearance	Tot. Dech. gal	Well Vol. Purged	PCE ug/l	TCE ug/l	Total Dissolv. Solids mg/l
B1-MW6-01	B1-MW6-01		08/31/88	14:30		L00010	602.82	82	122	520.82	112.45	490.37	20.9	1024	7.05	126	clear	180	5.0	0.010	ND	652
B1-MW6-02	B1-MW6-02		08/31/88	16:30		L00010	602.82	160	180	442.82	112.45	490.37	21.4	1010	7.13	27	clear	200	4.0	0.010	0.013	636
B1-MW6-03	B1-MW6-03		08/31/88	20:30		L00010	602.82	286	306	316.82	112.45	490.37	20.5	852	7.19	-33	clear	220	4.0	0.006	0.005	514
B1-MW6-04	B1-MW6-04		08/31/88	22:00		L00011	602.82	354	374	248.82	112.45	490.37	20.0	1013	7.47	6	near clear	300	6.0	ND	ND	630
B1-MW6-05	B1-MW6-05		09/01/88	02:00		L00011	602.82	398	418	204.82	112.45	490.37	20.1	1008	7.41	1	cloudy	270	5.0	0.007	0.005	624
B1-MW7-01	B1-MW7-01		09/15/88	17:00		L00024	613.24	101	141	512.24	123.05	490.19	22.5	687	7.43	96	lt. cloudy	210	5.0	0.250	2.405	396
B1-MW7-02	B1-MW7-02		09/15/88	19:00		L00024	613.24	162	182	451.24	123.05	490.19	19.9	684	7.41	95	cloudy	190	3.5	0.173	2.008	439
B1-MW7-03	B1-MW7-03		08/15/88	21:00		L00024	613.24	234	254	379.24	123.05	490.19	19.8	689	7.34	95	murky	190	3.5	0.204	2.159	446
B1-MW7-04	B1-MW7-04		09/16/88	08:30		L00025	613.24	307	327	306.24	123.67	489.57	20.1	630	7.31	-40	lt. cloudy	210	3.8	0.202	2.153	404
B1-MW7	B1-MW7-TB		09/16/88	11:00	Trip Blank	L00025	613.24													ND	ND	ND
B1-MW7-05	B1-MW7-05		09/16/88		Sample not obtainable		613.24	337	357	276.24	123.67	489.57	19.9	662	7.40	6	lt. muddy	120				
B1-MW7-06	B1-MW7-06		09/16/88		Sample not obtainable		613.24	410	430	203.24	123.67	489.57										
B1-MW8	B1-MW8-01		09/02/88	10:30	Equipment Blank	L00012	601.28													ND	ND	18
B1-MW8-01	B1-MW8-02		09/02/88	13:00		L00012	601.28	95	135	506.28	111.10	490.18	22.1	680	7.33	89	clear	250	4.0	0.006	0.007	270
B1-MW8-02	B1-MW8-03		09/02/88	17:00		L00013	601.28	156	176	445.28	111.10	490.18	20.9	721	7.15	101	clear	200	4.0	0.007	0.043	438
B1-MW8-03	B1-MW8-04		09/02/88	20:00		L00013	601.28	218	238	383.28	111.10	490.18	19.8	629	7.44	60	murky	250	4.0	0.005	0.009	364
B1-MW8-04	B1-MW8-05		09/03/88	08:30		L00014	601.28	290	310	311.28	112.52	488.76	20.1	671	7.54	78	cloudy	260	4.7	0.007	ND	396
B1-MW8-05	B1-MW8-06		09/03/88	10:30		L00014	601.28	363	383	238.28	112.52	488.76	21.7	531	7.56	-51	cloudy	340	6.0	ND	ND	338
B1-MW8-06	B1-MW8-07		09/03/88	13:30		L00014	601.28	404	424	197.28	112.52	488.76	21.8	632	7.46	-37	lt. cloudy	280	5.0	0.006	ND	394
B1-MW9-01	B1-MW9-01	School	10/13/88	13:30		L00046	665.04	138	178	527.04	171.45	493.59	20.7	941	6.96	139	clear	130	5.9	3.653	2.388	563
B1-MW9-02	B1-MW9-02	School	10/13/88	15:30		L00049	665.04	264	284	401.04	171.45	493.59	20.4	879	7.01	-36	clear	240	4.2	1.011	0.536	578
B1-MW9-03	B1-MW9-03	School	10/13/88	17:00		L00049	665.04	332	352	333.04	171.45	493.59	19.7	905	7.19	-61	clear	215	3.8	1.107	0.634	600
B1-MW9-04	B1-MW9-04	School	10/14/88	18:00		L00050	665.04	386	406	279.04	171.38	493.66	19.4	898	7.21	-35	near clear	250	4.4	1.544	0.716	606
B1-MW9-05	B1-MW9-05	School	10/15/88	09:00		L00050	665.04	454	474	211.04	171.62	493.42	19.2	1006	6.78	90	clear	237	4.1	4.019	1.468	582
B1-MW9-06	B1-MW9-06	School	10/15/88	11:00		L00050	665.04	498	518	167.04	171.62	493.42	19.8	1026	7.00	92	lt. y-br	182	3.2	1.300	0.630	656
B1-MW9-06	B1-MW9-07	School	10/15/88	13:00	Dup of B1-MW9-06	L00051	665.04	498	518	167.04	171.62	493.42	19.8	1026	7.01	92	lt. y-br	182	3.2	1.554	0.747	608
B6-MW1	B6-MW1-01		10/11/88	09:00	Equipment Blank	L00042	746.36													ND	ND	ND
B6-MW1-01			10/11/88		Sample not obtainable		746.36	200	240	546.36	239.60	506.76										
B6-MW1-02	B6-MW1-02		10/11/88	14:00		L00042	746.36	272	292	474.36	239.60	506.76	19.6	726	7.13	97	lt. rusty	270	4.8	0.023	0.005	448
B6-MW1-03	B6-MW1-03		10/11/88	15:30		L00042	746.36	334	354	412.36	239.60	506.76	19.7	726	7.15	63	cloudy	260	4.6	0.016	ND	436
B6-MW1-04	B6-MW1-04		10/11/88	17:30		L00043	746.36	364	384	382.36	239.60	506.76	19.6	731	7.24	37	lt. cloudy	240	4.2	0.014	ND	448
B6-MW1-05	B6-MW1-05		10/12/88	11:00		L00043	746.36	479	499	267.36	239.69	506.67	19.7	738	7.01	-87	cloudy	265	4.7	0.013	ND	430
B6-MW1-06	B6-MW1-06		10/12/88	13:00		L00043	746.36	520	540	226.36	239.69	506.67	19.7	734	7.05	-84	lt. rusty	240	4.3	0.009	ND	440
B6-MW1-07	B6-MW1-07		10/12/88	15:00		L00044	746.36	624	644	122.36	239.69	506.67	19.7	709	7.04	-110	lt. rusty	220	3.9	0.006	ND	412

TABLE 3
SHEET 4 OF 5

LOCKHEED AERONAUTICAL SYSTEMS COMPANY - BURBANK FACILITIES, AUG-OCT 1988 SAMPLING DATA

Sample Location	Sample No.	Sample Area	Sample Date	Time	Comments	Chain of Custody No.	Ground Elev.	Screen Top Depth	Screen Bot. Depth	Top Screen Elev.	Ground-water Depth	Ground-water Elev.	Temp., Cent.	Sp. Cond. umhos	pH	Eh, mV	Sample Appearance	Tot. Dsch. gal	Well Vol. Purged	PCE ug/l	TCE ug/l	Total Dissolv. Solids mg/l
B6-MW2-07	101		08/17/88	12:00		L00001	702.46	470	490	232.46	203.74	498.72	19.9	633	7.50	-10	cloudy	280	4.5	0.056	0.036	452
B6-MW2-06	102		08/17/88	18:00		L00001	702.46	441	461	261.46	203.74	498.72	20.2	625	7.42	21	lt. cloudy	300	4.8	0.084	0.040	420
B6-MW2-05	103		08/19/88	19:00		L00002	702.46	379	399	323.46	203.78	498.68	19.8	601	7.39	105	cloudy	380	5.5	0.063	0.031	422
B6-MW2-04	104		08/20/88	10:00		L00003	702.46	338	358	364.46	203.86	498.60	20.2	601	7.41	96	near clear	230	3.5	0.008	0.006	448
B6-MW2-03	105		08/20/88	13:00		L00003	702.46	276	296	426.46	203.86	498.60	20.2	618	7.43	84	clear	240	3.5	0.195	0.125	432
B6-MW2-03	106		08/20/88	14:30	Dup of 0105	L00003	702.46	276	296	426.46	203.86	498.60	20.2	618	7.43	84	clear	240	3.5	0.174	0.106	430
B6-MW2-02	107		08/20/88	18:30		L00004	702.46	235	255	467.46	203.86	498.60	21.3	631	7.28	115	lt. cloudy	180	3.0	0.323	0.120	404
B6-MW2-01	108		08/20/88	21:00		L00004	702.46	174	214	528.46	203.86	498.60	20.2	817	7.28	111	clear	150	3.0	0.353	0.230	526
B6-MW2	01-TB		08/18/88	14:00	Trip Blank	L00001														ND	ND	16
C1-MW1-01	C1-MW1-01		10/12/88	13:00		L00045	726.75	198	238	528.75	229.81	496.94	19.1	683	7.52	136	colorless	436	3.9	0.027	0.011	455
C1-MW1-02	C1-MW1-02		10/12/88	16:00		L00047	726.75	262	302	464.75	229.85	496.90	19.1	683	7.52	136	colorless	436	4.2	0.016	0.010	442
C1-MW1-03	C1-MW1-03		10/13/88	10:30		L00047	726.75	350	390	376.75	229.89	496.86	18.9	664	7.13	75	lt. y-brn	365	3.5	0.012	ND	386
C1-MW1-04	C1-MW1-04		10/13/88	16:00		L00048	726.75	402	422	324.75	229.89	496.86	18.8	718	5.80	7	lt. y-brn	203	3.5	0.010	ND	412
C1-MW1-05	C1-MW1-05		10/13/88	18:00		L00048	726.75	470	490	256.75	229.89	496.86	18.6	724	7.27	-45	lt. y-br	174	3.0	0.015	0.006	412
C1-MW1-06			10/14/88		Sample not obtainable		726.75	502	522	224.75	230.15	496.60	19.5	607	7.13	105	mod. brown	53				
C1-MW1-07			10/14/88		Sample not obtainable		726.75	534	554	192.75	230.15	496.60										
B1-CW1	B1-CW1	Area 1(D)	10/07/88	11:00		L00040	645.58	590	600	55.58	157.74	487.84	20.7	515	8.40	-130	dark olive	130	4.9	0.096	0.010	268
B1-CW2	B1-CW2	Area 1(I)	10/06/88	15:00		L00039	645.52	250	260	395.52	155.15	490.37	19.3	815	7.31	-66	near clear	210	9.0	1.652	0.127	520
B1-CW2	B1-CW4	Area 1(I)	10/06/88	17:00	Dup of B1-CW2	L00039	645.52	250	260	395.52	155.15	490.37	19.3	815	7.31	-66	near clear	210	9.0	1.850	0.143	488
B1-CW3	B1-CW3	Area 1(S)	10/06/88	19:00		L00039	645.22	150	160	495.22	154.14	491.08	19.7	888	7.59	7	clear	60	5.0	5.570	1.540	574
A1	K0014	Area 2	10/05/88	13:00	Equipment Blank	L00035														ND	ND	ND
A1-CW1	A1-CW1	Area 2(D)	10/06/88	16:00		L00038	682.12	560	570	122.12	196.18	485.94	19.6	380	8.22	-50	v.lt green	202	7.9	ND	ND	220
A1-CW2	A1-CW2	Area 2(I)	10/06/88	21:30		L00038	682.18	350	360	332.18	189.41	492.77	18.8	574	7.70	-73	v.lt y-br	206	8.0	0.015	0.006	376
A1-CW3	A1-CW3	Area 2(S)	10/06/88		Sample not obtainable		682.30	175	195	507.30	188.70	493.60										
A1-CW3*	A1-CW3	Area 2(S)	10/22/88																	0.18	0.64	559
B6-CW1	B6-CW1	Area 3(D)	10/03/88	20:30		L00033	697.32	580	590	117.32	186.38	510.94	20.2	330	8.91	56	cloudy	130	3.2	1.303	0.236	300
B6-CW2	B6-CW2	Area 3(I)	10/03/88	13:00		L00033	697.29	330	340	367.29	198.10	499.19	20.1	835	7.29	-70	murky	180	8.0	0.165	0.121	556
B6-CW2	B6-CW12	Area 3(I)	09/30/88	15:00	Dup of B6-CW2	L00034	697.29	330	340	367.29	198.10	499.19	20.1	835	7.29	-70	murky	180	8.0	0.023	ND	572
B6-CW3	B6-CW3	Area 3(S)	10/03/88	10:00		L00033	697.22	195	215	502.22	199.20	498.02	20.0	855	7.19	160	v.lt cldy	160	4.3	7.380	0.199	563
B6	B6-CW10	Area 4	09/28/88	15:00	Equipment Blank	L00030														ND	ND	7
B6	B6-CW11	Area 4	09/28/88	16:50	Equipment Blank	L00030														ND	ND	27
B6-CW4	B6-CW4	Area 4(D)	09/29/88	10:00		L00031	722.65	510	520	212.65	219.99	502.66	22.1	855	8.17	-41	cloudy	100	4.0	ND	ND	496
B6-CW5	B6-CW5	Area 4(I)	09/28/88	18:00		L00030	722.85	345	355	377.85	220.60	502.25	20.4	847	7.09	-65	near clear	170	8.0	ND	ND	530
B6-CW6	B6-CW6	Area 4(S)	09/29/88	15:00		L00031	722.80	215	235	507.80	220.95	501.85	20.4	880	7.11	40	v.lt y-br	200	5.7	0.007	0.066	556
B6-CW7	K0012	Area 5(D)	10/04/88	18:00		L00035	724.44	492	502	232.44	226.02	498.42	19.8	509	10.10	-58	lt. green	245	9.4	ND	ND	218
B6-CW8	K0010	Area 5(I)	10/03/88	15:05		L00032	724.42	361	371	363.42	223.65	500.77	20.9	609	7.37	2	lt. y-brn	210	7.8	ND	ND	382
B6-CW9	K0011	Area 5(S)	10/04/88	10:50		L00032	724.37	242	262	482.37	222.78	501.59	20.4	742	7.34	136.	v.lt r-brn	268	5.2	0.142	0.030	353
B6-CW7	K0013	Area 5(D)	10/04/88	20:10	Dup.of K0012	L00035	724.42	492	502	232.42	226.02	498.40	19.8	509	10.10	-58	lt green	245	9.4	ND	ND	226

TABLE 3
SHEET 5 OF 5

LOCKHEED AERONAUTICAL SYSTEMS COMPANY - BURBANK FACILITIES. AUG-OCT 1988 SAMPLING DATA

Sample Location	Sample No.	Sample Area	Sample Date	Time	Comments	Chain of Custody No.	Ground Elev.	Screen Top Depth	Screen Bot. Depth	Top Screen Elev.	Ground-water Depth	Ground-water Elev.	Temp., Cent.	Sp. Cond. umhos	pH	Eh, mV	Sample Appearance	Tot. Dsch. gal	Well Vol. Purged	PCE mg/l	TCE mg/l	Total Dissolv. Solids mg/l
B5-CW1	B5-CW1	Area 6(D)	10/05/88	15:00		L00036	695.23	542	552	153.23	211.54	483.69	22.7	588	7.96	-49	olive	90	3.2	0.025	ND	300
B5-CW2	B5-CW2	Area 6(I)	10/05/88	10:00		L00036	695.06	339	349	356.06	204.11	490.95	19.3	574	7.47	-110	cloudy	230	9.0	0.042	0.012	284
B5-CW2	B5-CW4	Area 6(I)	10/05/88	18:00	Dup of B5-CW2	L00037	695.06	339	349	356.06	204.11	490.95	19.3	574	7.47	-110	cloudy	230	9.0			
B5-CW3	B5-CW3	Area 6(S)	10/04/88	19:00		L00036	694.89	209	229	485.89	203.50	491.39	18.8	969	7.33	179	near clear	205	4.0	0.136	0.087	576
C1	C1-CW3-01	Area 7	09/22/88	15:00	Equipment Blank	L00026														ND	ND	ND
C1-CW1	C1-CW1	Area 7(D)	09/23/88	16:00		L00027	737.19	481	511	256.19	240.18	497.01	17.8	593	7.90	-16	lt. brown	250	8.0	ND	ND	378
C1-CW2	C1-CW2	Area 7(I)	09/23/88	14:30		L00027	737.57	382	392	355.57	237.40	500.17	18.8	608	7.70	-48	near clear	270	9.0	ND	ND	370
C1-CW3	C1-CW3-02	Area 7(S)	09/22/88	18:00		L00026	737.79	260	280	477.79	237.79	500.00	18.6	692	7.37	101	near clear	220	4.5	ND	ND	426
C1-CW4	C1-CW4	Area 8(D)	09/27/88	13:30		L00029	718.18	652	662	66.18	231.20	486.98	19.8	634	7.23	-80	v.lt brown	235	11.4	0.006	ND	422
C1-CW5	C1-CW5	Area 8(I)	09/26/88	16:35		L00028	718.17	376	386	342.17	228.57	489.60	22.6	586	7.62	15	lt.y-brn	205	9.5	ND	ND	344
C1-CW6	C1-CW6	Area 8(S)	09/27/88	18:05		L00029	718.31	232	252	486.31	225.68	492.63	18.2	952	7.02	61	lt. brown	180	4.5	ND	0.008	614
C1-CW6	C1-CW7	Area 8(S)	09/27/88	10:20	Dup of C1-CW6	L00029	718.31	232	252	486.31	225.68	492.63	18.2	952	7.02	61	lt. brown	180	4.5	ND	0.006	607

Notes:

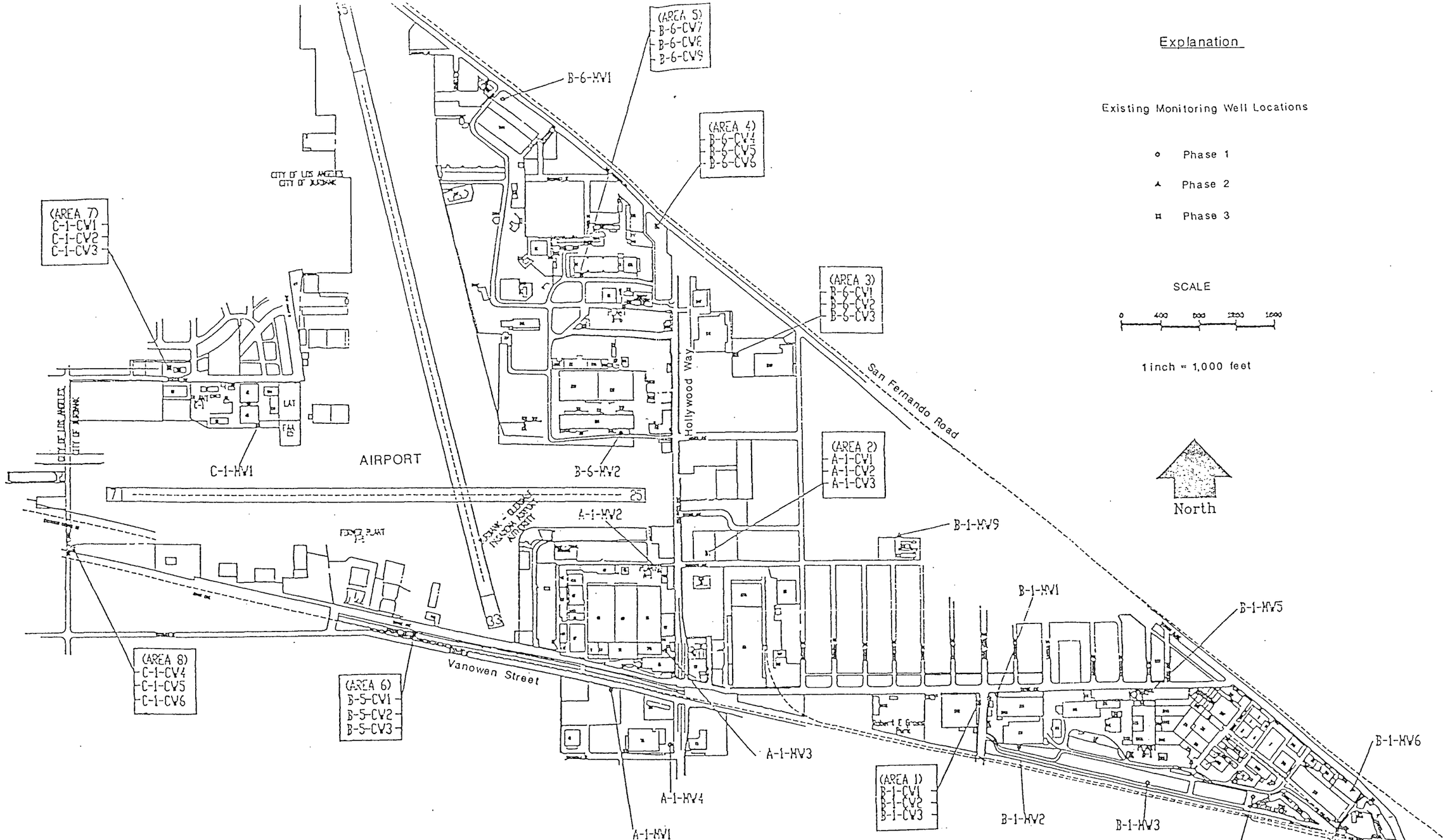
1. Dup = Duplicate sample. Duplicate samples were given false times for QA/QC purposes.
2. Sp. Cond. umhos = Specific conductivity in micromhos per centimeter
3. Eh, mV = Oxidation - reduction (redox) potential in millivolts
4. Tot. Dsch. gal = Total volume of water purged prior to sampling, in gallons
5. Well Vol. Purged = Approximate well volumes purged prior to sampling, representing total volume pumped divided by volume of water within casing and filter sand in the sample interval
6. PCE = Tetrachloroethene
7. TCE = Trichloroethene
8. mg/l = Milligrams per liter
9. ND = Not detected, detection limits for TCE AND PCE are 0.005 mg/l (using EPA Method 624)

* Sample A1-CW3 was collected by URS Consultants Inc. on October 22, 1988 as described in Appendix G of MARK Phase 2 sampling report.

Date 12-16-88

Approved By

Prepared By KJK



Drawing Reference: URS Consultants, Inc.

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

SITE PLAN AND WELL LOCATIONS
LASC
BURBANK, CALIFORNIA

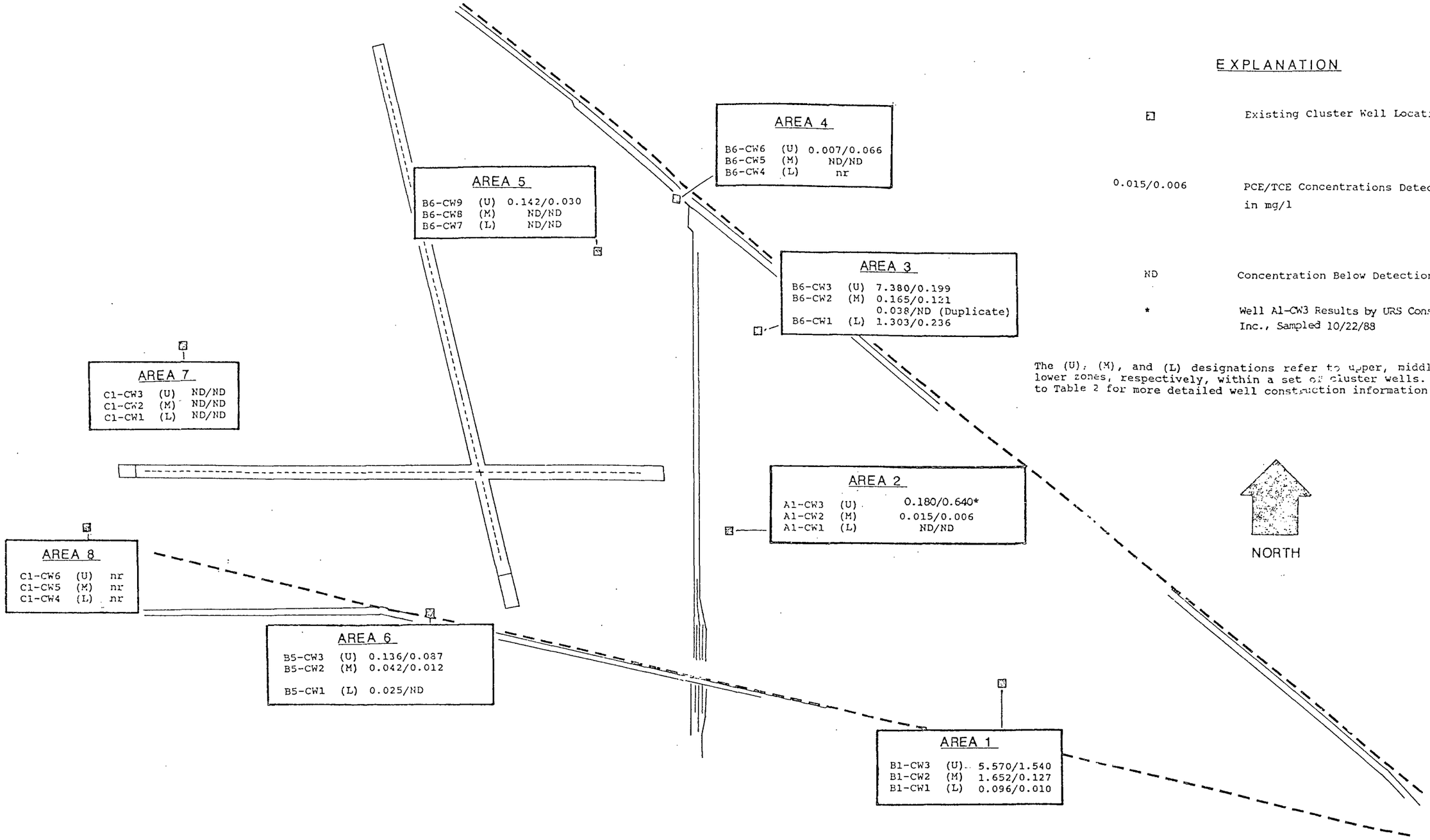
PROJECT NO.
88-03128.18

DRAWING NO.
1

Date

Approved By

Prepared By KJK



EXPLANATION

⊡	Existing Cluster Well Location
0.015/0.006	PCE/TCE Concentrations Detected, in mg/l
ND	Concentration Below Detection Limit
*	Well A1-CW3 Results by URS Consultants, Inc., Sampled 10/22/88

The (U), (M), and (L) designations refer to upper, middle, and lower zones, respectively, within a set of cluster wells. Refer to Table 2 for more detailed well construction information.

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

PCE/TCE DISTRIBUTION IN CLUSTER WELLS

LASC

BURBANK, CALIFORNIA

PROJECT NO.
88-03128.18

DRAWING NO.
2

APPENDIX A

SAMPLING PLAN

TABLE OF CONTENTS

Page

1.0 INTRODUCTION....1-1

2.0 PROJECT ORGANIZATION....2-1

3.0 FIELD EQUIPMENT CALIBRATION, OPERATION AND MAINTENANCE....3-1
3.1 General....3-2
3.2 Hydrostar (TM) Positive Displacement Piston Pump System....3-3
3.2.1 Technical Data....3-3
3.2.2 Pump System Installation and Operating Instructions....3-4
3.2.2.1 Pump System Assembly and Installation....3-5
3.2.2.2 Operating Instructions....3-6
3.2.2.3 Pump System Maintenance....3-7
3.3 YSI 3500 Water Quality Monitoring System....3-7
3.3.1 General....3-7
3.3.2 Technical Data....3-8
3.3.3 Operation, Calibration and Maintenance....3-10
3.3.3.1 Assembly of the Flow-Through System....3-10
3.3.3.2 Temperature Measurement....3-11
3.3.3.3 Conductivity Measurement....3-11
3.3.3.4 pH Measurement....3-14
3.3.3.5 Redox Potential Measurement....3-17
3.3.3.6 Sample Chamber Assembly....3-18
3.3.3.7 Water Quality Monitor....3-19
3.4 Water Level Meter....3-20
3.4.1 General....3-20
3.4.2 Operation....3-21
3.4.3 Maintenance and Calibration....3-21

4.0 GROUNDWATER SAMPLING PROTOCOL....4-1
4.1 General Procedures....4-1
4.2 Decontamination and Waste Management....4-1
4.2.1 General....4-1
4.2.2 Decontamination Area....4-2
4.2.3 Decontamination Procedures....4-3
4.2.4 Work Area Procedures....4-4
4.2.5 Waste Management....4-5
4.3 Water Levels....4-6
4.4 Purging....4-7
4.5 Sampling....4-8
4.5.1 Before - Sampling Activities....4-8
4.5.2 Sampling Procedures....4-8
4.5.2.1 Purge Organics (VOC)....4-9
4.5.2.2 Semi-Volatile Organics....4-9
4.5.2.3 Sulfides....4-10
4.5.2.4 Metals....4-10
4.6 Post Sampling....4-10

TABLE OF CONTENTS

5.0 QUALITY CONTROL PROCEDURES FOR FIELD ACTIVITY.....5-1
5.1 Water Level Measurements.....5-1
5.2 Field Parameters.....5-1
5.3 Sampling.....5-2
5.3.1 Field Equipment Blanks.....5-2
5.3.2 Travel Blanks.....5-3
5.3.3 Field Duplicate Samples.....5-4
5.4 Sample Handling, Packaging, and Shipping.....5-4
5.5 Sample Preservatives.....5-6
5.6 Chain of Custody.....5-6
5.6.1 Field Custody Procedures.....5-7
5.6.2 Transfer of Custody and Shipment.....5-7
5.6.3 Laboratory Custody Procedures.....5-8
5.6.4 Custody Seals.....5-8
5.6.5 Field Records.....5-9

6.0 ANALYTICAL LABORATORY REQUIREMENTS.....6.0

List of Tables

Table 4-1 Containers and Preservatives
Table 5-1 Summary of QA Sampling Planned

List of Drawings

Drawing 3-1 Hydrostar Positive Displacement Pump, Principles of Operation
Drawing 3-2 Hydrostar Pump Motor Assembly
Drawing 3-3 Completed Pump Motor Assembly Installation
Drawing 3-4 YSI Model 3560 Water Quality Monitoring System
Drawing 5-1 Typical Sample Label
Drawing 5-2 Sample Container Packaging
Drawing 5-3 Sample Container Packaging
Drawing 5-4 Sample Chain of Custody Record
Drawing 5-5 Typical Custody Seal

1.0 INTRODUCTION

This sampling plan has been prepared by The MARK Group Engineers and Geologists, Inc. to provide quality control/quality assurance guidelines during Phase 3 groundwater sampling at Lockheed Aeronautical Systems Company (LASC), Burbank, California.

Quality assurance is defined as the integrated program designed to assure reliability of monitoring and measurement data. Quality control is defined as the routine application of procedures for obtaining prescribed standards of performance in the monitoring and measurement process. Whether MARK Group staff or outside contractors are involved with monitoring, the protocols presented herein should be followed to assure the necessary precision, accuracy, completeness, and representativeness of the data.

Presented herein are the quality assurance and quality control for the collection of field data in a manner that will maximize data validity for monitoring purposes and also provide a data base that can be legally admissible as evidence. The information presented is additionally useful for training field sampling staff or for LASC to contract for outside services from environmental consultants.

This sampling protocol has been prepared for exclusive use by LASC for the sampling program at their Burbank facility. As such, this document contains proprietary data and should not be copied or used in any form without express written permission from LASC.

2.0 PROJECT ORGANIZATION AND MANAGEMENT

2.1 General Information

The purpose of the Sampling Plan is to provide the QA/QC guidelines and rules to be followed to optimize the accuracy, precision and reliability of the data. The success of the plan depends on the awareness and cooperation of each individual participating in the project.

Representatives of LASC and MARK share responsibility for assuring that the quality, QA/QC objectives and procedures presented in the plan are followed.

The chemical analytical laboratory for this project will be Associated Laboratories of Orange, California. The quality assurance officers from LASC and for the laboratory will be responsible for assuring that all samples are analyzed in accordance with approved and properly documented procedures.

2.2 MARK Project Management

Project Management with The MARK Group is coordinated among various individuals who are assigned specific project responsibilities commensurate with their experience and education. Key functional positions on the MARK Management Program include the Principal-in-Charge (PIC), Project Manager, Quality Control Officer (QCO), Health and Safety Officer (HSO), and Task Leader (TL). A description of the general responsibilities of each functional position follow.

2.2.1 Principal-in-Charge

On every project, a Principal of the firm is directly involved as the primary executive contact with the client. The PIC is responsible for insuring that contract obligations are met and that necessary resources are available for completion of these obligations. The PIC is ultimately responsible for the health and safety, quality control, and overall performance of the project team.

The PIC is an officer of the firm, registered with the appropriate discipline in the state in which the work was performed, and signs all proposals, major correspondence, reports, and contracts relating to the work.

2.2.2 Project Manager

The day-to-day efforts and budget expenditures of the project team are coordinated by the project manager in cooperation with the client's representative. Briefly, the PM has the responsibility to monitor and control the project scope, schedule, and costs and to advise the PIC and client where changes in the scope and (or) budget may occur. The PM prepares progress and status reports as necessary, conducts project progress and status reports as necessary, conducts project progress reviews and assists the client as needed. Requests for additional resources to complete the work are made by the PM to the PIC. The PM is usually the main technical representative of The MARK Group and the client during meetings with regulatory agencies.

2.2.3 Quality Control Officer

During the proposal stage, as the work progresses, and prior to the issuance of reports, the QCO reviews the objectives and respective scope of work for technical merit and completeness. The QCO is a senior officer of the firm who acts as an advisor to the PIC. The responsibilities of the QCO include developing and implementing chain-of-custody, field, and laboratory Quality Assurance/Quality Control (QA/QC) programs. Along with the PIC, the QCO insures that the work is completed in accordance with criteria derived from five sources: The Project Sampling Plan, MARK standard procedures, generally accepted engineering and geologic practice, standards of care required in the geographic area, and the limits prescribed by the client and mutually agreed to in writing.

2.2.4 Health and Safety Officer

The responsibility of the HSO is to develop, implement, and enforce the Standard Safety Operating Procedures (SSOP) in compliance with applicable state and federal regulations, our corporate Safety Plan, and the client's safety policies. The HSO is an officer of the firm. He works closely with the company's medical group, the Ridgecrest Medical Center, and reports directly to the Corporate Safety Officer (CSO). The HSO normally conducts safety inspections during field operations and "tailgate" safety meetings. However, for LASC Phase 3 groundwater sampling a site health and safety coordinator will be provided by URS Consultants, Inc. The URS personnel will be present throughout sampling to coordinate implementation of the site Health and Safety Plan that has been included in the LASC RFQ scope of work for the project.

2.2.5 Task Leader

A Task Leader is assigned to the project based on his respective expertise in a given discipline or level of experience. These project personnel report directly to the PM and are responsible for supervising subordinate staff and subcontractors and conducting the day-to-day work. These project workers are all professional with proven leadership abilities and specialized experience to accomplish the assigned tasks. Many are registered professionals within the states where the work is conducted.

2.3 Project Personnel and Responsibilities

2.3.1 Raymond L. Moresco, Principal-in-Charge

Raymond L. Moresco is a certified engineering geologist (C.E.G.) and the Principal-in-Charge for the LASC project. Mr. Moresco has over 27 years of responsible professional experience in almost every aspect of civil, geotechnical, environmental and waste management engineering. In addition to

being one of the leading hydrogeologists in California, Mr. Moresco has over 20 years of progressively more responsible experience in managing multi-million dollar projects. Over the past 10 years, he has contracted and overseen the execution of most aspects of investigation and cleanup activity related to environmental issues, ranging from air quality monitoring through toxicological risk assessments. Mr. Moresco has provided and orchestrated teams for subsurface and groundwater investigations and remediations for industrial plants, tanks farms, chemical drum storage areas, railroads, landfills, pits, ponds, and various Superfund sites. As the Director of MARK's Southern California Operations, Mr. Moresco has the responsibility for client interaction, regulatory liaison, fiscal project management, and technical performance of the Southern California staff.

2.3.2 Gary Halbert - Project Manager

Gary Halbert is a California certified engineering geologist with nearly nine years experience in geotechnical, environmental, and waste management engineering. Mr. Halbert will manage day-to-day control of the project. Within the last 6 years Mr. Halbert has worked almost exclusively managing environmental groundwater projects involving well design, aquifer analyses, monitoring, and sampling for chemical analysis, particularly organic compounds. Recent projects he has managed include hydrogeological assessment reports at refineries and a power plant, groundwater assessments for existing waste disposal landfills and feasibility studies and siting investigations for new landfills. Mr. Halbert has also managed numerous soil and groundwater investigations and remedial programs for leaky underground tanks.

2.3.3 Mr. David K. Rogers, Health and Safety and Quality Control Officer

David K. Rogers is a professional engineer (P.E.) and Certified Engineering Geologist with over 20 years experience. Mr. Rogers is a Principal of The MARK Group and serves as the corporate Health and Safety Officer and Quality Control officer for MARK's southern California operations. Mr. Rogers has prepared and reviewed numerous closure plans for evaporation ponds and landfills. He has developed and evaluated alternative remedial actions for cleanup of soils and landfills containing arsenic, metals, and various organic compounds for several sites bordering the San Francisco Bay Area in similar hydrogeologic environments. He has designed vacuum extraction systems to remove volatile constituents from the soil and is well-versed in the requirements for earthwork, excavation support (slurry walls, sheet piles, tie-backs), groundwater extraction and treatment.

Mr. Rogers has written and managed Health and Safety programs according to EPA guidelines for major environmental projects including Superfund sites.

2.3.4 Dani Renan, Task Leader

Mr. Dani Renan will be the task leader for the project. As task leader, he will be responsible for coordinating field activities and conducting the sampling program according to the sample plan. Mr. Renan has Bachelors Degrees in both geology and chemistry. He has five years of professional experience in a wide range of geological and engineering projects. His experience includes serving as project manager on health risk assessment and regulatory compliance projects. He has conducted site assessments, remedial investigations, and remedial actions for the California Department of Health Services and the TES IV contract for the EPA, which included both soils and groundwater investigations. He has served as Project Coordinator and Health & Safety

Officer for projects similar to LASC groundwater sampling, coordinated contract analytical laboratory services, and managed computer data management.

3.0 FIELD EQUIPMENT CALIBRATION, OPERATION AND MAINTENANCE

3.1 General

The equipment used in collecting field data will include a variety of instruments. Proper maintenance, calibration, and operation of each instrument is the responsibility of the MARK Group staff member assigned to the project. Whenever possible, duplicate or equivalent equipment and spare parts will be kept on hand to minimize downtime during sampling and purging activities. All instruments and equipment are to be maintained, calibrated, and operated according to the manufacturer's guidelines and recommendations. At a minimum, all instruments should be inspected and calibrated upon receipt. In the event that the instrument is not supplied with manufacturer's recommendations for calibration and calibration frequencies, the following guidelines apply:

- All equipment should be calibrated prior to a field program. This includes instruments used to measure water quality parameters, water levels, and well discharge rates.
- Instruments for which calibration cannot be easily checked should be either tested against another calibrated instrument of a similar type, or returned to the manufacturer for appropriate calibration. If tested against another instrument capable of making the same measurements, variation between instruments must not exceed 5%. If readings vary more than 5%, the instrument should be returned to the manufacturer for calibration.
- Instruments that require frequent calibration checks, such as pH meters, will be calibrated daily during use and after maintenance and repair.

A routine schedule and record of instrument calibration should be maintained throughout the duration of the study. A calibration manual for a pH meter might include:

- The date and name of the person(s) performing the calibration.
- The temperature(s) of buffers used for calibrating.
- Results of calibration checks with each buffer used for calibration.

Well water flows through a closed pump discharge system into the flow-through sample chamber. Thus, measurements of water quality parameters are made on well water which has not contacted the atmosphere. The water quality monitor contains three digital meters which use 3 1/2 digit 1/2-inch high LCD's, for easy reading. The instrument is housed in a molded plastic case.

Instrument sensors are housed in a flow-through sample chamber made of clear styrene for easy observation of the well water being sampled. The sample chamber is easily removed from the sensor mounting plate for calibration of the sensors and for cleaning.

Sensors available for use in the Water Quality Monitoring System include:

1. Flow-through conductivity cell. Well water enters the sample chamber through this probe, which measures conductivity or temperature-compensated conductivity;

2. pH electrode, which measures pH or temperature-compensated pH;

3. Redox (Eh) electrode, platinum, with a silver/silver chloride reference electrode in the same body, for measuring oxidation-reduction potential;

4. Temperature probe. Measures water temperature and provides automatic temperature compensation for conductivity and pH measurements.

3.3.2 Technical Data

The manufacturer makes the following statements about the YSI 3560 Water Quality Monitoring System.

Temperature

Range:	-5.0 to +50.0°C
Accuracy:	±0.4°C
Response Time:	95% of reading in 10 seconds

Conductivity & Temperature-Compensated Conductivity (automatically compensated to 25°C with a 2%/°C coefficient)

Ranges:	0.00 to 2.00 mmhos/cm 0.00 to 20.00 mmhos/cm 0.00 to 100.00 mmhos/cm
Accuracy at 25°C:	± 3% of full scale from 0 to 2.00 mmhos/cm and from 0 to 20.00 mmhos/cm; ± 6% of full scale between 0.0 and 50.0 mmhos/cm. Accuracy of ± 6% of full scale can be achieved from 50.0 to 100.0 mmhos/cm by platinizing the cell.
Response Time:	95% of reading in 10 seconds

pH and Temperature-compensated pH

Range:	0.00 to 14.00 pH
Accuracy:	Subject to calibration using available pH buffer solutions in measurement range
Response Time:	95% of reading in 10 seconds
Temperature Compensation:	0 to 50°C (manual) -5 to +50°C (automatic)
Operating Temperature:	-5 to +50°C

Oxidation Reduction Potential (Eh)

Range:	-1500 to +1500 mV
Accuracy:	±2% of reading plus 1 count
Response Time:	95% of reading in 10 seconds
Operating Temperature:	-5 to +50°C

Instrument

Ambient Temperature:	-20 to +50°C
Humidity:	10 to 90% relative humidity, non-condensing at 25°C
Shock and Vibration:	MIL-T-28800-C, Class 3, Style A

3.3.3.2 Temperature Measurement

The YSI 3510 Temperature Probe may be used as either a temperature/ATC conductivity probe or as a pH/ATC probe when attached to the corresponding input jack on the monitor. It is usable over a temperature range of -5 to 50°C with an accuracy of ±0.2°C. The polyurethane cable is terminated at one end with a watertight MS connector. The YSI Thermilinear Thermistor is mounted in a stainless steel sheath.

To measure temperature, connect a temperature probe to the monitor. Temperature is measured in °C and is shown continuously on the top display.

The temperature probe requires very little maintenance in normal use. The stainless steel sheath and polyurethane cable may be cleaned with a mild soap and water solution. A solution of 50% isopropyl alcohol and 50% water may be used to remove stains and mineral deposits. The probe should be stored dry in its own shipping container and kept in a dry location.

Under normal usage, the temperature probe will not need re-calibration. If the unit has been accidentally damaged, it must be returned to the manufacturer for re-calibration.

The temperature probe may be tested using an ohmmeter. With the sheath of the probe submerged in a 0.0±1°C ice bath, thermistor resistance can be compared to the values listed by the manufacturer in the instruction manual.

3.3.3.3 Conductivity Measurement

The YSI Water Quality Monitoring System is equipped with a Model 3520 Flow-Through Conductivity Cell, an integral conductivity cell of rigid and durable chlorinated polyvinyl chloride (CPVC). A polyurethane jacketed cable is attached

to the cell body with a bend relief and a watertight MS type connector terminates the cable.

Two electrodes are used in the cell to measure conductivity. The cell response time is 10 seconds for 95% reading of conductivity changes, and accurate measurements can be made with a flow rate of up to 1.5 gpm.

Before using the conductivity cell, it should be soaked in distilled or deionized water for at least one hour. To make conductivity measurements, connect the conductivity cell to the monitor. A function switch controls each of the three ranges of conductivity and automatically temperature-compensated conductivity as indicated on the middle display. Set the conductivity function switch to 2 and observe the displayed value after the reading is stable. The display is read in millimhos/centimeter (mmhos/cm). If the overrange signal (1.___) is displayed, the conductivity of the sample is greater than 1.999 mmhos/cm. Reset the function switch to 20. If the overrange signal is displayed, reset to 100. If the overrange signal is still displayed, either the conductivity is greater than 100.0 mmhos/cm and the YSI 3560 cannot be used for conductivity determinations, or else there is a system error.

To measure automatically temperature-compensated conductivity, both a YSI 3510 Temperature Probe and a YSI 3520 Flow-Through Conductivity Cell must be connected to the monitor. Set the conductivity function switch to the correct ATC conductivity range. Readings are automatically compensated by 2%/°C to 25°C. The temperature probe must be located in the sample under test for the automatic compensation to work correctly. If no temperature probe is connected to the monitor, the display will show the overrange signal (1.___).

The stainless steel electrodes of the 3520 do not require platinization when used between 0.0 and 50.0 mmhos/cm. When conductivity values from 50.0 to

The slope control on the YSI 3500 will allow a pH electrode with an 80% to 100% efficiency to be calibrated to the slope adjustment value. If this cannot be set, the electrode is probably below an 80% efficiency value and requires cleaning or reconditioning according to manufacturer's recommendations.

pH measurements are not absolute measurements. For this reason, calibration with buffer solutions of known pH values, traceable to the National Bureau of Standards (NBS) is necessary. For two-point calibration, the first fixed point should always be at pH = 7.00. If the range of pH values to be measured is known, it is recommended that the second fixed point should be chosen so that the fixed points bracket pH values to be measured.

The generally recognized fixed points for the conventional pH scale are the standard pH values published by the National Bureau of Standards (see R.G. Bates, "Revised Standards Values for pH Measurements 0 to 95°C", Journal of Research of the NBS, Vol. 66A (1962), No. 2, p. 179-184). From these, buffer solutions for technical use have been derived which are characterized by a high buffering capacity and low dilution effect. Commercial buffer solutions are supplied with data concerning pH values of these buffer solutions at different temperatures.

Buffer solutions ready for use have a shelf life of a few months when kept in well-stoppered containers. In no circumstances should buffer solutions be poured back into the storage bottles. Fresh solution should be used for calibration every day. Buffer solutions should be regarded as expendable material.

The frequency at which calibration is needed depends upon the electrode, the pH monitor, and the characteristics of the water to which the electrode is

5. Rinse the sensors with distilled or deionized water, followed by a rinse with a small amount of Zobell Solution.

6. Half-fill a 50 ml sample cup with Zobell solution and fully immerse the bulb of the ORP electrode assembly and the end of the sheath of the temperature probe.

7. Allow the sensors to equilibrate and note the reading.

8. The displayed mV value is not temperature compensated and should be corrected to 25°C at 1.3 mV/°C. The temperature coefficient is inversely proportional to the temperature. The calculated value for the Zobell solution standard should be 231 ±10 mV at 25°C, confirming that the ORP system is functioning properly.

9. Rinse the sensors with deionized or distilled water and discard the used Zobell solution.

NOTE: If the ORP electrode assembly and another potentiometric sensor such as the pH electrode assembly are to be installed at the same time into the sample chamber, and if both have their own reference electrodes, both reference electrodes must be immersed in the reference solution during calibration.

The ORP electrode assembly should be periodically inspected for coating of the platinum surface, which can cause erroneous readings. The bulb guard of the electrode can be removed to expose the platinum for cleaning. The need for cleaning can be determined by calibration of the electrode. Refer to manufacturer's recommendations for cleaning procedures.

3.3.3.6 Sample Chamber Assembly

The sample chamber assembly is designed to be attached to a pump outlet but can be used equally well as a non-flowing sample chamber. It is designed to hold up to five sensors and to provide inlet and outlet ports for fluid movement through the chamber. The sample chamber holds approximately one liter. and provides good mixing of fluids so residual sample will not be a problem. The clear acrylic chamber sides permit observation of fluid flow.

Gaskets prevent fluid leakage from around the sensor mounting plate and base plate, while o-rings in each of the sensor ports provide excellent seals. The location of each sensor is permanently marked on the sensor mounting plate.

The sample chamber assembly comes apart easily. The o-ring seals in the ports, and the chamber gaskets should be inspected periodically and replaced as needed. Refer to manufacturer's recommendations for installation of seals and gaskets.

The chamber parts and associated fittings should be cleaned periodically with a mild soap solution or with isopropyl alcohol for tough stains. Rinse thoroughly with distilled or deionized water to remove any residues which might cause interference with measurements.

3.3.3.7 Water Quality Monitor

The YSI 3500 Water Quality Monitor allows the user to visually monitor three parameters simultaneously by means of three LCD displays. The monitor is housed in a molded ABS plastic case which has been tested to military specifications for shock and vibration.

An on/off switch controls power to the instrument. A second function switch controls each of the three ranges of conductivity and temperature compensated conductivity, as indicated on the middle display. When a temperature probe is attached, temperature is read out constantly in °C on the top display. A third function switch controls the bottom display which shows manually temperature compensated pH, automatically temperature compensated pH or a millivolt function designed to work with optional electrodes such as the YSI 3540 ORP electrode assembly.

The monitor is powered by six alkaline D cells which will power it for a minimum of 1400 hours. Need for battery replacement is indicated by BAT shown

on any of the displays. It is important to replace all the alkaline batteries at the same time for long life between battery changes.

To replace batteries remove the four rubber feet located on the back of the instrument and take off the back. Replace the batteries in the battery holder tubes, making sure the polarity is correct. Reassemble the case, being careful to align the gasket correctly to prevent water infiltration. The rubber feet should be reinstalled finger tight.

Clean the instrument as needed with a mild soap and water solution followed by a clean water wipe. Either a probe or connection cap should be in place over every jack to keep water out. If water gets into the instrument, disassemble it and wipe it dry.

When storing the monitor for long periods, remove the batteries to lessen the possibility of leakage.

3.4 Water Level Meter

3.4.1 General

A Solinst Flat Tape Water Level Meter will be used to determine the depth of the static water level in groundwater wells. It will also be used during purging of groundwater wells to measure changes in water level, if any, which occur during pumping of wells.

The meter operates by sensing the resistivity change that occurs when the probe is submerged in water. When this resistance change is detected, a high-pitched tone sounds. If the probe is moved back into the air, the tone ceases. The meter is powered by a 9-volt transistor battery and will operate for one year under normal use and conditions without needing replacement.

4.2.4 Work Area Procedures

A spill containment area will be established at each sampling area. A new, clean 6 mil PVC plastic sheeting will be placed on the ground in each area, immediately surrounding the monitoring well. A 20 foot x 20 foot square of plastic will generally be adequate to cover the well area and the area upon which the pipe is placed. The sides of the spill control area will be raised by placing 2 x 4 boards under the edges of the plastic sheeting. This will provide containment in the event of accidental leaks, spills, or splashing of groundwater.

Care during purging and sampling operations should minimize the likelihood of spilling or splashing purged fluids. If spills occur on the plastic sheeting, they should be contained on the plastic and wiped with an absorbent material as soon as reasonably possible after spillage. All used absorbent material and used plastic sheeting shall be treated as contaminated waste and disposed of as described in the following section.

Disposable latex gloves will be used by all personnel involved in sampling of groundwater and handling of sampling equipment.

Waste containment bags will be maintained in the sampling area. One bag will contain potentially hazardous materials, i.e. any material that comes into contact with groundwater. A second bag will contain non-hazardous waste materials, i.e. paper towels used for washing hands, scrap paper, etc. This bag will be disposed of as regular trash. The bag holding potentially hazardous waste will be disposed of as described in the following section.

The guidelines and procedures set forth in the Site Health and Safety Plan for LASC Phase 3 groundwater sampling (provided in the RFP Scope of Work) shall

be followed at all times. Emergency procedures for situations such as personal injury or spillage of contaminated materials are covered in detail in the Health and Safety Plan.

The On-Site Health and Safety Coordinator (URS) will be primarily responsible for the health and safety aspects of sampling, including monitoring air quality in the sampling area, and establishing and coordination emergency procedures for situations such as personal injury or spillage of contaminated materials.

Sampling team personnel will have on hand personal protection equipment including respirator, protective clothing, gloves, and eye protection. Eye protection and gloves will be worn by all sampling team personnel during purging and sampling activities. Need for additional protective clothing and/or equipment will be determined by the On-Site Health and Safety Coordinator.

4.2.5 Waste Management

Water discharged during well purging and sampling will be discharged into a mobile holding tank (Baker Tank) or other suitable storage container. After completion of purging and sampling, the holding tank will be transported to the staging area and its contents pumped into a large holding tank (Baker Tank). Closed containers for liquid waste shall be filled to no greater than 95% capacity to allow for temperature-related expansion of liquid materials.

An open 55-gallon metal DOT drum will be used during filling of sample containers to contain waste water discharged. Immediately after sampling, this water will be transferred to the on-site holding tank.

Solid, potentially hazardous waste will be transported to the decontamination/staging area where it will be stored in sealed, 55-gallon metal DOT drums.

All potentially hazardous water collected during purging and sampling activities will be transferred to one or more 21,000-gallon holding tanks (Baker Tanks) to be located adjacent to the decontamination area for disposal by LASC.

All containers of potentially hazardous materials generated by purging and sampling activities will be labeled according to federal, state and local regulations. These materials remain the property of LASC, who will retain responsibility for proper disposal.

4.3 Water Levels

Water levels are to be recorded in a field notebook or on a preprinted form. Specific procedures follow:

1. Record the pertinent heading information, if necessary.
2. For each well, record the time and ambient weather data.
3. Unlock the well cover and prepare to measure water levels with an electronic water level meter (sounder).
4. Note the location of the reference notch or marking on the top of the steel casing, if any.
5. Switch on the electronic sounder and lower the probe into the well until the high-pitched tone is heard. Repeatedly raise and lower the sounder tape until a constant reading is obtained.
6. Hold the sounder tape as close as possible to the notch or marking on the top of the steel casing and record the distance from the top of the steel casing to the water.
7. Repeat the procedure to check for error. Switch off the sounder and withdraw the sounder tape, but do not rewind the portion that was in the well.
8. Record the data on the form.

The containers needed for sampling and preservatives are listed in Table 4-1. Once opened, a container must be used at once for storage of a particular sample. Unused but opened containers are to be considered contaminated and must be discarded. Because of the potential for introduction of contamination they cannot be reclosed and saved for later use. Likewise, any unused containers which appear contaminated upon receipt, or which are found to have loose caps or missing teflon liners (if required for that container) should be discarded or returned, unused, to Associated Laboratories. The following specific guidelines for filling water sample containers are given. Specific analyses to be performed on samples provided by MARK will be specified by LASC to Associated Laboratories.

4.5.2.1 Purgeable Organics (VOC)

- Samples for VOC's are collected in triplicate 40-ml glass vials equipped with teflon-backed septum screw caps which have been prepared as specified in Table 4-1.
- The sample vial should be rinsed three times with sample water to ensure that possible contaminants in the sample vial are removed.
- When sampling for volatiles, the 40-ml sample vials should have no headspace or bubbles. Aeration or agitation of the sample should be avoided to the greatest possible extent. To avoid aeration, the glass vial should be held at an angle so that the stream of water flows down the side. Fill the vial until it overflows to eliminate any air bubbles and replace the teflon-lined cap.
- Turn the vial upside-down and tap it to check for air bubbles. If any air bubbles are observed, empty and refill the vial and check for air bubbles again. Repeat this procedure until an acceptable sample is obtained.
- The sample should be labeled, packaged and placed immediately into iced sample containers.

4.5.2.2 Semi-Volatile Organics

- Water samples for semi-volatile organics will be collected in duplicate one-liter amber glass bottles with teflon lined caps which have been supplied by the contract laboratory, as specified in Table 4-1.

- The sample bottles should be rinsed with sample water a minimum of three times to remove possible contaminants.

- The sample bottle is filled, capped, labeled and placed into iced sample containers.

4.5.2.3 Sulfide

- Samples are collected in prepared 500-ml polyethylene bottles, containing zinc acetate as a preservative, which have been prepared by Associated Laboratories, as specified in Table 4-1. Bottles will be supplied by the laboratory with labels indicating the preservative used.

- The sample bottle must not be rinsed before collecting the sample. It should not be overfilled, or preservative may be lost.

4.5.2.4 Dissolved Metals

- Water samples for dissolved metals analyses are collected in 250-ml polyethylene bottles with polyethylene caps, containing nitric acid as a preservative, which have been prepared by Associated Laboratories, as specified in Table 4-1. Bottles will be supplied by the laboratory with labels indicating the preservative used.

- The samples are filtered in the field using a disposable vacuum filter containing a 0.45 micron membrane filter component.

- pH of the samples is checked before capping with narrow-range pH paper. A small amount of sample is withdrawn from the sample bottle with a disposable glass pipette and applied to the pH paper. If pH reads greater than 2, small quantities of nitric acid are to be added until the pH is below or equal to 2. Never dip pH paper into the sample container.

4.6 Post Sampling

Post sampling procedures should include completion of all field forms, labels and chain-of-custody documents. All sampling equipment to be used at other sites should be decontaminated. The sampling site should be cleaned and the wells covered and locked before leaving the vicinity.

5.0 QUALITY CONTROL PROCEDURES FOR FIELD ACTIVITY

5.1 Water Level Measurements

Water level measurements will be obtained by utilizing an electric water level meter prior to obtaining measurements. Field personnel should check to see that the instrument has been properly calibrated.

At each location, the water level measurement will be determined by the experienced sampling team member and recorded on the appropriate field data form. Data should be recorded to the nearest 0.01 feet.

Data should be compared to previous measurements at the well. If large discrepancies exist from previous measurements which cannot be explained by local groundwater activities, changes, or trends, the equipment should be re-calibrated and the measurements repeated. If possible, an alternative instrument should be utilized to verify the accuracy of the data.

5.2 Field Parameters

Temperature, pH, specific conductivity, and redox potential will be measured in a flow-through sample chamber in line with well water discharged from the pump. Field parameter readings will be taken using calibrated instruments as noted in Section 3.3. Calibration of components of the water quality monitoring system will be recorded on the appropriate field data form or in the field notebook.

Measurements of temperature, pH, specific conductivity and redox potential will be performed during each well water purging and sampling event. Prior to obtaining measurements, a sampling team member should check to see that the instrument is properly calibrated. For pH and specific conductivity, reference

solutions should be utilized to properly calibrate the instrument. All reference solutions should be traceable to the National Bureau of Standards (NBS).

When obtaining data for water quality parameters, field measurements should be compared with previous data and examined for large variations. If variations greater than 10% exist and cannot be accounted for by changes in field conditions and/or water quality stabilization, the instrument should be recalibrated and the measurements repeated. The most accurate measurement will be determined by the experienced sampling team member and recorded in the field notebook or on the appropriate field data form. If possible, an alternative measuring device (i.e. another thermometer, pH meter, or specific conductivity meter) should be utilized to verify the data.

5.3 Sampling

The sampling quality control methods are implemented by the use of trip blanks, field equipment blanks and duplicate samples, although blanks and duplicates also provide checks on laboratory procedures.

A summary of field QA samples to be prepared for analysis is presented in Table 5.1.

5.3.1 Field Equipment Blanks

Field equipment blanks will be prepared according to the schedule in Table 5.1. Field equipment blanks are intended to check several variables:

- Possible contaminants in the sample containers provided;
- Possible contaminants in the ASTM Type II reagent grade water (DI water) being used to rinse equipment;
- Possible contaminants from ambient conditions in the field during sampling;
- Possible contaminants from inadequately decontaminated equipment;

- Possible contaminants introduced by the laboratory once the samples arrive at the laboratory.

Therefore, field equipment blanks will not be labeled as such. The laboratory shall not be told which samples are field equipment blanks.

Field equipment blanks will be prepared at the sampling site, after equipment has been decontaminated and rinsed with DI water, but before equipment has been installed in the well. ASTM Type II Water, provided by Associated Laboratories, will be poured through the pump and a randomly selected 10-foot length of discharge pipe. A complete set of samples will be prepared, according to procedures used for obtaining and preparing groundwater samples, as described in Section 3.5. Field equipment blank samples will be stored and transported to the contract laboratory according to procedures used for groundwater samples.

5.3.2 Trip Blanks

Trip blanks will be prepared according to the schedule in Table 5.1 The trip blank is intended to check several variables:

- Possible contaminants in the sample containers provided;
- Possible contaminants in the ASTM Type II reagent grade water (DI Water) being supplied by Associated Laboratories;
- Possible contaminants from handling and transit of sample containers;
- Possible contaminants introduced by the laboratory once the samples arrive at the laboratory.

Trip blanks are prepared by Associated Laboratories, using organic-free ASTM Type II Water and containers provided by the laboratory. They are sorted alongside the collected samples and transported to Associated Laboratories for analyses.

5.3.3 Field Duplicate Samples

Field duplicate samples will be collected according to the Schedule in Table 5.1. Duplicate samples will be collected in the same manner as the groundwater samples. This procedure will involve the collection of a second, distinct sample immediately after the routine groundwater sample is collected. Two sets of filtering will be needed to fill the sample bottles for dissolved metals analyses.

Duplicate samples will not be labeled as such. They will be assigned an identification number which will not identify the sample as a field duplicate sample. The laboratory shall not be told which samples are duplicate samples.

5.4 Sample Handling, Packaging, and Shipping

It is assumed that samples collected may contain either below detection or trace levels of constituents; therefore it is essential to avoid the possibility of incorrect sampling or shipping procedures that could result in false positive results.

Table 4-1 summarizes container types and container preparation for the compounds of interest relative to the LASC groundwater sampling program. Sample container preparation and sample transport is the responsibility of Associated Laboratories. MARK field personnel are responsible for correct sample collection and sample handling (logging in, packaging, storage prior to transport to the analytical laboratory, custody procedures, etc.)

The following guidelines apply to sample handling, packaging and shipping activities:

- Field sampling staff should read and fully understand the monitoring requirements in Table 4-1 to ensure that the correct analytes are identified and that sufficient sample containers, properly prepared and in sufficient numbers, are available.

5.5 Sample Preservatives

Sample preservatives and other comments on special handling are specified in Table 4-1. MARK staff responsible for sampling will instruct Associated Laboratories to provide necessary containers, cleaned and containing preservatives, as indicated in Table 4-1. Reagent grade preservatives shall be used in all cases. Field personnel must be familiar with preservation requirements to ensure that preservatives are not inadvertently discarded when containers are filled, and must recognize the presence of acids and other chemicals in certain containers.

5.6 Chain of Custody

Sample identification documents must be carefully prepared so that identification and chain of custody can be maintained, and sample disposition can be controlled. Samples collected during a site investigation must be traceable from the time the samples are collected until their derived data are used in the final report. The sample identification documents, described more fully in a subsequent section, are listed here:

- Chain of Custody Records. See Figure 5-4. Chain of Custody Records will be serially numbered;
- Custody seals. See Figure 5-5;
- Field notebooks.

The sampler must fill out adhesive sample labels (described in the section on sample packaging) and secure them to the sample container. Forms and labels are filled out with waterproof ink. Where necessary, the label is protected from water and solvents with clear label protection tape.

To document sample possession, chain of custody procedures are followed. These procedures are outlined in the sections that follow.

5.6.3 Laboratory Custody Procedures

A designated sample custodian accepts custody of the transported samples and verifies that the information on the Sample Identification number matches that on the Chain of Custody Records. Pertinent information as to shipment, pickup, and courier is entered in the "Remarks" section.

The laboratory custodian uses the Sample Identification number and assigns a unique laboratory number to each sample and ensures that all samples are transferred to the proper analyst or stored in the appropriate secure area.

The custodian distributes samples to the appropriate analysts. Laboratory personnel are responsible for the care and custody of samples from the time they are received until the sample is exhausted, no longer suitable for analysis, or otherwise directed by LASC.

When sample analyses have been completed, the unused portion of the sample must be disposed of properly. The laboratory retains all identifying tags, data sheets, and laboratory records as part of the permanent documentation and appropriately disposes of sample containers and remaining sample material.

5.6.4 Custody Seals

When samples are transported to the laboratory, they must be placed in containers sealed with custody seals that make it possible to detect any tampering with the samples. An example of a custody seal is shown in Drawing 5-5.

Two seals must be placed on each shipping container (cooler), one at the front and one at the back, to allow the recipient of the container to make determination as to whether or not the container has been opened. If the shipping container is hinged at the back, one seal may be used at the front.

5.6.5 Field Records

The sampling team leader should maintain sample identification numbers and Chain of Custody Records, Water Purging & Sampling Logs, pH Meter Calibration Logs, Conductivity Meter Calibration Logs, and daily activity records, to provide a daily record of significant events, observations, and measurements during field investigations. Sampling team members should be familiar with the required documentation before any field work is initiated. An example of a Water Purging & Sampling Log pH Meter Calibration Log, and a Conductivity Meter Calibration Log are provided at the end of this text. These documents will contain information such as personnel present, site conditions, sampling procedures, measurement procedures and calibration records. Field measurements will be recorded on the appropriate forms. Data forms should be signed and dated by the sampler and the reviewer.

Entries to field records should be made in waterproof ink. If weather conditions do not permit the use of waterproof ink, pencil may be used, and a notation made in the field notebook explaining conditions which prevented use of normal procedures.

Errors should be corrected by crossing a single line through the error. Initial and date the change.

The field notebook should be a bound notebook with water resistant, sequentially numbered pages. Numbers may be printed or handwritten. All entries in the field notebook should be signed and dated. The field notebooks and data forms should be kept as permanent records. All field records should be maintained in a secure manner.

6.0 ANALYTICAL LABORATORY REQUIREMENTS

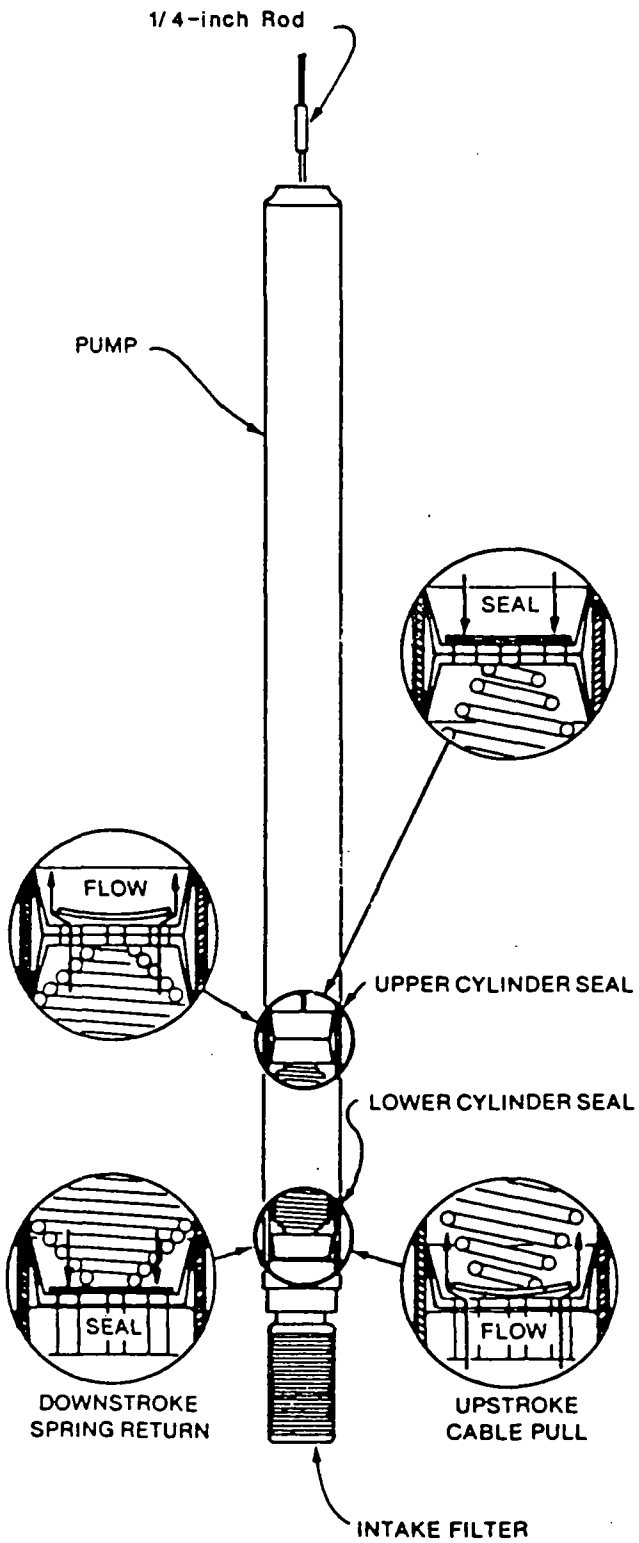
In general, the laboratory should adhere to those recommendations as promulgated in 21 CFR Part 58, "Good Laboratory Practices" and criteria described in "Methods for Chemical Analyses of Water and Wastes", March, 1983 (EPA-600/4-79-020). The requirements of this section (Analytical laboratory Requirements) form the basis for the analytical services provided by Associated Laboratories of Orange, California under contract to LASC. All laboratory analytical services are the responsibility of Associated Laboratories, under contract to LASC.

TABLE 4-1 CONTAINERS AND PRESERVATIVES

Parameter	Container/Preparation	Preservative	Holding Time
Temperature pH Specific Conductance Redox Potential	Determined in Field	-	-
VOC (EPA Method 624)	Three 40-ml VOA Vials with teflon-lined septa. Vial and septum washed with phospate-free detergent and twice rinsed with organic-free water. Dried one hour at 105°C.	4°C No headspace	7 days
Semi-Volatile Organics (EPA Method 625)	Two one-liter amber glass bottles + caps with teflon lining	4°C	7 days
Water Quality Parameters (Anions)	One 5000 ml polyethylene bottle + cap	4°C	48 hours
Sulfides	One 500 ml polyethylene bottle & cap	4°C Zinc Acetate	7 days
Metals	One 125 ml polyethylene bottle + cap	4°C HNO_3 to pH < 2 Filtered in field	6 months

TABLE 5-1
SUMMARY OF QA SAMPLING PLANNED

Monitoring Well(s)	Number of Screened Intervals	Type of Q/A Sample Planned
A1-MW1	6	Equipment Blank
A1-MW2	5	Equipment Blank
A1-MW3	7	Duplicate (Shallow Zone)
A1-MW4	14	Equipment Blank/Duplicate (Intermediate Zone)
B1-MW1	6	Duplicate (Intermediate Zone)
B1-MW2	6	Duplicate (Shallow Zone)
B1-MW3	6	Equipment Blank
B1-MW4	5	Duplicate (Intermediate Zone)
B1-MW5	6	Equipment Blank
B1-MW6	5	None
B1-MW7	6	Trip Blank
B1-MW8	6	Equipment Bank
B1-MW9	6	Trip Blank
B6-MW1	7	Equipment Blank
C1-MW1	7	Duplicate (Deep Zone)
Area 1 (Cluster Wells)	3	Duplicate (Intermediate Zone)
Area 2 (Cluster Wells)	3	Equipment Blank
Area 3 (Cluster Wells)	3	Duplicate (Intermediate Zone)
Area 4 (Cluster Wells)	3	Equipment Blank
Area 5 (Cluster Wells)	3	Trip Blank
Area 6 (Cluster Wells)	3	Duplicate (Deep Zone)
Area 7 (Cluster Wells)	3	Equipment Blank
Area 8 (Cluster Wells)	3	Duplicate (Shallow Zone)



HYDROSTAR POSITIVE DISPLACEMENT PUMP, PRINCIPLES OF OPERATION

Prepared By _____ Approved By _____ Date _____

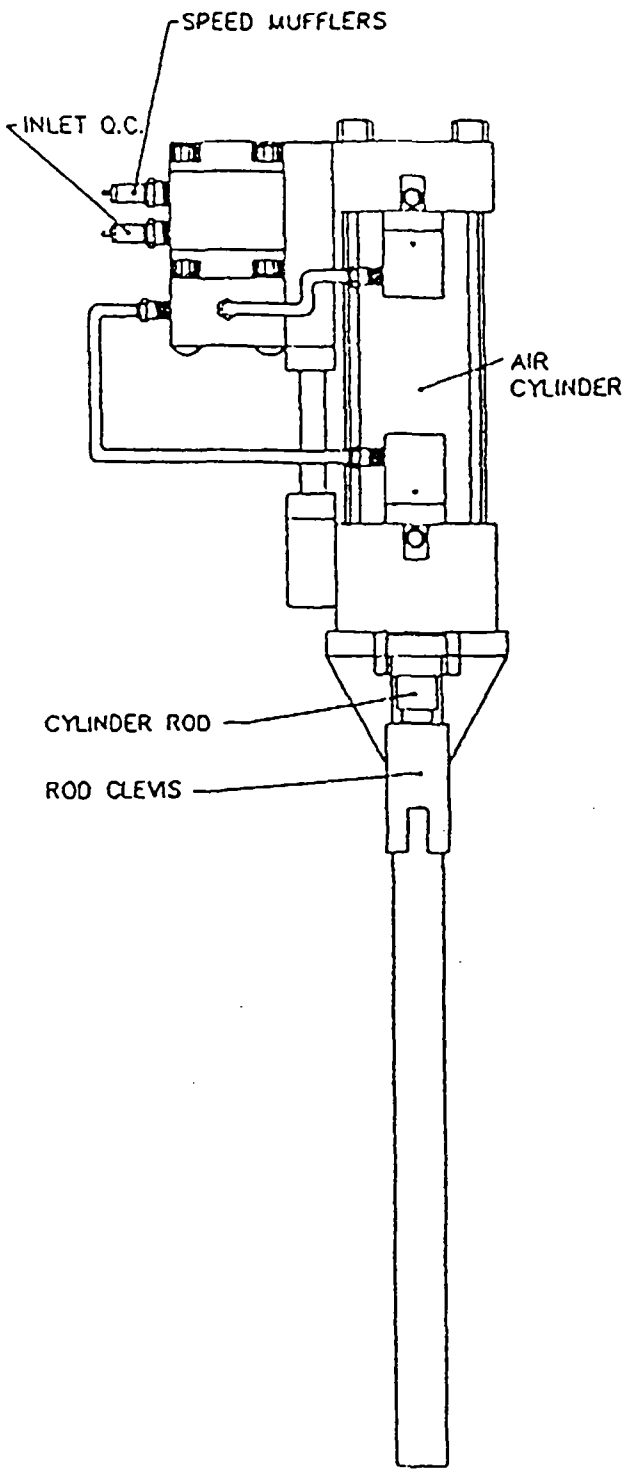
THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

SAMPLING PROTOCOL

LASC
BURBANK, CALIFORNIA

PROJECT NO.
88-03128.18

DRAWING NO.
3-1



Prepared By KJK Approved By Date

HYDROSTAR PUMP MOTOR ASSEMBLY

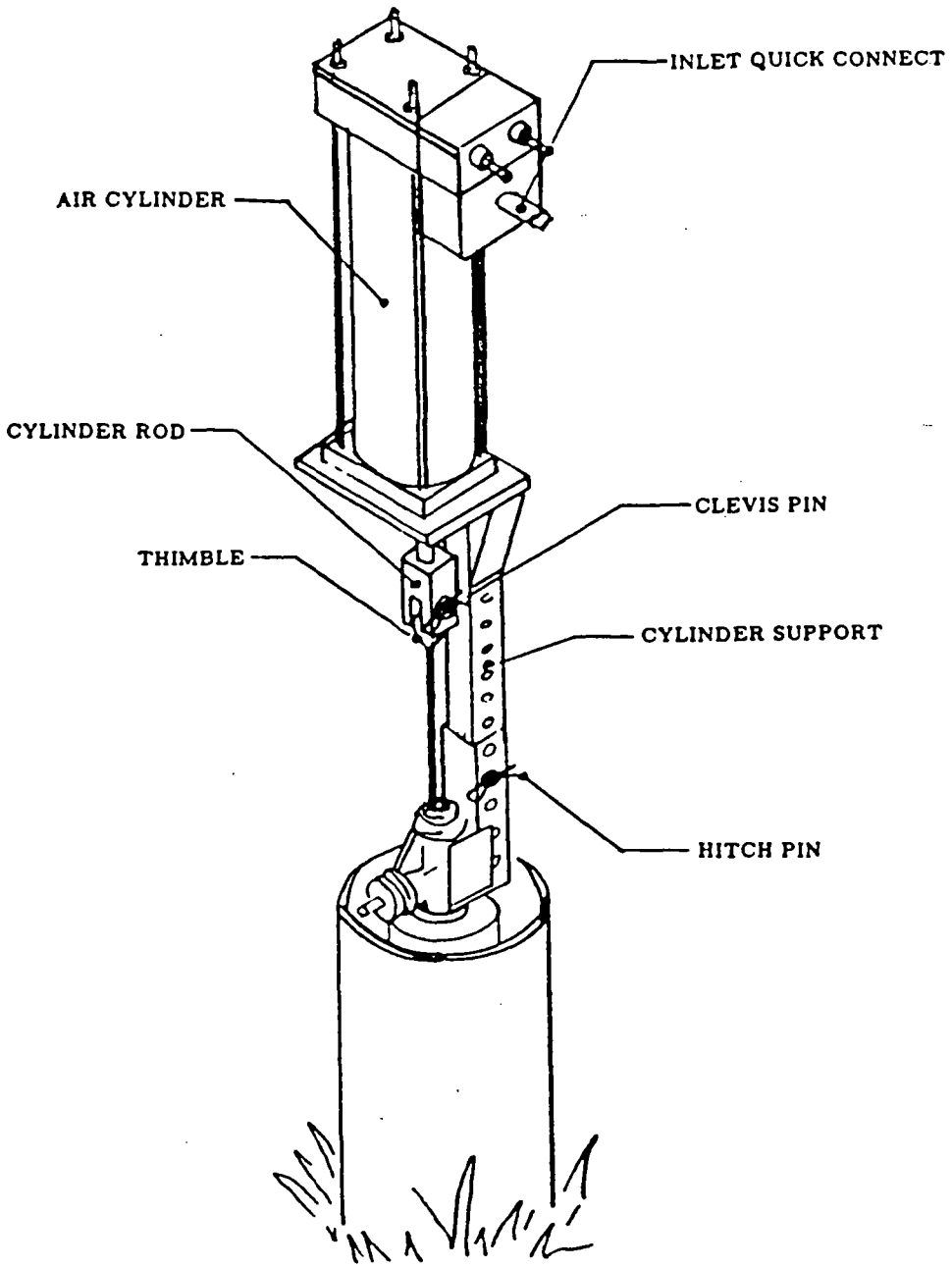
THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

SAMPLING PROTOCOL

LASC
BURBANK, CALIFORNIA

PROJECT NO.
88-03128.18

DRAWING NO.
3-2



COMPLETED PUMP MOTOR ASSEMBLY INSTALLATION

Prepared By RDK Approved By Date

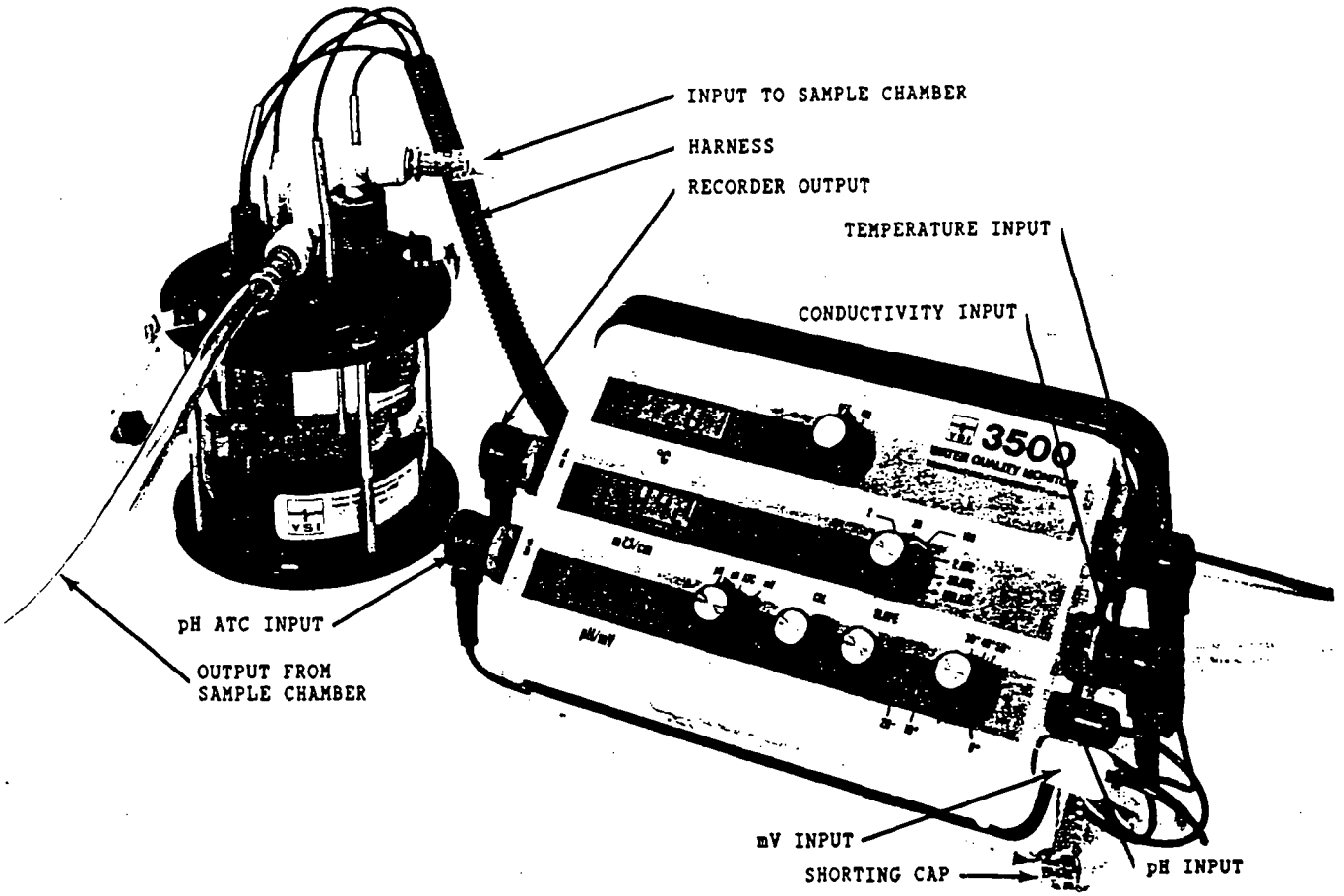
THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

SAMPLING PROTOCOL

LASC
BURBANK, CALIFORNIA

PROJECT NO.
88-03128.18

DRAWING NO.
3-3



YSI MODEL 3560 WATER QUALITY MONITORING SYSTEM

Prepared By _____ Approved By _____ Date _____

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

SAMPLING PROTOCOL

LASC
BURBANK, CALIFORNIA

PROJECT NO.
88-03128.18

DRAWING NO.
3-4

THE MARK GROUP
ENGINEERS & GEOLOGISTS

1221 East Dyer Road
Suite 110
Santa Ana, CA 92705
(714) 546-0602

Client	Date
Lab. No.	Sample ID
Initials	Time

Analyze for

Preservative: None $CuSo_4/H_3PO_4$

H_2SO_4 HNO_3 NaOH $ZnAc_2$

Prepared By KJK Approved By Date

TYPICAL SAMPLE LABEL

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

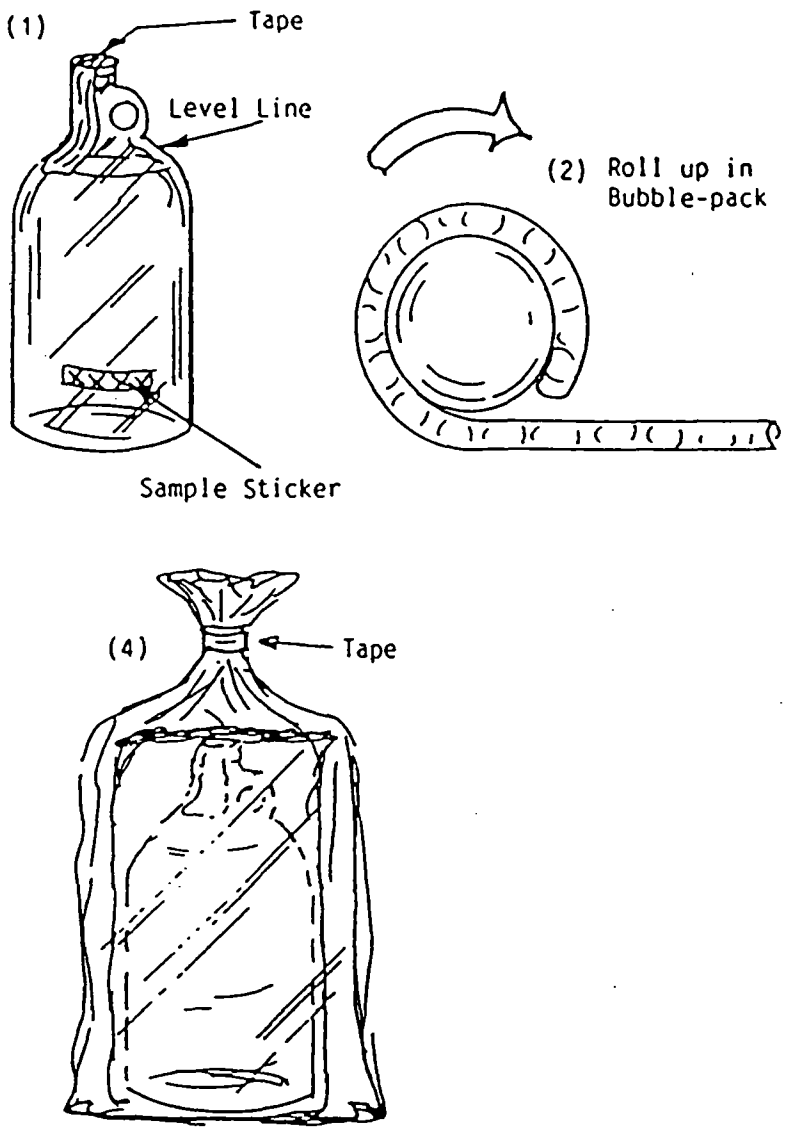
SAMPLING PROTOCOL

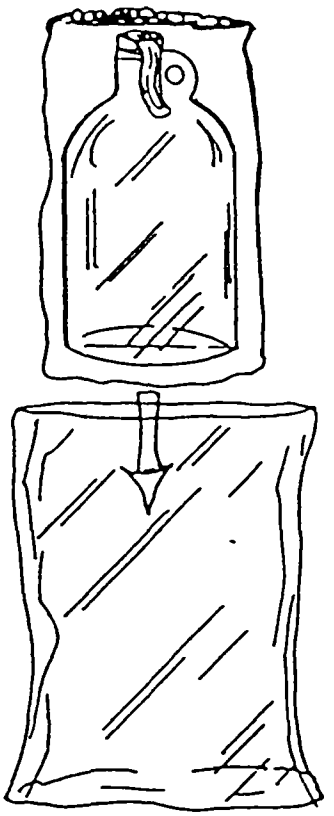
LASC
BURBANK, CALIFORNIA

PROJECT NO.
88-03128.18

DRAWING NO.
5-1

1 liter glass bottles:





(3) Plastic Bag

Prepared By KJK Approved By ____ Date ____

SAMPLE CONTAINER PACKAGING

THE MARK GROUP
ENGINEERS & GEOLOGISTS

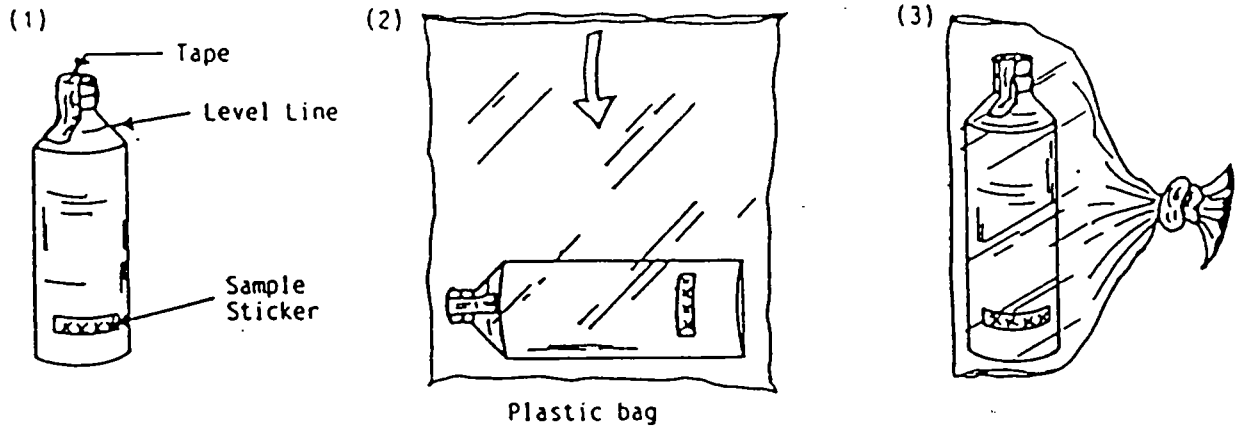
SAMPLING PROTOCOL

LASC
BURBANK, CALIFORNIA

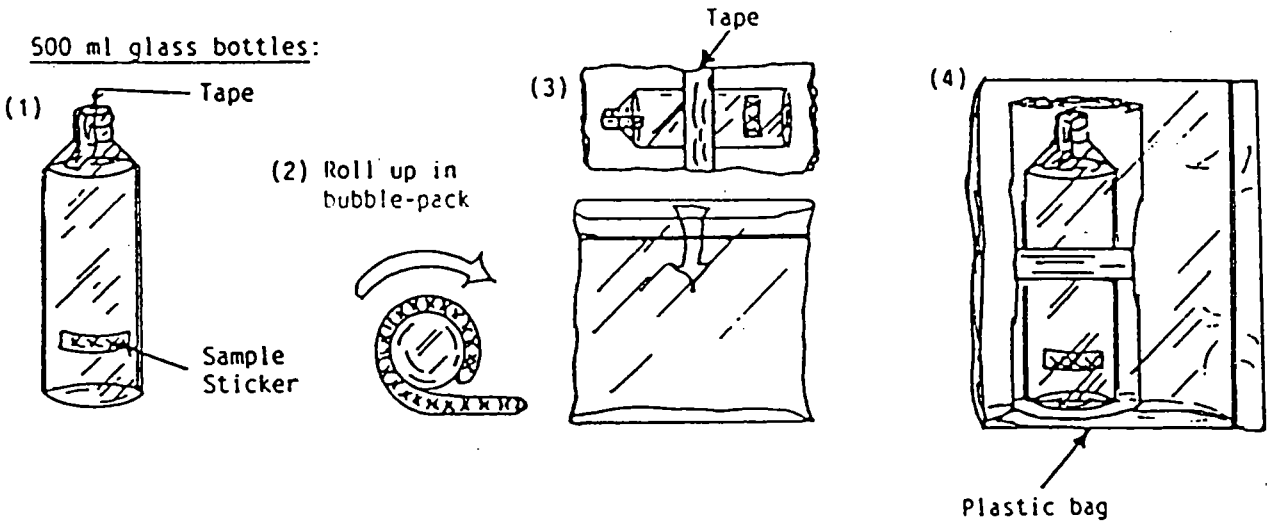
PROJECT NO
88-03128.18

DRAWING NO
5-2

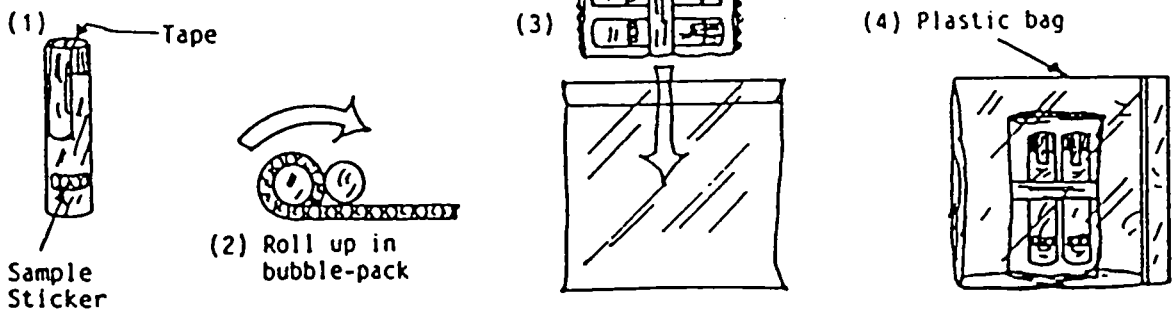
Polyethylene bottles:



500 ml glass bottles:



40 ml glass vials:



Prepared By KJK Approved By ____ Date ____

SAMPLE CONTAINER PACKAGING

THE MARK GROUP
ENGINEERS & GEOLOGISTS

SAMPLING PROTOCOL

LASC
BURBANK, CALIFORNIA

PROJECT NO
88-03128.18

DRAWING NO
5-3

Prepared By KJK Approved By Date

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

Project No.	Sample Point:
Date	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

SAMPLE CHAIN OF CUSTODY RECORD

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

SAMPLING PROTOCOL

LASC

BURBANK, CALIFORNIA

PROJECT NO.
88-03128.18

DRAWING NO.
5-4

Lightweight paper with pressure-sensitive adhesive
(tears upon removal)

THE MARK GROUP
ENGINEERS & GEOLOGISTS

CUSTODY SEAL

By: _____ Sample Type: _____

Date: _____ No. of Samples: _____

Shipment Via: _____

1½"

6"

Date _____

Approved _____

Prepared By KJK

TYPICAL CUSTODY SEAL

THE MARK GROUP
ENGINEERS & GEOLOGISTS

SAMPLING PROTOCOL

LASC
BURBANK, CALIFORNIA

PROJECT NO.
88-03128.18

DRAWING NO.
5-5

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date _____ Sample Location _____

Project Name _____ Project No. _____

Weather Conditions _____

Observations/Comments _____

Samples Collected By _____

QUALITY CONTROL

Purging/Sampling Method _____

Method to Measure Water Level _____

Pump Lines or Bailer Ropes: new cleaned dedicated _____

Method of Cleaning Bailer/Pump _____

pH Meter No. _____ Date Calibrated _____

Sp Conductance Meter No. _____ Date Calibrated _____

PURGING AND SAMPLING DATA

Water Level (below MP) Start _____ End _____

Measuring Point (MP) _____

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity

Total Discharge _____ Casing Volumes _____

Method of Disposal of Discharge Water _____

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Conductivity Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/Actual	Standard/Actual	Standard/Actual	Project No.	Operator	Comments

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

pH Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/Actual	Standard/Actual	Standard/Actual	Project No.	Operator	Comments

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date _____ Sample Location _____

Project Name _____ Project No. _____

Weather Conditions _____

Observations/Comments _____

Samples Collected By _____

QUALITY CONTROL

Purging/Sampling Method _____

Method to Measure Water Level _____

Pump Lines or Bailer Ropes: new cleaned dedicated _____

Method of Cleaning Bailer/Pump _____

pH Meter No. _____ Date Calibrated _____

Sp Conductance Meter No. _____ Date Calibrated _____

PURGING AND SAMPLING DATA

Water Level (below MP) Start _____ End _____

Measuring Point (MP) _____

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity

Total Discharge _____ Casing Volumes _____

Method of Disposal of Discharge Water _____

Sheet ___ of ___

APPENDIX B1

DAILY FIELD NOTES
CREW NO. 1

J# 8803/28.13

Book 1 of 3
8/12/88 through 9/7/88

Property of The MARK GROUP

PROJECT: LASC - BURBANK

Address 1221 EAST DYER ROAD Suite 110
SANTA ANA CA 92705

Telephone (714) 546 0602

LASC PHASE 3 GROUNDWATER
SAMPLING
TEAM 1

This Book is manufactured of a High Grade 50% Rag Paper having a Water Resisting Surface, and is sewed with Nylon Waterproof Thread.

INDEX

B-6 MW-2	4	B1-MW6-03	11
B6-MW2-07	18	B1-MW6-04	11
B6-MW2-06	21	B1-MW6-05	12
Mobilization	29	B1-MW8-01	13
B6-MW2-05	39	B1-MW8-02	13
B6-MW2-04	45	B1-MW8-03	13
B6-MW2-03	47	B1-MW8-04	13
B6-MW2-02	49	B1-MW8-05	13
B6-MW2-01	51	B1-MW8-06	14
Demob/mobilization	56	B1-MW8-07	14
A1-MW2-05	63	B1-MW2-01	15
A1-MW2-04	65	B1-MW2-03	15
A1-MW2-01	72		
A1-MW2-02	73		
A1-MW2-03	74		
B1-MW1-01	93		
B1-MW1-02	97		
B1-MW1-03	99		
B1-MW1-04	102		
B1-MW1-06	104		
B1-MW6-01	113		
B1-MW6-02	115		

1 3

FRI. 8/12/88

6:40 Dave Renan arrives onsite. Agreed to meet the Baker Tanks at 7:00.

7:10 Go to staging area. Todd waiting, but no Baker Tank. Go out to the Road

7:30 See the 20,000 Tank. Driver waiting. Ask the guards to call Bill Robinson. They asked ~~what~~ is about the tank and if the driver was a US citizen and let him in 39

The driver say that the other tank had to go back since he lost the top hatch. Will arrive latter. ils

8:00 Left tank in place and the driver left.

DR 8/12/88

ATTACHMENT B

Moved the "clean" pit" to its place.

9:00 The second tank arrives and we get him in, and unhooks the tank

9:40 Driver leaves, Dam & Todd go to the offices to get blue & black dots on Thanisbadge. I.D. says that George Nolan has to OK it. Talk to Ron Helgarson. Ask about a grid system. He said none has been established. Explained the why. He gave me a blue print with the elevations. Gave him the package from Gary. He got us the paperwork for the security dots.

10:30 ID - got the dots. Go to Water makes for equipment

DR 8/12/88

Get. 100 PSI x 100 CFM compressor
Steam cleaner (needs electricity)
Fire (3") hose & couplings.
Suction hose & couplings
Compressor hose 100 ft.
Rent for 1 week. Gave them the credit applications. Will rent for a month afterward.
Cost for the week: $ 645.70
Call the office to said that Ryan will pick up the drums & pipe (tubing) & estimated he'd arrive by 2:00. Cost: 92.39

12:00 Unload all the equipment.

12:30 Go to A Wales Building Materials
Get Visqueen, Hoses, couplings.

1:45 Return unload the equipment.
Check if Ryan is there.

2:15 Find that the cafeteria is closed.

DR 8/12/88

2:30 Leave to eat.

3:15 Receive call that Ryan has arrived, go back and unload the equipment. Todd starts stapling the visqueen to the glicon pit, Dani goes to call.

4:15 The pit is finished. Check the pump and decied to assemble the motor and try out the compressor. It all works. Found the T for intake.

5:30 Go to B-6-MW2 and look the site over. Plan placement of the equipment.

6:00 Leave site.

DR 8/12/88

MON 8/15/88

7:00 Todd arrives.

7:15 Dani arrives. Take the 4000 gal. tank and put into place

7:45 Ramesh Shah from URS comes by. Move compressor & reg. into place. Lay visqueen on the ground. Open the well

8:30 Seveda Drousé, Kevin Kobible arrive w/ Ramesh Shah and ~~Michael~~ Mitchell from Middagh from URS. Mitchell ~~will~~ is a H&S officer. Will serve as the site H&S. Go over the plan. Ask about QA/QC samples. Seveda Drousé made out a plan, comes to one sample ~~for~~ per day (or well.)

DR 8/15/88

9:00 Gary arrives. Have a tailgate long meeting. Discussions on the QA/QC, and numbering of samples agreed to have (01) two digits for wells, and second two digits for each interval.

Todd unloaded and assembled the pipes and sucker rods.

10:30 Everyone left. Got some drinks.

10:50 Find out that the seals are all 5 1/2". Found some true 5", installed them

11-12 Check for the lab guy - didn't arrive. Discussed the calibration of the YSI ~~long~~ Kevin said the the calibration standards were not good - needs date & certification.

DR 8/15/88

12:20 Todd measured depth to water 203.74' from elevation mark about 6" below ground.

Pump = 3' 10"

12:30 ~~At~~ 1st length from packer: 14' 3"

2 5' 0.5" - total station reka 19' 3.5" - first length -

~~12:30~~ Start lowering the pipe down the hole.

1:10 Gary says the lab is waiting. Go and can't ~~leave~~ let them in - a lockheed employee must give an OK. They didn't have anyone's phone ~~&~~ ~~so~~ but ~~we~~ finally got a hold of Bill Robinson who signed them.

Gary came in.

Gregg Wilson tel at RL (719) 771 6900

DR 8/15/88

1:45 Leave to eat. Cafeteria closed. Gary and Gregg went to get bagels. We went to grab a bite

3:00 Returned. Ron Helgerson came out with Michael T. At 203 feet the packers got stuck ~~on the~~ apparently on the screen.

3:40 Got through the hard area, Ron left

3:50 Shah, Sevda, Kevin arrived. Shah asked about the length between the packers - 19' + he said it wasn't enough - it had to straddle ~~both~~ either side. Said that we have more pipe on order.

4:20 Dave went with Zevda, Shah, Robbie to see the farm area. Then they left the site.

DR 8/15/88

6:00 Finish but the rod is too high. Must pull the last 10' and exchange with a 5'

7:10 Finish and set the motor on the pipe. ~~Rod is down~~ Top packer set at 464.0' (The rod sticks up 1 foot above elevation mark)

7:12 Start pumping. Comes to the surface in 2 min. Half way ~ 48 strokes/min at 40 strokes per min output is 3/4 / min. The out put leaks. - Fix out put.

7:30 Clean-up

7:45 Leave site

DR 8/15/88

TUES 8/16/88

7:00 Dave arrives and unloads the equipment goes to get a bite & look for the ½" tubing. Can't find it. Told is off buying boots and other equip.

7:35 Met Mitchell. He goes to pick up some gatorade.

7:45 Ramesh Shah comes to see how things are working. Dave starts to calibrate the VSI

8:30 Todd returns with boots,

8:45 Gary arrives and we review the complaints.

1. The setting of the packers. They want 25'. I explained that it wasn't critical. But the URS people thought it was. Gary will talk to Ken. If we don't hear from him in 2-3 hours, then we'll pull the string and redo it.

~~10:00~~ 2. They complained about the calibration solutions & said I agreed with the Cond. solution but the pH solutions are buffered. (That was Kevin's complaint.)

3. H₂S is mainly the eye guards. (Todd got boots).

9:50 Gary leaves to talk with Ken. He'll bring up the Methanol as well, since Kevin said not to bother.

10:00 Finished with the calibrations. Took Mitch to locate W.C.

DR 8/16/88

DR 8/16/88

10:20 Tried the DO meter in place of the pH.

10:40 Gary comes and says that Ron's in a meeting - plans to pull the pipe out and replace. The ~~pipe~~ rod is stuck apparently from the sediment. We try to take it apart but it won't go finally ~~for~~ let pressure and it falls so we look it up and get it pumping.

11:10 Starts pumping - rate 2 gal/min. (at the top of the tank.) By ~~the~~ The colour is red brown and very murky. ~~W~~ Figure it should take about 25-30 min. to pump one casing out.

11:35 Starts to clear.

Start setting up YSI

DR 8/16/88

11:50 Start to pump through the cell - at 1 gpm the pressure is too much and the probes shoot out of the cell. Lower pressure is better but the pressure still is enough to push the probes out, need to hold them in or tape them down. The O rings fall out of the Cond. probe house.

12:20 Gary came by with Steve Dicky (Lockheed.) Looked over everything - said we're going to eat.

12:45 Went and washed out the YSI cell with regular water.

1:30 Returned and started pulling

1:45 the pipe.

DR 8/16/88

2:15 Gary came by with some first-aid equipment (eye wash etc.)

2:50 finished pulling. The packers were eaten up somewhat ~1/16" assymetrically. Heavy sediment on the top of the packers - large flakes of rust. - Break

3:20 Readjust the packer spacing.

4:00 Packers set at 29' 3.5"

4 Break

4:45 Start lowering pipe down the hole.

6:15 Finish and set motor. Remove leaves. Clean-up

6:30 Leave site

DR 8/16/88

WEND. 8/17/88

7:00 Todd arrives on site - cleans up and gets the tubing ready. Dave stops at the store for drinks - Gatorade, Coke, soap.

7:30 Dave arrives on site - Arrange the drinks, and ~~start the~~ tubing check pump motor.

7:40 Start compressor.

8:00 Started pumping - took about 5-10 minutes to surface. Colour - rust - very murky.

8:15 Health & safety briefing w/ Ramesh Sohal. He asked about pumping time - I said 4 well volume is ~65 gal and we measured the rate was in excess of 2 gpm. so it

DR 8/17/88

would take an hour and a half to purge 3 volumes. I ~~he~~ said that we'd hook up the cell in about 1 hr.

8:30 Went to call Gary. He said that we should monitor with the cell for ~~at~~ ~~the~~ the whole time and record. He said that the dirt will have to be cleaned out. Also discussed cond. I said it was 6. He said that was impossible it had to be at least 600. He said that he'd call the lab and come over immediately said not to sample until he ~~coo~~ arrives.

DR 8/17/88

8:50 Return and turn the pump down to 48 str/min: pumps 3/4 gpm.

Fix the O rings on the cell. need to tape the probes down.

9:30 Check depth after 1 hr. of pumping. depth 204.00'. Start pumping through the cell - and taping each probe down with electrical and duct tape. Complete of try

10:00 Finally get the cell ready. Pump at 48 spm. Readings have already stabilized

Cond: 575 C.C 635 ±5

Temp 20.1

pH 7.41 pH ATC: 7.48 ±5

Eh 93

~~Depth~~ Measurement of the Measuring tape loc. to top of the well - 1.3"

DR 8/17/88

10:30 Gary arrived looked over everything said we need more documentation. Brough pH paper & acid from the lab, asks calibration for the pH, and beakers, pipets. Increased flow to 1.5 gpm

11:00 Gary went to get bypass valves for the tubing. The cell is still leaking, but very little Pumping at 48 str./min.

11:10 Check W.L. - Still at 203'. ~~10.7~~ 74'. Check flow - 1.5 gpm 46 str/min on maximum - but it is pumping exactly 500' including into the tank.

11:15 Monitor parameters again - Still slight change mainly the Eh is dropping. Ron Helgerson arrived

11:30 Parameters seem to have stabilized

DR 8/17/88

11:45 Gary returns with Brass tubing for discharge.

12:00 Take last reading and ~~start~~ figure it is OK to Sample.

12:10 Finish labling all bottles ~~B~~ B-6-MW2 270-290 ~~#~~ 0101

12:20 Start sampling - Triple rinse for all bottles except w/ preservation Pump squirts to much - for the VOC get only from ~~[illegible]~~ ~~back~~ the back ~~[illegible]~~.

12:30 Gary leaves to get ~~some~~ a fixture for the fixture.

12:40 Finally started filtering the filters kept ~~coming out~~ tearing, went through three filters.

DR 8/17/88

Checked the pump they sent us - the vacuum pump. Works on ~~DC~~ 110 V.

~~12~~ 1:00 Gary returns and said if it's needed it's needed. Tried it again - no good. Gary suggested ~~pouring the~~ filling up a beaker and pouring it in the open top and then vaccum. It worked. Filled up one cup but only enough for ~~ha~~ half a bottle. Used a second filter.

1:30 Checked the pH. it was ~ 7.0 had to add some acid with pipette.

1:45 Boxed the samples and Todd pulled 30'. checked again the next interval is 441-461'.

DR 8/17/88

2:00 Agree to set packer at 438. but there is no 3 foot pipe. Add 5' and set ~~the~~ motor on the plate above the surface elevation - 0.72 feet above marker. Elevation measuring point (reference to the tape sounder.) 0.86 feet = 10 1/4"

2:20 ~~Top~~ Pop packer sitting at 439'. 1 3/4"

~~2~~ Gary goes to pick up lunch.

2:40 Gary returns - Ramesh left suggested that I sign the bottles i.e. Initial ~~the~~ who the sampler was. Also to pack the sample in seperate bags

2:50 Gary leaves the site.

3:10 Water level measement: 203.74.

DR 8/17/88

1315 Start purging. Pumping at 2 gpm 52 strokes/min
Didn't empty the cell so there is mixing with the old water.
Old water Temp - 34.0 °C

3:25 Take measurements - ~~Most of the~~ at least half of the material pumped seems to be sediment

3:50 Started calibrating the DO meter but there is still no place to stick it

4:00 Take measurements again, but think that the sediment ~~is~~ that settled may influence the results, going to empty.

405 Cleaned out cell from old water & sed. Rinsed five times.

4:15 Measurements seem to be approx within the same order No ~~substantial~~

DR 8/17/88

fluctuations from the norm.

4:20 Todd measured flow rate - 1.5 gal/min. suggested the rate since 4:00 on the sheet to accomodate.

6:00 Recorded every 15 min. Trying to calibrate the O_2 (DO) meter. It's taking forever.

6:20 Take last reading nearly 300 gal. Readings stabilized. Start sampling - Sampled through the garden hose, assumption that after 3 hours the hose has been purged. Ramesh didn't think so, I contend that it is better sample for VOC - that the lower pressure allows for no squeezing.

DR 8/17/88

6:50 Finished taking the samples. Ramesh strongly suggested using two zip lock bags and an extra label in the second bag. He supplied us with Ziplock bags.

7:30 Finished the ~~zip~~ bagging and putting on ice.

7:40 Was going to try the DO meter without slop calibration and found that the pump wasn't pumping. ~~He took~~ Todd climbed up and found that there was no flow through the green hose. Check the pump motor and it was still running at about 18 strokes/min. Since we had 2gpm at the beginning and then it went

DR 8/17/88

down to 1.5 gpm, and now nothing, we think that the Teflon cups are worn out from all the sediment passing by or through impossible to tell for sure, we'll have to pull the pipe out tomorrow and check.

8:00 General clean up. Wash all the probes with DI and pack away. Clean up the yard.

8:30 Leave the site.

11:00 Call Gary. Gave him the background and he said if we have to pull then we have to. He asked about the size of the sed. Mainly silt with rust flakes. He suggested that we filter the intake. Said he'd call Lockheed etc.

DR 8/17/88

THUR 8/18/88

7:00 Todd arrived. Started organizing all the equipment

7:15 Dave arrives. Pull out equipment

7:30 ~~and~~ Ramesh arrives. Told him we are going to pull the string. He gave us the H.S. briefing, ~~and~~ ~~by~~ we signed, and he left to help on the well completion ~~at~~ (for the extraction well

7:15 Started pulling

8:45 Finished pulling the string

8: 1 hr for 465 ft.

8:50 Start disassembling the pump. The cups are worn - the top ~~cup~~ of the top cup was worn about 1/4". The seats are a little rough and

DR 8/18/88

discolored. ~~Figure~~ the balls are OK. very minor pitting.

9:15 Decide that we need at least one set of cups per well maybe two, and two sets of balls and seats for backup. ~~Outside~~ External cylinder is OK. somewhat rough on the inside.

- Round to go get equipment and then decon.

10' 3/4" pvc hose
hose clamps 3/4"
press fittings
ice (for both samples and drinks)
nylons - for filter
toothbrush or small hand brush

DR 8/16/88

9:30 Ramesh returned with Bill Robinson. Ron Helgerson showed up a couple minutes later. We showed them what we needed. ~~Ha~~ Ron asked how long it would take, asked us to call him when we knew. Ramesh and Bill seemed more concerned about the packers. They wanted to know when we plan to change them. Todd showed them that they still hold a good seal. But new ones are amazing today so we'll get the new ones on.

10:10 Called Gary and told him the story. He said to call Robert Lansing from Instruments

DR 8/18/88

Northwestern. I told him that Todd is scheduled to leave in a few weeks and asked if Gary can request from Steve Howard that he stays on to the end of the project. He said that Steve Howard suggested 10/1000 in slots for the screening. He said that Lockheed didn't seem to enthusiastic about using PVC.

10:30 Called the lab. Talked to Gregg Robison. He said he'd come about 1:00.

10:40 Called Instruments Northwest. Talked to Robert Landing. Told him the problem - that we needed the follow assembly and the ball check (retainer)

DR 8/18/88

He said that he'd ship a new pump as well as replacements. I asked for 20 sets of caps (seals) 2 sets of seats and balls, but he said that the seats are pressed in. Also asked for ~~no~~ 20 more packers, and asked him to send it counter to counter and call bary to tell him what flight. He said O.K.

11:00 Went to Rosco's and bought 3/4" tubing fitting, and clamps for the outlake from the well, brass brushes and gloves. (Neoprene - surgical cost 60¢) pr

12:00 Set everything and took lunch. Todd not feeling well and went home.

DR 8/18/88

1:00 Returned and started organizing paperwork. Todd returns wait for ~~the~~ Gregg & Karen.

1:15 Gregg arrives, ~~and~~ He ran out of gas. He says he'll take a trip blank, so Todd goes to buy bags while I ~~mark~~ label them and make out chain of custody forms. He brought more surgical gloves.

2:15 Start bagging and making second labels. Karen arrives. She brought the pump equipment that was sent yesterday and MSA equipment. From NW - Packer seals, lengths of pipe and couplings. MSA - Full face Medium Respirator, cartridges, and a box of Neoprene glove (the same as we bought at the store).

DR 8/18/88

3:00 Gregg takes off. Returns five minutes later - forgot the Chain of custody forms. Taped them in the cooler. (He delivered another three coolers with sample bottles.)

3:30 Show Karen the area and the project in general.

3:45 Todd leaves.

4:00 Go with Karen and call Gary. He gives me the ~~bill~~ airway bill number and say it should arrive at 6:00. Said there are some messages and that he talked with Mary Jones.

5:00 Show Karen the decon area and discuss the project & office

5:30 Leave site. Accident

6:10 Return home and call the airline - The plane - flight 203 arrived at 6:05.

8:30 Call Mary. She said she talked to Gary, and asked about population in the area - receptors. The superfund site does not include the area of highest concentration i.e. the school yard. She said that the results from one zone were extrapolated to the other zones (apparently by Gregg, Inc's work)

8:30 Arrive at Alaska airlines counter to counter. Debbie said that the package didn't arrive, and there was no record of it. Suggested that I try air freight. Air freight finally tracked it down and said that it would be a

flight 116 which arrives at
9:00 (Checked through airbill
number - 13136756. Went to
collect Todd. He declined:
still was a little under the
9:05 weather. Returned to counter
to counter - they still don't have
the called air freight and they
just received it.
9:20 ~~They~~ Air freight has the package
but no airbill. The clerk
calls and gets all the details
and writes it up, and gives it
to me. Total cost: 29.70
$20 to ship $1 tax: 8.70 - Insurance.
$9:46 Drop it off at the site
- 10 hours. or so.

DR 8/18/88

FCI 8/19/88

7:00 Todd arrives.
7:15 Dani arrives and open package
from INW. Received
1 pump (complete)
1 well screen (5", 1¼" ϕ)
(with neck to ¾" ϕ)
1. 1¼" to ¾" adapter
1 bottom valve: (intake, seat, ball,
and ball check)
1 upper valve (cage, seat, ball,
ball check
20 teflon cups
7:40 Took new pump apart and
checked all fittings. put
Teflon Tape on the joints.
7:45 Went to washout the cell and
other equip regular water than DI.

DR 8/19/88

Todd rebuilds the ~~second~~ first pump.

8:15 Return - Paul at the site. He forgot the Health & Safety forms to sign for the briefing -

8:30 Went to look for a welder. Found 30 on Claybourn Rd, but the welder suggested that someone else do the lathing for the pipe - he didn't have ~~the~~ a lathe that could handle stainless steel.

9:00 Went to _____ and it was closed. ~~as~~ We looked around the corner and there were two more machine shops also both closed. ~~The~~ Someone returned to _____ and we asked him to cut and tap ~~the~~ a 3/4" female

8/19/88

in the bottom of the screen ~~ft~~ Cost - minimum charge $30.

9:30 Went to Wanamaker Rentals - Still no clearance for credit. Said to come back or call between 10 and 1.

10:00 To the bank. Deposit rental check and take $130. The machinist will probably want cash.

11:00 Eat. - Return to shop.

11:15 Pick up part cost $20

11:30 Pick up more drinks & ICE: $1.20

11:45 Return - Dani starts calibration of the VSI 3500. Todd takes inventory of the pipe. Replaced bottom paker seal with new seal. Total inventory from 1 NW ...

8/19/88

52 joints 3/4" ϕ × 10' w/ 50 rods
3 joints 3/4" ϕ × 5' w/3 rods
2 joints 3/4" ϕ × 3' w/rods
3 joints 3/4" ϕ × 2' w/rods
Top assembly: 15' - (3' + 2' + 10')
bottom: pump - 3' 10" 1 1/4"
screen - 1' × 1 1/4" ϕ
catch - 2' × 3/4 ϕ
Total 6' 10"
4 packers
20 cups.
2 complete pumps
packers set below catch pipe and two joints above the pump leaving 26' 10" between the packers.

11:00 Start calibrating the pH. Rather scary. Am able to calibrate

DP 8/19/88

the 7 for both pH and temp compensation. The 4.00 can be calibrated for either ATC or straight. There is 0.06 difference either way. Calibrate to the ATC.
Redox is O.K. Comes to 219 at 34.2°C, at 1.3 ~~[illegible]~~ mV/°C the temp correction comes to ~~231.74~~ 231.74 (well within the range of 231.
Todd starts lowering the pipe to 285'. ~~Paul comes~~
1:30 Finish calibration and pipe. I go to call while Todd assembles the motor. Paul (URS) comes by and leaves
1:45 Call Ron Helgeson, tell him we are ready to pump. He said he'd be out.

8/19/88

2:00 Call the office give Gary an update.

2:40 Call EI ~~get~~ they gave me the number of David Duke, their representative in Burbank. He suggests calling Orion

3:00 Call Orion - they have finished for the week (EST).

3:10 Call Richard in EI suggests ~~calling~~ checking the membrane.

3:15 Return and we get ready to pump. Ron Helgerson & Steve Dickey show up - The water is clearer; no sediment, but

3:30 still murky. High conductivity, ~~but pt~~ lower pH and higher Eh. The filter works.

~~4:00~~ Measure the flow - over 4 gal/min. at 30 strokes/min.

DR 8/19/88

4:00 Start playing with the valves and checking flow rate get down to 1 gpm but need to cut some of the airflow ~~Fast~~ Maximum is 4.5 gpm at 48 ~~spm~~ str./min. ~~Slow down to [illegible]~~ The rate is linear; ~~[illegible]~~ 1/3 quart/stroke i.e. 12 strokes per gallon. Slow down and put the teflon sampling ~~pip~~ tube on. - Can get to a slow ~~[illegible]~~ rather steady flow.

4:15 Start lowering pipe to 375 - screen at 379 to 399.

4:20 Go and call Bill Robinson - to tell him we will be at A-1-MW4 on Sunday.

5:15 Finish installing to 375' - Check the leftover pipe. ~~37~~ In the well there is

DR 8/19/88

39 10' pipes of which two are below the packer and one is part of the top assembly. ~~[illegible]~~ One 5' length was ~~[illegible]~~ as part of the top which comes to 370 + 5 = 375. Left over is 13 10' which is a total of 52. ~~and~~

17:45 Start pumping - ~~rate~~ maximum rate 3.5 gpm (48 strokes/min.) Monitor physical parameters every five minutes (x 3) then every 10 min (x3) every 15 min.

~18:00 Paul arrives and sits to the end. ~~19:00~~ Try to figure well volumes. The well volume is ~27 gal. The 65 that we calculated doesn't make sense. I kept getting the annulus at 170 gal. Then while talking with Paul

DR 8/19/88

I remembered that the porosity of the gravel pack must be included. So 65 gal is one well volume plus the gravel pack of the annulus for 26'. These well volumes in this ~195 gal. So pumping should last about 1 hour.

19:00 Parameters that seem to have stabilized change. pump another ½ hour

19:30 Take last reading and begin to sample. Use the teflon tube which splatters over everything. There is no flexibility in the hose. Can't get it down to a rate that we can use for VOC's & fill the bottle. End up by converting back to the 1/4" plastic tubing and finish the samples.

DR 8/19/88

20:00 Filter for the metals and break the beaker. Enough for analysis, but needed to add HNO_3. pH ~ 0.

20:30 Bag all the samples (double bag) and put in cooler.

21:00 ~~Went~~ Go and get 3 packs of ice. bring back and store samples in locked cab of the rig.

21:30 Leave site

~12 hr.

DR 12/19/88

DAT 8/20/88

7:00 Todd arrives. starts getting rig ready

7:15 Dave arrives. Start pulling 40' of pipe. Top packer setting at 334.3 and bottom at 461.0'. Screen between 338 and 358.

7:40 Finish rigging up and start the compressor. Todd checks compressor gasoline and goes to get some gas. He said to bring for the rig, but the rig is propane driven.

7:45 Start calibrating the DO meter with new cap.

8:25 Todd returns - the DO meter isn't calibrated

DR 8/20/88

8:30 Start compressor take a while

8:40 Start the pump - adjust to 46 strokes/min. Yield = 2.5 gpm. Take readings the first couple of times at 3-5 min intervals, then every 10 min.

9:00 Still pumping 2.5 gpm. All parameters (except Eh seen to stabilize after 60 gal.

10:00 Label all the bottles - 0104 Put away DO meter - still can't get it to calibrate. Todd takes the cardboard tubing ~~for~~ to store at the Decon area & returns.

10:15 Finish monitoring - Start sampling procedure - get vacuum pump ready etc, unhook hoses.

10:25 Start rinsing, ~~Paul~~

DR 8/20/88

10:30 Paul arrives.

10:45 Wrong part to the fotor - take the vacuum pump apart and clean.

10:55 Finish ~~table~~ sampling.

11:00 Bag the samples and start pulling 60' to 274' (top packer) Go and call the lab so that Gregg will come and pick up the samples. No answer and Bob Wellbe not home

11:15 Return make out extra labels for second bags. Todd finished with the pipes and set up

11:20 Count the joints 29 10' pipes + 5' are down the well. sits above the well head to 274.3'

11:35 Start pumping and taking readings there is a slight drawdown at 3 gpm. of 0.1 of foot.

DR 8/20/88

12:00 Measured yield - still at 3.0 gpm
13:00 Pumped ~ 240 gal. parameters stable - started sampling. Took duplicate
Sample # 0105 & 0106 both taken at screened interval 276-296. ~~Filter~~
Sampling by split. All ~~GCS~~ VOC were collected and then the samples were segregated by number. The filtered samples were each filled half way with one filter and the rest by another filter.
~~14:~~ Time listed for duplicate: 14:30 (#0106)
14:45 Disassemble motor and go to eat and Wanamaker

DR 8/20/88

15:10 Go to Wanamaker - Month O.K.ed will bill us.
15:30 Went to Store for Gags, ice, Gatorade. $ 36.00
16:00 Return and pull to 234.3' bottom packer at 261. Go call the lab again. Paul leaves.
16:30 Call lab - Gregg left 10 min. before. ~~Went to get~~ Call Bob Welbor - still not home -
16:20 Go get gas for compressor (7 gal) and truck $ 20.00
16:45 Return. Paul already returned, Packers set at 234.3'
~~17:00~~ Fill up compressor.
17:00 Gregg Wilson arrives brings blue ice & 1 box of filter.
17:45 Pump rate too fast getting some drawdown - ~ 2". adjust

DR 8/20/88

from 3.25 to 3.00 gpm - starts recovering slowly. Will take two more readings to see if to slow down more. All parameters seem to have stabilized after ~120 gal.

18:00 Still have drawdown - some recovery to 203.98. Slow down to 36 str/min - 2.5 gpm.

18:30 Parameter stabilized - feet still at same level.

18:40 Try to get John Lopez from Howard Pump into the site. Can't.

19:00 Take one more reading and start sampling

19:30 Finish sampling - ~~start pulling~~ ~~to~~ Water level recovered somewhat to 2. Start pulling pipe

19:50 Took 40' off the Packer setting

DR 8/20/88

at 195.0 bottom at 221.7. Screen is 174-214. Water level is estimated at 203.86 (Return to semi normal.) Will pump only at 3 gpm.

19:55 Count pipe again. — 21 x 10 down the hole (31 out) + 5 total - 215 - 20 = 195 - top packer.

20:15 Start pumping - Water ~~level~~ starts in about 2 min. Set at 40 str./min - ~~Water~~ is Rate is 2 gpm. Either the as unconfined or pumping half a zone - or the chips are wearing out. - We'll know when we disassemble the pump.

20:30 Start the chain of custody for all samples to be

DR 8/20/88

Shipped today they include:

0103	8/19/88	19:00	
0104	8/20/88	10:00	
0105	8/20/88	13:00	
0106	8/20/88	14:30	Dup. of 0105
0107	8/20/88	18:30	
0108	8/20/88	20:00	

tomorrow:

0109	8/21/88	EB:

20:45 Todd packs all the samples.
21:30 Start Sampling -
21:45 Finish Sampling Todd starts to disassemble and pull the well.
22:00 Finish chain of custody - put serial numbers on

DR 8/20/88

L00002 Sa 0103
L00003 0104, 0105, 0106
L00004 0107, 0108

Sign or initial the number and Paul Azevedo also initializes it.

22:10 Gregg Wilson signs the chain of custody - and we tape it in the cooler - put tape around the cooler with a seal.
22:15 Gregg leaves
22:20 Finish pulling the well - Everything is in tack - The screen and patch pipe are holding
22:30 Minor clean up - leave everything for tomorrow - leave site

DR 8/20/88

SUN 8/21/88

8:15 Todd arrives onsite starts ~~[illegible]~~ disassembly.

9:00 Dani arrives, ~~st~~ disassembles and clans YSI. empty all hoses into the Baker tank. General clean up

10:00 Finish clean up - move water from drums to baker tank by the Old bucket brigade Method.

10:10 Transfer the baker tank to the decon area (Compressor at 10:10)

10:30 Site is totally clean - left man hole cover open to let the water dry out.

Took ~~[illegible]~~ water level reading at 10:00 - 204.00' lower than last night. Drop not

DR 8/21/88

due to our pumping.

10:45 Start hook up to the Baker tank.

11:00 Paul Azivido arrived - hook up, and start pumping w/ the diaphram pump. ~~[illegible]~~ too much pressure to hold hose so we tie it down.

11:15 Start pumping - (~~[illegible]~~ about 50-60 gpm est.). Unload the pipe into the decon pit. the pipe was set on visqueen - will change after decon.

11:45 Finish pumping. Took the pump apart - the upper cup had some wear - so we replaced it. left the lower cup - pump clean. Opened the screen - very clean. the catch

DR 8/21/88

pipe had about 4-5" of silt.
The bottom packer is in
excellent shape. The top is a
little worn. Will replace
the top.

11:50 Hook up the electrical system.
Extention cord from the Porcent
light to the steam cleaner.

12:00 Try out the steam cleaner - It
works but there is no inlet
for soap

12:30 Go to A-1. ~~They~~ At the gate
they said that they'd have to
make calls since ~~we are except~~
~~[illegible]~~ ~~[illegible]~~ our 10 cards any
All except A-1. So we may not
be able to get in. So we'll set
up in B-1-MW1 with Both
wells are less than 500 (bottom

DR 8/21/88

screen) However if the water
level ~~is below~~ fill the same
amount as B-6-MW-2 (20')
then the first screens (top)
will be above water level.

+ ~~The problem is the~~

12:50 To eat.

14:00 Return to A-1 - Sign in -
(They call) Go to A-1 MW-3
check out how to position equipment
but there are cars in the way.
~~The second~~ Check out well A-MW2
in the parking lot. Easy access.
~~Figure~~ will start with A-1 MW2.

15:00 Return to Base

15:15 Start decon.

15:30 Todd takes rig to fill w/
propane. Dani Starts the
steam cleaning.

DR 8/21/88

4:00 ~~Hank~~ Steam cleaning until Todd returns. Need to roll the pipes to ensure all is washed out.

4:15 Todd returns. Rotate the pipes while steam cleaning the inside. Tried spraying the pipes with DI water inside - very unefective

5:00 Load the pipe onto the rig and drain the water in the pit to the Baker tank. Todd used his hands as a filter. Rather difficult

5:30 Hook up the Baker tank and take it to A-1. Put into position. ~~On the~~ Need sawhorses. Go to Rasco's and Adwhole. Both closed.

6:00 Go back and load the rig and

DR 8/21/88

pickup and take all the equipment to A-1.

6:30 Start to set up at A-1 MW2. Put ~~plus~~ visqueen down and make a barrier with caution tape. The well is locked.

7:30 All in place. Leave site

8:00 Call Gary. Told him about the DI water and he said to find some method we must do it. Figured we could use a siphon. Asked him for 10 mil Polyethelene he said to call tommorow.

Need:

1. Saw horses
2. Table + 2 chairs (saw horses and plate
3. 10 mil visqueen
4. Call Lab if DI water OK for Blank
5. More DI water + ~~Blank~~ Table.

DR 8/21/88

MON 8/22/88

6:45 Call Orion. (in Boston) they said they would send a new one out and that we should send this one back after we receive the ~~a~~ new one.

7:00 Paul Arwido & Todd arrive onsite. No key to open the well.

7:10 Call Bill Robinson for the key. He's not in so I leave a message that we are at A-1 MW 2.

7:25 Arrive on site.

7:30 Leave to get saw horses and Paul ~~went~~ leaves to get the key.

8:30 Ron Helgerson arrives ~~and~~ to see how things are going. Say's he'll be back ~~with~~ or get a key

DR 8/22/88

by 9:30

8:40 Ron leaves

8:45 Come back ~~up~~ and start setting up the saw horses and table.

9:10 Move the pipes all to the Saw horse

9:30 Start decoring the pipes ~~to~~ Key arrives

9:45 Call the lab - Bob Webber Says that the DI water is to be used for Blank samples. Its 10 μΩ (or something) equivalent to Mark II grade

~~He~~ Talk to Gregg tell him we need more DI water and gloves. I said we should be done by 20:00.

9:55 Call Gary and tell him not to worry about the DO meter

DR 8/22/88

on the table. ~~We discuss~~
He asked if he need come and
I said not really. ~~We~~
Talked to Karen. She asked
about 123.

10:20 Take blank - Equipment blank
through the pump and a 10 ft
length. - Sample 0201

11:15 Finish blanks - not enough DI
water for the second ~~Oz~~ Semi
Volatiles. Take water level
measurement. - 490.80 feet.
the top two screens are for
100 to 140 and 150 to 170,
both above water level.
Thus we will sample only
4 zones.
Bottom zone is 428 to 481.
Paul leave to go to his other site

DR 8/22/88

11:30 Start running pipe -
will set top packer at
~~419'3" feet~~ (419'4") bottom will
be at 441'3".
~~Packers Set~~

11:55 Paul returned.

12:00 Asked if were going down to
140. Looked at the bell sounder
and saw that it was B-1.
~~Chang~~ We have to add more
lengths, will set ~~top~~ packer
at 457'5" and bottom at 481'3"

12:10 After a count decided to leave
5' off so top pack will set
at 454'5". bottom at 481'3".
thus well have 47 10' and
one 5' in the well. ~~Tube~~
10 foot lengths should remain.

DR 8/22/88

12:20 Paul explained that Ramesh had the keys and made copies (but included the wrong key) Someone from URS (Maxwell) had to bring it from Long Beach.

1:15 Appently reach TD at 476' can't go down any more according to the records TD is 504'.

1:30 Take of a 10' and replace w/ a 5' - thus Top packer is at 449'5" and bottom is 476'3" pH meter won't calibrate totally it is either in pH or pH ATC. Since I'm somewhat skeptical of the probe or electronics I'll go with the regular pH. will take pH measurements only without ATC. The difference at pH 7 is about .02. so we can ~~do~~ correct

DR 8/22/88

latter if necessary.

14:00 Hook up - Will ready. will adjust Temp. manually for pH & cond. readings.

14:15 Start pump.

14:20 No water coming out ~~of the~~ Try pinning - no help.

14:30 Gary arrives. Take WL. - Same at ~~2~~ 190.80 We pull 20' and go to the next zone. if no water we have to pull the whole

14:45 length Ron Helgerson arrives

15:00 Try pumping from 428 - 448 zone. Didn't work, pump pumping freely - no suction. Have to pull the whole length. Ron leaves.

DR 8/22/88

15:15 Gary goes to the Tecan area to check. continue to pull the pipe. Think of trying a different zone. pump by hand and there is no response. The ball valve must be shut

16:00 Finish pulling the pipe. There is lots of sediment on both the top and bottom packer. Pumps totaly blocked up with sediment.

16:30 Sound the bottom of the well - as we reduced: 476'

17:00 Paul returns, & Mike Arends comes. Discuss how to solve the problem. ~~Gary~~ There is a Johnson sand filter that we have at LAX and will try that Paul suggests

DR 8/22/88

- that we sound all the wells and see which are developed. Gary says he'll try to pick up the filter and be here at 8:00

17:30 Gary leaves

17:45 By drinks, ice, Start measuring B-1 wells

B-1-MW7	TD-453'	WL - 123.15'	
B1-MW2	TD 452'	WL 145.275	
B1-MW1	TD 475	WL 151.54	
B1-MW4	TD 440	WL 116.15	
B1-MW3	TD 450	WL 127.50	
B1-MW5	TD 452	WL 134.76	

20:~~00~~ Leave site

DR 8/22/88

TUES 8/23/88

7:00 Todd arrives - start loading pipe onto rig

7:15 Dave arrives

7:30 Paul arrives - goes to other site go to decon area H&S briefing

8:00 ~~Start~~ load the pipe and decon while Todd calls in his time.

8:15 ~~Calls~~ Todd ~~so~~ was told that he can't move the Baker Tank. It's not in the contract.

8:30 Gary arrives at A-1 places the well screen (fiberglass) and

8:45 comes to the decon area. Tell Gary about hooking the Baker tank so he ~~says~~ said to get a hoist and I'll move it.

9:30 Go to A-1. ~~Gary said we have~~

DR 8/23/88

We figure we have 3 choices:

1. To hook up the fiberglass screen and pump B-1MW2, since all the equipment is set up there

2. To bail and swab the ~~[illegible]~~ well and then pump.

3. To move to another well and come back.

The obvious preference is 1. But we have to see what Lockheed says.

9:15 Lil Faeder comes by and asks what we're doing. After introducing himself as Rick's boss, Gary explains where we are and what alternatives there are. He then leaves.

10:00 Todd takes the screen to get adapted to 3/4"

DR 8/23/88

welded on. Gary and I go to talk with Steve Dicky & Ron Helgerson. We explain the three actions as we see them. ~~The~~ Steve agrees that the best thing is since we are in place to finish A-1 MW2, then go to B-1 area. They are interested in ~~BW~~ 4, 6, 8 in the SE, since that's ~~here~~ where they plan an injection well. There is some concern about Nitrates.

10:40 Leave and return to decon.

10:50 Paul arrives. ~~Gary~~ Gary gives him an outline of where and how were are going. He said that CRS is interested in 4, 6, 8.

11:00 Gary leaves. Paul says that he'll stay until we are finished

DR / 8/23/88

~~11:~~ and then he'll leave. Tommorow Rene is suppose to come and he'll go over ~~the~~ all the projects with her. She has temporary assignment to the Long Beach office.

11:05 Paul leaves

11:30 Todd returns - fixed the screen - $8 ~~40~~ (115 materials $25 welding), ~~load pipe~~ wash & load pipe.

12:00 eat

13:00 Get ice for cooler, & rig to site.

13:30 Replace visquen and put ~~the~~ rig into place lay new visquen and put the pump together.

13:45 unload pipe

13:55 Water level meas: 190.73

DR 8/23/88

14:05 Put bottom assembly together.
Packer to packer: 24' 11.5"
14:25 Lower first joint into well
15:00 Finish lowering & fine adjusted
15:05 Start pumping at 48 strokes/min
= 4.5 gpm. Water rusty for about
30 gal. clears up nicely. Pump return
16:10 Pumped ~270 gal. total
Cond. kept falling a little.
One well volume came to 20 gal
(8 feet x 10") ~13 well volumes
pumped. DO meter registers -250 wd fill.
16:10 Took samples - clean -
16:35 Start lowering to 270' (269'.3")
(time 270 - 290.).
Call Gary - told him it seems
to be working. Called Gregg
Wilson said we should be
done by ~8:00 pm or 7:00.

D.R. 8/23/88

Told him to make sure the
bring DI water and gloves
17:05 Finish lowering the pipe -
install well head. Put gas
in the compressor.
17:20 Start pumping water clear -
start measuring at 17:25.
pumping at 4 gpm.
17:25 ~~Start~~
18:00 No change in water level
parameters stabilizing 3 vol.
but still doing paper work.
Pump rate the same 4 gpm.
18:20 Last reading. Start sampling
18:45 Finish sampling start lowering
the pipe to 360' (359'.3")
the screen is a 90' screen
so we'll pump from the
middle.

DR. 8/23/88

19:15 Pull to reject the motor.
17:25 Start pump.
17:28 The water is very rusty colour
Decide not to take measurement
since the particles don't wash
out and the sediment causes the
readings. Todd goes and gets ice
19:40 Clears up. Start measures
19:50 Still 3.5 gpm no loss
18:00 Todd returns - Gregg arrives
20:15 Last measurement start sampling
20:30 Finish Sampling - Start
lowering pump - Add 60'.
Top ~~Pump~~ packer will be setting 419'3"
bottom at 444 or if there
is no resistance will add
another 5' and straddle the
zone. ~~So~~ However since
there was silt in the

DR 8/23/88

last zone we might not
get down that far.
21:10 Finish setting the pipe & motor.
21:15 Water level 210.92 (drop)
Some floting (last 25')
21:20 Water arrives - very rusty
colour.
21:30 Starts clearing pump start to
slow down to 36 strokes/min
1 filter ~~starting off~~ clogging up
21:33 Measure at 24 strokes/min
- 1/3 gal.
21:35 18 strokes/min
21:37 14 " "
21:40 - Stop pumping. Start packing
samples.-
21:45 Start chain of Custody forms.
20:15 Finish C.o.C. forms Still
packings Dave, Paul sign the
serial number

DR 8/23/88

Samples Taken:

L00005

8/22/88 930 0201 Equipment Blank after Decon

L00006

8/23/88 1600 0202 158-176

8/23/88 1830 0203 270-292

8/23/88 20:30 0204 352-392

8/23/88 None 0205 Sediment only - Stop pumps 428-448

20:30 Seal cooler. -

Gregg phone (home) (714) 535-5751

22:45 Leave Site

DR 8/23/88

WENDS 8/24/88

8:00 Paul arrives - Leaves to other site

8:10 Dan arrives - starts packing

8:15 Todd arrives. Gone cleaning.

8:30 Start pulling pump 9:00 Paul

9:30 Finish pulling the pump Steve Dickey & Bill Robinson arrive and the Security Capt. We ~~said we~~ told Steve that it worked fine except for the bottom zone. Showed him the screen. Screen totally plugged up with fine silt/clay.

10:30 Load up the pipe and clean the site take rig and one load to the Decon area

DR 8/24/88

11:00 Finish unloading the pipe
Return to A-1 - Empty
The water ~~bots~~ drum and
take all but the tank back
to decon. - Starts rain
11:30 Dani goes to pick up hitch
& get money. No hitch
available at Wanamaker
(G1 hitch) Ball not strong
enough. ~~Starts~~
12:00 Todd organizes the equipment
12:30 Dani Returns - Go to Eggy
Hitch - they're no longer in
business - eat
1:30 Go back to Wanamaker
and buy hitch:
Return to A-1 and install
Pick up Todd's truck, and
Move the Baker Tank.

DR 8/24/88

2:30 Paul & René waiting at
the decon area.
Unhook the tank.
3:00 Ron Helgerson & Steve Dicky
arrive. They meet René.
René Lawver (URS) will take
over from Paul.
Show Ron and Steve the
filter (expain to René the
method). Go over the records
of the wells, when we
encountered silt.
Ron questioned whether we'll
need ~~then~~ the filter if
we're sampling from top to
bottom. Steve said yes -
since there is silt there.
I ~~[illegible]~~ said that Gary would
be calling Johnson scans

DR 8/24/88

to see if we could get a smaller one that we can exchange the sand.

3:10 Ron seemed more concerned about the cluster wells. He was worried that maybe they too are silted. ~~Checker~~ took sounding & water level in the deep well in Area 5 - CW5-7. Depth was 500' and was listed in the workplan as 590 with screens from 560-570'

4:00 Paul sat the well and looked it up in his log. TD was 501.' So the WorkPlan numbers are wrong.

4:10 Steve & Ki leave.

4:15 Go over the details which

DR 8/24/88

Bill Robinson ~~Bill~~ Paul - Similar to what he said during our first walk around.

4:30 Sign H&S sheets, Todd Work Sheets. Todd leaves

4:40 Leave site.

5:10 Call Gary. He ordered a 3/4" ϕ inner and 2" ϕ outer screen ~~with~~ with the capability of changing sand. Johnson will fly it to Burbank. Still move to pick up ~~[illegible]~~ package.

DK 8/24/88

Thurs 8/25/88

10:30 Guy calls - Says to get in contact w/ David Duke. We have to return the YSI and we suppose to get a new one.
He said to call Orion and ask about the O_2 meter. Also have to get sand - He said a silica gel. He'll take care of that.
Told him that we couldn't take DO reading since it never stabalized and started at -250 and kept going lower. Also the samples are extremely aerated I believe it is the drop in pressure.

DR 8/25/88

He said that we have to be sampling with the TIP. Said that VRS is doing it occasionally with the HNO, both over the well and samples. He said fine then to return the TIP since its needed on other jobs.

11:30 Called David Duke in the office and left a message since he wasn't there. Called him at home - only an answering machine.

12:15 Called Orion. Got back to technical services: Got the same person: Kathleen Sulivan. She asked for an RA number and I said I didn't have one 4376. Send the old meter in on that number. UPS Red.

13:30 - Dave Duke Cable Need YS.

14:00 Go and deliver the YSI to Dave Duke

84 Bill return it on Monday

FRI 8/26/88

Started updating the computer file from the field book.

SAT 8/27/88

Continued spatially updating the computer files.

SUN 8/28/88

Continued most of the day updating
11:00 the file Talked to Gary. He said the parts from Johnson will arrive on Tues. not tomorrow. He doesn't like the idea of hauling the baker tank, but I said it's better than any

DR 8/28/88

85

alternative I've heard so far.
14:00 Called Dave Duke - no answer left message.
Called Todd at home - (619) 254-2668 in Barstow - no ~~answer~~ answer.
18:00 Called Dave Duke again still not home. Todd neither.
21:00 Call Todd at the apt. Got him out of bed. He brought the filter back.
Finish time sheet.

DR 8/28/88

MON 8/29/88

6:45 Todd takes Steve Gibbs to get a badge. The paperwork hasn't been done so they went to George Nolan who wrote it up on the spot.

7:20 Dave arrives. We are at decon so went to Alaska Airlines to pick up the ~~pa~~ package from INW. It's not there and there is nothing on the computer

7:50 Go to Air Cargo - also nothing

8:00 Todd & Steve arrive. Start clean the pipes

8:10 Dave returns - hook up the diaphram pump & pump water from tank to tank

9:00 Finish decanning and transferring the water to the large tank

DR

Go to MW8 to check depth etc. Can't open lock, and there is no access to the area. Must tell Bill to move stuff

9:15 Go to B-1-MW6 and check depth & W.L. start at 9:30. TD is 445' although the listed depth is 442'. The water level W.L. - first measurement at 203' final at 112.94'. ie. 5 zones

9:45 Return. Todd & Steve load the pipe. Call Gary. He asked about the YSI. I said that I haven't been able to get ahold of Dave Duke. He said to try again. I asked about the package. He didn't know. Said to call back.

DR 8/29/88

10:00 Call Dave Duke at his office
Transferred to the Concord office
talk to Richard then to Barry.
Barry said that Dave called him
yesterday and said that he's trying
to get one to us today.
Called Dave Duke at home - left
message on his answering machine.
That he should call the office and
leave a message where & when
we can pick it up.
10:05 Call Instrumentation Northwestern.
10:15 Talked to Robert Landing. He
said that the package was sent
on Tuesday 8/23/88 counter to counter
on Alaska the airway bill is
11372745.
10:10 Called Gary again and told him.
Reminded him to bring the check,

sand and 20 and PVC. He said
there is a meeting at 13:30.
He said that Greg Wilson called
and that I should call him
back.
10:15 Call Greg Wilson - said that
we'll probably be sampling, but
can't be sure. We'll call him
in a few hours.
10:20 Return, the pipes are loaded,
Most of the equipment is loaded,
except for the tubing that has to be
cleaned and the weld screen.
10:25 Go to the airport while Todd is
installing the pump.
10:35 There is no package - it is
not manifested, so it never
arrived. The counter person
asked if it was delivered.

11:00 Return to decon area. The Reg is there but Todd & Steve aren't. Take the table and saw horses and put them at the gate

11:20 Return to decon area. No one there, so go return to B-1

11:35 The North gate is closed. See that Michael Arend & Harry are talking to Todd.

11:40 ~~come over and~~ Talk to both of them. They ask how things are going. I say that we need the as-builts.

11:50 Go get the compressor w/ Steve. Todd remains to start setting up.

12:15 Set compressor in place

P Todd finished laying polyethylene

Mobe ~~Hart~~ B-1 MW-1 DR 8/29/88

12:30 Ramesh comes by. Says we don't have to sample B-1-MW1 that it was sampled (time sequence) in June. I said that we'd check w/ Ron or Steve. Decide to go eat

13:00 Arrive at Ron's office. Hes not there. Go & see Steve and Bill. Give them our tentative schedule for the B-1 area. Steve said we definatly should sample B-1-MW1. He said that Dave Duke called and will deliver the YSI to the office (Lockheed). Steve asked about the packers, and how they'll put in Transducers for

DR 8/29/88

the clinton well.

13:10 Dave Duke arrives. Gives the YSI Meter.

13:30 Ray arrives and said that Gary was on his way. Steve gave me a copy of the QA review and made copies of my tentative schedule and well logs. Said that we need the as built's.

13:40 Gary arrives. Tell him that I talked to NW, and that he'll be looking into the package. He said that sampling NW is not in the contract. I said that Steve said we should sample. So it will be a add on item.

13:50 Go to eat

DR 8/29/08

14:15 Return to the site. René is waiting. Give him an outline.

14:35 Go and pick up the Baker Tank while Todd is DIing the pipes and teflonning the c.m.'s.

15:15 Get the Baker tank on site.

15 René has been monitoring the well with the HNu and is getting between 200-400 ppm. So we all have to put a respirator.

15:30 Start moving the Baker tank into place.

15:45 René goes to call Steve to tell him of the HNu measurements. Take another one before leaving - no change.

DR 8/29/08

16:00 The tank is in place and set up the table. Find Rest room tel. 4

16:10 Call Gregg to tell him not to come today. Will come tomorrow at in the afternoon.

16:15 Todd & Steve go to buy rec & drinks.

16:45 Gary and Remesh arrive. Gary says there was very little new. Our job is to sample.
Gary gives me my checks & the silica for the well screen.

17:00 Renée arrives

17:05 Todd and Steve return. Start lowering pipe.

17:30 Screen at 199-299 Packers at 189'2" and 215'11"
(pump setting 10' above WH.

DR 8/29/88

17:40 Start calibrating the YSI.

18:05 Gary leaves took all the papers necessary.

18:10 Renée goes to call.

18:20 René goes to get some food

18:30 Finish calibrating all the YSI parameters - ~~No problem~~ Salinity both in DI water & standard solution 1000µmhos. pH couldn't calibrate for 4.00 7.00 OK, finally put the Eh pipe in and the 4.00 ~~was~~ then calibrated with no problem.

18:45 Start with the DO meter

19:05 Finish with the O cal. Start w/ slope

19:10 Finish calibration - Ready to pump - W.L. 159.60'

19:15 Renée Returns with food.

DR 8/29/88

19:40 Start pumping. Monitoring all parameters incl. DO.

~~[illegible]~~ 2000 W.L. drops a bit but stabilizes. All parameters are more or less stable

20:15 Reach 3 well volumes get ready to sample

20:20 Start sampling

20:40 Finish sampling take head space in bag. - ~~Reco~~

20:45 Measure head space with (HNu) PID - 22 ppm

21:00 Finish bagging and setting up for night.

21:15 Left site

2200 Start inputting in to computer

1:00 Finish

13 hrs

DR. 8/29/88

TUES 8/30/88

6:30 Todd and Steve arrive start lowering string.

7:00 Renee & Dani arrive Start organizing area.

7:15 Todd & Steve finish lowering pipe. Screen at 235 to 275 (40') They added 50 ft ~~length~~ (5x10' lengths) Packers are setting at 239'2" and 255'11". Water level - 151.425 (7:00)

7:30 Check pipes - 27 out - ~~15~~ then 25 10' in the hole. Top packer at 230 + 5 - 5 : 140 - 10'

7:45 Take water level - 157.40

7:46 Start pumping Renee takes PID 3 ft at WP

8:00 Measure W.L. 151.60 seems to be

DR. 8/30/88

dropping.

8:07 W.L. seems to have stabilized pumping at 48 stroke/min discharge 4.25 - stay constant

8:15 Renee checking PID (HNu) 0.5 ppm at NH. and 1-1.5 ppm at the motor.

8:25 Start sampling - B1-MW-02 830

8:40 Finished sampling W.L. ~~140~~ 151.40 returned to previous level. - drawdown i.e. pumping too fast will slow down to 3.5 gpm.

Head space PID (HNu) - 25 ppm

8:45 Start pulling and adding pipe ~~sita~~ Screen at 338-358. Packers ~~too~~ 334'2" & 360'11" adding 105 feet to the string.

DR 8/30/88

9:15 Finish lowering the pipe.

9:20 Todd goes to get some ice, dunks & baggies

9:25 check pipes 17 x 10" out. 33 above the packer + 5' = 335 ft 60" above well head = 334'2"

9:35 Start pumping. There is some drawdown after 1 min from 151.50 to 151.90 Slow the rate of pumping from 4.25 gpm (48 strokes/min to 3.5 gpm (or a little less (20 strokes/min).

10:00 Parameters stable after 1 well volume. The water is rusty some sediments ~~at~~ for about 20 gal basically the casing.

10:10 The DO measurements are difficult when pumping the spread is over ±10.

DR 8/30/88

decide to close valve and wait
15 sec. it stabilizes to some
degree - more than that the
O_2 is slowly depleted.

10:30 Start sampling take head
space bag.

10:50 Start bagging. The sample
is B1-MW1-03 time 10:00

11:00 Start lowering the string.
Removing the 5'
Screen 400-420
Packers 399'2" - 425'11"
Need to add 70'

11:05 Call Gregg Wilson he already
left.

11:10 Call Robert Lowding for INW
he said that the package
was at drainage (John Wayne)
I asked about the tap sucker

DR 8/30/88

and packers - he said that he
would send some. But wanted
an address in Burbank

11:20 Called Steve Dicky - He's not
in. Got address
The Mark Group
c/o Environmental Engineering
Dept. 3815 Build 76 Plant A-1
Lockheed Aeronautics
2311 N. Hollywood
Burbank CA 91520.

11:30 Call Gary. He said that
he would send Ryan to
pick up the stuff from John Wayne
and the ~~stuff~~ Johnson Screen
from Emery in Van Nuys.
Said to call about the Baker Tank

11:45 Call INW back with address

DR 8/30/88

11:50 Todd said there was about 30' of floating. May not be able to get sample.

12:00 Start pumping. Water very rusty. 4 gpm. at 48 strokes/min

12:10 Depth - 151.85 a drawdown of 0.2 ft. slow pump to 36 then 34 and gauge is at 2.75 gpm

12:20 Depth 151.80 - returning

12:25 Start labeling bottles.

⊗ B1-MW1-04	12:00	
B1-MW1-05	13:00	dup.

13:00 Finished purging

13:20 Finish sampling. Take head space readings - 11 ppm - Orgg. organics.

13:30 Finish packing samples. Eat.

14:30 Return from lunch.

DR 8/30/88

14:35 Ray Ryan arrives with the packers: Johnson screens - about 4' and balls and seats.

14:50 Start lowering the string

15:00 After lowering 20' (420')

Todd and Steve can smell some volatiles - take whiff

chlorinated smell.

PID (HNU) reading 3 ppm at knee level - 200-400 at well head.

15:05 Everyone does respirators & continue work.

The string is floating - expect a lot of sediment in this zone.

15:15 Pipe lowered screen 440 - 460

The packer won't go down to 465. The bottom stops pretty much at 440 - 445.

DR 8/30/88

16

15:20 Decide to pull 20 feet out so will have only 5' of zone. Packers will sit at 431' 2" - 457 11"
Count ~~20~~ 8 outside 44 in the well 420 above the packer + 12 head = 432 (- 10")
So we are getting nearly 15' of the zone.

15:45 The other zones 03, and 04 were off by 10' (lower) which may explain the drawdown and the need for slower pumping rates. Should not have effected the Samples

15:58 Start pumping - 46 strokes/min

16:05 ~~8~~ 4 gpm - Slow to 3.5 gpm 42

16:10 (~~42~~) Todd and Steve go to get the screen fixed

Sample B1-MW1-06 16:30

DR 8/30/88

16:30 Pumping at 3 gpm water cleaning
Measuring (w/ HNU) PID -

16:50 & 6-12 at knee 300 - 400 ppm
Renie goes back Todd & Steve return

17:00 Began sampling took last reading after ~180 gal pH = 7.10
C.C. 813 - temp 20.3 Eh 70
DO - 37 The DO is hard to use - it seems not to be calibrated. If we stop the flow it drops rapidly and ~~if~~ the reading increases in proportion to the flow and is very unstable.

17:05 Renie returns

17:10 Finish the sampling & packing.

17:20 Start pulling the pipe
Start with the Coin of Custody

17:45 Finish C. of Custody

17:50 Seal Cooler and Gregg leaves

18:00 Check head space PID = 10 ppm

DR. 8/30/88

18:40 Finish pulling the pipe - the screen comes out but no bottom packer - will have to fish for it. Since they don't have any fishing equipment will just close up and come back latter (about 2 week) and fish. It should take a whole day.

19:00 Load the pipe onto the rig and loading the H.P. truck. Todd & Steve go to the decon area unload the pipes

19:15 Dani & Renée empty one drum then Dani moves the tank so we can bucket the water up with a rope.

19:30 Todd & Steve return. Finish emptying the water and loading all the equipment

20:00 Arrive with the Baker tank to the decon area. Had Renée in the lead & Todd & Steve in the back.

20:15 Renée leaves.

20:20 Finish unloading all the equipment and go to B1-MW6 and set up barricades and tape

20:40 Leave the site. Still have to decon in the morning empty the water and set up at the site. The well screens will be ready only at 9:00

23:00 Input into the computer

13 hrs

Note did not put serial # on C-O-C. from they are L00007 L00009 L00009

DR 8/30/88

DR 8/30/88

WINDS. 3/31/88

6:40 Todd and Steve arrive on site
they start decoming and mobilizing
they pump the water from the mobile
Baker Tank to the large Tank
At the end the hose tears
from the wear and shoots
water all over. Immediate
shut down.

7:20 Renee arrives on site

7:00 Dam arrives and goes into talk
with Bill. Only Ron Helgerson
is in. Tell him about the
mobile baker tank problem,
and he's surprised. Also
tell him about the our
parting gift to BL-MW1.

DR 8/31/88

7:20 Steve Dicky comes in
Repeat the stories. They
don't see a problem hauling
the tank around since
everything else is moved
between plants.
They want to know at what
depth the packer is. I
said we pretty sure that
it is approx 467' 11".
They would like a depth
reading for verification.
No need to fish it out, at
least in the near future.

7:30 Ron Lewis. Bill Robinson
arrives and ask ~~do~~ where
to put the other baker tank
He says either near the gate
on the inside, or on the

DR 8/31/88

parking lot outside. There are tanks in both areas.

8:00 Ask Steve if I could print out there. He showed me a printer that we can use

8:15 Leave the office and go to the site. ~~That~~ pipes are all loaded and ready to go. Pack some more.

8:30 Dani leaves to go ~~buy~~ cap a 3/4" stainless cap, and Visqueen at Roscoe's and pick up the screen. Steve starts decoring the tank

9:00 Pick up the screen from 36 Welding - Beautifully done costs $30.

9:15 Return and find ~~that~~ no one in the decon area.

~~9:20 Call Gary NW. Robert Landing~~

DR 8/31/88

~~said that he tracked it down and it was sent to Orange.~~

9:30 Call Gary Marks about the 20 mil PVC. He said he needed a truck to transport it, but will deliver next time someone ~~is~~ comes up. Told him about the conversations with Ron, Steve, and Bill. He agreed to continue hauling the tank.

9:45 Arrive on site. Everyone returns to the decon to ~~look~~ clean the screens and fill it with sand, and to look up the Tank. ~~Filled the~~

10:00 Filled the screen with sand and washed it down. Closed cap and washed with

DR 8/31/88

high pressure through the screen (inside to out).
After rinsed with 1 gal of DI water.

10:30 Hook up tank and transport to site.

11:00 Unhook and start setting up.

~~11:30~~ Steve hooks up the bottom assembly - includes screen. (5' 10") pump and a 15' length. Total between packers 24' 10.5"

11:30 Dave ~~[illegible]~~ goes to pick up the compressor. Steve starts running pr.

12:45 ~~Bring~~ bet ice & drinks, but forgot the fork for the ball.

12:00 ~~[illegible]~~ Return to site take the fork and return for compressor.

12:40 Return to site. ~~[illegible]~~

DR 8/31/88

12:45 Writing and ~~begin calibrating~~ set up instruments.

13:00 Count pipe. 11: 10' in ~~hole~~ the well (41 out) 2: 5' in well a 3' and 2 2'.
Top assembly = 12' (5 + 3 + 2 + 2)
Bottom assembly = 24' 10.5"
(Pump, screen 10 + 5')
10 lengths above the top packer + top assembly = 112'
The surface is 7" above WH.
~~pa~~ Screen 82 - 122
W.L. (11:00) : 112:45
Packers 111' 5", 136' 4"

13:20 Start calibrating instruments.

14:00 Finish all calibration & paper work. Recalibrated DO meter

1408 Start pumping.
52 strokes/min discharge 4 gpm

DR 8/31/88

17:20 Pump working at 52-59 strokes/min and the discharge came to 5 gpm.

14:40 Parameters stabilized (≈1440) and finished ~~mea~~ labling the bottles. Can't take water level measurements since the top packer is 1 ft above water level.

DO is nearly impossible to ~~measure~~ measure. The faster the flow the higher the DO value (it works off of pressure). Since we don't have a flow meter one must estimate. At the end figured to slow ~~it~~ the flow just when the probe stops pulsating.

15:00 Finished sampling - Start lowering pipe.

Screen: 160-180 ~~the~~ lowering

DR 8/31/88

Sample B1-MW6-01 T- 14:30 115

~~at to 159'~~ the top packer to 159'5" (160'-7") Removing a 2' joint and labling 50'.

15:20 Make more labels. Count pipe - 16 10 in the well (36 out) one ~~bottom~~ 10' in the bottom assembly

150' + (5, 3+3) Top assembly = 160'

160' - 7" = 159'5"

Packers are thus 159'5" & 179'4"

15:35 Measure head space - 120 ppm max

Wait for Renee to return to dist.

15:40 Start pumping - 52 strokes/min at 5 gpm. The water is extremely rust colored. some small particles.

16:00 ~~Pump~~ Discharge the same. Parameters seem stable but there is a lot of sed. clean cell and little change.

DR 8/31/88

116

SAMPLE B1-MW6-02 T-16.30

16:20 ~~to~~ Start sampling 10 min
Took head space.
16:40 Head space - 0
Samples all packed.
17:00 Go for lunch - Cally Gary
that he should be finished
around midnight. He wasn't in
so I left a message. Called
Gary. Gave him a update.
He said ~~gto~~ that ~~UPS~~
the teflon packers are in UPS
office in Sylmar. He said
he'd call them to have it delivered
to Steve. I said that's
what I had organized.
17:40 lunch
18:30 Go buy gloves, bags +
Bags, paper towels, medicine $ 77 -
19:00 Osco for gloves, chain 48 -

DR 8/31/88

19:20 Return to site start labeling
bottles & labels, drop pipe
to next zone.
Screen 286 - 306
Packers 284'5" - 309'4"
adding 105'.
19:55 Finish setting pipe & motor
Check p count pipes 27 in the
hole - 10 under packer + 10 (top) + 5
cover to 275. Added 115'
Needs another 10'.
20:10 Premount motor
Sound W.L. 110.93 - gained
~~over nearly~~ over 1.5 ft.
20:17 Start pumping water very nearly
Pumping at 50 strokes/min
discharge about 5 gpm
20:45 Slight drawdown (0.2 ft)
adjusted the rate - to

DR 8/31/88

SAMPLE BI-MW6-03 20:30

14 strokes min. = 4 gpm

21:00 Slow down more - starts spitting

21:10 Slow to 40 str. 3 gpm.

21:20 Parameters continued to drop and stabilize

21:25 Start sampling

21:45 Finish sampling & Packing Start lowering pipe. Renee is ready to leave, finishes Labeling Bottles

22:00 Count - med 20'

22:15 Count: 17 outside ⇒ 35 ~~to~~ 10' in hole 350 + 10 + 10 = 350 Packers sitting at 349.5' and 379.4'.

22:15 - Renee leaves.

22:20 Start pumping. Water arrives after ~3 min. Very heavy with sediment.

DR 8/31/88

22:30 Pumping at 48 strokes/min discharge = 4.5 gpm + last 20' was flotting lots of sediment

22:00 ~~There is still a lot~~ The water is still discoloured with a rusty brown shade, Apparently the screen does not hold back much of the finer particulates. Like before - at nearly 3 well volumes - ~50 gal. the water starts clearing up.

23:00 Pumped over 200 gal. water still not ~~pure~~ clear. pH are slowly rising but EH is falling ~~of~~ is rising with pumping

23:30 Dropped pumping rate to

DR 8/31/88

32 str/min. ≈ 2.5 gpm
Finally getting clearer water.
Since the pH and cond. kept
on slowly increasing it seemed
as if it hadn't stabilized. However
after about 2 well volumes the
Eh which was falling to -07
started going up. At slower rates
the Eh went down some

23:45 Start sampling.
Sample # ~~14~~ B1-MW6-04 T. 22:00

24:05 Finish sampling & packing samples
had some problems with the ~~filter~~
Vaccum pump.

9/1/88 W.L. - 112.55

24:15 Start lowering pipe
Zone 5 - Screen: 398-418
putting packers at: 394'5, 419'4"
adding 45' of pipe.

DR 9/1/88

9/1/88

24:30 Count pipe - 13 leg of 10' outside
390 (-10+10) + 5 = 395
395 - 7" = 394'5" top packer.

24:45 Start Pumping slow 34 strokes/m
discharge - 3 gpm

24:49 The water arrives to the cell.
Very rusty coloured, looks like
sediment

01:05 Water level down .025. ~~Nothing~~
~~but~~ Although little pumping at
barely 3 gpm shouldn't cause any
drawdown. If so what was
really happening at 5 gpm.

1:40 Increased to 40 strokes/min
discharge = 3 gpm. earlier
must be ~~[illegible]~~ estimated at
2.5 or 2.75

2:00 Take W.L. measurement. 112.61
it went up. Checked the

DR 9/1/88

discharge pump still working at 40 stroke/min but the discharge is 2.5 gpm. ~~It is getting~~ The pumps efficiency has decreased. It could be do to the screen getting clogged or wear of the teflon cups or leaks from the seat.

02:20 Increased speed to 46 stroke/min a little over 2.5 gpm. Really losing efficiency.

02:30 Start sampling

02:55 Finished sampling and packing

0300 Start pulling the pipe.

0305 Head space - 0 1/9/88

Sample: B1-MW6-05 0200

DR 9/1/88

0315 Demobilizing

0330 Took compressor to B1-MW8

0~~400~~ Finished pulling pipe ~~Mov~~ To decon

0430 Left site - Left drum & tank on site

20 hrs.

DR 9/1/88

THURS 9/1/88

12:00 Meet at Guido for lunch and planning. Mark ~~from~~ Howard is comming in tonight. Renée is leaving tommow for 1 wk vacation. Paul will substitute.
We figure if with no problems we can flenish MW8, by and decon etc by sat, but we can't do MW4. It will have to wait untill next week.

1:15 Return to site - Todd & Steve stop for some more ice.
Start Chain-of-Custody.

DR 9/1/88

1200 Start decanting the pipes. Start Chain-of-Custody.

14:30 Gregg Wilson arrives -

c-of-c #	Time	Sample #	Screen
L00010		~~B1-MW6~~	
8/31/88	14:30	B1-MW6-01	82-122
8/31/88	16:30	B1-MW6-02	160-180
8/31/88	20:30	B1 MW6-03	286-306
L00011			
8/31/88	2200	B1-MW6-04	354-374
9/1/88	0200	B1-MW6-05	398-418

Transfered to Gregg Wilson
9/1/88 1445
Dani Renan and Renée Lawver initialized the serial number.

DR 9/1/88

15:00 Called Gary. Gave him an update. He said that the packers (UPS) should be in ~~the~~ the building office.

15:20 Finished deconning the pipes loaded the screens with ~~sa~~ silica and washed & deconed. Loaded up the pipe, Deconed the tubbing.

15:45 Dani left for the office to pick up the packers -

16:00 Gave Ron and Steve an update, and schedule. Told Steve that the DO measurement is useless since there are two degrees of freedom. it is very time consuming he asked about the Eh. I said that the Eh and then the pH are the most indicative

DR 9/1/88

of the different zones.

16:00 Todd, Steve, & Renée went to B1-MW8 to set up.

16:30 Dani Returns and loads table etc. and leaves for the site. Everyone wanting outside the gate. The gate to Bud 294 is locked. The inner gate is open and sort of a pathway is cleared. But ~~we~~ can't get in ~~with~~

16:45 Go to security to see if we can get the gate open. ~~If not so~~ Some one is suppose to come out with a key. If we can't get in now or that ~~they'll leave it~~ we'll have restrictions in getting in and out - Then we'll set up out

DR 9/1/88

B1-MW2, and leave MW8 for next week, and let them solve the security problems before.

17:45 Grand arrives, he hasn't the right key to the lock, Goes to get ~~an~~ a lock opener.

18:15 Returns, ~~still~~ the other keys don't work. Go to MW2 to check it out. Still has junk around it. ~~Leave~~

18:30 ~~Decide~~ Unpack equipment in front of the gate and go to empty tank.

19:00 Move tank to decon area and hook up the diaphragm pump. After last time, which the hose tore, we wraped the hose bat, all that happend is that

19:15 Renee left. Will come tomorrow for 2 hrs

the the ropes ~~held that~~ a ~~closer~~ s closed off the hose to a large extent, and the pumping was slow.

19:45 ~~M~~ Todd goes to search for Mark who is ~~say~~ scheduled to arrive.

20:10 Mark arrives. The hose ripped again. We decide to stop. There is about 6" of water left.

20:30 Todd returns. Get the convoy ready and move tank to B8-MW8.

21:00 Leave site.

8 hrs

DR 9/1/88

FRI. 9/2/88

7:00 Todd & Steve Gibbs arrive and start loading the truck to move inside to B1-MW8

7:10 Dani arrives. The area is still cluttered up and one of the workers (Jarmara) moves a lot out of the way. a Trailer is sitting in the entrance. He called to get it moved but doesn't know when they'll be out.

7:45 Start to move rig into place

8:00 Hook up tank to move into place

8:10 Mark Howard arrives.

8:20 Get the tank into place by hand. Start setting up the table unloading

DR 9/2/88

the pipe etc. Had to break the lock on the well, since the key didn't work, broke the rusted chain instead. Rebuild the other pump put new seat in. Renée comes by.

8:45 Get the compressor into place.

9:00 Set up chemicals.

9:15 Go and get more sample bottles, ice, ~~[illegible]~~ Todd's mark get

Call Gary not in.

9:30 Start calibrating the YSI for pH conductivity D.T. with DI water.

Eh OK.

9:45 Renée comes and says that Paul should be by soon

She leaves until 1/12/88

1000 Take Water Level 112.10' and TD 453'5".

DR 9/2/88

~~nearly that~~ 1.5 more than listed. Paul arrives

10:15 ~~Star~~ Finish calibrating YSI Start taking Equipment Blank ~~[illegible]~~ - The sample is taken through both the pump and a 10' length selected at random. The bottles are labeled Sample # B1-MW8-01 date 9/2/88 time 10:30

10:50 finish the blank start lowering pipe. Put in 120' of pipe. ~~so~~ There are 9" between the well head and the plate. Thus the packers will be sitting at 119'3" and 144'2" The screen is for 95'-135' Putting the screen lower will allow us to measure the water level while pumping.

11:15 Paul asks about well volume. For the upper row we are pumping 29' of pipe between packers and ~~around~~ the 23 ft of the annulus (water level 112 to bottom of the screen) which gives a well volume of approx 60 gal.

11:35 Take sounding water level 111.95'

12:55 Take DO by shutting off the circulation and rocking the cell Water level ~~starts returning~~ ~~recovers~~ dropped to 116.72 slowed pump from 52 strokes/min (5 gpm) to 42 stokes (3.5) gpm

12:00 Water level returns to 115.29

DR 9/2/88

DR 9/2/88

12:45 Water level continues to rise slowly.
Paul taking some head space measurements with PID (Mr) all 0.

12:50 The ~~pum~~ vacuum pump doesn't work Steve & Todd take it apart and clean it

13:00 Finish vacuum pump. Start sample. Sample # B1-MW8-02 13:00

13:25 Finish sampling & bagging. We bag them in single bags since we don't have labels for second tag. Will get them later

13:30 Start lowering pipe to 35'. Screen is 156-176. Packers are at 154'3" and 179'2" Counted pipe before - 240 length out side ⇒ 12 length

DR 9/2/88

in the well ⇒ 120' to top packer. (120+10-10)

13:40 Count pipes after lowering 37 outside ⇒ 15 in the hole + a 5' ⇒ 155' (100+10-10+5) - 9" ⇒ 154'3"

14:00 Ready to go to eat - go out one of the workers ask how long we plan to say and said that it is impossible. ~~[illegible]~~ Taken to the chief in Building 183 (Dennis) and he said that the area is to government property and no one can be in the area without a GAA person. He calls someone from GAA, who yells at me for notifying one day in advance. I suggest that we buy a key and lock it, but that

DR 9/2/88

is also against regulations.
Finally she told Dennis
that she would be out here
at 7:00 tommorow.

14:30 Go for lunch.

15:30 Return get caught with
the gate closed and get
in only at 15:55.

1 Note from Ron Helgerson to
call ASAP. Called his not in.

16:00 Todd & Steve return - they got
a new hose from Wanamaker
to pump from the mobile tank
to Baker tank, & cards for
the sample tables. Todd leaves.

16:15 Start the pump - water level 112.10
Starts pumping at 50+ strokes/min

16:20 Slow down to 46 strokes/min
water level falls 1 foot to 113.1

DK 9/8/88

16:25 Pumping at 46 strokes - at
4 gpm

16:35 Slow more ~~to~~ measured again
the pump was going at a rate of
50 strokes/min slowed to 42
then to 45. ⇒ 3.5 gpm

16:40 Water level starts slow recovery
from a low of 113.15 to 113.08

17:00 Pump gained some speed slow
down to 42 strokes/min discharge
a little over 3 gpm

17:15 Water clear ~~ready~~ parameters
stabilized. Steve returns
w/ lock & drinks. Sample.
Use vacuum pump both way.
(vacuum and positive pressure)

17:30 Start lowering pipe & add 60'
Screen ~~for~~ 218 - 238 -
packers: 214'3" & 239'2"
Sample # ~~MW~~ B1-MW8-03 17:00

17:45 Count the pipe: 31 lengths out
of the well ⇒ 21 in the well
+5 ⇒ 215'.

17:50 Water level 112.54 lower
than before lowering the pipe
Suspect that it from forcing
the water down with the packers.
and well wait for a few minutes
to see if the upper zones recharge.

18:02 Start pumping water very rusty
pump starts at 52 strokes/min.
Water level drops to 112.65
slow down pump to 48 strokes/min

18:15 pumps ~1 gpm then to 40 strokes
and pump less than 3 gpm (~2.75)
water level stabilizes.

18:35 Increase rate to 44 strokes/min
to check if water level stays the
same. discharge = 3.5 gpm

DR 9/2/88

No change

19:00 Keep pumping at ~3 gpm moves
up and down water level is not
stable. Water still cloudy

19:20 Start sampling BI-MW8-04 19:00

19:45 Finish sampling lowering
pipe 95' (take off 5'
add 80'.)
The screen is from 290-310'
packers will set at
289'3" and ~~28~~ 319'2".

20:15 Finish lowering pipe -
count, 23 length out ⇒
39-10' length in the well
the 5' was removed ⇒
390' (+10-10) - 9" above the bit
⇒ 389'3"

20:30 ~~Decide~~ to start labels
and second bagging of all

DR 9/2/88

13

the samples.

20:45 Finish the ~~labeling~~ packing ~~and~~ ~~to~~ empty the water from the cooler and lock in the cab of the rig

21:00 Leave site. Lock the inner gate with both GAA and our lock (in case the GAA person is late or doesn't show up.) and simulate locking the outer gate.

13 hrs

DR · 9/2/88

SAT 9/3/88

7:00 Steve, Paul, Dave arrive onsite.
Screen: 290-310
packers 289' 3" & 314' 2"

7:20 Start pumping at 50 strokes/min discharge = 4 gpm
For DO reading keep flow at maximum and take the second highest reading ~~for~~ in 30 sec

7:35 Very slight drawdown (112.50 to 112.52) at 4 gpm

7:50 Colour changed to more rusty parameters still stable more or less. slow pump to 50 strokes at 3.5 and then to 44 at 3 gpm

8:20 Still very murky.

8:30 250 gals take sample
B1-MW8-05 8:30

DR 9/3/88

8:45 Water level went up to 112.45'
Start lowering pipe - add 70'.
Screen 303 - 383
packer set 357'3" - 381'2".
9:00 ~~There~~ ~~was~~ The pipes are flotting
after about 30'. (~320')
probably a lot of sediment
9:10 Finished lowering pipe
flotted the last 40'
9:15 Count pipe 16 out of well
=> 36 in the well => 360',
9:22 Start pumping at 48 ~~st~~
discharge ~3.75
9:30 slow rate ~~to 3.5~~
9:40 slow rate again 42 => 3.5 gpm
Water started as a olive brown
colour - very turbid changed
to dark brown. Can see the
movement as colloid, (emulsion)

DR 9/3/88

10:00 Turbidity the same - dark brown
with a lot of rust flakes
I would suspect from the
turbidity and the rust flakes
that we may have a leak
in the packer, that were
pumping from the well casing
and not the formation
however since were still
pumping at over 3 gpm ~~and~~
at 44 strokes/min (13 strokes/gal)
it would have to be a big
leak. But the main argument
is the changes in parameters
the conductivity is in the 400's
and the Eh is -65 the lowest
it has ever been
10:30 Take measurement before sampling
and the parameters change

DR 9/3/88

142

pH goes up a bit so does the conductivity and temp. But ~~the~~ also the Eh and the colour is becoming lighter. Wait for another reading before sampling.

11:00 Pump 300 gal. Parameters ~~see~~ are still slowly changes,

11:15 Took samples

BI-MW8-06 10:30

11:30 Start lowering the pipe - 40'. Screen 404-424 packers at 399'3" - 424'2' Count pipe 120 length out of well => 400' in the well, =>

11:45 Take break to get ice, gas etc. Dan goes for ice, Steve & Paul for gas

DR 9/3/88

12:45 Return, take water level - 112.22, ~~and start pump~~

12:25 Start pumping. at 48 strokes/min => 3.5 gpm (13 strokes/gal) (No loss of pressure) Steve Peters

12:40 The effluent has a yellow tinge - like drillers mud.

13:00 Pump increased to 50 strokes/min still at 3.5 gpm No change in the water (visually)

13:15 Pump losing efficiency: 50 strokes/min => 3 gpm (16 strokes/gal) cups are wearing. The water is clearing - No drop in W.L. started the chain of Carstody from Paul return

13:50 Compressor ran out of gas

13:55 Filled (2 gal) compressor & started it again &

DR 9/3/88

14:00 Gregg arrives

14:10 Starts raining - Sun is out and there is one cloud in the sky.

14:15 Start sampling

14:45 Finish sampling & packing.

~~B~~ B1-MW8-07 13:30

pack in two coolers

Chain of Custody:

200012

9/2/88	10:30	B1-MW8-01	Equipment Blank
9/2/88	13:00	B1-MW8-02	95-135

200013

9/2/88	17:00	B1-MW8-03	156-176
9/2/88	19:00	B1-MW8-04	218-238

200014

9/3/88	8:30	B1-MW8-05	290-310
9/3/88	10:30	B1-MW8-06	363-383
9/3/88	13:30	B1-MW8-07	404-424

DR 9/3/88

15:00 Start pulling the pipe from the well.

15:00 Finish Chain of Custody and sign & load the samples.

15:30 Finish pulling the well and loading the pipe onto the rig

15:45 Take the compressor to B1-MW2 area, load the equipment

16:00 Take rig and most of the equipment to ~~the~~ decon.

16:30 Hook up tank and empty ~~to~~ clean.

16:40 Move ~~off of~~ off of site - start raining

17:05 Can't make it up the grade to ~~the~~ B-6 plant - tires spinning - Steve gets rig to pull. Tires dig and it pulls

17:30 Unload and leave site

~~10~~ 10 hrs

DR 9/3/88

SUN 9/4/88
Off - Input notes into computer

MON 9/5/88
Labour day - Continued with notes into the computer -

TUES 9/6/88
Somewhat comp time:
9:00 Entered notes into the computer and did time sheet.
10:00 Called Bill Robinson and told him we planned to be at B1-MW2 the next day. Asked him if he could get some of the equipment moved. He said that it was no problem. He added that he'll be starting

DR 9/6/88

in vacation on Fri. So we'll have to quit work & I laughed and he said he'd pass everything to Steve Dickey.
10:30 Called Ron Helguson & left a message with Candy.
11:00 Ron called back. Said that note pertained to the problems at B1-MW8. Since we already solved it - there was no problem.
13:00 Gave Nona my time Called Candy. Told him that definitely two people on the rig goes faster. He asked how - and how much time it would cut down. - He said that he talked to Steve Howard who said that we were working too long - hours and taking 2½ lunches. I said that I asked everyone and no -

DR 9/6/88

one complained. He asked weather
I needed someone. I said not really
we need someone that can swing
a wrench, lower pipe fill out
tags and label bottles. Basically
left it at that. Said we'd see
how things went. He asked how
much time was wasted due
to different factors. I said I
could summarize it.

16:00 Called Dean Marachi. He was on
the other line. Said he'd call
back.

16:15 Called Audrey Mathieson. She
wasn't in. Left my number.

16:30 Dean Marachi called me back
said he'd like to meet when
I came up for a break.

17:30 Called Mary. She said she'd call back

DR 9/6/88

22:00 Finished inputting up through
9/2/88. Left it.

8 hrs.

13:30 Called Steve Howard. Asked him
if there were any problems
with our timing. He said no.
I asked him about price.
He said the minute someone
works - the rig is on standby
so no matter what its $75/hr.
I asked for 2 people - it would
be ~~close~~ like $100/hr
I also asked about the 2½ hundred.
He said he never heard of it.

DR 9/6/88

WENDS 9/7/88

7:00 Steve arrives and starts unloading and setting up for decon.

7:30 I arrive, help take off the pipes. ~~and g~~

7:50 Take the fire hose to Wa-[illegible] to get the right size (3").

8:30 Return to the site decon. pipes, tubbing & YSI cell.

9:25 Paul arrives. Steve starts fixing [illegible]

9:40 Paul asks about the D1 water [illegible] I said we have 2-3 gal. He asked where we planned to ~~decon~~ D1 the pipe. I said either in decon or site, it didn't matter. Paul argued it dick, [illegible] according to the Plan. ~~DS~~ I said all D1 since does is wash the salts from the tap water off.

DR 9/7/88

that there is no use in collecting it. I ~~didn't~~ not sure about current EPA practice but, DHS definitely not. Looked at the plan - It is ambiguous.

10:00 Started pumping from mobile Baker tank to large one. Filled up the truck w/ equipment.

10:30 Finished pumping - Hooked up the tank.

10:35 Convoyed the tank over to the site and put it in place.

11:10 ~~Tap~~ Unload all the equipment

11:20 I left to go get ice, drinks, and a tarp - Steve went to gas up the rig.

12:30 Returned to the site and unload

12:40 Steve & Paul arrive. Finish unloading and returned to decon to D1 the pipe and send up the filter.

DR 9/7/88

13:00 Grabbed a bite on the way.

13:10 Update the paper work while Steve and Paul finish the DI. There is only about 2 1/2 gal of DI water. They start loading the pipe onto the rig.

13:30 Finished DIing and sanding and loading ~~up~~ all on the rig. Moved to the site.

13:45 Went to (Build 195) ~~to~~ B1-MW8 to get the chain. Met Dennis Jones and Jamie there. The gate was still locked with our chain - got it back.

14:00 At the site - set up rig - table etc.

14:50 Start lowering pipe. Water level - 145.69'. The top ~~[illegible]~~ zone is below the water level -

DR 9/7/88

~~put set pipe top packer at~~

Second screen 150-170.

Motor base - 10" above WH.

Set packer at 149'2".

Bottom 274'0".

15:05 - Calibrate YSI.

15:30 Finish lowering the pipe finish calibrating. Start hooking up the tubing found that the 3/4" was melted on the exhaust.

15:40 Took Steve to his truck.

15:50 Called Gary. Told him were ready to pump. He told me to call Gregg.

16:10 Called Gregg - said we needed more DI water and that I would call tomorrow to tell him what time to pick up the samples.

DR 9/7/88

He again asked ~~[illegible]~~ to take a third 1 l sample but only one per well. The technician started to explain to him for what, but he didn't understand.

16:20 Returned to site, Steve had already returned & set up the tubing.

16:35 Count the pipe (37 out) => 15 in => 150' (-10 wH) => 149'2"

16:50 Started pump & stopped to take water level - 145.56 Start at 46 strokes/min

17:00 Head space 150-100 ppm in sample increased to 57 strokes/min.

PID - 1ppm at bore hole - 0 at [illegible]

17:05 Slowed down to 44 strokes/min

discharge = 3.5 gpm 1165 strokes/gal.

17:10 Water level slowly returning 145.74

~~Wt~~ Head space = sample - 30-40

DR 9/3/88

at the bore hole - 1.2 ppm.

DO meter shows a L. i.e. batteries loss - and the first was dead so no measurements today.

17:30 42 strokes/min just a little over 3.5 gpm. No change in water level

17:45 Start sampling - took two samples

~~[illegible]~~ - duplicate

B1-MW2-01 17:00 9/6/88

B1-MW2-02 1830 9/6/88 dup of 01

screen - 150-170'

18:15 Start lowering pipe - 75' to the third zone - screen 229'-249'

75' ~~[illegible]~~ that the packers will set at 224'2" and 249'1". (The pump line is 9.5" above the W.H. and the packers are 24'10.5" so the packer is 1" below the screen,

DR 9/3/88

18:20 Start labels and bagging

18:15 Finish bagging & put in cooler

Finished setting the pipe. 30 out

22 in well => 220 + 5 added => 225 - 9.5'

=> packers at 224' 2" & 249' 1".

18:50 Slive leaves

19:00 Start pumping - the spigot was closed and spray all over. Got it open & started pumping at 19:10. 42 strokes/min & 3.5 gal.

19:15 Water starts clearing

19:20 Still pumping at 42 strokes/min

19:35 Fold in the canopy.

20:00 Still pumping at 42 strokes/min and at 3.5 gpm. Ready to sump

Head space - sample 130 ppm

2 ppm at WH & 0 in Breathing space

DR 9/3/88

20:05 Start sampling. B1-HW2-03-2000

20:25 Finish sampling & packing.

20:30 Paul leaves & clean up a bit.

20:45 Leave the site

All entries and samples of this day are labeled 9/6/88 but the real date was 9/7/88.

Since the samples are packed, ~~we will~~ no changes will be made

DR 9/3/88

END OF BOOK 1

Property of DANI RENAN

THE MARK GROUP

Address DANI RENAN / GARY HALBURT

Telephone (714) 546-0602

This Book is manufactured of a High Grade 50% Rag Paper having a Water Resisting Surface, and is sewed with Nylon Waterproof Thread.

INDEX

B1-MW2-04	1	B1-MW3-03	54
B1-MW2-05	5	B1-MW3-04	56
B1-MW2-06	9	B1-MW3-05	58
B1-MW2-Demob	12	B1-MW3-06	59
B1-MW5-Mob	15	B1-MW3-07	61
B1-MW5-01	17	B1-MW3-Demob	63
B1-MW5-02	19	B1-MW7-Mob	66
B1-MW5-03	22	B1-MW7-01	68
B1-MW5-04	24	B1-MW7-02	71
B1-MW5-05	26	B1-MW7-03	72
B1-MW5-06	28	B1-MW7-04	73
B1-MW5-Demob	30	B1-MW7-05	75
B1-MW4-Mob	32	B1-MW7-TB	76
B1-MW4-01	35	B1-MW7-Demob	77
B1-MW4-02	38	Admin -	80
B1-MW4-03	40	Area 7 - Mob	83
B1-MW4-04	41	-C1-CW3-01	91
B1-MW4-05	42	C1-CW3-02	92
B1-MW4-Demob	44	C1-CW2	93
B1-MW3-Mob	48	C1-CW1	103
B1-MW3-01	49	Sampling Plan	110
B1-MW3-02	50		

Cont →

Area 8 - Mob	111
C1-CW5	114
C1-CW4	118
C1-CW6	130
Area 8 Demob	131
Area 4 - Mob	139
B6-CW10	143
B6-CW11	144
B6-CW5	145
B6-CW4	147
B6-CW6	152
Area 4 - Demob	163

THURS. 9/8/88

7:00 Steve Gibbs & Paul Azavido arrived on site

7:05 Dani Resane arrived on site

7:15 Started lowering pipe down 90'. The next screen is from 318-338 The packers were set at 314'2" and 339'1".

7:40 Count pipe 21 out => 31 in' in the well, => 310' (10-10) + 5' - 90" = 914'2".
Finished lowering pipe start setting the motor

8:00 Steve leaves to get gas for the compressor. Start the pump. shut down for to open valves

8:05 Start pumping at 44 strokes/min. 3 gpm. (14 strokes/gal.)

DK: 9/8/88

8:15 Water level falls to 145.95
~~the~~ about 0.25 ft. Adjusted
pump to 40 strokes/min -
little less than 2gpm.
The water ~~the~~ colour is bright
rusty colour
8:20 ~~The~~ Colour starts to lighten up
8:30 Still at 42 strokes/min but
discharge went down to 1.5gpm
(Efficiency has gone way down -
now ~28 strokes/gal.
The water is lightening
8:50 Water has cleared. Steve Dickey
arrives on site. We tried the
DO meter, even though it's
low on batteries, it registered
something. When we took all
the probes out of the cell
the reading stabilized.

DR 9/8/88

Steve prefers to see ppm and
not % Saturation since it
doesn't mean anything to him
(nor either) took two readings
12.8 - cleaned the cell and it
came to 13.4.
9:15 Steve Dickey left. Took
another measurement - It was
1.01.5 and didn't change in
in stirring or whatever.
9:20 Checked discharge - Pump
still going at 42 strokes/min
but the discharge is 2.5 gpm
there was a slight fall in
the water level.
9:40 ~~Start~~ Still going at 41-42
strokes/min with a discharge of
2.5 gpm. Parameters are stable
except for Eh which is slowly
falling

DR 9/8/88

9:45 Eh starts to reverse itself.
goes from 102 to 109
9:50 Steve Dickey showed up again
when we started sampling
10:15 Finished sampling & filtering
10:20 Start lowering the pipe.
Steve leaves. We discussed
the DO meter - need new bellows
and we'll try again. He said
that the pH stabilized only
when there were no probes.
It makes sense since the
probes slowly deplete the
DO. He said that stainless steel
is stainless only if there is DO
in the water, that the steel
(Ni & Cr in it) take up the O2
and passify ~~the~~ the steel,
but in a reducing environment

DR

Sample. B1-MW2-04 9/8/88 9:00 9/8/88

Stainless steel isn't
10:25 Pipe to be lowered to
379'2". add 65' (took off
the 5' and added 70')
10:50 Counted pipe - it doesn't
⇒ 380 (+10 - 10) - 10" or 379'2"
for top packer
Screen 380 - 400
Packers 379'2"; 404'1"
Toward the end there was some
flotting.
11:02 Take WL. 145.72
Start pumping at 44 strokes/min
down to 42 at 1.5 gpm. very
heavy material
11:30 Sample water full of sediments
bright murky colour.
There is about 3/4" sediment
on the bottom of the cell.

DR 9/8/88

the sediment looks like very
fine sand and rust particles.
Some stratification on the bottom
of the cell.

11:45 Still 42 strokes/min WL. same
discharge = 2 gpm
Speed up to 46 - 2.25 gpm
Efficiency increase from 28 → 20 → 19
strokes/gal

11:50 Increase to 50 strokes/min ⇒ 2.5 gpm
But there is a drawdown to 145.86
within 2-3 min. Slow back to
44 strokes/min. The Eh increased
as well instead of declining &
which ~~mu~~ probably must we
were pulling from the anaerobic.

12:15 Increased to 45 strokes/min ⇒ 2.4 gpm
the Eh ~~sto~~ went up as well as
the pH

D.R. 9/8/88

12:25 Steve Dickey arrived

12:30 took reading, Steve tried
again with the DO meter
~~The pump~~ Speed up the pump

12:40 to 2.5 gpm ~ 44 strokes/min
The Eh shot up to 121 -
was sure we were getting another
zone.

12:50 Slowed it 36 strokes min. ≈ 1+ gpm
Steve left, said he'd be back in
about 20 min

13:00 ~~Slowed down to 3~~ The Eh is
rapidly falling and the water
level rose to 145.78

13:05 Went to call Gregg Wilson
and Gary. Left messages
for both. Told Gregg that
we'd be finished about 15:00 -
16:00

DR 9/8/88

13:20 Return take final reading
no real change Eh fell to 104.
Still pumping at 1gpm.
Water lever rose back to
145.76

13:25 Started sampling
B1-MW2-05 9/8/88 12:00

13:45 Finish sampling start lowering
pipe 40' ~~to~~
Screen 421 - 441 ~~FD~~
packer 419'2" 444'1"
TD as of 8/22/86 - 452
So we might'n't get down to the
zone.

14:00 Finished bagging and packing
the samples. Finished
putting in 40' but the pipe
was caught - ~~seems~~ felt
like a packer caught on

DR 9/8/88

a screen pulled up and
took off 10'
Packers now sitting at
409'2" and 434'1"
which leaves 13 feet of
screen to pull from.
thus the one well volume
would be ≈ 40-45 gal.

14:16 Start pump - Pump at 44
strokes/min - discharge 2 gpm.

14:30 Lowered pump rate after WL
fell to 145.83. Rate: 38 strokes/min
for 1.25 gpm. Efficiency is
about 28 strokes/gal.

14:45 Flow lightens to a murky cloudy
~~[illegible]~~ colour. Pump at 40 strokes/min
Paul takes head space sample
6 ppm.

15:00 Pump at 38 strokes/min - 1gpm

DR 9/8/88

15:15 Pumping at 44 strokes/min. discharge is 1.5. The parameters have stabilized water level is still 145.76

15:30 Slowed to 42 strokes/min. The Ch was reversing. Effeciency is down to 30 strokes/gal

16:00 Call ~~Greg~~ Greg. He had already left. Called Gary. Told him we are still pumping. He asked why. I told him that yesterday we were pumping at 3.5-4 gpm after we had slowed it down because of drawdown. But today we were pulling so much sediment that the efficiency went down. But the critical factor was that the flow of the formation was so low so we had to

DR 9/8/88

pump at that speed - at the bottom zone ≈ 1.25 gpm. That was the critical point. We could up the rate to 2.5 or 3 gpm but we got immediate drawdown, and the parameters change.

He said that Ryan was driving up tomorrow. I asked for sample labels & chain-of-custody forms

16:15 Turn the pump down to 1.25 gpm.

16:40 Take samples

B1-MW2-06 9/8/88 15:00

17:00 Gregg arrives -

17:05 Finish sampling and start packing and pulling the well.

17:45 Finish pulling the well &

DR 9/8/88

finish chain of custody:

L00015			
B1-MW2-01	9/6/88	17:00	150-170
B1-MW2-02	9/6/88	18:30	dup of 01
B1-MW2-03	9/6/88	20:00	229-240
L00016			
B1-MW2-04	9/8/88	09:00	318-338
B1-MW2-05	9/8/88	12:00	380-400
B1-MW2-06	9/8/88	15:00	421-440

Samples labled 9/6/88 were actually sampled on 9/7/88.
Serial signed by Dave, Paul
Chain of Custody signed and transfered
9/8/88 - 18:00

17:50 Pulled pump and bottom packer was loose - poured DI water

DR 9/8/88

on both seals in the well and the water flowed through. Will need to replace.

18:00 Gregg left off 46 gal of DI water, part of it left by the compressor, and part in my truck

1805 Gregg left the site. Steve & Paul loaded the pipe on to the rig.

1815 Bucketed the ~~water~~ drum water into the tank and Paul left.

1820 Brought the rig and some equipment back to the decon area.

18:45 Returns to site, hook up the tank and load the trucks. Fight the compressor 20 gal + of DI water & table & drum

DE 9/8/88

at the site will transfer it
on a as needed basis tommaso
and the weekend.

18:15 Leave the site.

19:30 Set tank in place and position
the diaphram pump. Unload all
the equipment.

19:45 Steve leaves site; I went to
B1-MW5 and put up caution
tape around the well.
took up both lanes (≈ 1/6 of
the lot.

20:00 ~~Return~~ Left site

13 hrs.

19 days from Beginning

DR 9/8/88

FRI 9/9/88

7:00 Paul & Steve arrived on
site. Paul sorted out soil
samples for URS borings (cluster
well)

7:15 Steve transfered the water from
the Mobile Baker tank to the
large tank w/ the diaphram
pump.
I updated the notebook and
made a back up of the
computer file (up to 9/2/88)

7:45 Washed the pipe - the steam
cleaner ran out of kerosene
Organized materials

8:30 Arrived on site - ~~went~~

8:40 Went to Wanamaker and got
kerosene ~6.00 (added to bill.)

DR 9/9/88

Steve worked on the rig -

9:15 Returned to the site. Filled the steam cleaner and deconed the pipes.

9:45 Took all the trash (non hazardous) and emptied into a bin.

9:50 ~~Deconed the~~ Loaded the pipe onto the rig. Start loading the trucks

10:00 Decon the tubbing, pails etc

10:15 Fill the screens with SO_2

~~10:20~~ Deconed & cleaned the sounder.

10:30 Hooked up tank and moved it to the site. Returned for the rig.

11:15 Went to B1-MW2 picked up DI water, compressor hose, table.

11:30 Set up rig - table etc Visqueen, pipes

12:15 Go get ~~generator~~ compressor, Dan fill up with gas (& truck) $40 -

DR 9/9/88

Get ice & drinks.

13:00 Returned. Paul arrived, and Ryan arrived w/ checks, forms took back the first notebook for copying

13:15 Ryan left. Set up compressor

13:30 Left for lunch - & paper work

14:30 Returned. DI the pipes, & took blank sample (equip blank) Used ~4 gal for decon & 1.25 for the blank sample.

~~15~~ B1-MW5-01 9/9/88 15:00 equip blank

15:00 Bag samples & tag.

15:05 Paul checks sketch against his numbers - found a mistake on the diagram - there is five zones not 4. Corrected ~~sample~~ sheet.

15:10 Took water level measurement

DR 9/9/88

135.21 ft BWH. Packer Test -
Top zone is from 9C to 13C
thus with 0.78 feet - we can't
take a sample -
The next zone is ~~f~~ 160-180'
15:20 Paul took HNo measurements -
found 200-280 ppm at the
well head and up to 4 ppm
at knee level.
15:30 Paul left to find out what to do,
stopped work
15:45 I took another reading - exactly
the same - 280 - maximum at well
head, 4 ppm max at knee level
(average >1) and >0.5 max at
waist or breathing level
15:55 Paul returns. earlier ~15:15
poured DI water on the packer.
it seeped slowly. I thought

DR 9/9/88

it was fine. Paul worried
Talked to Ramesh. Brought
more water to do measure
seepage.
16:00 Seep test - 45 seconds for
1 gal of water to seep through
the packer (nothing under it.
16:35 Finished calibrating the YSI.
17:10 Ready to pump - measure W.L.
full from ~~dt~~ 135.73 to 135.05
~~18~~ Mike Arend said that the
18" extraction well is on a
pump test. They were pulling
9 ft of water ~5 min' and shutting
of. Distance ~1800 ft. (from 'D' map.
17:20 W.L. ~~135~~ 134.53
17:35 W.L. 134.47
18:00 Went to call Gary. Paul left
to talk to Ramesh.

DR 9/9/88

Told Gary wasn't in. Talked to Ray Maresco. He suggested that we sample and note that there is drawdown. Discussed different possibilities.
Stopped & talked with Paul and then Ramesh. Ramesh said that there is no way that his pumping effected our W.L.

18:30 Started pumping at 3 gpm (44 strokes/min). The pump started sputtering. Told Steve to de rig and move the rig inside the B1-gate. Stopped the pump for 5 min

18:40 Resumed pumping must last for ~3 min. Steve leaves with the rig. Increase pump to 50 strokes/min ⇒ 4 gpm

DR 9/9/88

18:50 Parameters look stable.

19:00 Slow to 44 strokes/min ⇒ ~3.0 gpm

19:15 Measure still at 3.5.

19:25 Take sample B1-MWS-02 9/9/88 19:00 160-180

19:45 Finish sampling & Steve pack the samples.
Start loading the truck with all movable equipment

19:55 Leave only the tank, visqueen table & pipe. All else is loaded. Will keep in the truck over night with the tarp over it.

20:00 Leave site.

11 hr

DR 9/9/88

SAT 9/10/88

7:00 Steve Gibbs & Paul Asivido arrived on site
Put 40' of pipe in the hole.
9:15 I arrived - ~~alarm~~ Tailed to put on the alarm.
9:25 Finished unloading equipment and start lowering pipe - by 90' (including the 50 from earlier to the screen is
Third screen is from 252-272 packers set at 249'3" and 274'2"
9:45 Count pipe 27 out => 25 length in => 250' in well @ 9" => 249'3"
9:48 Start pumping at 9:48 50 strokes at 4.5 gpm

DR 9/10/88

9:50 Water light rusty (purple)
10:05 The Pumping rate is 52 strokes/min with a discharge of 5 gpm
No registration on the PID ~~on tour~~ from the well head or from head space sample
10:15 Reduced rate to 48 strokes/min with a discharge of 4 gpm efficiency is a little under 12 strokes/gal
10:20 Sun comes out - start setting up the canopy.
10:30 Start sampling
10:45 Finished sampling

B1-MW5-03 9/10/88 10:30 252-272

1:00 Start bagging & lowering pipe by 45' to Screen 296-316
11:00 Finished lowering pipe -

DR 9/10/88

Counted pipe => 23 10' out of the well => 29 10' in the well. 5' were added for a total of 295. -9" from well free. Packers were at 294'3" & 318'2"

10:10 Start pumping at 48 strokes/min → 4.5 gpm. Water arrives 2.5 min. dark rusty

10:15 WL - 154.93. Slowed pate to 46 strokes = 4 gpm - murky sediments colloid movement.

10:25 Slowed to 42 strokes/min = 3.5+ gpm Lowering 4 for the 10 min interval

11:35 check again & slowed pump rate to 40 strokes/min => 3.5 gpm efficiency is slowly declining to ~12.5 strokes/gal W.L. is basically unchanged.

11:45 At 40 strokes/min discharge is 3.5

DR 9/10/88

no change - The efficiency is about 12. ~~Went~~ Apparently went up as the water cleared.

12:20 Parameters stabilized. Pumped about 240 gal ~ ~~4~~ 4 well Volumes. The drop in water level. Start sampling

12:40 Finish sampling

B1-MW5-04 9/10/88 12:00 296-~~296~~ 316

Started lowering pipe to the next zone. 354'-379'

Took off the 5' and added 60' so packers sat at 349'3" and 379'2"

13:00 Counted pipe 17 10' lengths out of the ~~hole~~ well => 35 in the well => 350' (5' out) -9" => 349'3".

DR 9/10/88

1305 Start pumping at 44 strokes/min

13:10 Lots of ~~sediment~~ particulates in the water, settling in the cell.

~~13~~ Pump rate = 48 strokes/min - discharge is 4 gpm. The efficiency is 12 strokes/gpm

13:15 There is over ½ inch of sediment on the bottom of the cell.

13:20 Paul returned. Took PID measurement 100 ppm at the hole

13:30 Still pumping at the same rate the water cleared to murky. Cleared the cell and the readings changed; pH up, Eh down, cond. up. After a few minutes they shift towards the original - (reggesion towards the norm)

13:45 Pumping at 48 strokes/min - discharge 4+ gpm so change in water level.

13:50 Slowed to 34 strokes/min discharge

DR 9/10/88

a little under 3 gpm.

14:00 Start sampling.

~~14~~ B1-MW5-05 9/10/88 14:30 354 394

14:10 With the sediment it takes ~10 minutes to filter for the metal. ~~B1-MW-05 9/10/88 14:30~~

14:20 Finished sampling and start lowering the pipe by 70' Paul returned

Screen at 422 - 442.

Packers set 419'3" - 4

14:35 The pipe started floating at about 380'. at ~~dep~~ 415 ~~at~~ stopped going down - needed a crunch to twist the final inches wouldn't go so set it on the fork - 2" higher so packers set at 419'1" and 444'0.

DR 9/10/88

Paul took head space w/ PID
from sample - 0 ppm.
14:50 Start pumping at 40 strokes/min
3 gpm. 4 minutes for water to arrive
15:00 Very heavy with sediments
Beginning to settle in the cell
Slight drawdown, believe it is
the natural decrease of sit after
15:10 PID measurement 28 sample
250-300 ppm at the well head -
Breathing area - 0
15:25 Speed up the pump to 44 strokes/min.
~~15:30~~ ~3.04 gpm
15:30 PID - sample 0.6 ppm Wlt 300 ppm Breathing
15:35 Speed up to 46 strokes. discharge 3.5
efficiency fell to 13+ strokes/gal
~~15:40~~ Water level fell ~~a bit~~ to 135.29
(0.04) Reduced back 42 strokes/min
discharge = 3 gpm.

DR 9/10/88

Efficiency is 13+.
15:50 Parameters more or less stable
after 2 cleanings of cell.
15:55 Start sampling
B1-MW5-06 9/10/88 16:00 422-442
16:15 Finished sampling & packing samples
Start pulling pipe
16:20 Went and called Gregg Wilson
He said he'll leave soon and
should be at decon abo 1-1.5 hrs
16:30 Returned - Steve & Paul are
wearing respirators to pull the
pipe.
17:00 Finished pulling the pipe.
brought up a lot of water
& rust. Took compressor to
B1-MW2 area
17:15 return - Rig set to go
17:30 Pack all the equipment

DR 9/10/88

and hook up the truck to the
Baker tank and move to decon
17:45 Arrive at the decon area and
hook the tank to the diaphram
pump and pump the water to the
large baker tank. Gregg Wilson
arrives at ~~the~~ with us to the
area. Start Chain of Custody
18:05 Finished pumping. Unhook the
tank from the truck and Paul
takes Steve to get his truck.
18:15 Steve returns ~~we~~ We agreed to
move the tank the next day
after spotting the site.
I told them I'll be in late, ~~be~~ So
Steve said they could decon in
the meantime. He left the
site
18:20 Finished the Chain of Custody form

DR 9/10/88

and transfered the samples
to Gregg. ~~The forms were~~
18:30 Paul returns and signs the forms
The forms are

L00017			
B1-MW5-01	9/9/88	15:00	Equipment Blank
B1-MW5-02	9/9/88	19:00	160-180
B1-MW5-03	9/10/88	10:30	252-272
L00018			
B1-MW5-04	9/10/88	12:00	296-316
B1-MW5-05	9/10/88	14:30	354-394
B1-MW5-06	9/10/88	16:00	422-442

The serial numbers were initialed
by Paul and myself, and the
samples were signed over from Dani
Renan to Gregg Wilson
18:45 Gregg and I unload the truck and leave
the site

DR 9/10/88

SUN 9/11/88

8:00 Steve arrived and put the rig in place. Fixed hoses on the diaphram pump

8:30 ~~Dani~~ I arrived, moved the diaphram pump to the decon pit and pumped the water from the pit. Removed the visqueen and washed down the area ~~and~~

9:15 ~~Went to site to~~ Paul arrived as we were leaving to the site to spot emplacement of the rig and tank.

9:30 Returned to decon and put the black PVC into place - laid a ~30' stretch down on the ground and another covering the pit.

DR 9/11/88

10:15 ~~Left~~ Went to A-Whals to get Visqueen, valve, and staples. Steve starts decoming the pipes. Paul also went to Awals

10:45 Went to ~~Hal~~ Heights for ice, drinks, paper towels, bags

11:00 Went to Osco drugs for gloves. (10 packs of 5 pairs)

11:30 Return to decon, Organize all the materials in decon & box them. Steve finishes decoming the trailing.

12:15 Hook up the Tank and move it to the site. Paul joins us and we unload the equipment

13:00 Go to eat

13:50 - Return. Dl the pipes, Sand the filter, and load the pipes

DR 9/11/88

etc at the rig. Paul wanted to bring 4 barricades. I didn't think it was necessary.

14:45 Took rig to the site. ~~Started~~ I went to B1-MW2 to get the compressor and DI water

15:00 On site at B1-MW4 and set up the saw horses and site.

15:30 Rig in place and set up the Visqueen and table. Water level is 116.55. Since there is less than 3.5 ft of the first zone we will start at the second zone 162-182. There are 4 zones. ~~Start Lower~~

15:45 Paul sets up barricades. Start lowering the pipe to 160'. Set up table and equipment. Paul checked the map - The

DR 9/11/88

zones are the same.

16:15 Decided to take a duplicate of the third zone. Finish setting the pipe

16:20 Count pipe - The top packer is out. Must pull the pipe and reset.

16:25 Start calibrating the YSI 3500 and setting up the tubing. HNu - Paul measured 20 ppm at the well head. Paul and Steve don respirators to pull the well

17:10 Finished calibrating YSI

17:20 Finished setting pipe count = 36 out of hole ⇒ 16 in hole. 10" from WH to base ⇒ 159'2" to top packer.

DR 9/11/88

B1-MW4-01

Screen is 162-182

packers 159'2" 184'1"

17:30 ~~Re~~ Ready to pump take Ground water level measurement - 116.25. Paul took the measurement, & checked it and it was 116.20. We wanted a minute and it was 116.15. Then on a average of 1 min 15 sec the water level continued to rise 0.1 ft. ~~first~~ at first the rate was 0.1 ft/min

17:45 The rate of rise was 0.1 ft / 1 min 45 sec (114.9)

18:00 Still rising but at ~~3 min~~ 0.1 ft/3 min. 114.20'

18:10 Rising slowly - 0.1/5 min - 113.90

18:17 Still rising - 0.1 ft/5 min 113.80

18:19 Started pumping - Water arrives at 1.5 min rusty - ~~clear~~ gas Starts at

DR 9/11/88

52 strokes/min, gradually slows down to 46 strokes/min. Discharge - 2.5 gpm

18:30 Changed pumping rate to 50 strokes/min

18:30 ~~Change~~ Checked and the discharge ~~rate~~ was over 5 gpm. Stroke called out in 1/2 min. Slowed to 46 strokes/min => 4.5 gpm the efficiency is about 10 gp strokes gal.

18:45 Still at 46 strokes - 4.5 gpm and efficiency is still ~10

18:50 Slowed pump to 38 strokes/min => 3.5 gpm

19:00 Begin Sampling

19:20 Finish Sampling - Start bagging Take the motor off and close the well.

B1-MW4-01 9/11/88 19:00 162-182

19:30 May go to the top zone tomorrow if it retains the same depth to WL

19:45 Leave site

DR 9/11/88

MON. 9/12/88 B1-MW4-02

7:00 Steve Collins arrives sets up pipe, opened the well

7:30 I arrive set up YSI. Take water level reading 113.76 down from yesterday. Decide to continue down and if there is significant water in the way up, we will sample the top zone. Add the third ~~zone~~ ~~is~~ screen in from 214-234. ~~Lower~~ Added 5' of pipe so that the packers set at 211' 2" and 236' 1"

8:00 Finish lowering pipe. Count pipe 31 length out ⇒ 21 in ⇒ 210' + 2' - 10" ⇒ top packer at 211' 2".

8:15 Water level went down to 116.54 Wait until it stabilizes. Pull & Rinse auger

DR 9/12/88

8:20 Still at 116.54 start pumping at 48 strokes with discharge of 4.5 gal/min efficiency is about 11 strokes/gal

8:35 The motor is still pumping at 48 strokes/min with a discharge of 4 gpm. The efficiency is 12 strokes/gal.

9:00 Slow to 38 strokes/min discharge - 3 gpm efficiency ~ 13

9:10 Clean all parameters change some WHat - wait another 5 min to sample - pumped ~ 220 gal ~ 4 well volumes

9:15 Start sampling:

B1-MW4-02 9/12/88 09:00 214-234

The HNu doesn't work. The pump connections are apparently bad. The tube head space

DR 9/12/88

samples and will keep them until it is fixed.

9:35 Finish sampling and start packing. Steve starts lowering the pipe adding 83'. (Take off the 2' and adding the 5' and an extra 80'.

9:45 Paul leaves to fly back to Sacramento.

10:00 Finish setting the pipe for B1-MW4-03 and 04.
Screen at 297-317
packers at 294'2" and 319'1"
Count pipe: 23-10' out of the well
=> 29 in the well + 5' length => 295'
-10" => 294'2" to top packer.

10:05 Ready to pump but the water level seems to be falling 116.70 then 116.74. Waited a few minutes

DR 9/12/88

10:10 - WL 116.70

10:15 Start pumping at 40 strokes/min 4 gpm. efficiency ~ 11.5 strokes/gal

10:35 Check pump rate - remains stable. slight loss in efficiency.

11:00 Have pumped 180 gal. the WL is the same. Cleaning the cell brought the pH up a little the cond and Eh down a little But the Eh continues to decline

11:20 & the Eh is still falling. Slow pump down to ~30 strokes/min ≈ 2 gpm and the Eh still declined

11:30 See some stabilization in the Eh so start sampling.

~~12:0~~ B1-MW4-03 9/12/88 10:00 297 317

B1-MW4-04 1/12/88 11:00 "

04 is a duplicate of 03

DR 9/12/88

Taken alternating bottles. The
Metals were analyzed from a
~~split~~ a single sample taken
in a beaker. (a true split)

12:00 Renée left to call about the HNo.
Mutting resistance in lowering
the pipe. Floating when the top
packer was at 330'

12:15 Lowered the pipe 120 feet and
took off the 5' joint. Thus
the top packer should be sitting
at 409'2".
Count pipe - 11 out of the hole -
410 to the top packer. - 10"

12:20 B1-MW4-05
screen 411 - 431
packers 409'2", 431'1"

12:22 Finished placing the pipe the last
2' were very hard going in

DR 9/12/88

12:40 Finish packing the samples
Renée returns

12:43 Start pumping

12:45 Water arrive - Pumping at 40 strokes/
min - discharge - 3.5 gpm efficiency
is ~ 12 strokes/gal. No change in WL

12:50 Increased speed to 48 strokes/min

13:00 ~~Changed rate to~~ 40 strokes/min
4 gpm - efficiency 12 gpm

13:25 Still pumping at 48 strokes
a little under 4 gpm efficiency
12.5 strokes/~~min~~ gal

13:45 Start sampling.

B1-MW4-05 9/12/88 13:30 411 - 431

14:00 Start pulling pipe - It was
stuck - Tried turning it while
pulling, little progress.
Steve is afraid if he pulls too
hard it might break the strings

DR 9/12/88

14:20 Steve goes to call ~~of~~ Howard Pump to see if they could suggest something. They say to continue what he was doing

Finished cleaning & packing samples

14:40 Steve returns and starts pulling the string as leaves itself

~~Start packing~~

15:00 Take compressor to B1-MW2 area

15:15 Start loading the truck.

15:45 Finish pulling the pipe. Bucket brigade the Trum water to tank

16:00 Guard arrives to close the gate Said he'd send someone to open it in 10 min

16:05 Renée leaves to call. Load pipe onto rig and hook up the tank to the truck.

DR - 9/12/88

16:15 Start filling out chain of custody forms. Steve went to request the gate open.

16:30 Still waiting for Security to open the gate. Leaving Steve's truck and drum at the site. Also the barricades and sawhorses. Will return and set them up at B1-MW3.

16:40 Guard arrives and opens the gate.

17:00 Arrive at decon

17:05 Gregg arrives ~~Take~~ took the cooler with samples chain of custody:

L00019

B1-MW4-01	9/12/88	19:00	162-182
B1-MW4-02	9/12/88	09:00	219-234
B1-MW4-03	9/12/88	10:00	247-267

L00020

B1-MW4-04	9/12/88	11:00	297-317
B1 MW4-05	9/12/88	12:30	411-431

DR 9/12/88

dup of F3

Renee Lanover and Dani Renan
Initialized the C-of-C serial
number.
The cooler and chain of custody
was signed over to Gregg Wilson
of Associated Labs 9/12/88 17:15.
17:20 Renée returned and signed the
serial number left to call.
17:30 Finished emptying the tank.
~~Gregg left~~ Uloaded the truck
Gregg left.
17:40 Called Gary; Asked for
Rent, a flight ~~out~~ tire & Tires.
Gave in time & ~~ask~~ Gary said
that he'd order more pipe from INW.
I asked for cups, packers, seals
& sucker rod nuts. Gave home
and up date. He was surprised

DR 9/12/88

that only one well was
checked during the extraction
well pump test.
18:10 Went to site to pick up
Steve's truck and ~~put~~ went
to B1-MW3 and set up
barricades and set the drum.
~~Forgot~~ The caution was left
at decon.
18:30 Finished setting the barricades
and Steve left.
Went to decon and got tape
and went back and put
tape on the barricades
19:00 Left site.

11 hrs.

DR 9/12/88

TUES 9/13/88

7:00 Steve Bellis arrived. Started rebuilding the pumps.

7:10 I arrived clean-up; ~~loads~~ unloaded the pipe to decon.

~7:20 Renée arrived, started calibrating the HV.

7:30 Started emptying the filter, & decoming the pipes

7:45 Left to see Steve Dickey about cleaning up B1-MW7, and scheduling the other wells.

8:35 Return, - load pipe & ~~deca~~ tubbing ~~and sand~~

8:50 The steam cleaner ran out of kerosene. Made trash haul

8:55 Sanded the filter.

DR 9/13/88

9:10 Loaded up and hooked the Tank to the ~~trailer~~ trunk

9:30 HT site unload return for rig

9:50 Rig on-site - Get ice & drinks

10:20 Set up sawhorses - table, canopy. unload pipes. 6

11:10 ~~Start D1 pipes~~, Steve Dickey arrives Go over the ~~pl~~ schedule with him ask ~~for~~ if we could photograph - he said no. Received the data

11:55 Steve left.

12:10 Renee left to get sandwiches, and Fed Ex the HV

Started D1 pipes

took equipment blank.

B1-MW3-01 9/13/88 11:30 Equip blank

12:30 Start running the pipe -

DR 9/13/88

Took WL. measurement 128.40.
~~Pipe~~ ~~run~~ putting in 130' of
pipe to top packer. Will ~~we~~ this
be able to measure water level
while pumping
screen 102-142
packers 129' 2" - 154' 1"
~~13:30 Pipe in place - Got the compressor~~
~~and take lunch at site~~
13:15 Finished packing the samples went
to get compressor
13:30 Pipe in place - ~~[illegible]~~ take lunch
at site
WL - 127.60 (~~drop~~ rose 0.8')
14:15 Steve left to get material -
~~15:10 Steve returns~~ Start Calibrating
YSI 3500
15:10 ~~Finish~~ calibrating and go to
Hook

DR 9/13/88

15:40 Start pumping - 48 strokes/min -
~~15:45~~ ~~At~~ 4.5 gpm efficiency ~10.5
strokes/gal.
15:45 Take WL measurement - no reading
- slow pump down still - none
Stop pump and wait for recharge
slow recharge at ~~127.50~~ 127. 127.75
to 127.65 (0.1 ft) 1.5 min
16:00 127.65 - 127.55 - 2 min
127.55 - 127.45 - nil
16:10 Start pumping again
Water level drops below packer
Slow to ~~24~~ strokes/min ⇒
2 gpm. ⇒ ~11½ strokes/gal.
17:00 Slowed to 15 strokes/min 1.25 gpm.
17.30 Still no recovery - ie below
130' -
17:32 Shut off pump to see if the
well recovers

DR 9/13/88

17:42 Reaches 128'

127.90 - 127.80 - 40 sec

127.80 - 127.70 - 57 min

17:45 127.70 - 127.60 1 min 27 sec

127.60 - 127.50 3 min 25 sec

127.50 - 127.40 -

17:57: Stabilized at 127.47

18:05 18:06 Start pumping - 18 strokes/min 1.5 gpm

18:09 Draw down - 128.9

18:10 Slow to 12 strokes/min - Still 12.5 gpm - Still draws down below 130.

815 Stop pump and let the well recharge (Rene goes and go to pick up some food

18:30 Returns - Steve would like to go so he sets the pump motor down on the well head packers are now

DR 9/13/88

setting at 130', 154'10"

18:58 Back Steve to stay a few minutes and we pumped at maximum speed to see if there is recharge under the packer at a higher rate pumped at 54 strokes/min 5 gpm. the hose split and brew water around Renie kept eating. Cut hose and reattached opened valve and got 5 gpm

19:15 Pumped approx 250 gal (350 gal in the last 25 min)

19:20 Start lowering the pipe by 40'. Filter sample, Bag and pack - B1-MW3-02 14:30 102-142'

19:45 Finish packing, and lowering

DR 9/13/88

the pipe. Count pipe -
35 ~~36~~ out of the well -
⇒ 170' to top packer.
20:00 - Start pumping - at 54 strokes/min
with discharge of 5 gpm :
efficiency ≈ 11 strokes/gal
Water levels were taken as follows
19:50 128.35
19:55 127.70
20:00 127.55
Started pumping and the level
fell to 127.65 and remained
more or less stable
2:40 pumping about 250 gal and
stowed the pump to ~~30~~ 28 strokes/
min ~ 3 gpm ≈ to see if
parameters stabilize.
2:45 The tech starts sampling
21:00 All parameters have stabilize more

Co. DR 9/13/88

Start sampling.
21:20 Finish sampling - Start
disassembling the pump motor
& bagging samples.
21:40 Renée finished packing samples
~~the~~ we cleaned up and put the
cover over the well. Renée
left. Put the samples & YSI in the cab.
21:45 The fan is still on - call Steve
21:55 Steve arrives - find sweetest.
22:10 Leave site

B1-MW3-03 9/13/88 20:30 174-9 174

DR 9/13/88

WENDS 9/14/88

7:00 Steve arrives and pulls the first joint.

7:05 I arrived - Set up YSI - ~~Told~~ Start putting in another 65' of pipe into the well - next zone

7:15 Check bottles, we don't have enough 1L for the last zone. Will check at decon to see if there are more.

7:25 Renie arrives

7:30 Count pipe 29 length out of the well => 230' in well + 5 => 235 - 10" => 234'2" for top packer

~~Also~~ Screen: 236 - 256

packers: 234'2", 259'1"

7:47 Start pumping - at 50 strokes/min => discharge ~~4~~ 45 gpm

DR 9/14/88

8:40 Slow pump rate to 34 strokes/min > 3[illegible] gpm

8:50 Speed up and clean cell - the parameters change back to the original ± [illegible] right after cleaning the cell was 93 and started rising slowly

8:55 Started sampling B1-MW3-04 8:00

9:15 Started lowering the pipe by 60' (the 5' remained on the top string) so top packers was at 294'2"

9:35 Finish packing samples and lowering string Count pipe: 23 out of the well => 29 60' in well + 5' => 295 (-10") => 294'2" QED

7: Water level at 128.13

9:40 Water level at: 128.11

9:43 Start pumping at 48 strokes/min

~~B1-MW~~

DR 9/14/88

B1-MW3-06 9/14/88 1 58

discharge 4 gpm efficiency ~12 strokes/gal

9:45 ~~Very~~ Water arrives at the cell.

very rusty - high sediment content

Virtually no drop in water level

10:15 Pump rate at 50 strokes/min - discharge

4 gpm, efficiency 12.5 strokes/gal

~~Slow~~ ~~Tap~~ Material a mocha brown

emulsion, looks milky.

10:16 Slow pump to 42 discharge 3.5

10:20 Slow again to 40 discharge 3 gpm

efficiency ~12

10:40 Parameters stable & start sampling.

10:55 Finish sampling bagging & packing

B1-MW3-05 9/14/88 10:30 298-318

Start lowering pipe to 40 ft.

so top packer will be at

334'2" (Kept 5' on)

10:10 Count pipe - 19 10' length out

DR 9/14/88

B1-MW3-06 5

of the well ⇒ 33 in the well

with the 5' length - 335 - well

head 10' ⇒ 334'2".

screen at 339 - 359

packer at 334'2" - 359'1")

10:15 Went to check B1-MW7 - not

enough room - need to call

Steve Pluky to get more

removed

Called Gregg Wilson to tell

him we should be finished

around ~3:00

11:40 Returned

11:45 Start pumping

12:00 Checked depth & discharge

depth little chang 128.16.

The motor is still pumping at

50 strokes/min but with a

discharge of 4 gpm - Efficiency

DR 9/14/88

is 12.5 strokes/gal

12:25 Slow pump to 44 strokes/min, discharge 3 gpm efficiency ~ 14 strokes/min

12:45 Cleaned all and the ~~parameter change~~ ~~acco~~ only the Eh changed take final reading

12:50 Start Sampling

12 B1-MW3-06 9/14/88 12:30 339-357

13:10 Finish packing samples, drawing water

13:20 Left for lunch.

13:20 Returned - Steve started putting ~~the~~ 90' in the well - Gregg arrived

14:25 ~~The~~ There was ~~a~~ ~~[illegible]~~ resistance - floating after 30'-40'.

14:45 ~~Floatting~~ Called Gary - told him about the floatting - Also that we need more room in B1-MW7 area. He said he'd come out.

14:45 The pipe stops about 3' above

DR 9/14/88

the well head - Won't go down anymore. - Pull top assembly and remove 10' so final count 11' length out of the well => 41 in the well = 10' ~~for head~~ to well head the top packer is - 409'2".

B1-MW3-07 zone

screen 422 - 442

packers 409'2", 434'1"

15:03 Start pumping

15:05 Measure rate at maximum the pump motor is at 44 strokes/min and discharge is 3 gpm

15:08 Rusty coloured water arrives

15:10 The water is very heavy with sediments

15:15 Still pumping at 44 strokes/min - discharge 3 gpm efficiency is 16 strokes/gal

DR 9/14/88

Need to clean all for reading
3/4 of the cell is filled with
sediments

15:30 Steve Dickey comes by. He says
told us to go and explain to the
workers where to move the pipe so
we can get into MW7. Steve ~~went~~
Cobb's went to explain.
Showed Steve what we are pumping
the left

15:45 Steve Cobb returned and said they
would move ~~everything~~ what's needed

16:05 Still murky - and need to empty
the cell -

16:20 Parameters stable - with the
sediment - emptying can will ~~since~~
change the reading but only by
a certain amount.
Start sampling after 2/0 gal

DR 9/14/88

16:35 Finished sampling BI-MW3-07 16:00

16:45 Finished bagging, packing and
signing the Chain of Custody
that included:

L00021

BI-MW3-01	9/13/88	11:30	equipment blank
BI-MW3-02	9/13/88	14:30	102-142
incl. 3 SV. BI-MW3-03	9/13/88	20:30	174-194

L00022

BI-MW3-04	9/14/88	08:00	236-256
BI-MW3-05	9/14/88	10:30	298-318
BI-MW3-06	9/14/88	12:30	337-354

L00023

BI-MW3-07	9/14/88	16:00	422-442

The samples were passed to
Gregg Wilson of Analytical Labs
on 9/14/88 at 14:45. The serial
numbers were initialed by

DR 9/14/88

Dave Renan and Renée Lauver of URS.

16:55 Load up the samples on Gregg's truck and he leaves. Steve starts pulling the pipe

17:00 Start demobilizing. Take ~~off~~ the compressor to B1-MW7.

17:15 Return and load all the equipment that needed return to Decon and take it over to B1-MW7.

17:30 Steve finishes pulling pipe and starts loading it on the ~~truck~~ rig.

17:45 Hook up the truck to the tank and bucket brigade the drum.

18:00 Finish loading and leave site

1815 Put rig in place, tank in place and hook up the diaphram pump. ~~leave~~ and start pumping.

18:20 Renée leaves.

DR 9/14/88

18:30 Finish unloading the pipe into the decon area.

18:45 Finish pumping transfer pit to decon pit. Take Steve to the site to get his truck

19:00 Leaves site

DR 9/14/88

THURS. 9/15/88

~7:00 Steve arrives on site.

7:20 Dani arrives - Steve is waiting for kerosene for the steam cleaner.

7:25 ~~[illegible]~~ went to get kerosene from Wanamaker - 5 gal. ~$7.00

8:00 Returned. Renée had arrived. Start decoming. Take double screen filter apart - Had is soaking all night in the decon pit water - made it much easier to unload.

8:30 Renée went to get the visqueen from B1-MW7 - need it for the truck.

9:00 Finished rinsing the pipe start pumping water from the decon pit

- It was full. Renée returned

9:15 started DI ing the pipes, Steve rebuilt the pump.

9:45 Went to Call Gary & Oakwood.

10:30 Returned and rig was loaded. Washed the tubbing - sinded ~~pip~~ filter.

11:00 Hook truck to tank and moved to the site.

11:20 Couldn't move tank into site, waited for Mike (Build 140) [illegible]

11:35 Mike came and said that he could move the tanks after 12:00 Renée left.

12:00 Mike returned ~~to~~ and helped move the tank into place - Start setting up - rig in place - set up table & canopy.

13:15 Renée returns, Steve & I went

to lunch and to get his truck,

14:00 Return to site. ~~Set up~~ - Unload pipe - WL. 123.70 (14:30) before lowering the pipe first zone - screen is 101 - 141 Set ~~in~~ top packer at 130' so we could measure drawdown, and still have about 11-12' of zone => ~~to~~ / well volume ≈ 45 gal.

14:30 Start calibrating the VSI

15:00 Steve finished lowering the pipe.

15:20 Renée ~~[illegible]~~ left for drinks, ice & gas for compressor

15:30 Counted pipe: 37 out of the hole & at decon => 13 10' length in the hole => -9" ~~[illegible]~~ => 129'3".

18 B1-MW7-01 -

Screen: 101 - 141 ~~WL 123.33~~

packers: 129'3", 154'2"

DR 9/15/88

Water level.

14:30 - 123.70

15:30 - 123.85

15:35 - 123.33

15:40 123.18

15:45 123.10

15:50 123.07

15:55 123.05

15:55 Start pumping at 48 strokes/min 4 gpm

15:56 Water to the surface

15:58 W.L. drops below packer -

16:00 Speed up to 52 strokes/min 4.5 gpm => efficiency 12 strokes/gal

16:05 Steve Dickey came by with Al Novak. Wants us to start with the cluster wells next week. Start with area 7 then area 8 then area 4.

DR 9/15/88

16:20 They left, Started monitoring

16:30 Slower after ~160 gal slowed pump to 19 strokes/min ⇒ discharge of 2.5 gpm efficiency of 14 strokes/gal

16:45 Started sampling - took 3 Semi Volatiles Zone for calibration

B1-MW7-01 9/15/88 17:00 101-141

17:00 Started lowering the pipe by 30'. Second zone - screen: 162-182 packers sat 259'3", 184'2".

17:15 Finish packing samples - leave to call Gary. Flight on Sat - 8:15 U.S. Air

18:00 ~~Start pump~~ Count pipe 34 out - 2 at door ⇒ 260' in well - 9" ⇒ 259'3" to top packer. Start pumping 52 strokes/min

DR 9/15/88

with a discharge of 4 gpm ⇒ efficiency 13 strokes/gal.

18:05 Draw of .8 ft.

18:10 Slow pump to 42 strokes/min with a discharge of 3 gpm. efficiency 14 strokes/gal.

18:20 Water level still declining but slowly. Now 129.20 went down 0.1 ft in 10 min.

18:40 Slow pump rate to 2.5 gpm ⇒ 38 strokes/min. efficiency ~14 strokes/gal

18:50 Slow to ≈2 gpm (1.75). 38 strokes/min efficiency ~15 strokes/gal

19:05 Start sampling

B1-MW7-02 9/15/88 19:00 162-182

18:15 Start lowering the pipe by 70' - ~~to~~ top packer at 239'3".

DR 9/15/88

19:40 Count pipe - 27 lengths out
two at decon => 230' in the
well. ~9" to well head => top
packer is at 229'3".
19:30 Renée left for Dinner - should
return at sampling.
19:48 Start pumping at 50 strokes/min
~4 gpm (Chest fed the mark by
hand.
19:55 Water level ~~the~~ drops very little
from 123.25 to 123.30 -
Steve leaves.
20:25 Slow pump rate to 34 strokes/min
with discharge of 2 gpm
Water level remains stable
20:50 Start sampling.
B1-MW7-03 9/15/88 21:00 234 254
21:30 Finished sampling, clean up

DR 9/15/88

FRI 9/16/88

7:00 Steve arrives, Renée arrive
Starts dropping pipe by 75'
7:35 1 arrive, pipe dropped -
Count pipe 26 length out
2 at decon => and 5'
added => 305' - 9" => 304'2"
7:45 Start pumping at 50 strokes/min
The pump is jumping somewhat
from the cold.
Discharge 4 gpm efficiency ~ 12.5
strokes/gal.
Water level more or less stable slight
8:05 drop 123.72-123.74
8:10 Renée recalibrated the HP.
8:15 Clear cell - definite discharge
in parameters - The Eh fell
to a negative reading =>

DR 9/16/88

a different zone from the upper measurements

8:25 Slow pump rate to 40 strokes/min discharge ~ 3 gpm efficiency 13 strokes/gal

8:30 Clean cell - drop in tank after no difference

8:40 Start Sampling

8:50 Start lowering pipe by 30' so zp packer is at 334'3".

9:00 Finish ~~sam~~ bagging and packing.

B1-MW7-04 9/16/88 08:30 302-327

9:10 Finish lowering pipe. Pipe count 17 out of the well 2in below and the 5' => 335'-9" => 334'3"

zone 4 - ~~the~~

screen - 337 - 357

packers: 334'3", 357'2"

Renée left to get tickets and pickup travel clerk from decon.

DR 9/16/88

9:15 Start pumping at ~ 46 strokes/min the pump motor is skipping

9:20 Pumping at 50 strokes/min with a discharge of 3.5 gpm efficiency 15 strokes/gal

9:30 Check pumping rate - 52 strokes at 3.5 gpm - efficiency ~16.5 strokes/gal

10:00 Slow down the pump to ~ 40 strokes/min - no discharge - speed it up still no discharge. The motor kept going. Pull the motor and pulled on the sucker rod - the balls are holding. Most probably the screen is clogged - but there is no vacuum on the pump.

10:05 Lower the pipe and jerk it and whack and reassemble the ~~the~~ motor -

10:15 Pump at maximum - no discharge

DR 9/16/88

Start pulling the pipe.

10:30 - Called Steve Dickey and told him of the situation. Asked if we should continue on Mark. or abandon the sampling effort. He said to abandon the effort and start with the cluster wells. He suggested spotting the area 7 wells today.

Called Gary - advised him of the situation.

10:40 Called Gregg Wilson and told him of that we were finished and that we should be at the decon area by the time he arrives.

11:00 Finished pulling the pipe & start demobilizing

11:45 Finished loading pipe, & most equipment - Travel Blank packed

B1-MW7-TB 11/16/88 11:00 Travel Blank

Renée leaves for lunch

DR 9/16/88

12:00 Hook up tanks, move tanks & rig back to the site.

12:30 Steve takes rig to pick up his truck.

12:50 Steve returns - unload truck.

13:00 Steve leaves site.

I left to get compressor & decon, fill up ~~with~~ compressor w/ gas

20

13:30 Return Gregg as waiting (about 5 min)

Finished Chain of Custody forms.

L00024

B1-MW7-01	9/15/88	17:00	101-141
B1-MW7-02	9/15/88	17:00	162-182
B1-MW7-03	9/15/88	21:00	234-254

L00025

B1-MW7-04	9/16/88	08:30	307-327
B1-MW7-TB	9/16/88	11:00	Travel Blank

DR 9/16/88

Only Dani Rewan initialized the serial numbers as no one else was present.
Signed over the samples at 13:45 9/16/88 to Gregg Wilson from Analytical Lab.

14:00 Left site

15:45 Called Audry McPherson at Dealy Walter & Assc. (415) 465 3090 and gave her the information on the accident

16:10 Called Oakwood Corp. and told them I plan to stay another month.

16:15 ~~Called~~ Called the Pleasant Hill office, - Dean Marachi was on the phone - gave a message

16:20 ~~Call~~ Tried to call Mike Spindle - no such number called INW in Redmont. Talked to Bob.

DR 9/16/88

He gave me the info:
airbill # 1137 2734
sent 9/14/88

11:00 Called Gary. Reviewed the budget vis-a-vis extra time.

20:00 Drove to the airport - Picked up ticket at USAir - Went to Alaska Airlines - they checked - there was no package, I gave them the airbill, sender & receiver & dat they couldn't find it. Finally they found that it was sent on 9/15/88, to G. Hulbert ~~to~~ John Wayne Airport.

9 hrs.

DR 9/16/88

SAT 9/17/88

8:15 Flew to Oakland. Leased Car.
Called Dean Marachi - had left
the office

SUN 9/18/88

Called Dean Marachi a number
of times, but no one was in the
office.

MON 9/19/88

11:00 Mary called. Made tentative date
for ~~the~~ lunch next day.
Called Dean Marachi; he asked
me to come in ~~at~~ about 4:00 p.m.
16:00 Got all the papers in order

DR 9/19/88

3:00 Went to the office. Made out
my time sheet (77 hours
Sat - Fri).
Talked to Dean for over an
hour. He asked when did
he finished sampling and
when I could start with a
project there. I said ~~when~~
why where from 3 to 5 weeks.
6:00 Made two copies of the
Sampling logs and well logs.
(one for Lockheed & one for
the office).
Tried to print out the computer
file but there wasn't time
8:00 Left the office

DR 9/19/88

TUES 9/20/88

10:00 Received call from Bob from McLean.

22:00 Went to lunch with Mary Jones. She the following day there is to be a meeting with DHS, ~~and~~ EPA and the Water Board on the risk from the site (Superfund site - Burbank & N. Hollywood ground water)

15:00 Went to the office and finished ~~the~~ my expense account and g made copies. Gave the original in to Louise.

16:30 Left for airport - was forced into the wrong lane - had to drive through Oakland - was late Got a flight at 21:30.

~22:30 Arrived in Burbank.

DR 9/20/88

WENDS 9/21/88

7:00 Went to the store to pick up ice, towels, bags, drinks.

7:45 Arrived on site. Renée arrived but there is no rig and no one from Howard Pump.

8:00 Started organizing the boxes,

8:45 ~~Went to call~~ The rig still hadn't arrived, went to call Steve Bibbs. No one in the apartment, Call Barstow, ~~no one~~ talked to Steve Howard. He said Gary told him to have both rigs down on Thurs. I was surprised

9:00 Called Gary. He said that he told Steve that the second rig should come on Thurs. Said he'd call to get the rig

DR 9/21/88

down here now. Asked that I call back in 15 min.

9:20 Called Gary, He had called Steve Howard and said that we were waiting for the rig. ~~He~~ Steve said he'd send Steve Gibbs out immediately, that he'd be in around 12:00.

9:30 Went to talk with Steve Dickey. I gave him the copies of the purging ~~and~~ well ~~logs and the~~ and calibration logs. He gave me a schedule he made out.

10:30 Returned to decon. Renée had left. Washed out ~~eq~~ and organized equipment.

11:45 Went to B1 - to see if ~~they~~ VRS had something. They were working with a laptop. Said they need

DR 9/21/88

to make a measurement and will go to eat. Meet Rich from VRS

12:05 Left to get money from bank.

13:00 Meet for lunch

13:40 Returned to decon. Still no one there.

14:00 Started decanning pipes, Alconox & steam cleaning, ~~with~~ Renée wrote memo.

15:00 Remesh & Rich arrived. Renée gave Rich the background.

15:15 Went to call Gary to tell him that it was a waste of our time to sit around. He wasn't in.

15:30 Went home.

16:00 Called Gary. He said to call Howard Pump. Went over the order of the wells to sample. There is a shipment of pipe

DR 9/21/88

scheduled to arrive air freight.
Alaska Air at 10:30 from NW
He said that Karen will be out
tomorrow, and ~~with~~ they agreed to
meet John Lopez and Mark Howard
at the Cafe at noon. He suggested
that I also go to meet them.
Still there are problems with the
monitoring, Said we'd get a beeper.

10:30 Receive call from C.J.

~~12:00 Receive call from Stan.~~

12:15 Call Howard Pump. Everyone had
left but the operator said he'd
find out and call me back.
I said I had called the Apt in
Burbank and none answered.

12:30 Receive call from Stan.

12:00 Call the Apt, no answer from
Howard pump. Steve Gibbs answered.

DR 9/21/88

He left the shop at ~~noon~~
~11:00 went home to pack and
the rig blew a coil. He went
back to the shop to get it
fixed. Left the shop at 14:30
Arrived on site at 17:30.
Agreed to meet him at 7:00.

9 hrs.

DR. 9/21/88

Area 7 - C1CW3 88
Decon

THURS 9/22/88

7:00 Steve Gibbs arrives, takes pump apart and rebuilds. The top cup is totally worn.

7:15 Rich Tumbini arrives. Renée went to change her flight & rented to Sunday ~18:00

7:45 I arrived helped Steve finish decoming. Empty the filter & wash, rinse all the pipe & tubbing. Fixing the rig tanks.

8:30 Renée arrives.

9:00 Start emptying the Baker tank.

9:15 Start loading the pipe onto the rig, equipment onto the truck, Hook up compressor and move to site

9:45 Onsite. ~~Set Ulm~~ Unload the pipe, table & equipment. ~~Renée~~ Take well depth of ~~C~~ C1-CW3.

DR 9/22/88

Area 7 C1-CW3-Decon

(the western most well) and it came to 280'. Renée asked for the as built. I said that I never saw it, all I had was Topographical measurements. She and ~~Steve~~ Rich went to call Remesh to find out screen placement. Steve and I continued set up.

11:00 Renée and Rich returned Steve and I left. I took him to pick up his truck and then he'd go to Moscos to get some 3/4" Tubbing

11:15 I went to Alaska Air freight and picked up the INWI shipment of pipe & accessories.

11:35 Called Associated Labs, Gregg wasn't in as he was sick.

DR 9/22/88

I told them that we'd only have two samples; that he could pick them up tomorrow.

12:50 Unloaded pipe at decon. Kept the pump and assessories to check since we might have to do some welding.

12:00 Met Karen outside. ~~The~~ John Lopez hadn't arrived with the rig. Go over ~~everything~~ different aspects w/ Karen.

12:30 Leave to return to site. Steve the only one there, Renée & Erich went to eat. Go over the material from INW.

13:30 Steve takes the screen & caps to get it welded and pick up some food. Renée & Erich

DR 9/22/88

return and eat lunch on site. Karen arrived. Fix the tubbing.

14:00 Steve ~~[illegible]~~ returned w/ food. Steve Dickey arrives with John Lopez. He said he arrived at 11:30 and had been waiting for 2 hrs.

14:15 Steve left with John to get his badge.

14:25 Renée & Erich left to get John.

14:30 Started D'ing the pipes

15:00 Took ~~Blank~~ Equipment Blank

C1-CW3-01 9/22/88 15:00 Equipment Blank

15:15 ~~Took~~ Started packing samples. Erich gave the tailgate ~~[illegible]~~ H&S meeting w/ Renée, Karen, Steve, John and Dave present.

DR 9/22/88

Area 7 C1-CW3-02 92

15:30 ~~Bottom~~ Finish assembling pipe + ~~so~~ the bottom assembly consists of ~~pipe~~ screen, pump & 2' of pipe for a total of 11' 10.5". (packer to packer) We didn't want the ~~bottom~~ ~~[illegible]~~ bottom packer setting at TD.

~~Distance packer to~~

Total of 260' of pipe thus packers are setting at: 259'3 & 270' 2"

Karen & John left for a buying spree. Erich tested the packers. (apparently under Renault's orders)

16:00 Started calibrating the YSI

16:25 Finished calibrating, finished lowering pipe. Went to get ice etc. Rinse [illegible]

16:52 Start pumping. Stop to measure water level ~~to~~ 237.79. W

17:00 Recovered to 237.74.

17:06 Start pumping. Immediate drawdown to 238.20 Slow pump from ~~[illegible]~~

DR 9/22/88

Area 7 C1-CW3-02 93

18 strokes/min to 44 strokes/min (3.5 gpm)

Water a ~~milky [illegible]~~ goes from black to mocha.

17:10 ~~Be~~ Water level recovers some to 238.15

17:25 Clean cell - Water level stable.

18:00 Continued since ~~pump~~ Eh is still falling albeit slowly. Slowed to 34 strokes/min.

18:10 Started sampling took 3 liters of Semi Volatiles, ~~[illegible]~~ 1 for calibration

18:30 Start pulling pipe and packing samples.

19:15 Finished pulling and cleaning the YSI and loading the pipe

All samples were packed

C1-CW3-02 9/22/88 18:00 260-280

DR 9/22/88

Area 7 C1-CW3-02 Demob 94

19:30 Pack up all the equipment and move to decon. Left the compressor chained to the Baker tank and left the Table.

~~18:00~~ 17:45 Steve, & John & Erich left

~~20:0~~ Karen and I went over some of the procedures

20:30 Karen and I left the site

22:45 Call Gary. I told him we'd be meeting at decon.

DR 8/22/88

Area 7 C1-CW2 Decon. 9

FRI 9/23/88

7:00 Steve Gibbs & John Lopez arrive onsite. Unloaded and decanned pipe. Renee Lawver and Erich Tambini arrive.

7:15 Erich leaves

7:30 Dani Kenan arrived onsite. Asked Renee if she had the as builts for the C1-CW wells. She said that Erich had them written down.

Loaded pipe onto rig.

8:45 Gary arrived. Discussed the project, and what was needed. From the lab we needed.

- Vaccum pump
- Beakers 3 1000ml 4-5 500ml
- Pipettes, pH paper

DR 8/23/88

Area 7 C1-CW2-Decon 96

- ~~The~~ Calibration solutions pH, Cond.
- More DI water
- Filters
- Coolers, bottles

9:30 Discussed worktime vs breaks, both John and Steve want the weekend John has been working since Monday and Steve since Tues. As both have kids they suggest finishing today and Starting Monday. Gary agrees.
He ~~says~~ said if I wanted to work there was enough to do. I agreed and the first thing is a sampling plan.

10:00 ~~Gary left.~~ John and Karen ~~move~~ finish putting the new structures steel pipe together (in 20 foot sections) with the sucker rods.

DR 8/23/88

Area 7 C1-CW2-Mob 97

Had to empty the water tank since it ~~is more than~~ contained over 200 gal and the capacity is 315. ~~The~~ Mark Howard arrived.

10:15 The seal broke and the rigid pipe was thrown out spilling a lot of the water from the tank. Emptied the tank and then went to since the pipe again. Gary left.

10:45 Move to site. John remains to decon the new pipe.

11:00 Arrive on site and start setting up. - unload the pipe Gary arrives and we told him that we planned to use both rigs - one over each hole and switch the pumping.

DR 8/23/88

He thought it was a good idea
He neeled the make of the
vaccum pump. and left.
Mark & one of the phillies came
by. sent Mark to pick up buckets
for Diving. Steve went with him.
11:30 John arrived with the second
rig. Steve Dickey and Ron
Hebgeson came by as I was
finishing setting up the canopy.
Explained todays strategy.
Both agreed, ~~I said that~~ as I we
told them that were taking the
weekend off.
they said that the Kevin is
stated to come on Tues., and the
first thing he'll ask for is
the sampling plan ~~then~~ I told
him I'd write it over the weekend

DR 9/23/88

And they were concerned about
having a new setup ~~while~~
~~the~~ during an audit, so we
stretched, Tuesday will be
mobilization, ~~and~~ Monday
Karen will take over most
of the sampling while I ~~go~~
go to print the sampling plan.
They left.
11:45 Went with Karen to call
the lab and tell Greg that
he wasn't drive up, ~~to~~ and
asked dental when can Karen
deliver the samples. He said
he'd wait. I went over the
list with him, He'll get
everything ready and Karen
will pick it up and bring it
on Mon. Gave him my keyper

DR 9/23/88

number. (714) 938-8286

12:00 Pick up 2x4 for sais house, and return to site.

Steve Gebbes starts running the pipe into C1-CW2.

TD is 393'. Water level 237.40

put in screen with packer above. (one packer only.) Packer at

(380'2" - 9" above wit) ~~B~~ 379'5". Bottom of the ~~screen~~ filter is ~ 386. Screen is 382-392.

~~12~~:30 Calibrate the YSI. and start hooking up the tubbing

13:15 Start D1 ing the ~~sand~~ pipe for the second well (C1-CW3)

13:30 ~~and~~ start running pipe

screen 481-491 TD 490.

packer at 479' 1".

= C1-CW2 has 260 ft of Stainless pipe w/ sucker rod - pump & 10' of

DR 9/23/88

Stainless without rods and 5 lengths of black pipe (106' 5") Then packer (379' 5") (180' 2 9") and screen

C1-CW1 has 260' of Stainless steel ~~and~~ pipe with sucker rods, pump an 5' of Stainless steel without rod, then 10 legths of black pipe - (212' 6") ~~total~~ 480' 3" packer at ~~479'~~". (~~9" above wet hill~~) ~~packer~~ ~~screen~~. Above WH - 1'9" => packer 478' 6".

14:05 Start pumping at 38 strokes/min. cell squirts all over and took time to clean up.

14:10 Discharge measurements - 3 gpm, efficiency ~ 12 strokes/gal. Water goes from clean to murky to clouds

14:15 Karen returns with food.

15:00 ~~Pum~~ Still pumping at 36 strokes/min

DR 9/23/88

but the ER keeps dropping
cleaned well by forcing all water
through the well - ER kept dropping.

15:30 Took sample. Steve & John
kept dropping pipe for ~~HW~~
C1-CW1 to the ~~pa~~ depth as
written - checked the number of
pipes laid out. 10 length of
black pipe & 13 double lengs (260')

16:00 Karen packed the samples. Steve &
John had to pull the top pipe
and adjusted the sucker rod.

C1-CW2 9/23/88 14:30 382 - 372

Decided to get the Baker tank
so not to wait for Steve to
unload the tank and return.

16:15 Unloaded the drum from the truck
and left to decon. Karen followed.

16:40 Return with the tank. Move table

and put the drum in place

16:50 Steve & John finish adjusting
the pump.

17:00 Hook up tubing ~~and~~ to the
tank and pull the cond. meter
wire. Set to fix the cond. meter

17:20 Fix the wire - tested - OK.

17 Steve ~~for~~ & John finished
pulling the pipe from C1-CW2.
and loaded it on ~~the~~ Steve's rig.

17:28 Take reading - W.L. 240.12'

17:30 Start pumping at a rather
high rate ~ 4 gpm for a minute
Water level fell to ~~242~~
above 243'. Slowed pump motor rate
to 32 strokes/min 2.5 gpm
The ~~ground~~ water level started
to come up. Steve finished loading rig and
moved it to decon with John

17:50 The water is a small green

with a Eh of -229.

18:00 The Eh went up to -114 and the water became heavy with sediment approx 2/3 of the cell.

18:10 Pump stopped pumping. Jacked the pump to 5 gpm, water level fell, but there was discharge. Pumped at full speed then slowed the motor jacked a lot. adjusted

18:30 the pump to pump at 32 strokes/min discharge - 2.5 gpm. Efficiency

18 is at 13 strokes/gal. At 18:00 the pump discharge had fallen to 1.6

18:30 gpm and then to nothing. (Steve & John return.)

19:00 The parameters are still changing but somewhat stabalized. Eh went up to -38. ~~Left~~ Was paged twice by Gary so left to call.

DR 9/23/88

17:10 Called Gregg Wilson - He was still in the lab. Told him that we were sampling the zone and should be finished shortly. According to ~~our~~ my estimate Karen should arrive around 2900. He was surprised (disappointed) that it took so long. He said there might be some problems about signing the samples in, especially for the 48 hr turn around.

17:20 Called Gary. No one was in the office. Left message on his home machine

17:40 Returned to the site. Karen and Renée were just finishing sampling. Steve and John start pulling the pipe from CI-CW1.

DR 9/23/88

Area 7 C1-CW1-Demob/OC

19:50 Some problems with the rigs generator - get it fixed enough to filter the metals sample. & start filling out the Chain of Custody forms. I forgot to give them the serial numbers which should be L00026 and L00027.

20:15 Finish packing the samples and the chain-of-Custody forms. Karen takes the samples in the Van to take to the Lab. She will sign the C-of-C form to the lab. the samples are:

L00026			
C1-CW3-01	9/22/88	15:00	Equipment Blank
C1-CW3-02	9/22/88	18:00	260-280'
L00027			
C1-CW2	9/23/88	14:30	382'-392'
C1-CW1	9/23/88	16:00	481'-491'

DR 9/23/88

Area 7 C1-CW1-Demob/OC

~~20~~ Steve and John finish bucketing the water from the drum to the tank. Decide to use the tank at Area 8 as well.

20:25 Take the tank to decon w/Karen following. She unloaded the visqueen and other materials and went to call lab and drove to Orange. I ~~[illegible]~~ unhooked the tank and ~~returned to site~~. Unloaded the equipment. John came and then a security officer arrived ~20:40 and said we couldn't leave and return. I argued that it was impossible. She asked us to wait and called the Captain. She explained that they were closing the plant for about

DR 9/23/88

on hour. ~~I told John~~ Renée
arrived I told John to ~~get~~
leave and get everything finished.
Waited for the Captain. ~~He finally~~
~~came~~ I asked to leave and I'd
be back before the Capt. arrived
She ~~asked~~ asked us to wait. The
20:55 Captain arrived and asked how
long it would take - I said
about 5 minutes - he said to
hurry. That we wouldn't make
it. I said we'd lock the compound
to the gate (Present fence) near the
entrance.)
Speed back and picked up the
stuff and told Steve to wait
somewhere and get there before
they closed.
21:00 Entered the gate and they asked

how long it would take -
I said 5 min.
We unloaded and were out
by 21:15. (It took 6 min).
Meet Renée and John at
the gate - Renée gave
me the HPW equipment
to hold till Monday since
~~they~~ she was leaving the
left morning.
21:15 Signed off for ~~Pa~~ Steve & John
21:20 and everyone left.

Sampling Plan 110

SAT 9/24/88

Transfered DW3 files to ASCII to W.P. Started rewriting the sampling plans. Finished some paper work 4 hrs.

SUN 9/25/88

Transfered a few more files. Started ammending H&S plan & Writing Sampling Plan. Conquered out at 2:00 7 hrs

DR 9/24/88

Area 8 C1-CW5-Decon 111

MON 9/26/88

7:00 Steve and John arrives. They start taking the pumps apart. The diaphram pump is out of gas. Karen arrives and goes to get gas. Unloads all the lab equipment

7:30 Dave arrives, unloads equipment. The second pump won't open - there is a bulge in the steel. Finally force it open - and the threads were totally striped, the spring wouldn't come out.

7:50 Karen returns. Decide to use both rigs at area 8. This is further reinforced by the fact that Karen must leave by ~46:00. ~~the~~ Also she must still get some more equipment

DR 9/26/88

for demobilization eq. compressor.
Agree that for Area 8 and
Area 3 (next set) will be carried
out in the same format. Then
we will split up.

8:15 Go talk to Steve Dickey to ~~talk~~
OK. the plan. also must get
the as builts. ~~Sto~~

8.20 Steve not in for the next two
days. Wait for Ron Helgerson to
return

8:45 Discuss the situation with Ron
he agrees with the leap frogging
but wants the sampling plan done.
The LV. people ~~will~~ will be delayed
until Wednesday.

9:15 Call the office ~~to~~ and give in
time. and talk to Gary.
He said that leap frogging is

DR 9/26/88

O.K. but I have to keep an eye
on things. Forgot to give in
my time and tell him about
the pump.

9:45 Return to decon. hook up the
baker tank and load up. ??

10:00 Move to site.

10:30 Rig on site, set up. ~~Move~~
Maneuver the tank. / Toilet get by Paul Ayr
Renesh, Milton Tiffin
Jeff Miller
UK
Time

10:45 Go and get the compressor
pick up the CI-CW1-3 visqueen

10:15 Return and figure out depth.
Renesh gave the ~~figure~~ as
builts:

		Bill depth	screen	gravel pack
11:16 Area 8	CW4	665 660'	652-662	643-66[illegible]
	CW5	391 TD [illegible] 384	376-386	366-391
	CW6	253	232-252	223-25[illegible]

Set up on the intermediate well -

DR 9/26/88

Area 8 C1-CW5 114

C1-CW5. WL. - 228.25

~~Decided to Set pump at 160~~

11:40 Re Measure FD - 384 (386 according to specs) decide to place packer at ~375 (1 foot above screen) and to put a packer below the screen & filter

Thus - 260 ft of SS.

3'10" ft of pump

5' of SS

156'3" - 5 lengths of black pipe

Total, 375'1"

Count pipe - as above

12:00 Start calibrating the YSI. Paul complained about the fact that we were DI ing in the field, and that they wouldn't allow us to do it again. I said that I didn't know that it was their prerogative. Karen left to get cardboard for containment

DR 9/26/88

Area 8 C1-CW5 11

12:10 Steve & John start running in the pipe.

12:40 Finish calibrating the YSI used the new conductivity solution.

~~13:00 Finish~~ Ramesh asked if we took into consideration the 3/4" pipe while purging. I said that at the time no but afterward yes. of course we pumped a lot more, Besides it was about 2.5 g

13:00 Finish paper work etc. Karen starts labeling. Set up canopy drum & tubbing

13:30 Steve & John finish running the pipe it & start the compressor

13:43 I leave the site to continue with the sampling plan.

They started pumping. HNu readings at well head = 0

DR 9/26/88

13:45 Water arrived.

Karen calculated the amount of water per well volume:

6 ft of casing x 1.5 = 6.6

10 ft of annulus x 1.47 = 14.7

106 ft of 3/4" pipe = 2.4

1 well vol = 21.3

+ 3 well vol = 63.9

+ 2.4 = 2.4

Total = 66.3 gal

Minimum to be purged = 66.3 gal.

14:15 Steve & John left to get second rig.

14:23 HNu still at 0

14:45 pumping at a rate of 24 strokes/min discharge 1.6 gpm, after adjusting to decline in W.L. Water level fell over 1 ft from 228.57 to 229.75 - ~~[illegible]~~ at (2 gpm) and stabilized at 229.26 - 222.15

DR 9/26/88

15:00 Paul left for lunch

15:20 Still pumping at 24 strokes/min. Paul returned from lunch, Steve & John arrived with second rig and began setting up

15:27 Ramesh arrived

15:30 Paul and Ramesh left the site Steve & John started tripping down the hole - at CW4. Ron Helgeson stopped by, looking for Ramesh

16:00 Started sampling.

16:35 Dave Returned. The final readings for the physical parameters were - 205 gal pumped (~9.5 vol)

pH - 7.18/7.62 Temp 22.6

Cond - 586 colour - light yellow brown slight turbidity Eh - 15

Water level ~ 229.15

C1-CW5 9/26/88 16:35 376 - 386

DIC 9/26/88

16:45 Finished packing. The pipe was set in CI-CW4 - and the water transferred from ~~CW3~~ CI-CW5. Ready to pump. Took WL in both wells
Elev for CI-CW4 - 228.46 &
Start for CI-CW5 - 231.50
John & Steve left for lunch.

16:55 Start pumping. ~~Karen leaves~~

17:00 Still no water. Karen said the well was deep to wait a little more. Karen leaves.

17:05 Adjust the ~~pump~~ pump from 40 strokes/min to 60 strokes/min -

17:25 Still no water - shut pump off. Decided to finish for the day: Pull pipe etc. Do paper work.

17:40 Steve & Paul return - I ask again how much pipe was put in.

DR 9/26/88

We received it -
270 ft of Stainless steel (27 joints)
382' 6" of black pipe (5 joints)
3' 10" of pump.
656' 4" to top packer
- 1' 3" above well head - 655' 1"
Although our calculations show that the bottom packer should be setting 1 ft below TD measured TD (660') an 1 ft error is probable. (Also the TD measurement is ± 1 ft.)
In any case the screen should be within the screened interval: (even if it wasn't we'd still get some water) - Steve guesses that the filter was put in inverse with the capped side up.

DR 9/26/88

Area 8 CI-CW4 IRO

18:00 Decided to leave both strings in the well - demobilize and pull both strings tomorrow. Start packing

18:30 Leave site. Dropped the well cover on to well head and tapped up the holes. ~~pa~~ Tapped legs to the oil queen covering the well head. Can't put well cover on since the sucker rods are sticking out. Secure the sawhorses to the compressor and it to the fence. Put all tubbing on the Baker tank.

18:40 Unload all equipment at lease and park the rigs

18:45 Steve & John leave w/ paul to pick up their truck

19:00 Finish collecting all the non-hazard garbage and putting it in the bins.

DR 9/26/88

Area 8 CI-CW4 Admin 121

19:10 Leave site.

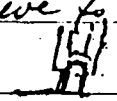
During the Afternoon.

14:00 Call the lab - Gregg isn't in. Talked to Bob Webber and ask him about the Zetag (he doesn't know off hand) and the pH for sulfides. He explained that the addition of NaOH is only to neutralize very acidic conditions (<3 pH) ~~so that~~ the to stop the formation of H_2S (usually a catalyst.)

14:30 Talked to Gary. Told him about my arguments with Paul. He ~~said~~ called Ray and called me back. According to the meeting they are not empowered to stop our work - only to complain to

JR 9/26/88

Lockheed. What ever they don't like can go through Steve Dickey or Ron. We are not to take orders from them. Also that I was right not to allow them to use our DI water to check the seals.

~15:00 Called Robert Landing from LNW. He said to send the pump back. I also ordered more nuts. I suggested that they use longer ~~arms~~ legs for the ~~moto~~ pump motor base thus allowing in essence two degrees of freedom. He said that it was the first time he heard about it but they were short in order to close the well cap. I suggested then a sleeve to align to both. ie:  long enough to be stable - and two pins.

14 hrs DR. 9/26/88

TUES 9/27/88

5:15 Start to work on the sampling plan, but decide to make sure the paperwork for the project is in order first.

7:15 Finish the immediate paperwork including sampling logs and ~~dis~~ field notebook. Figure the lengths for the shallow well.

7:30 Continue working on the sampling plan.

9:00 Karen calls. Asks if I'm coming. She also needs the books. She said that Steve & John (arrived at ~7:00 Karen at 7:20) ~~put in another~~ 100 measured ~~TD~~ depth to packer and added another 100' of pipe (stainless steel.

9:30 I arrived on site. They were

DR 9/27/88

ready to pump. Karen arrived.

9:45 Started pumping - nothing happened. Shut off and decide to pull the length.

9:50 I went to get the ~~sauder~~ sandering iron and other equipment, since the ~~lead~~ cond. lead to the YSI broke again. Also the eh plug adapter is loose. Asked what happend, ~~was~~ was someone substituting the YSI for a football. No bait it was knocked over.

10:15. Returned to fix the YSI - Steve & John hadn't yet started pulling the pipe yet.

10:25 Fixed the canopy - and they start pulling the pipe

10:45 Finish sandering the YSI. Calibrate the conductivity.

DR 9/27/88

11:00 The pipe is pulled - they had used 12 lengths of black pipe (instead of the 18) plus 20' of stainless steel => 275' below the pump. The part in 36 lengths of 10' + 15' - Total of 375 above the pump. Total length to top packer - 653' 10". ~~Water should~~ The scum starts at C52. I said the could keep the same pipe if they could put the top of the sacker and 2 feet above the well head. We measured and it came to 1'8" above. I said we needed at least another 4". We exchanged the 5' pipe for a 3' pipe.

11:10 Started pulling into the well.

DR 9/27/88

~~12' of 12 lengths of~~	
12 lengths of black pipe	255'
2 lengths of 10'	20'
pump	10"
27 lengths of 10'	270
1 length of 3'	3
Total	558' 10"
well head to top of suction hose	1' 8"
Top packer at	650' 2"

11:20 Took water level reading for C1-CW6 (the shallow well): 225.94

11:50 Finished getting pipe into well. Start installing the pump motor. Karen finished labeling sample bottles and log.

12:07 Take W.L. reading: 231.38'. Started pumping at a rate of 90 strokes/min with a discharge of

DR 9/27/88

3.25 gpm. and a pump efficiency of 12 ~~strokes~~ gal.

12:04 Water arrives - brown; rather light ~~and clear~~. Karen takes reading

12:20 Measure the discharge - no change from before. Steve and John take break. Also go to get 5 gal of kerosene for the steam cleaner

12:30 Leave to continue the ~~report~~ sampling plan

13:00 Call Gregg Wilson. He said he'd have a difficult time to make it today. I said early tommow will be fine. Bet to Greg Dr water.

14:30 Receive call from Karen. They had finished sampling and are now going into the last well C1-C8 (the shallow well).

DR 9/27/88

Area 8 Admin - Sampling Plan 28

16:00 Called Mindy. Chico GW is finished and they are displaying it in a Chico fair. Recieve cap during the conversation (from the office).

16:20 Call the office and talked to Ray and Gary. Ray said that they just recieved a call from Ron Helgerson that URS people complained that we are not doing the pipe sufficently or some thing to that effect and that ~~we~~ the sampler coolers didn't have any (or enough) ice. I told them about my arguments over the DI rinse, but I never heard that we failed to rinse. And I can testify that the was enough ice since Karen got two bags

DR 9/27/88

Area 8 Admin - Sampling Plan 29

in the morning. Obviously some of the ice melted during the night but there was still ice in the morning. Ray suggested that we start a complaint book and list all the complaint and throw it away at the end. I suggested giving it to Lockheed and to show them what time & effort was wasted on the trivial.

16:45 ~~Although~~ Since I forgot the original plan at the site it slowed the writting down, so I had to skip parts.

17:50 Recieved call from John Lopez ~~saying that he~~ He said that Karen said they would be

DR 9/27/88

sampling in 15-20 min.

18:40 Arrived on site. The rigs were gone. only Karen was there all the boxes were loaded in the van. I check out the wells and found that the pipe was in the shallow well. I asked why they didn't pull it. She said that they said they'd do it the next morning. I was surprised. We discussed it and I said there was no advantage in having two rigs. ~~Walkin~~ John and Steve working together just means that they are working faster, and sitting around more. and because they're company they seem to do less work. Karen said she thinks that Steve

DR 9/27/88

is leaned out. I asked what else we could do, he only worked 2 days last week and went home for the weekend. She told me that they did not get the kerosene, Paul did.

17:00 Took the Baker tank back to the site, unloaded. Karen asked where we were to put the samples in cooler. Steve and John had mentioned that they ~~went~~ were to lock it in the rig but they had left and the rigs were locked. I said to keep it in ~~the~~ the van but she wanted to return the van, that she was planning to ~~put~~ go give it back since it kept dogging on her.

DR 9/27/88

I suggested that she stay for
at least another day and
take the truck.
19:40 Went to pick up the compressor
- 20:30 Left the compressor on site and
check everything. Went to eat.
We discussed ~~the issues~~ Steve
and John's attitude problem.
I think that John is too reckless
~~and Steve~~ which adds to Steve's
attitude. We decided that Thurs
or even Wednesday afternoon
we would separate into 2 crews.
I suggested that Wend's morning
they be assigned different tasks
Only Steve should go and pull
the pipe while John decons
and empties the tank. He
should be set up to start

DR 9/27/88

the first well by the time
Steve returns. ~~He~~ One of
them should go and take
well measurements from the
wells in Area 4 (the next
set) tomorrow evening well
set up the bannaders at A1-MW11
and Thurs. they'll start there
while Steve and I finish
the last well in Area 6.
I had mentioned the weekend
and Steve said that they had
plans for this weekend and
next. I asked when we
would do A1-MW3. In
three weeks I plan to be finished.
I said I wanted one to
leave on Fri and return
on Sunday the other to

DR 9/27/88

take off from Sunday - Tuesday.
~~they~~ but they only have one vehicle
I told them to bring another,
Looked over the ~~well~~ pumping data
Karen said she took a duplicate
at C1-CW6 and called it C1-CW7
with a bogus time.

ON SITE WHILE I WAS GONE?

7:00 John & Steve arrive, ~~on site~~ Take
rig on site ~~and pool the string~~
~~from C1-CW4 added 100'~~ took TD and added 100'

7:20 Karen arrived on site and loaded
the Jaw and ~~left~~ went to the
site. ~~tried pumping and nothing~~

~~8:00 Finished they began to pull the~~
~~pipe from the hole~~

~~8:30 Finished pulling~~

7:30 ~~They~~ Steve & John take a
depth measurement and found

DR 9/27/88

they were 100' off. ~~Add~~
They then added another 100'
of stainless steel pipe.
Karen refigured the length and
found it OK. Diagrammed it in
a schematic.

8:30 Karen recalibrated the YSI 3500
pH with solutions Sp cond - w/ DI water.
Personnel on site included.
Karen, Steve & John (Howard Pump)
Paul, Jeff, Milton (URS)

12:00 The stick up from the wellhead
on CW4 was 1' 9"

12:08 Start pumping

12:10 First water

12:24 Pump rate - 40 strokes/min discharge
3.4 gpm, efficiency 12 strokes/gal

12:45 Paul took PID reading 0 at the wellhead

DR 9/27/88

Area 8 C1-CW4 136

1330 Started sampling.

C1-CW4 (Area 8-dup) 9/27/88 13:30 652-662

1355 Final water level measurement.

1 well vol. calculated: 6' casing - 6.12

: 10' screened diameter @ 14.60

and 6 gal for the 3/4" pipe / 20.12

3 well volumes ≅ 66-67 gal

~~1400~~ Steve & John return from lunch.

(had left at 12:00) also got gasoline

1400 Started pulling CW4. Karen left to

1400 call me.

1430 Karen returned - everyone except Milton

had left (John & Steve finished pulling

pipe and left for decon.

1500 Paul returned and took Milton to

another site. Karen calculated

purge volumes for C1-CW6.

9.4' between the packer @ 192 = 9.59 gal

20' of screen - annulus 29.20 gal

DR 9/27/88

Area 8 C1-CW6

Total 38.8 - 3 Vol - 116.4 gal.

1555 John & Steve return with rig and

set up & start lowering the pump

1600 Paul & Jeff return. Steve sounded

C1-CW6 - 251 ft.

1637 Finished setting pump.

1648 Started purging ~~water just 16~~

Water arrived at 16:49. The sounder

won't measure as there is too much

water in the pipe. ~~Pump~~

1720 Steve & John start pulling pipe for

CW4. ~~Start~~ Pumping at 40

strokes/min Discharge 3.1 gpm effluent 12.7

strokes/min.

1740 Steve and John finish pulling the

C1-CW4 and left for decon.

1745 Parameters seem pretty stable

(Jeff concurs with Karen) after

170 gal. start sampling.

DR 9/27/88

Area 8 CI-CW6 - Demob 138

17:50 CI-CW6 (Area 8 shallow) 9/27/88 18:05 232-252-

18:10 Finished sampling. Demobilize -

18:20 URS & Steve & John left.

17:50 Took duplicate of CI-CW6 - called CI CW7 (which doesn't exist) with a bogus time of 10:20

CI-CW7 (Area 8 shallow) 9/27/88 10:20 dup of CI-CW6

Karen made up the Chain of Custody form and Gregg was scheduled to come the next day at noon.

2000 Left the samples locked in the van w 3 bags of ice. Karen dropped me off and took the truck (She was going to drive back to Orange but I figured this was better since I could get around in my car).

15 hrs

DR 9/27/88

Area 4 Mob 7

WENDS 9/28/88

8:30 Start working on the sampling plan.

7:30 Everyone - Paul Mill Jeff (URS) John & Steve (H.P.) and Karen assemble for a short meeting on logistics & safety

~~10:00~~ 9:00 I called Gregg and asked him to come ASAP. Steve & John went to pull CI-CW4

9:30 Karen called to ask for the keys. She said that Steve & John said they plan to do the Area 4 wells today & tomorrow and decon on Fri and leave early. I said no way.

9:45 Called Howard Pump. Todd & Mark were not in and Steve Howard was on the other line.

11:00 Called Gary. Told him what Karen had told me and

DR 9/28/88

he said no way. That were under pressure, and we are under no commitment for them to leave on Fri at noon - That's ridiculous.

10:30 Steve arrived on site and told Karen that the QA/QC (IALW) people were coming out. So far only the pipe had been pulled.

11:45 I arrived on site and Karen told me ~~they~~ that the QA/QC people were coming as they drove up. Steve & John were still deconning the pipe. ~~Sevda~~.

12:00 Talked to Steve Dickey - told him that I thought they were coming the next day. He said so did he. Told him that I hadn't finished the sampling plan nor did

DR 9/28/88

I bring any of the paperwork. The QA/QC people included Sevda Droese, Kevin Cobble, and Karen. They go to look at the decon procedure. They talked to Paul and Steve Dickey - they wanted to run two equipment blanks on the black pipe. Steve talked to John.

12:30 Gregg Wilson arrived. Brought some more coolers. Karen transferred the samples. Two chain of custody w/ 4 samples:

L00029

C1-CW7	9/27/88	10:30	dup. of C1-CW6
C1-CW4	9/27/88	13:30	652-662
C1-CW6	9/27/88	18:05	232-352'

L00028

C1-CW5	9/28/88	10:35	376-386'

DR 9/28/88

~~12:30~~ Gregg said that the KCl 1M standard is OK by the Beaver of Standard. It has a conductivity of 1.4 (1.39..) mmhos.

12:30 Went to check the site BG-CW44

12:40 Called Gary, gave him an update.

13:00 Start setting up at site. Steve takes the QA/QC team to change their tickets so that they can see our sampling

13:00 Unload the pipe etc - Steve and John go to eat

13:30 Karen also went to eat. Started calibrating the YSI, and got and set up the compressor.

13:50 ~~John & Steve return~~. Continue calibrating the YSI, but the conductivity doesn't fall below 1020 mmhos on the ATC mode

DR 9/28/88

and is even higher on the regular 2 mode. (1056) Some fluctuation. The pH is exact. Don't take the ch reading (since it can't be calibrated and has never been off.

14:10 Seada, Kevin, and Karen return and ask the calibration, especially the calibration notes. I explained that they were at home as I hadn't intended to come today.

14:45 Steve & John return.

15:00 Karen returns. I take the DI water and ~~had filtered~~ tabled the bottles and made up tags for them.

15:30 Start taking samples. The first is taken from the

DR 9/28/88

first group of pipe (that will be lowered into BG-CW4) Through two black pipe and one stainless steel. One of the VOC was entirely from the stainless steel. All ~~other~~ the larger bottles were mixed. Made up bougus wells & tins

BG-CW10 9/28/88 15:00 Equipment Blank

16:00 Finish the second sample and pack them. the sample is taken from three black pipe that will be used in BG-CW4

BG-CW11 9/28/88 16:30 Equip. Blank

16:15 Steve and John start lowering the pipe ~~at~~ into the intermediate well BG-CW5. Although John was asking when they should start I kept putting him off so I could

DR 9/28/88

~~count~~ figure and count the pipe. It turned out that Karen had already done and given them a scematic. counted pipes

17:15 Finish running five lengths of black pipe 23 lengths of 10' stainless (220') and 5 feet of stainless for a total of 107.5 + 235 = 342'6". With a stick up of 9" over the well head the top packer is sitting at 342'6". With only the screen ~~[illegible]~~ 5'7" the bottom packer is at 348'3" (Angst 7)

17.25 Start pumping at 4 gpm at ~ 44 strokes/min - efficiency ~11. One well volume is ~ 20 gal - 23 gal 3 volumes = 60-70 gal. pH stabilizes after ~50 gal cond. ~ 80 gal. Temp. the same - Eh

DR 9/28/88

Area 4 BG-CW5 14C

drops from 11C to -65 throughout the pumping and seems to stabilize at the end.

1805 Take sample, filter & bag

BG-CW5 9/28/88 18:00 345-355

18:30 Karen starts filling out the chain of custody and Karen would take it to the lab. After calling Gregg she said she'd deliver it in the morning. Locked samples in the Vans.

Steve and John start demobilizing their rig. I pack up all the equipment in the truck and will leave it ~~on site~~ at the decon area fully loaded. Steve & John

19:30 Steve and John start running pipe into BG-CW4 (the deep well)

19:00 Karen leaves. Takes samples.

DR 9/28/88

Area 4 BG-CW4

Talk to Paul about the QA/QC the visit and Steve & Paul's work, our efficiency in general and the arguments that we have had. Straighten things out - more or less.

20:00 3 patrol cars come by to check us. They got a call that someone was stealing equipment. They asked to see our badges and apologized. We said we were quite happy with such a response and thanked them.

20:30 Left site

DR 9/28/88

Area 4 Admin 148

THURS - 9/29/88

6:50 ~~Hello~~ Pack to leave. Notice the chain of custody for the blanks and B6-CW5. Called Karen. She realized that she forgot it but remembered all the details. We reviewed them - ~~and~~ OK. As follows.

L00030

B6-CW10	9/28/88	15:00
B6-CW11	9/28/88	16:00
B6-CW5	9/28/88	18:00

Only Karen initialized the serial number and transferred the samples and ~~the~~ to the lab, and signed the chain of custody form at

DR 9/29/88

Area 4 B6-CW4

0907 - 9/29/88. Went to the office and then to site.

7:30 I arrived on site. Steve & John all ready on site with both rigs. Set up. Bottles etc. Set up pump motor.

8:05 Take water levels 219.99'

8:10 Start pumping at 48 strokes/min. Steve checks discharge - 1.5 gpm. I find it hard to believe - I check the discharge as it falls from 1.5 to 1 gpm.

8:20 ~~The efficiency is~~ turn up the pump to maximum - boring at 48 strokes/min. efficiency is at ~48 strokes/gal.

~~8:30~~ The water is highly odorous with a crude/diesel hydrocarbon

DR 9/29/88

Area 4 BG-CW4 150

Smell and there is free product in the effluent.

8:30 Adjust the pump to 50 strokes/min still no increase in rate, actually it fell to ~0.8 gpm and went back to 1 gpm, and starts falling again. I am worried that we won't get a sample - that the pump will fail before we finish purging.

9:00 Still no change at 55 gal purged

9:30 The pH is slowly increasing as is the conductivity. Temp. more or less stable and Eh is falling. ~~the~~ Cleaning the cell has a large effect in the same directions

10:00 ~~Desc~~ The parameters have stabilized. ~~to a~~ Sent Milt to get some ice & drinks

DR 9/29/88

Area 4 BG-CW4

10:10 Start sampling. BG-CW4 9/29/88 10:00

10:30 Finished the sampling - filter 570-520

Karen arrived and did Milt with the ice. Packed the samples. Verified temperature - at 4°C

10:00 ~~Karen~~ Steve & John ~~start~~ finish pulling pipe from BG-CW5 and go to decon. Finish some paperwork.

11:30 Karen starts chain of custody. I take the tubbing to decon. Steve & John left for lunch. I decon the tubbing and they arrive. Return to site

12:00 Karen goes for lunch. I continue with the documentation.

12:15 Karen returns, ~~labled~~ finished labling the bottles & tags. Started schematics for the Area 3 wells.

DR 9/29/88

13:10 Take lunch & return

13:15 Steve & John arrive from decon and start setting the pipe at BG-CWC.

13:20 Karen and I count the pipe – no packers since the water level is below the screen.
All stainless steel 23 lengths of 10' – and 1 length 5'. => 225', pump and screen. Stickup is 1' 9" so the top of the pump is at 223' 3" and the bottom of the screen is 232' 8".
Water level is 220.95 TD measured is 235'.

11:18 After pulling the pipe Steve stated that the screen & two packers are ~~at the~~ still on the bottom. the packer attachment apparently

unscrewed and the end of the Black pipe was ~ 75% sheared. I figured that the packer was stuck and wedged and that the unscrewing of the pipe freed the packer.

13:25 I eat while writing notes. John & Steve take a break from lowering the pipe.
Steve told us that his back hurts from slipping and falling at the decon pit while unloading pipe on Monday. It had been getting progressively worse.
I suggest that he go to the doctor and have it check and report it to Lockheed and his work as soon as possible as

he must report it to the state. There are a lot of forms to fill out. ~~Pat~~ Paul suggested that he not work anymore today. I concurred that he shouldn't lift anything. Paul said that the URS personal can haul the pipes. I said that he could check on the ~~screen~~ 2nd screen and take readings on the wells in area 3. We needed the readings.

1300. Steve left. Picked up the screen.

1400. I went to the Welders to make sure the screen could be used. The welder had cut the screen and emptied the sand.

DR 9/28/88

Steve and I figured out how to use the ~~scree~~ screws to tighten the screen. It will replace the one that's lost.

14:30 Steve left for the site. I ~~went to pick up the~~ called Gary ~~[illegible] left at area 8.~~ for update told him about Steve.

1450 I returned to the site as they finished setting the pump motor and hooking it up.

Water level at 220.90

~~1455~~ 15:03 Start pumping. Stick up ~~at~~ is 21 inches from well head to top of the sucker rods. (new pump, motor)

Thus: Screen: 215' - 235

TD (measured) 235'

Top of pump 223.20' or 223' 3"

Water level 220.90'

Bottom of screen 232' 8'

DR 9/28/88

Pumping at a rate of 44 strokes/min discharge is 3.5 gpm with an efficiency of ~~N-B~~ 12.5 strokes/gal.

15:20 There is some drawdown to 221.64 ~~slow~~ pump to still at 44 strokes, run with a discharge of 5 gpm. efficiency: 14

The water is a yellow brown colloid suspension and clearing no visable hydrocarbons. Everyone seemed to be complaining about headaches etc. Some thought that it was the hydrocarbons in the water or the fumes of the compressor. Paul said no since the PID readings ~~in the~~ at the well head for all three wells was less than 0. In fact the QA/QC team questioned ~~his~~ the accuracy

DR 9/29/88

on ~~the~~ his calibration of the HNu. He explained that the 0 is calibrated in the open air, and that the well air is denser than the atmosphere. Everyones eyes seemed to be effected which further supported my contention that the heavy smog was responsible. (Later found out that the NO_2 levels were above 200 ppb - more than 100 for O_3, NO_2 or particulate carbon is considered a smog alert.

15:35 Cleared cell and the parameters jumped. Can't read the water level as the sounder is constantly buzzing from the wetness in the well.

15:55 Parameter had stabilized - Started

DR 9/29/88

Area 4 B6-CWC 162

Sampling. Took 3 semi Volatiles samples - one for calibration

16:16 Finished sampling. Filter ~~and~~.

15:00 Started discussion w/ Paul, Karen & Steve, that he needed to see a doctor. He said that ~~they~~ Howard Pump is changing policies and Barstow isn't known for its great medicine. I told him to go to the clinic at B-1. Paul argued that it was important to do it quickly. I asked Paul if he would take him.

15:15 They left for a checkup

16:30 John & Jeff start pulling the pipe. We finish packing the samples and Karen the chain of custody for two samples.

DR 9/29/88

Area 4 Demob

B6-CWC 9/29/88 15:00 215-235

Karen planed to drive to Orange and said she'd deliver the samples in the morning.

17:00 ~~The~~ John & Jeff finish pulling the pipe and the cap of the screen was missing. I asked how is it possible for the cap with no packers to unscrew and fall. He said that the pipe hung up twice while pulling.

17:05 Start demobilizing - Take compressor and then tank back to ~~site~~ decon. John takes both rigs back.

17:40 Finish demob - Paul and Steve return. Steve is OK to work

17:45 Steve & John leave.

18:00 Karen and I discuss ~~[illegible]~~ the next day she won't need to come.

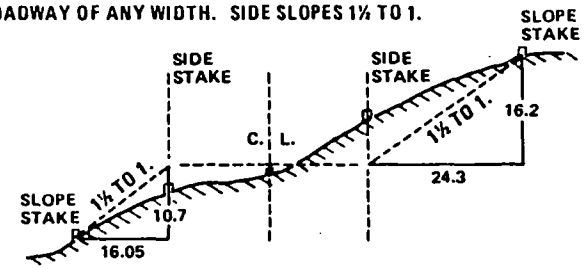
~~18:30 Everyone leaves~~

DR 9/29/88

We discussed the lack of
~~USAF 8:15~~ efficency.
I said that the end is that
I could have done better
with one rig than we did
with two. I also thought
that John's workmanship left
a lot to be desired.
We haven't had such a bad
week since we began. At least
in equipment.
The YSI cond. cable broke,
John put the screen upside down.
Lost both a screen and cap down the
hole.

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

ROADWAY OF ANY WIDTH. SIDE SLOPES 1½ TO 1.



Cut or Fill	Distance out from Side or Shoulder Stake.										Cut or Fill
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.00	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	0
1	1.50	1.65	1.80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	1
2	3.00	3.15	3.30	3.45	3.60	3.75	3.90	4.05	4.20	4.35	2
3	4.50	4.65	4.80	4.95	5.10	5.25	5.40	5.55	5.70	5.85	3
4	6.00	6.15	6.30	6.45	6.60	6.75	6.90	7.05	7.20	7.35	4
5	7.50	7.65	7.80	7.95	8.10	8.25	8.40	8.55	8.70	8.85	5
6	9.00	9.15	9.30	9.45	9.60	9.75	9.90	10.05	10.20	10.35	6
7	10.50	10.65	10.80	10.95	11.10	11.25	11.40	11.55	11.70	11.85	7
8	12.00	12.15	12.30	12.45	12.60	12.75	12.90	13.05	13.20	13.35	8
9	13.50	13.65	13.80	13.95	14.10	14.25	14.40	14.55	14.70	14.85	9
10	15.00	15.15	15.30	15.45	15.60	15.75	15.90	16.05	16.20	16.35	10
11	16.50	16.65	16.80	16.95	17.10	17.25	17.40	17.55	17.70	17.85	11
12	18.00	18.15	18.30	18.45	18.60	18.75	18.90	19.05	19.20	19.35	12
13	19.50	19.65	19.80	19.95	20.10	20.25	20.40	20.55	20.70	20.85	13
14	21.00	21.15	21.30	21.45	21.60	21.75	21.90	22.05	22.20	22.35	14
15	22.50	22.65	22.80	22.95	23.10	23.25	23.40	23.55	23.70	23.85	15
16	24.00	24.15	24.30	24.45	24.60	24.75	24.90	25.05	25.20	25.35	16
17	25.50	25.65	25.80	25.95	26.10	26.25	26.40	26.55	26.70	26.85	17
18	27.00	27.15	27.30	27.45	27.60	27.75	27.90	28.05	28.20	28.35	18
19	28.50	28.65	28.80	28.95	29.10	29.25	29.40	29.55	29.70	29.85	19
20	30.00	30.15	30.30	30.45	30.60	30.75	30.90	31.05	31.20	31.35	20
21	31.50	31.65	31.80	31.95	32.10	32.25	32.40	32.55	32.70	32.85	21
22	33.00	33.15	33.30	33.45	33.60	33.75	33.90	34.05	34.20	34.35	22
23	34.50	34.65	34.80	34.95	35.10	35.25	35.40	35.55	35.70	35.85	23
24	36.00	36.15	36.30	36.45	36.60	36.75	36.90	37.05	37.20	37.35	24
25	37.50	37.65	37.80	37.95	38.10	38.25	38.40	38.55	38.70	38.85	25
26	39.00	39.15	39.30	39.45	39.60	39.75	39.90	40.05	40.20	40.35	26
27	40.50	40.65	40.80	40.95	41.10	41.25	41.40	41.55	41.70	41.85	27
28	42.00	42.15	42.30	42.45	42.60	42.75	42.90	43.05	43.20	43.35	28
29	43.50	43.65	43.80	43.95	44.10	44.25	44.40	44.55	44.70	44.85	29
30	45.00	45.15	45.30	45.45	45.60	45.75	45.90	46.05	46.20	46.35	30
31	46.50	46.65	46.80	46.95	47.10	47.25	47.40	47.55	47.70	47.85	31
32	48.00	48.15	48.30	48.45	48.60	48.75	48.90	49.05	49.20	49.35	32
33	49.50	49.65	49.80	49.95	50.10	50.25	50.40	50.55	50.70	50.85	33
34	51.00	51.15	51.30	51.45	51.60	51.75	51.90	52.05	52.20	52.35	34
35	52.50	52.65	52.80	52.95	53.10	53.25	53.40	53.55	53.70	53.85	35
36	54.00	54.15	54.30	54.45	54.60	54.75	54.90	55.05	55.20	55.35	36
37	55.50	55.65	55.80	55.95	56.10	56.25	56.40	56.55	56.70	56.85	37
38	57.00	57.15	57.30	57.45	57.60	57.75	57.90	58.05	58.20	58.35	38
39	58.50	58.65	58.80	58.95	59.10	59.25	59.40	59.55	59.70	59.85	39
40	60.00	60.15	60.30	60.45	60.60	60.75	60.90	61.05	61.20	61.35	40

STADIA REDUCTIONS FOR READING 100

Vertical Angle	Horizontal Correction	Difference in Elevation	Vertical Angle	Horizontal Correction	Difference in Elevation
2°–00′	0.1	3.5	18°–30′	10.1	30.1
3°–00′	0.3	5.3	19°–00′	10.6	30.8
4°–00′	0.5	7.0	19°–30′	11.2	31.5
5°–00′	0.8	8.7	20°–00′	11.7	32.1
6°–00′	1.1	10.4	20°–30′	12.3	32.8
7°–00′	1.5	12.1	21°–00′	12.8	33.5
8°–00′	1.9	13.8	21°–30′	13.4	34.1
9°–00′	2.5	15.5	22°–00′	14.0	34.7
10°–00′	3.0	17.10	22°–30′	14.7	35.4
10°–30′	3.3	17.9	23°–00′	15.3	36.0
11°–00′	3.6	18.7	23°–30′	15.9	36.6
11°–30′	4.0	19.5	24°–00′	16.5	37.2
12°–00′	4.3	20.3	24°–30′	17.2	37.7
12°–30′	4.7	21.1	25°–00′	17.9	38.3
13°–00′	5.1	21.9	25°–30′	18.6	39.0
13°–30′	5.5	22.7	26°–00′	19.2	39.4
14°–00′	5.9	23.4	26°–30′	19.9	39.9
14°–30′	6.3	24.2	27°–00′	20.6	40.5
15°–00′	6.7	25.0	27°–30′	21.3	41.0
15°–30′	7.2	25.8	28°–00′	22.0	42.0
16°–00′	7.6	26.5	28°–30′	22.8	41.9
16°–30′	8.1	27.2	29°–00′	23.5	42.4
17°–00′	8.5	28.0	29°–30′	24.3	42.9
17°–30′	9.0	28.7	30°–00′	25.0	43.3
18°–00′	9.5	29.4			

Chains to Feet	
1	66
2	132
3	198
4	264
5	330
6	396
7	462
8	528
9	594
10	660

Feet to Chains	
100	1.515
200	3.030
300	4.545
400	6.060
500	7.575
600	9.090
700	10.606
800	12.121
900	13.636
1,000	15.151

Property of The MARK Group

DANI RENAN / GARY HALBURT

Address

Telephone (714) 596 0602

This Book is manufactured of a High Grade 50% Rag Ledger Paper having a Water Resistant Surface, and is sewed with Nylon Waterproof Thread.

INDEX

Area 9 - Mob/Demob	1	BG - MW06	106
BG - CW3	22	BG - MW07	108
BG - CW2	27	BG - MW - Demob	111
BG - CW1	31	B1 - MW9 - Mob	115
Area 3 - Demob	36	B1 - MW9 - 01	119
Area 6 - Mob	39	B1 - MW9 - 02	122
B5 - CW3	43	B1 - MW9 - 03	126
B5 - CW2	47	B1 - MW9 - 04	135
B5 - CW1	52	B1 - MW9 - 05	138
Area 6 - Demob	56	B1 - MW9 - 06/07	139
Area 1 - Mob	57	A1 - MW3 - Mob	140
B1 - CW2	60	A1 - MW3 - 01	141
B1 - CW3	66	A1 - MW3 - 02	141
B1 - CW1	71	A1 - MW3 - 03	141
BG - MW4 Mob	80	A1 - MW3 - 04	142
BG - MW4 01	87	A1 - MW3 - 05	144
BG - MW4 02	90	A1 - MW3 - 06	146
BG - MW4 03	95	A1 - MW3 - 07	149
BG - MW - 04	97	A1 - MW3 - 08	153
BG - MW05	99	A1 - MW3 - Demob	155

Area 7 Decon

FRI 9/30/88

7:00 Steve Gilbert & John Lopez arrive onsite. They start unloading the pipe from the rigs.

7:10 I arrived onsite. Paul Azarido and Jeff Miller were also onsite. We had a quick meeting. I gave the basic agenda ~~talk~~ of the day: decon all the pipes, empty the tanks and drums and set up and run pipe into B6-CW3 - the shallow well in Area 4. They had

DR 9/30/88

already finished emptying
the mobile Baker tank.
I must check the volume of water
the Baker, and when we
will have to order a new one.
Paul mentioned that we
can't leave the pipe in
well over the week-end. I
asked why not. He said
it was against procedures.
I answered that I never
heard of such a thing, and
that there is no chemical
reaction as far as I know.
Paul said that there was
a Health and Safety
issue - that people could

DR 9/30/88

fall in. I said that
between the caution tape
and barricades someone
would have to be trying
very hard to fall in a hole,
but if that is still a
problem we could back
the rig up over the hole.
He still wanted to clear
it with Steve Dickey.
7:30 Paul and I went to visit
Steve Dickey. I told him
about the plan that Rancwad I
had suggested - 3.5 days
per crew on one rig.
Neither Steve Dickey
nor Ron Helgeson

DR. 9/30/88

Candy said they were in the vicinity of the stripping tower. We left a message with Candy that we had been there and if they could come out to the site

7:15 We returned to the decon area

8:50 I took the truck ~~from~~ to pick up the vesqueen from Area 8. (this included the vesqueen used both in areas 7 & 8) Dropped by ~~the~~ 3-6 welding. The welder was just beginning with the screen. He said it should be done by noon or so.

DR 9/30/88

9:10 I returned and found Steve Dickey and Jon Helgerson at the decon area. I asked about having the pipe in the well over the weekend. They said that they had discussed it with Paul and that it was OK, but we should move the rig over the hole. I told them about our idea for two crews instead of two rigs. I explained that what we were doing wasn't sufficient. I saw a decrease in the efficiency, even in overall productivity.

DR 9/30/88

Ron said that how we choose to do the work is our business, all they are interested is in results. Any ~~bad~~ problems that we have with Howard pump is our business and they don't want to interfere.

9:25 I went to call Gary. I asked if he discussed the idea of two crews with Karen. He said that we have to use both rigs since we ordered them. He knew I was against it from the beginning and didn't understand why. I said it proved to be ineffective as I suspected. He asked

if it might not have been a self fulfilling prophecy. I said that I didn't believe so. He asked again to reiterate the problems. I mentioned the KSI, the Baker tank the amount of pipe, and that I think John's work has been detrimental to the job. Gary said that the problem was that we weren't working ~~together~~ as seperate groups as planned. Starting next week we will divide into two groups. He asked who I should work with whom.

I said that originally I believed that John and I should work together since Steve has more experience, but after working with John during the last week I don't want to work with him. He agreed fully. I said that I still disagreed with the idea of two crews, at least as it was conceived, my experience and gut feeling tells me that it won't work. I can't pinpoint the problems.

He also said to take the weekend and rest, that I have been under too much stress, and that it was

evident that I was arguing too much and with everyone. I explained that I haven't been arguing that I was frustrated by the fact that the crews seemed more inefficient and painfully working slow. I said there were too many mistakes that should not have happened. The arguments with DRS was that they were coming up with stupid arguments (the DI issue, the pipe in the well over the weekend) and untrue accusations (the lack of ice, not

carrying out a final DI
rinse) I believe it had
to do more with the fact
that we were moving according
to plan, and as competitors
who didn't didn't believe
we could succeed in our
methodology were doing
everything to prove themselves
right. In fact Steve Dicks
noted that after looking at the
arguments, in the end it
all came back to Ramesh.

9:50 Returned to the decon area
hooked up the compressor
and took it to the site.
(Area 3) Johnson asked me

about the screen. I said
it should be finished by
noon. There was a fire
drill in progress at Area
3, and there were three
cars parked in the lot
in our way. Went into
the reception building and
talked with Colette who
said they'd call over
the loudspeaker in the
shop, and if that didn't
work, they'd send someone
through the offices to ask.
I waited for a while at
the site and went back
and told the receptionist

that none of the cars were moved. I left a list of the car makes and licences to give to Colette and left for the decon area.

10:15 Returned to the decon area and hooked up the Baker tank. John again asked about the screen. Took the tank to the site followed by the rig.

10:30 Arrived on site. The cars still hadn't been moved. I went back to the reception area. They said that they had just started to notify people. The receptionist said that in the worst case they should move by ~~noon~~

DR 9/30/88

within an hour (lunchtime) I thanked her and returned to the site.

10:50 Two cars had been moved and Steve & John started to set up the rig. We unloaded the truck, and the third car owner came and moved his car.

10:55 At the entrance I saw Colette and told her that every thing had been cleared and thanked her again. Drove to 3G welding and picked up the screen - It cost $100.00 Paid with personal check. Returned

DR 9/30/88

to decon took a load of equipment and continued on to the site. Steve & John asked about the screen and I said it was in decon, and that I wanted to return as fast as possible so I could begin to set up. Both John & Steve went to decon to decon the screen.

11:15 I went to decon and Steve said that ~~[illegible]~~ the screen needed a plug. I asked if a nipple and cap were OK. Steve said they were very low on nipples. Couplers I we have, but MW didn't send nipples with the second

DR 9/30/88

pump and pipe. I said we'd order some more.

11:20 Went to Rosco's and got two plugs and one cap. We are loosing too much to be short

11:40 Go to decon, decon the parts and return to site

11:50 Gave Steve the plug and they started running the pipe. Made final counts: 21 lengths of 10' and 1 length of 5' for a total of 205' of Stainless pipe into BG-CW3 (Area 3 shallow well) The pump and screen are below the pipe with no packers.

DR 9/30/88

they started to run the pipe.
Paul and I set up the canopy,
tubbing and table. After
looking up the tubbing I
figure it was slight not
to use the Baker tank.
By the time Karen & John
would set up the other
rig we could take two
samples, then I could take
it back if needed.

12:40 Steve and John finish
running the pipe, back
up the rig - and John exclaims
"we're outta here!"

12:50 I signed Steve & John's
work sheets for the week

DR 9/30/88

and they left. I added
that Steve was at the
doctor on Thursday afternoon,
i.e. he was not working.
I said that while we were
pumping the shallow one,
Steve could be running
pipe into the second well.
He answered with what
screen & pump. I hit my
head and told him to
forget it. They left.
Paul was finishing laying
out the barricades and
tape. I looked over the
site and gestalted the
problem of why it was

DR 9/30/88

taking so long against
expectations. I gave Paul
the basics and he asked
if I wanted to get the Baker
tank. I said yes and he left.
13:00 Returned with the Baker tank
and moved it into place.
13:30 Paul left to catch a
flight to Sacramento. I
moved the compressor behind
the tank and arranged the
equipment. Left the site.
14:00 Returned home and figured
out the schedule difference
between one and two rigs.
The critical path is the
pumps and screen and

then the pipes - the
number of rigs is incidental.
Splitting the rigs will make
it go even slower. It
is a question of rig time
management. One rig with
all the equipment that can
run one well after another
without needing to pull the
first can finish a cluster
in 10-12 hours. A rig
with one pump and screen
it will take approx. 20+
hours, even more if not
in a secure area.
14:30 Called Gary. Talked to
Karen and she said to

forget it, we're stuck with
two rigs. ~~Gary~~ Talked to
Gary and gave him my analysis
and he said that we'd order
some more pumps, at least
one more. Asked about screens
he said we'd have to use what
we have. ~~He~~ He said that
Steve and I would use the
Baker tank. Karen would
use the tank on the rig and
the other monitoring equipment
I said it would take them
three days. He said fine.

8 hrs.

DR 9/30/88

Sat. 10/1/88

9:00 Wrote up the last 4 days
in the notebook. Finished
the notebook.

12:00 Went to the bank and site.
Checked the Baker tank.
Still have 4-5000 gal left.
We didn't order another tank
until next week.

14:00 Continued with the notes.

8 hrs

Sun 10/2/88

900- Continued with the notes.

14.00 Went to Wanamakers for another
computer.

8 hrs

DR 10/2/88

MON. 10/3/88

7:00 Steve & John arrived at decon.
7:10 I arrived at decon. Finish packing and Steve and I move to Area 3. Move rig from over the well & set up.
8:00 Start recalibrating the VSI. Steve picks up the pipe necessary. I went over my basic plan to use both screens & pumps at area 3 and that it would take Karen & John at least until noon to set up at area 5. Karen was quite upset as was John.

DR 10/3/88

8:30 Steve started ~~pumping~~ to get ready to run the intermediate well: BG-CW2. 220' of stainless pipe (220') pump (3'10") and 5 lengths of black pipe: (106'3"). Packers set on both sides of the screened filter. Screen is 330-340. Top packer: 229'3" & Bottom packer 334'10" (The stick up over the well head is 10'.) But since we don't have the extra pump - we have to wait.
9:18 Start pumping BG-CW3.

DR 10/3/88

Pumping at 44 strokes/min
with a discharge of 3.0 gpm and
an efficiency of ~14 strokes/gal.

9:25 Parameters normal; drawdown
is 0.3 feet. ~~Speed~~ Increase
pumping to 48 strokes/min
with a discharge of 3.5 gpm
and an efficiency of 13 strokes/gal.

9:35 Figure one well volumes at
37.8 gal (1.02 + 1.46) × 15'.

9:45 Parameters beginning to appear
to stabilize except for a
small continual drop of the
EC. Still pumping at 48
strokes/min with a discharge of
3.2 gpm and efficiency of 15

10:00 Parameters stabilized

DR 10/3/88

10:05 Start sampling. Took 3 SV.

10:15 Steve and Jeff start to
pull the pipe.

10:20 Finish filtering. Steve
Dickey & Bill Robinson
arrive. Discuss the QA/QC
report. Steve said to
continue using the same
numbering system. About
the pulsating, I agreed
that any solution will just
complicate things and won't
help, that changing the
diameter may cause more
volatilization. Steve suggested
stopping the pump and
pouring the water out

DR 10/3/88

into the vials. I said it is possible but doubted that it would make any difference. Opening the tubes and lifting may cause more aeration. I showed Steve how we are taking the sample. He said that it was OK for now. Area 3 shallow BG-CW3 10/3/88 10:00 AM

10:45 Steve Dickey & Bill Robinson leave.

10:50 Steve & Jeff pull out load the rig and go to decon.

10:55 Gary arrival and we went over the plans and I fill him of the conversation with Steve.

DR 10/3/88

11:30 Gary leaves to go further to decon to see how Karen is doing. He said she was upset about my attitude of taking all the material. I said that I was trying to get the job done a soon as possible and optimize the operations. He said he would go immediately and order the pumps etc. from NW.

11:40 He left.

11:55 Steve and Jeff return from decon and set up the rig & I counted 220' of stainless pipe and 5 lengths of

DR 10/3/88

black pipe.

12:00 They start unwrapping the pipe into BG-CW2

12:25 I take the tubbing to decon. Talk to Gary about the need for a second Baker tank. He said he would talk to Karen. He left.

12:45 Finish decoming the tubbing and return to site

13:00 The pipe starts floating at ~ 280'-200' (at water level)

13:40 Finish setting the pipe.

13:45 Jeff & Steve went to eat. I went to decon to pick up the gas can and get tags from Karen

DR 10/3/88

14:15 Return and fill compressor with gas. Steve & Jeff return.

14:30 Started pumping - Steve said that the cups were OK and that he didn't change them - turned the pump up to maximum: 48 strokes/min with a discharge of 4.5 gpm and an efficiency of ~10.5 strp. Water level drops ~0.5 foot 198.18 to 198.75.

14:50 Still pumping at the same rate and discharge. Water level the same. Slow

15:04 Slow pump to 40 strokes/min. with an estimated discharge of

DR 10/3/88

3 gpm. The parameters seemed to have stabilized.

15:10 Take last reading - Parameters stable (one or two) Water level rose a bit.

15:15 Start sampling

15:30 Finish sampling and start pulling. Took duplicate.

Area 3 - intermediate well.

BG-CW2 10/3/88 13:00 330-340

BG-CW4 10/30/88 15:00 Dup. of above

16:00 Finish packing the sampler

16:20 Finish pulling & loading the pipe. Reviewed the scematic for the deep well. Notice that the containment is wet - The packer seems to good -

DR 10/3/88

it brought up about 30 gal of water, and spilled into the parking lot.

16:30 Steve and Jeff leave for decon.

17:00 Take tubing to decon. check out Area 6 for the next day. It is due east of the car sale.

18:30 Return to site - counted pipe (at decon) 215' of Stainless, pump, & 17 lengths of black pipe (361'3") for a total of 580'1" to the top packer - stick up is 9" above well head So top packer is setting at

DR 10/3/88

579' 4".

Bottom packer 588' 11".

Screen is from 580-590.

They have put in 10 lengths of black pipe, and want to quit. It is very difficult getting the pipe down - it's floating very slowly. I ask Steve to remain to put all the pipe in - Jeff

18:40 Jeff leaves. Steve and I put the remainder in - mostly by hanging on the pipe wrenches on the pipe.

19:15 Paul arrived and asked if we wanted something to eat.

19:30 Paul said that the other compressor knocked out, and that Karen quit for the day. He went to get some food.

20:05 Finish setting the pipe (well over 2 hrs). Set pump motor. Steve leaves - I finish notes and start to pump.

20:14 Start at 44 strokes/min. Water arrives in 4 min. Very murky.

20:30 Pump stops. Start again at 46 strokes/min.

20:40 Check discharge - 47 strokes/min at 1.1 gpm. efficiency 43 strokes/gal. Heavy, very strong hydrocarbon (possibly phenolic) odor. with free product sheen.

and black globules.

21:00 Paul returns with ice, drinks & pizza.

22:00 Still pumping at 47 strokes/min but the discharge went down to 1.0 gpm

Figure one well volume to be 36.8 + 7.3 gal in the 3/4 pipe thus 3 well volumes is 110.4 + 7.3 => 117.7 gal.

Paul was waiting, sitting in the car writing his reports

22:30 Start sampling to Area 3 - deep well

BG-CW1 - 10/3/88 20:30 580 - 570.

22:50 Finish sampling.

23:00 Pack samples. Paul leaves

DR 10/3/88

23:20 Load samples in the truck. Organize site, load up some barricades and go to Area 6.

23:40 Set up barricades and find I need more tape return to decon get tape. Leave cooler in the cab and lock the cab. Check temperature - 2°C.

24:00 Leave decon and tape up Area 6.

24:30 Leave site.

17 hrs.

DR 10/3/88

TUES 10/4/88.

7:00 Karen, John, Steve arrive onsite. From URS Paul Jeff & someone else.

7:45 I arrive onsite Jeff and Steve are at Area 3 pulling the deep well. Karen asked for the truck, - she needed a new compressor. I said I'd get her ours. It has enough fuel, and we are sure it works, and it will take only 10-15 min. It did.

8:30 Returned to Area 3. They finished pulling the well and loading the rig.

DR 10/4/88

We also loaded the truck left the Nisqean to day, along with the barrel. - again they pulled up about 30 gals of water. Also left the tank in place. Followed the rig back to decon, unloaded the pipe & truck.

9:00 Asked Jeff to come & convoy me with the tank. I arrived on site and waited

9:20 Returned to decon to look for Jeff. On the way I saw the other person from URS at ~~Area 4~~ Area 4. I asked what happened to

DR 10/4/88

Jeff. He said that Russel flagged him down to go to decon. I asked what they were doing - taking a sample with a bailer to make sure there are really hydrocarbons in the samples.

9:30 Got to decon and was able to pull Jeff away.

9:40 Took the tank directly to Area 6 - set it up and unloaded all the equipment from the truck. Jeff returned to decon

10:00 Went to pick up the shipment from UW. It was at counter to counter. Took it

DR 10/4/88

10:30 Back to decon. Opened it and there were two new pumps - one for regular and a smaller one for only up to 300'.

Steve told me we were out of kerosene. We also needed to weld the filter as it tore two of the welding spots and part of the screen while pulling out.

11:00 Left filter at the welder. Asked him about the threads. He said to buy a new plug at Roscoe since he didn't have one of that size.

Went to Wanamaker, got

DR 10/4/88

kerosene and exchanged compressors.

12:30 Returned and only Steve was there. He had finished rebuilding the pump. The caps had some 1/16" of black tar-like material on them.

13:00 Went to Roscoe's and got 2" plug & 3/4" adapter for the filter.

14:00 Figure the pipe needed for Area C.

14:15 Greg arrived. Wrote out chain of custody as did Karen. The samples and the C-o-C are

DK 10/4/88

L00032

Area 6	K00010	10/3/88	15:05	
	K00011	10/4/88	15:50	
	L00033			
Area 3	BG-CW3	10/3/88	10:00	145-265
	BG-CW2	10/3/88	13:00	330-340
	BG-CW1	10/3/88	20:30	580-590
	L00034			
	BG-CW12	9/30/88	15:00	(dup of BG-CW2)

14:20 Karen signs off over L00032 to Gregg Wilson

14:30 Dave signs over the samples on L00033 & L00034 to Gregg Wilson. All VOC are requested a 48 hr. turn around.

DK 10/4/88

15:00 Leave for Area 6. Start setting up.

15:30 Take well depths and water level readings of each well. The wells are not marked so identification can be made only by measurements

	TD	WL	well
East	230	203.50	B5-CW3
Middle	350	204.11	B5-CW2
West	542	209.64	B5-CW1

14:00 Set up rig over the eastern - shallow well - B5 CW3.
Screen 209-229.
Lower 220' of pipe with pump on the bottom -

DR 10/4/88

no packers - Top of the pump setting a 220', 17.5' below the water level.
TD measured 230 - Bottom of the screen is 229. The bottom of the ~~filter is~~ Hydrostar 300 - no filter is being used is 222'3" (pump is 2'3") 7 9" above TD.

14:30 ~~Go to pick up the screen. Below~~ ~~Take [illegible]~~ Start calibrating the YSI & start running the pipe down B5-CW3

15:10 Finish running the pipe. Steve moves rig and starts running the pipe down B5-CW2

DR 10/4/88

Count pipe - 5 lengths of
black pipe 106' 3", and
230' of stainless, ~~Total~~ of
and a 3' 10" pump for a
total of 240' 1". Must have
a stickup of 1' 6". So the
packer will sit at 338" 7'.

16:00 Take water level reading
at B5-CW3 - 203.50. Gary arrived

17:00 Start again calibrating the YSI.

17:45 Finish organize equipment

17:55 Take another W.L. - 203.59
fell a little

18:00 Start pumping, water arrives
in two minutes

18:10 52 strokes/min with a discharge
of 3.5 gpm. efficiency 15 strokes/gal

DR 10/4/88

Water starts rusty and slowly
clears. Water level falls
~ 1 foot. Parameters stabilize
in normal fashion. Steve leaves

18:55 Still pumping at 52 strokes/min
~~efficiency~~ discharge at 3.2
with an efficiency of ~17 strokes/gal

19:05 Slow pump to 1 gpm - parameters
stable - pH - 7.33 temp 18.9
Cond - 969 Eh - 179 water near
clear. pumped about 200 gal.
approx 4 well volumes

19:12 Start sampling

19:30 Finish sampling - since Steve
took the rig I took an
extra 1 liter bottle filled
half way and drove to

DR 10/4/88

Area 6 B5-GW3 4C

decon & filtered the sample and checked pH. Returned to site Jeff had disconnected and loaded the majority of the equipment.

20:00 Unloaded at decon and Jeff left

20:20 Returned for last load. - Lock compressor to the water tank and leave

(Area 6) B5-CW3 · Skyflow 10/4/88 1910: 209' 229

12 hrs

DR 10/4/88

Area 6 B5-CW2 mob 47

WENDS. 10/5/88

Steve & Paul

7:00 Arrive on-site, Steve has ug loaded and ready. John and Karen demobilizing Area 5 and ready to move to Area 2. Karen told me that ~~Paul~~ it took over 1 hr extra the night before because Paul said they needed to take a duplicate & said that they were supposed to ~~take~~ send a Travel Blank for as the QA QC sample. She said that Paul demonde to take a duplicate just

DR 10/5/88

as they were ready to sample.
Starting to table took a
long time - they were ~~there~~ on site
very late

7:45 Took the truck to Area
6 and set up. Checked
calibration of YSI. Set up

8:30 ~~Talk~~ Went to talk to
Steve Dickey. Told him
about the duplicate sample.
I said it fouled things
up. We straightened things
out, but every time they
come up with a demand
it just wastes time

9:00 Return. All set up
and ready. Pat arrives on site

DR 10/5/88

9:05 Take W.L. reading - 204.11'.

9:10 Start pumping at 52 strokes/min
with a discharge of 3.4 gpm
and an efficiency of ~13 strokes/gal
Starts with an dusty dark
Brown colour.
There is a slight drop in the
water level - to 204.59
(drop of 0.48').

9:35 Still pumping at 52 strokes/
min with a discharge of
3.8 gpm slow down pump
since we have already
exceeded 3 well volumes
1 well volume = 24.8
(1.02 + 1.46) × 10' and 106' 3"
of black pipe ⇒ 3 well volumes

DR 10/5/88

equals 77.1. Slow to
2 gpm. Start pulling shallow well.
10:00 the pH and temperature have
stabilized but ~~not~~ the cond
~~continues~~ and Eh continue
to decline
10:30 The parameters seem to
have stabilized after over
9 well volumes final readings
are pH - 7.42, T = 19.3°C
Cond. 574 µmhos Eh - -110
Depth was unreadable
after 10:10 due to the
moisture in the well.
Start sampling.
B5-CW2 10/5/88 10:00 339-349
Area 6 - intermediate well

DR 10/5/88

10:40 Finished pulling the
shallow well B5-CW3,
10:50 Finish pulling. Moving
rig ~~to decon the pipe~~
to B5-CW2 to pull
the pipe.
11:00 Start pulling the intermediate
well. Finish packing. Samples.
Karen comes over and yells
for keeping Pat all morning.
I tell Pat to go and help
Karen.
11:30 Finish pulling the pipe -
I go and call Gary. He
said that Pat is too heavy
Karen. I said OK.
Steve & Jeff take rig to

DR 10/5/88

decon. &c.

12:30 I come to decon with the tubbing -

12:45 Finished decon & loading pipe return to site. I decon the tubbing collect more water & return

13:00 Finish running pipe into the deep ~~zone~~ well B5-CW1 210 foot of stainless steel pump and 15 lengths of black pipe (318'9") for a total of 532'7" to the top packer. No lower packer was set. Bottom of the screen is 538'2". (about 4' above TD.

DR 10/5/88

13:10 Measure Water level. 211.54'

13:15 Start pump. Water reaches surface at 13:19, Water is black.

Pumping at a rate of 48 strokes min - with a discharge of 1.25 gpm. There is a draw down of nearly a foot to 212.60.

All the parameters start dropping.

13:30 The cell has about 35-40% sediment. Clean cell.

13:35 The water changes to a dark olive green - high sediments looks like clay. after 30 gal

15:15 Parameters seem to have

DR 10/5/88

stabilized. To a degree.
clean all take a last reading
which is somewhat off - wait
a minute to return to a
semblance of normal - They
do (about half way to the
earlier reading) Discharge down to 0.9 gpm.

15:20 Take sample.

15:30 End water measurement 211.9
less than the beginning.

~~16:00~~ Start pulling pipe.

15:40 Steve Dickey arrives. Show
him what's occuring - fast
pumping little discharge
and 30-40% solids. He
suggests taking a sample
B.A.P before the screen

DR 10/5/88

stopper up. Steve Gibbs
think it may be a leak
in the seat - shuts off
valve very little draw
down. He agrees that the
screen is probably plugged
up, or the cups worn, even
though they are new.

16:00 Finish packing the sample.
Area 6 - Deep well
B5-CW1 10/5/88 15:00 532 - 542.

16:30 Load up and return to decon

17:30 At decon. Steve leaves with
John. I said I wanted to
catch the debriefing. Talk
with Karen. She suggests
making up a daily plan

DR 10/5/88

and have a daily meeting

18:50 Leave site. Karen finishes the shallow well at Area 2.

11 hrs.

Made up schedule for Thurs

THURS → 11:00-11:30 Gregg arrived and picked up samples from Karen and wrote chain of custody:

L00035

K0012 10/4/88 18:00

K0013 10/4/88 20:10

K0014 10/5/88 13:00 →

L00036

Area 6 B5-CW3 10/4/88 19:00

~~Area~~ B5-CW2 10/5/88 10:00

B5-CW1 10/5/88 15:00

L00037 10/5/88 18:00 Dup of CW2

B5-CW4

DR 10/5/88

THURSD 10/6/88

7:00 Karen, Steve & John arrive

URS personnel - Paul & Jeff.

7:20 I arrive. Steve & John setting up. No meeting. Go over the plans with Karen and Pat, & Jeff. We agree that Karen's group will try to finish today. They will get prepared on the equipment.

8:00 Karen moves to Area 2 and start running the pipe into the deep well. We emptied the tank and started to decon. Set

9:30 Pat said that he called

DR 10/6/88

Gary who told him that Karen Cobble should be on site around 12:00, and that he (Gary) will also come up.

9:00 Pat takes the compressor over and Steve & Jeff come to measure the TD & water level. - No keys - I go to pick up the keys from Pat and then Karen

10:00 Take the readings. ~~Stel~~ The problem is the flower bed - Jeff went to call Bill Robinson - He wasn't in so I went over to the office and ~~spoke~~ talked to Steve - He said to lay out the visqueen -

DR 10/6/88

11:00 Got the rig on site - and unloaded the truck. Still a problem with the flower bed. Gary arrived and said we should wait since Bill is supposed to come. We set up and wait.

11:30 Eat lunch. Go over the problems with Gary. He said that Lockheed is dissatisfied with our work. That they feel frustrated - I answered so do I, but what more do they expect?

12:30 Gary left. I went to Steve to ask him if we should uproot the plant.

DR 10/6/88

After our experience at
A1-MW2 I didn't want to
get into arguments.
Steve said he'd come out. I
went to decon to pick up
more equipment.
13:00 Returned to site as Steve
Dreiley was leaving - Steve
Gibbs & Jeff were digging
out the shubberies.
13:20 Set up into place and unload
14:00 Start running pipe into
the well. B1-CW2
intermediate well - 4 lengths
of black pipe, pump and 160'
of stainless steel pipe
160 + 3'10" + 85' ⇒ 248'10"

DR 10/6/88

to the packer. No bottom
packer. screen is from
250 - 260.
Measured TD at 262.
14:30 Start calibrating the YSI
15:00 Finish running the pipe
and calibration.
Plan on duplicate of the
sample, and 3 liters of
Semi Volatiles for calibration.
15:15 Steve & Jeff go to pick
up the pump for the shallow
well, figure out well
Volumes
11' of pipe @ 1.02 = 11.22 gal
10' of screen @ 1.46 ⇒ 14.60
Total: 25.82

DR 10/6/88

In addition there is 85' of black pipe below the pump - add another 1.7 gal.

3 vol = 25.82 × 3 + 1.7 = 79.16

15:30 Take WL - 115.15'. Steve & Jeff return - John still hasn't started to pull the shallow. Steve asks to use the regular pump for the shallow, we'll have to clean anyway before running the pipe for the deep zone. I said OK.

15:33 Start pumping water arrives at 15:35. Speed up the pump to 52 strokes/min with a discharge of 4.5 gpm and an efficiency of 11.5 strokes/gal. The water

is murky but slowly clearing.

16:00 The water level dropped 0.5 foot. (to 155.56).

All the other parameters are also falling. Have pumped 110 gal, more than 3 well volumes. Slow pump to 28 strokes/min with a discharge of a little over 2 gpm and an efficiency of 13.5.

16:10 Ready to run pipe into the shallow well - I count the pipe 55' of stainless pipe 3'10" for the pump and 14" for the small screen. Together comes to 160',

which is exactly TD.

16:25 Pipe reaches TD and head is sticking out over 3 feet. Pull string and remove 5'.

16:30 The water being pumped (intermediate well - CW2) changes colour to murky. No big change in the parameters - the conductivity starts rising pH, Eh continue dropping

16:40 Still pumping at 2 ppm.

16:55 Parameters have stabilized to an extent pH - 7.31 temp - 19.3°C Cond - 815 µmhos Eh - 66. Water level rose back to 155.34 and had been stable for over 0.5 hrs.

DR 10/6/88

start sampling.

17:20 Gary leaves as we finish filtering. Move the pump motor to CW1 - the shallow well.

Area 1

B1-CW2	10/6/88	15:00	250-260
B1-CW4	10/6/88	17:00	Dup of CW2

Also took 3 Semi Volatiles (- for calibration) from B1-CW2.

17.30 Start pump on B1-CW3. Pump for 10 min. - nothing happened. no water. The water level fell to 155.60 below the pump. the top is at 150, bottom at ~~152'10"~~ 153'10". - The pump cannot pull a vacuum of 1'2".

DR - 10/6/88

Area 1 BI-CW2, CW3 6

17:30 Steve wants to pull out and take pipe to decon. I ask to add a 2' or 3' length. Steve said he doesn't have one on site. - So he left to get one from decon. I explained that the shallow samples were considered the most important, that we had to try everything. - finish packing samples BI-CW2 and BI-CW4.

18:35 Steve & Jeff return with the 2' pipe - pull the head ~~out~~ ~~tower~~ add the pipe, lower and set the motor. The top of the pump is now at 152' and the bottom is at 155' 10"

DR 10/6/88

Area 1 BI-CW3 C7

The bottom of the ~~screen~~ filter is at 157' 2" supposedly 2' 10" above TD.

18:35 Start pumping at 48 strokes/min. lots of air - with a discharge of 0.5 gpm. Efficiency is ~120 str/gal

~~18:50 Slow~~ water level falls to 154.95.

18:40 Slow pump to 30 strokes/min. and discharge increases to 0.75 gpm. Water level ~~drops~~ stabilizes at 157.00 efficiency ~40 strokes/gal

18:50 Well volume is 5' of water x 2.48 = 12.4 ⇒ 3 well volumes is 37.2. However if we take 3' of water one well volume is 7.14 and 3 well volumes is 22.32.

DR 10/6/88

19:20 Slow pump to 18 strokes/min
discharge remains 0.75 but
less air in the discharge
efficiency is increased to 24 strs/gal
19:25 Since there is no change in the
water level; slow pump to 11 strokes/
min. Check cooler - 3°C
19:30 Slow again to 10 strokes/min.
discharge is 0.6 gpm. efficiency
~16. Kevin arrived
20:00 Parameters are stable pH - 7.59
Temp 19.7, Cond 988 µmhos and Eh
7. (climbed from a - 30). Water
level returned to 156.07 and
continued to rise
~~20:10 Started~~ Showed Kevin the parameters
. Had discussed the order of

DR 10/6/88

sampling. He said VOC's
are first since in surface
samples they first are the least
disturbed. The groundwater
sampling really doesn't matter,
but it is a continuation of
the water sampling procedures.
(as written in the EPA manual.)
Discussed other issues.
He looked at the parameters
and said they looked good.
20:10 Started sampling. Kevin observed
the methodology. He said
that the VOC sampling was OK.
just as good if not better than
the way they (Karen's crew) tried
by unhooking the tube at

DR 10/6/88

the well head and pouring.

20:25 Finish sampling and start fitting Steve & Jeff begin to pull the pipe from the well. BI-CW3 (shallow) 10/6/88 19:00 150-160

20:35 Kevin left

20:45 Finish packing samples - Check cooler. - 4°c.

20:50 Load up truck and return to decon. Leave tank, ~~any~~ ~~compr~~ compressor & table in place

21:00 Set everything in decon. Steve and Jeff take off.

Z I went to see how Karen is doing.

22:00 Leave

14 hrs

DR 10/6/88

FRI 10/7/88

7:00 Steve & John arrive. Karen isn't coming up today.

7:20 John goes to gas up rig.

7:25 I arrive onsite, Start loading truck.

8:00 Move to site. Set up

8:00 Lower pipe into BI-CW1 the deep well.

screen is 580-590

set packer at 579' 7"

Run 19 lengths of Mack pipe (403' 9") pump (3' 10") and 170' of stainless. add 2' of stainless

thus packer setting at 579' 7".

Bottom of the screen at 585' 2'

DR 10/7/88

Finish running pip and set up at 9:40. ~~Take~~

9:45 Take water level 160.50 till since yesterday.

9:50 Start pumping. Compressor dies, and restart.

9:52 The water arrives - starts out very rusty and starts clearing in a few minutes

9:55 Motor is pumping at a rate of 52 strokes/min with a discharge of < 2 gpm and an efficiency of 28 strokes/gal.

10:00 Took the parameters - ~~Depth~~ Water level fell 16' to 176.20'. Slowed pump to 26 strokes/min with a discharge of ~1.9 gpm

DK 10/7/88

and an efficiency of ~14 strokes/gal.

10:15 The water turned black within 1 minute after 40 gal. This comes to about 1 well volume (24.8 gal) plus the volume of draw down (~20'). The colour and texture is similar to that of the deep well in area 3 (B6-MW1). The odor is similar but not as strong (somewhere between sewer, hydrocarbon, plastic - Paul thinks it is phenolic.)

10:40 Slow pump to 24 strokes/min with a discharge of nearly 1 gpm. 0.9 and an efficiency of 26 str/gal

11:05 Water level still falling. Reached 193.20. Slow pump

DK 10/7/88

to 10 strokes/min with a discharge of 0.8 gpm efficiency is ~12 strokes/gal

11:10 the water level is beginning to recover; the water level was measured at 191.40

11:20 Have pumped 107 gal, of which 31 gal is from the drawdown, - so the real volume purged from the zone has been 73 gal, nearly 3 well volumes (82.5)

11:25 Check the discharge - the pump motor is pumping at a rate of 10 strokes/min with a discharge of 0.75 gpm and an efficiency of 12 strokes/gal.

DR 10/7/88

Put bottles in the cooler. Check temperature inside the cooler - 4°C. Add two more packs of ice.

12:00 Pumped 180 gal (at least 90 from the zone) The parameters seemed to have stabilized. There is a lot of material in the water which effect the readings. The parameters are influenced by the time since ~~the~~ last washing of the cell. Every washing, there is a jump in the parameters and they slowly return to or towards what they were before the washing.

DR 10/7/88

The pH is 8.40, Temp 20.7
Comp. Cond. 515 and Eh-130.
The water still has a dark
olive colour and colloid
texture: Water level was
186.05.
Start sampling.
Jeff left for the weekend - drove
back to Modesto.
12:15 Steve starts pulling the string
while I pack the samples.
12:30 John returns and assists
Steve.
12:~~35~~ They finish pulling the pipe
& load it on the rig.
13:00 Load the truck and hook
up the tank to the truck

DR 10/7/88

and return to Lecon.
Put the rig in place and
unload the truck. I signed
Steve's work sheets and
they left for the weekend.
13:40 Go & pick up the compressor
& visqueen from the site.
& return. Greg had just
arrived.
13:55 Fill out Chain-of-Custody
and sign over the samples
to Greg Wilson. Chain-of-
Custody included:

1000.39 - Area 1				
inter.	B1-CW2	10/6/88	15:00	250'-260'
	B1-CW4	10/6/88	17:00	Dup of B1-CW2
shallow	B1-CW3	10/6/88	19:00	150'-160'

DR 10/7/88

Area 1 B1-CW1 78

L00040 Area 1

drop. B1-CW1 10/7/88 11:00 580'-590'

~~L00030 [illegible]~~

Only I initialized the serial numbers.

Signed the samples over at 14:10

10/7/88

14:15 Gregg left. Started to organize the decon area, did a garbage run on cleaned off the truck.

15:15 Went to the office, Bird 76, and told Steve Dickey that we had finished sampling the cluster wells.

16:00 Returned home, called Gary at the office.

16:05 Gregg picks up Karen's Samples: →

8 hrs

DR 10/7/88

~~Area 1~~ Admin 79

SAT 10/8/88

Transcribed some of the field notes in to note book.

3 hrs

SUN 10/9/88

Continued transcribing. Didn't get to expense account

4 hrs.

Asked Stan about the pressure regime in the pump and under it. He didn't know.

- L00038

A1-CW1 10/6/88 16:00

A1-CW2 10/6/88 21:30

DR 10/9/88

MON 10/10/88

8:45 Paul Azavido calls. He asked if we were working today. He arrived at 7:00 with Jeff and had been waiting. I told him we planned to meet at 9:00

9:00 Steve arrived. starts washing off rig

9:10 I arrived and ~~he been~~ Steve said he had to go and gas up the rig. He also said that his coil was failing again

9:15 Steve left, and I went to Manamakers to get kerosene and a cooler. No kerosene

and no cooler.

10:00 Go to Bill Robinson since I couldn't locate the well at BG-MW1. He explained where it was. Talked to Steve Dickey, he showed me the thermal diagrams for A1-MW4 and MW1. I asked him about the pressure regime under the pump. He also didn't know.

10:45 Return to decon. Steve returns with the rig. He had to go to Sam's U-Haul in Van Nuys.

11:00 Went to check B1-MW11 and to H-Wahl for the kerosene. They also didn't have a cooler.

11:30 Return to BG-MW1 ~~set up~~
One car is moved. Return
to the decon and drop off the
kerosene and pick up some
barricades. Return to the site,
a car moved in. Asked
the guard how to page the
owners of the car to move
them. He gave me the phone
number. A long drawn out
process.

11:50 One car - the middle one -
over the well, moved. Set
up a barricade, and caution
tape.

12:00 Returned to decon. Steve had
just unhooked the fire hose

from the first large Baker
tank and connected it to
the second. Moved the
diaphram pump to the decon
pit, but there wasn't enough
fire hose.
Went to Wanamakers and got
another hose. Stopped at
a sporting goods store in
Victory and got a Coleman 54 qt
cooler. Then picked up
ice & drinks.

13:20 Returned and hooked the
hose up.

13:30 Went to lunch

14:30 Returned. Figured pipe
fitting this needed for the

first 4 zones will use 425'
of stainless. For the lower 3
zones we can use 212' ~~stain~~
black pipe (10 lengths) and
up to 405' of stainless pipe
We took 435' of stainless
-Karen will need 425' of stainless
for the first three zones at C1-MW1
and then 12 lengths of black pipe
and 255' of stainless. ~~Since~~
As we only have ~800' of
stainless we will have to
transfer 60' from B1-MW1
right after finishing the ~~[illegible]~~ last
zone.

14:45 Move the diaphram pump to
decon pit and empty it

DR 10/10/88

15:00 Move the diaphram pump
and start emptying the
Mobile Baker tanks.

15:30 Take compressor to site -
the second car moved out.
Secure the area

16:00 Call Gary. Give him an
up date. ~~Karen & John~~ ~~[illegible]~~

16:30 Return to decon. Steve
had just finished emptying
the second Baker tank.
Load up the truck, hook
up the Baker tank and
move onto site.

17:00 Position the tank with Paul.
Steve comes with the rig.
We set up the requirements,

DR 10/10/88

set rig into place and take measurements. TD is 653'
12' less than the listed (665').
Either the original measurement was wrong or we have a lot of sediment in the hole.
Water level is 239.60, less than half a foot above the bottom of the top screen.
We cant take a sample from the top zone.
We need to take an equipment blank and then we'll get up in the 272'-292' zone. Set up table & equipment
18:00 Leave for the day. The area is to be locked at 20:00.
8 hrs.

DR 10/10/88

TUES 10/11/88

7:00 Steve & Paul arrive. Steve worked on the rig
8:15 I arrive and only then find out that it is 8:15 not 7:15. I couldn't figure out where that hour went.
8:20 Unload the pipe from the rig.
8:45 DI the pipes. While DIing the pump we kept getting black flakes the same as from the Area 1 and Area 3 wells. Steve said there was about 1/16" on the cups, and apparently

DR 10/11/88

it is caked in the barrel of
the pump. Steam cleaning
it doesn't remove the material
After feeling the flakes, we
noticed that there was ~~some~~
a lot of copper specks in the
material. Steve thought it
was like dope. He brought
some out, it seemed identical.
I suggested using Methanol
(and then steam clean) Steve
said that we needed to
brush it out on well. Steve
& Paul went to Roscoe's
I gave them $20. They bought
a toilet brush and tied
a long handle to it.

DR 10/11/88

Apparently it worked.
9:50 They return and we try washing
the pump with DI water.
Virtually no flakes come out
after a few strokes.
10:00 Start taking the blank
~~[illegible]~~
B1-MW1-01 10/11/88 10:00 equipment blank
10:25 Take another water level
reading = 239.60. So we
definitely can't take the pump
the top zone.
10:30 Steve goes back to decon to
get 2-10' lengths of stainless
pipe without the suction rods
for the bottom assembly, and
some VOC vial.

DR 10/11/88

10:45 I continue with the paperwork. Steve returns and sets up the bottom assembly. Two 10' lengths of blank (no screen rod) stainless and the filter in between them. The packers are outside of the two lengths, giving a distance of 26'6" from packer to packer. For the first 3 zones the pump will sit directly above the top packer.

Total lengths of pipe:

Bottom assembly 20' of pipe & screen: 26'6"

Stainless pipe 21 20' lengths + 10' + 5' 435

10 lengths of black pipe 212'6"

11:15 Start running the pipe to the first zone. Screen is

from 272-292'.

The packers will sit 268'10" and 295'9". Actually since the plate will sit 8" above the well head the packers will sit 268'2" & 294'8".

11:20 Count pipe. Only stainless 12 lengths of 20', 1 length of 10' & top assembly 10' & 5' ~~for~~ ~~the pump 3'10"~~ for a total of 265, with the pump (3'10") 268'10".

11:25 Start calibrating the YSI. The conductivity head tore again so I had to ~~solder~~ solder it. After flushing I realized I forgot the screw cap. So I taped it

with electrical tape.

12:00 Finish lowering the pipe and calibrating the VSI. Ready to start compressor. I forgot the key. Went to take the key from the other compressor. Return, ~~the~~ Steve noticed that he had forgot the 5' length and added it on. Greg came & left.

12:30 Count the pipe that is out. There are 9 60' length out which gives 12, i.e. 240' plus 10' plus top (10') plus 5' = 265'

12:50 Start pumping at 50 strokes/min with a discharge of 4.5+ gpm and an efficiency of ~11 strokes/gal. Karen & John arrive

13:05 Pump rate is the same and little change in water level. John & Karen leave.

13:10 Paul returns with pipe.

13:40 Slow pump to 32 strokes/min with a discharge of 2.5 gpm and an efficiency of ~12.5. We have pumped 225 gal, exceeding the 3 well volumes, but the parameters haven't stabilized. Actually since I cleaned the cell there was no way of knowing without extra readings.

13:55 Start sampling.

14:15 Finish sampling. Steve pulls pipe to add another 60'

14:30 Finish packing samples -
check temperature = 3°c.
Count pipe. There are 6 joints (20')
out of the well, so there are 15
in the well and the top + 10' + 5'
give 325. with pump = 328' 10"
The screen is from 334 to 354
the packers are at 328' 10" and
855' 4" or ~~of~~ counting stickup of
8" - top packer is ~~334~~ 328' 2"
and 35~~4~~8".

BG-MW1-02 10/11/98 14:00 272-292

14:35 Take water level measurement -
239.58' below well head.

14:38 Start pumping zone 03 at
48 strokes/min with a discharge
of 4.5 gpm and an efficiency of 10.5 s/gal

DR 10/11/98

14:39 The water changes to a very
murky (high sediment content of
rust particles) colour & flaky
texture. Both the pH and Eh
are high 7.38, & 131. There
is no appreciable drawdown
(about 0.1 of a foot)

15:00 Check the pump rate - no change.

15:30 Still no change in the pump
rate. The water has started
to clear. Have pumped 225 gal
more than 4 well volumes.
(Original figured well volume to
be about 76 gal. refigoring
lowered this by 20 gal.)
Start pump rate to 30 strokes/min
with a discharge of 2 gpm and

DR 10/11/98

an efficiency of 15 strokes/gal

15:45 Parameters have stabilized, Start sampling. Took 3 1 liter samples for Semi Volatiles, one for calibration.

16:00 Finish sampling. Needed to add some HNO_3 to the metal sample to achieve a pH of 2. Start adding 30' to the string. Start packing the samples.

BG-MW1-03 10/11/88 15:30 339-354

16:30 Adding 30 ft puts the top packer at 358' 2" and bottom packer at 384' 8" (this takes in consideration 8" of distance from the base plate to the well head)

DR 10/11/88

Screen: 364-384

14: Water level 239.53'

16:35 Start pumping at a rate of 18 strokes/min with a discharge of 3.5 gpm and an efficiency of 18.5 strokes/gal.

Count pipe: 85' left (440-85= 355 + 3'10" for pump => 358'10" - 8" stick up => 358'2" to top packer.

17:45 the parameters have stabilized and the water is clearing. Have pumped 215 gal. Slow pump rate to 25 strokes/min with a discharge of 1.25 gpm and an efficiency of 20 strokes/gal

18:00 ~~Took~~ Start sampling. Steve started pulling the

DR 10/11/88

pipe. He wanted to do it the next day but I feared we couldn't finish if we took all morning before we started pumping.

18:30 Finished making the sampler.

B6-MW1-04 10/11/88 17:30 364-384

18:45 Steve & Paul finished pulling the pipe & packed up.

18:50 Returned to decon. Steve left. Karen and I went over the details, plans for the next day

19:30 We left the site

12 hrs

DK 10/11/88

WEDS 10/12/88

7:00 Karen, Pat arrive on site, Steve & John & Paul ~~stuff from Howard~~ also. Steve goes to site.

7:15 I arrive, give Karen the key to the compressor, and make sure Pat has the keys to the truck.

7:20 I go to the site - B6-MW1. Steve is rebuilding the pump. Karen, Pat, John & Paul load and ready to move to C1-MW1.

7:25 Steve finishes rebuilding the pump. It is clean and shining. No black material

caked on.

7:30 Steve ~~tefflon~~ puts tefflon tape on the ends of the joints. There were some problems without the tape

7:45 Start tripping into the well. ~~Using~~ the same bottom assembly of ~~10' length~~ packer 10' length filter 10' length and packer for a total of 26' 6".

A tail pipe of 10 lengths of black pipe with a length of 212.5' (212' 6") the pump (3'10") and the various amount of stainless steel pipe & sucker rod above the pump.

Zone 05 has 260' of stainless pipe a total of 260 + 3'10" + 212'6" = 476'4" to the top packer - 8" from the wellhead to the base. = 475'8" bottom packer - 502'2".

Screen 479 - 499.

8:00 Recalibrate the YSI 3500 the pH was totally off. ~~Depth~~ Couldn't adjust for ATC and regular - one or the other. Choose ATC

8:40 Finished calibrating YSI

9:05 Finish running the pipe Make final count - 180' of stainless left => 435' - 180' = 260'

of stainless pipe.

9:13. Start pumping the water surfaces in two minutes — very murky, ~~with~~ sedimentaceous with rust flakes & silt. Pumping at 50 strokes/min with a discharge of 1 gpm and an efficiency of 48 strokes/gal.

9:20 Slow pump to 34 strokes/min and get a discharge of 3 gpm. and an efficiency of 12.3.

9:30 Try to increase the discharge but only ~~some~~ lower the discharge & efficiency. End with 33 strokes/min with a discharge of 2.2 gpm and an efficiency of 15.5 strokes/min.

DK 10/12/88

9:45 Took first reading of the parameters and they appear to be those of the pipe (after 75 gal pumped)

10:15 Steve returns after ~1 hr. Paul also shows up.

10:45 Clean all and ~~the~~ measure the discharge still pumping at 48 strokes/min but with a discharge of 2.0 gpm. Go to call Gregg. He wasn't in so I left a message to come as late as possible. I called Casey gave him an update and asked him to order 12 sets of cups & sets of seals for the packer

DK 10/12/88

(and to mill them down
to 4 7/8") 5 sets of seats for
the ball ~~cage~~ valves, and 1
~~[illegible]~~ well head packer -
a sucker rod house.
11:10 Return to site, take reading
very little change.
11:15 Start sampling.
11:30 Pat arrives on-site. He
said that Karen will need
another 80' of pipe for
the third zone. ~~I am somewhat~~
~~[illegible]~~ I figure since they
are only on the first zone
we'd be able to finish all
our zones before they need
the lengths. Ask Pat to

DR 10/12/88

get some more ice as
well as food.
11:30 Finish running and the 40'
of pipe in the well. Count
pipe → 135' ~~of~~ remaining
gives 300' of stainless steel
pipe in the well.
This puts the packers at:
300 + 3'10" + 212'6" (-8") =
top packer 515'8"
bottom : 542'2"
screen - 520-540.
14:00 Start pumping zone 06
at a rate of 36 strokes/min
with a discharge of 2.75 gpm
and a efficiency of 13 strokes/gal
12:00 Finish packing samples

DR 10/12/88

from zone 05.

BG-MW1-06 10/12/88 1300 479-499

12:15 The water is still very rusty, very sedimentaceous with rust flakes & silt. ~~Slow pump~~ Speed pump rate up to 48 strokes/min with an efficiency of 3.75 gpm and an efficiency of ~13 stroke/gal. Stop intake into the cell - Solids appear to be about 30% of the flow. The parameters except Eh

12 seem pretty stable.

12:35 Pump rate is the same; and there is about 15% sediment in the cell.

12:55 Exceeded 3 well volumes (actually 4) The water has started to clear

DR 10/12/88

It is now a light rusty colour. Slow pump rate to 30 strokes/min with a discharge of 2 gpm, an efficiency of 15 strokes/min.

13:00 Start sampling.

13:05 Pat returns with more ice food & drinks.

13:15 Jeff ~~Miller~~ Miller arrives onsite (He left Sunday due to family matters). Gave him lunch. He latter went for replacements.

13:30 Finished sampling & packing samples.

BG-MW1-06 10/12/88 13:00 520-540

Steve starts running pipe -

DR 10/12/88

adds 105' of stainless pipe.
Count pipe - 15 remain out
of the well => 425' of stainless in
the well for a total above the ~~packer~~
top packer: ~~[illegible]~~ 620' 8"
bottom packer: ~~[illegible]~~" 647' 2"
screen is ~~[illegible]~~. 624'-644'

14:05 Water level is at 239.60.
Start pumping at a rate of
42 strokes/min ~ 3 gpm

14:15 Speed up the pumping rate to
50 strokes/min with a
discharge of 3.5 gpm and an
efficiency of ~~[illegible]~~ ~14.3

14:30 Gregg Wilson arrives. I
ask him to go pick up
Karen's samples first, that

DR 10/12/88

way by the time he returns
will have other last sample.
He then left.

14:40 Check pump rate - It is now
pumping at a rate of 48
strokes/min with a discharge
of 4 gpm and an efficiency of
12 strokes/min.

* Clean the cell before taking
the next measurement. The
water colour appears to be
clearing. The Eh is rapidly
falling, the other parameters start
stabilizing.

14:55 Reached 3 well volumes, the
Eh is still falling. Slow
pump to 30 strokes/min with

DR 10/12/88

A discharge of 2.0 gpm and
an efficiency of 15 strokes/gal.
15:20 Start sampling.
15:40 Finish sampling and start packing
B6-MW1-07 10/12/88 15:00 624-644
16:00 Steve starts pulling 10' lengths
for transport to Karen's office.
Pulls 60' of pipe - continue
pulling the rest.
~~16:10~~ Gregg returns - finish writing
up the Chain-of-Custody forms.
16:10 Transfer the Chain of Custody
with the samples. The listed
samples are:
L00042
B6-MW1-01 10/11/88 10:00 Equipment Blank
B6-MW1-02 10/11/88 14:00 272-292

DR 10/12/88

B6-MW1-03 10/11/88 15:30 334-354
L00043
B6-MW1-04 10/11/88 17:30 364-384
B6-MW1-05 10/12/88 11:00 479-499
B6-MW1-06 10/12/88 13:00 520-540
L00044
B6-MW1-07 10/12/88 15:00 624-644
~~L00045~~
Karen gave one sample transferred
at 14:39
L00045
C1-MW1-01 10/12/88 13:00

I signed the samples over with
the chain-of-custody forms
at 16:00. Gregg Wilson received
all samples. There was

DR 10/12/88

an apparent misnumbering with
no Chain of Custody with number
100041.

16:15 Gregg leaves the site

16:20 I go with Pat to Decon.
We decon the 60' of pipe & DI
them. We loaded them up on the
truck after wrapping the ends
to take to Karen.

16:40 Drove over to the school.
The person there didn't have
a spare key nor had he heard
anything about our sampling.
He said that the supervisor
would be there in about two
hours, and that there would
be someone at the school

DR 10/12/88

from 7:30 on in the morning.

Return to site for demob.

17:00 Pack up YSI & ~~load~~ pack the
materials.

17:15 Steve finished pulling the
pipe & loading it with Jeff.
Moves rig to decon

17:18 Pat arrives with the truck -
We load the truck and hook
up the tank.

17:30 Return to decon - put
tank into place. The pressure
coupler to hook up to the
diaphram pump is still on
the other tank.
Go with Pat to the other site
while Steve & Jeff

DR 10/12/88

CI-MW1 / B6-MW1 - Admin

unload the pipe, and do a first rinse. Everyone evacuates CI-MW1. Return to decon

18:00 Karen & John tell of the horrors of CI-MW1. - Karen complains that the working conditions are sub-standard and definately sub-human. I said that I would try to call but she should also try, it would be more effective. Steve & John leave.

I continue to go over the logistics with Karen.

18:40 Karen leaves. I load the truck and clean up

19:30 I leave the site

12 hrs.

DR 10/12/88

CI-BW B1-MW9 - Mob

THURS 10/13/88

7:00 Karen & Pat, Steve & John Paul & Jeff arrive on site

7:20 I arrive on site. Go over the plans with Karen. I hope that they'll finish CI-MW1 today, but it is highly unlikely. Karen called Gary and Bill Robinson neither were in. I told Karen I'd try latter, and would ask Steve Dickey or Bill Robinson to come out to the site to talk with Karen.

DR 10/13/88

7:50 Karen, John & Paul leave for
CI-MW1. Steve finished
decontaminating the pipe and loaded
it up. Start loading the
truck to move to the school.
The plan is to do as much
as possible today and I'll
finish it with John the
next day, if they finish CI-MW1.
8:15 We loaded and ready to
move - I went to call Bill
Robinson, Steve Dickey and
Gary. Steve & Bill were not
in. I get Gary and told him
of Karen's complaints and that
they had finished only two zones
since she was told to stack

all 40' and it took a lot of
time to purge that volume.
Apparently Paul told her to stack
the zones. Gary was angry
since that issue was resolved
over 1½ months ago. He
said he'd come up today.
8:40 Steve took ing to get it
filled (with Propane) (there
was a leak or something)
9:00 Hooked up the tank and
Pat took the tank to the site
Got to the site and it was
locked. Ran around looking
for a key. Finally got it
opened and we agreed to back
our truck to their loading dock

9:30 Move tank into place and unload the truck. Start setting up.

10:00 Steve arrives onsite with the rig. (He had to go to Van Nuys to get the Propane & returned to get the compressor took the one with the most gasoline.

10:50 Set up the Vaseline's containment. Back rig into place, and unload the pipe (Steve & Jeff)

11:15 Started Calibrating the YSI.

11:30 Start take water level measurement: 171.45' below well ~~o~~head. the screen is

from 138 to 178'. There goes as about 6.5' of water in the top zone.

Start running pipe. Put a single packer, screen & pump and run 175' of pipe packer sits at 184'2".

11:50 Still haven't finished calibrating the YSI. The pH and pH RTC have a spread of nearly 1.00 at ~~pH~~ with the pH buffer.

Steve left to get some food.

Pat goes to see some art.

12:15 Steve & Jeff return, eat while I calibrate.

12:40 It is as good as it will get. keep recalibrating between the

Two solutions.

12:42 Start pumping at 42 strokes/min with a discharge of 3.75 and an efficiency of ~12. The water level dropped to 171.96, a 0.4 ft.

12:50 Speed up the pump rate to 44 strokes/min with a discharge of 4 gpm and an efficiency of ~11 strokes/gal.

13:00 Figure well volume:

13' of casing from water level to bottom packer: 13.26 gal

6' water in annulus: 8.76

Total: ~22 gal

3 well volumes to be purged: 66 gal.

DR 10/13/88

13:05 Exceeded the 3 well volumes but the parameters hadn't stabilized. Also hadn't finished labeling.

13:20 Started sampling. Took 3 bottles for Semi Volatiles (1 l), and extra one for lab calibration.

13:30 Gary arrived on site. Give him an update while finish sampling.

13:40 Steve & Jeff started pulling the pipe - putting 4 lengths of black pipe (85') pump (3'10") and 176' of Stainless pipe for a total of 263'10". The factor base - (stick up) is 8" above the well head so top packer is at 263'2".

DR 10/13/88

The bottom assembly with a packer
10' length, screen, 10' and packer
is 26'4". (packer to packer) Thus
the bottom packer was at 289'6"
14:00 Finish packing the samples.
B1-MW9-01 10/13/88 13:30 138-178
14:15 Gregg Wilson arrived. He collected
2 samples from Karen. Made
out the chain-of-Custody forms.
Checked temp. 1°C.
Put serial numbers on C-o-C forms
L00046
B1-MW9-01 10/13/88 13:30 138-178
L00047
C1-MW1-02 10/13/88 16:00
C1-MW1-03 10/13/88 10:30

DR 10/13/88

14:30 Signed over the samples to
Gregg Wilson.
14:40 Gregg left. Steve & Jeff finished
lowering the pipe & setting the
motor
14:45 Water level was 171.30' BWH.
a rise from 171.33 ten minutes
earlier.
14:48 Start pumping. Water arrives
two minutes latter. Pumping
at the strokes/min with a
discharge of 4 gpm and an
efficiency of ~11.5 strokes/gal.
The water is very rusty.
Figure the well volume: 85' of
black pipe: 1.7 gal. 26' of casing
27.03 and the annulus of 20'

DR 10/13/88

29.20 for a total of 56.23 gal
Bwell volumes to purge is 170.39 gal
(56.23 x3 + 1.7)

15:12 Check pump rate, It fell
to 44 strokes/min with a discharge
of 4 gpm and an efficiency of
11 strokes/gal.

15:30 Exceeded the three well volumes
Had turned the pump rate down
to 32 strokes/min with a discharge
of 3 gpm, and an efficiency of
~11 strokes/gal. The Eh was
continuing to decrease; fell
below 0.

15:55 Parameters stabilized at:
~~pH 7.00~~ Temp. 20.4 pH ATC - 7.00
C. Cond. - 874, Eh - -36.

DR 10/13/88

started sampling.

16:15 Finished sampling, Steve and
began to lower pipe: The
next zone has a screen at
332'-352' BWH.
added 65' feet of stainless
so the total of stainless pipe
is 240' and the pump 3'10"
+ 1 length of black pipe total
328'10". With a stick up of
8", the top packer is as
setting at 328'2" and the
bottom packer 354'6"

16:30 Finish packing the samples.

B1-MW9-02 10/13/88 15:30 264-284

16:35 ~~Ste~~ Finish setting up the pump
motor and start pumping.

DR 10/13/88

16:37 Very rusty water comes to the surface. Pumping at a rate of 46 strokes/min with a discharge of ~4.3 gpm and an efficiency of ~10.5.

16:45 John arrived and reiterated what Paul had said earlier - They need another 80 ft of stainless for their well. I said that I had figured out the lengths and there was no need to take our pipe. If they do we won't be able to do anymore. I agreed that CI-MW1 has first priority, but we should both have enough. I sat up half the night figuring it out. It turns out that they

need only 8 lengths of black pipe instead of the 12 that I had planned.

I instructed Steve & Jeff to break down the length into 10' sections & have them to Pat & John to transfer. The pipe was all cleaned and Dried.

16:50 John left with the pipe

16:55 Start measuring parameters.

17:05 Steve rigged down and moved off site. - Checked the sample: -1°C. Steve is taking off for his weekend

17:15 I realize that we need the rig to lower the pipe. Jeff goes and calls Steve.

17:25 Still hadn't finished any paperwork & the total discharge exceeded 3 well volumes. (The parameters are stable with the exception of a very slow decrease of the Eh.
Slow rate down so discharge is 2+ gpm.
17:35 Jeff returns - He missed Steve.
17:40 Start sampling.

B1-MW9-03 10/13/88 17:00 332-352

18:00 Finish sampling and start packing samples & loading the truck.
18:15 Everything loaded on the truck - Jeff leaves
18:20 Go to decon, filter metals and store cooler in cab. - Temp - 1°C
18:30 Ready to leave - Can't find keys for 15 min

11 hrs DR 10/13/88

FRI 10/14/88

11:30 Call lab - Gregg had left the before. Go to the site. Our plan was that Karen's crew should finish C1-MW1 by around noon and then John will transfer rig over to the school and I'll finish monitoring the well.
12:00 Arrived at the decon area. Only Paul Azevedo was there. He said that Karen & crew were still at C1-MW1. Went over to C1-MW1 and wanted for clearance and an escort. Went into

DR 10/14/88

the locked site.

12:20 Karen said they had only gotten into the site at 9:00. They started pumping from zone 06 and they got nothing. They pulled out, cleaned the screen, refurbished the pump and went back in. They had just begun to pump.

13:00 The pump has a discharge of 1.5 gpm and a very low efficiency.

13:40 I went up to measure the discharge and found it to be 0. Nothing was coming out. Finally stopped the pump after trying to pick the

DR 10/14/98

string. The caps ~~on~~ were apparently worn since the pump was pumping and the air vacuum was being pulled. They had lasted only 27 minutes. The amount of sediment - a greyish silt was excessive.

Discussed options. The guard had said that they were only scheduled until 3:30 and had to be out by then. I said that all things put together that we should pull the string and that we'd have no time to begin another sampling

DR 10/14/98

effort either in this zone or the bottom one. Thus we must abandon it for now, and if they (Lockheed) still want it done they'll have to schedule it. I said I would go talk to Steve Dickey and or Bill Robertson and inform them of the problem.

12:00 Gregg Wilson arrived and we transferred the samples over to him. We combined all the samples (from 4 sampling efforts) into one cooler.

We made out the chain-of-custody forms and inventoried them as follows.

DR 10/14/88

L00048			
C1-MW1-04	10/13/88	16:00	
C1-MW1-05	10/13/88	18:00	
L00049			
B1-MW9-02	10/13/88	15:30	264-284
B1-MW9-03	10/13/88	17:00	332-352

We signed the samples and chain-of-custody forms to Gregg Wilson at 12:45 and 13:00 respectively.

13:50 Go to the office to talk to Steve Dickey. He wasn't in so I talked to Bill Robertson. I advised him of the situation and that we were pulling

DR 10/14/88

out. He went to ask Ron Helgeson if it was OK. Ron said if we couldn't obtain a sample kick it off. He need to waste too much on it.

14:30 Returned to C1-MW1. They had just finish pulling out. I hooked up the compressor and returned it to decon

15:00 Returned to the site. Only Karen was left there with little equipment we hooked up the tank and moved out to decon.

15:30 Empty tank and start deconing some pipe - Need at least

DR 10/14/99

100' of stainless pipe. Moved back to A1-MW3.

Break for a quick lunch.

16:00 Move to the school yard. Set up rig and organize equipment. Start calibrating the YSI - DI water for conductivity and pH

16:30 Add 55' of pipe to the string so that the packers are at 383'2" and 409'6" the screen interval is 386'-406'.

17:10 Take water level - 171.38'

BWH - No change from yesterday

17:13 Rusty water arrives - speed up pump rate to 48 strokes/min with a discharge of 4.5 gpm and an efficiency of 10.5

DR 10/14/99

18:55 The parameters are still changing - continued drop in conductivity and Eh. although we have exceeded pumping 3 well volumes. Slow pump to 26 strokes/min with a discharge of 2 gpm and an efficiency of 13 strokes/gal.

1825 Have pumped over 45 well volumes (250 gal) and parameters are nearly stable.

Start sampling:

B1-MW9-04 8/14/99 18:00 386+406

1845 finish sampling + packing samples. Karen takes samples and will continue with the sampling the next day. She talked to

DR 10/14/98

Gary who said to finish the school well first before going over to the other (A1-MW3) well.

Karen will come in the morning and finish the bottom three zones, and then move to A1-MW3. The tank and compressor are in place.

19:00 We load up the truck and leave the site. Give the truck keys to Karen. John locks up the rig and leaves it onsite.

We had made a bet which is the deep well A1-MW3 or A1-MW4. John said it was MW3 - he lost.

9 hrs.

DR 10/14/99

SAT 10/15/88

7:00 Karen and crew arrive on site and set up at B1-MW9

8:00 I start work on notes.

Start pumping from zone 05.

~~7:00~~ Had lowered 70' of pipe.

The screen is 454-474.

The packers were set at 453'2' and 479' 6"

9:00 Started sampling.

B1-MW9-05 10/15/88 09:00 454-474

9:20 Add 40' to the pipe - Screen is from 498-518. Packers were set at 493'2" and 519'6".

DR 10/15/88

11:00 Start sampling, take a duplicate sample

B1-MW9-06 10/15/88 11:00 498-518

B1-MW9-07 10/15/88 13:00 dup of -06

11:30 Start packing and demobilize

Pack truck and move to decon

13:30 Take lunch break.

14:00 Move rig over to B1-MW3.

~~Start~~ Help set up. ~~Calibrate~~

Went with Jeff to get the compressor & collect all the other material from the school yard. Also got gasoline and ice.

Returned to decon, saw that the hoses were cut

DR 10/15/89

& got mad.

14:30 Returned to site and fought with Karen, after Jeff told them I was mad. I explained and apologized.

15:00 Calibrated the YSI except the Conductivity since the lead tore and had to be soulder again, but the souldering iron needs recharging. So packed it to Take home.

16:00 Unloaded the pipe and start lowering 190' of pipe (above the top packer (packer to packer: 24'10" (packer, 5', screen (6') pump, & 10')).

Screen 168'-208' WL 189.52'

DR 10/15/89

Packers at 189'7" & 214'

Start pumping

17:00 Start sampling - I left site.

A1-MW3-01 10/15/88 17:00 168-208

17:30 Lower pipe by 40'

Screen 219-213, packers: 218'3" & 243'4"

Start pumping

17:00 Start sampling

A1-MW3-02 10/15/88 19:00 ~~219-237~~ Dup of 01

19:30 Lower pipe by 40'

screen 263-283

packers: 259'3" & 318'1"

Start pumping

20:00 Start sampling

A1-MW3-03 10/15/88 20:00 219-237

5 hrs

DR 10/15/89

SUN 10/16/88

8:50 Steve arrives.

9:00 Jeff arrived.

9:10 I arrived, we load up and move onto site: A1-MW3

9:40 Set up in place

10:00 Start lowering pipe by 10' to 1 packer at 259'5" and 284'3". The screen is at 263 to 283.

10:30 Calibrate the YSI, have fixed the conductivity meter.

10:45 take WL - 189.52

11:00 Take second WL 189:47

11:01 Start pumping at 48 strokes/min with a discharge of 3.5 gpm

DC 10/16/88

and an efficiency of 13.7 strokes/min. The water level was 189.53

11:10 Speed up rate to 48 strokes/min (maximum) with a discharge ~3.2 gpm with an efficiency of 15 strokes/gal

11:15 Figured one well volume to be 54.2 gal (25 gal in pipe) + 29.2 (in annulus))

11:40 Clean out the cell there is some fine white sand and silt, giving the water a cloudy colour.

11:46 Slow pump rate to 46 strokes/min with a discharge of 3.5 and efficiency of 13.1

DC 10/16/89

12:05 Start sampling.

A1-MW3-04 10/16/88 12:00 263-283

12:25 Finish sampling, start packing. Need to add 35' of pipe to lower the packer to the next zone, however there is no 5' length on site.

12:40 We back for lunch and to pick up the 5'.

12:40 Return to the decon area and pick up and decon the 5' length.

13:50 Start lowering the pipe

13:55 The rig cable unsavels - must lower, cut off the strand and tap it up.

14:20 Continue - lower another 35' for a total of 295 of pipe

DR 10/16/88

above the top packer. The screen is from 298'-314' and the packers 293'3", 317'9"

14:28 Start pumping and the water milky muddy, arrives. Pumping at 46 strokes/min with a discharge of 3.3 gpm and efficiency of 14 strokes/min.

15:05 Clear cell, there is a fine dilute sand & silt on the bottom of the cell.

15:25 Slowed to 30 strokes/min at with a discharge of 2 gpm and an efficiency of 18 strokes/gal.

15:35 Start Sampling A1-MW3-05

15:50 Finish sampling. Begin to lower pipe by 80' so ~~295~~ that

DR 10/16/88

the top packer set at 375
(295+80') Zone 6 - the screen
is 362-402 (40')
packers 373'3" bottom 397'9"
16:10 Finish packing the sample
A1-MW3-05 10/14/88 15:30 294-314
Count the remaining pipe:
There is 40' of pipe left
thus 415'-40 = 375' - thus
another 100' are needed for
the other two zones.
16:18 Start the pumping at 46 strokes/min
with a discharge of 3gpm and
an effectiveness of 15.3 strokes/gal
16: Steve & Jeff go to decon to
decon & bring 60' of pipe
for the next zones. Decided

DR 10/14/88

not to pull out but just
to add the extra pipe
even though the efficiency
is rather low, but we're
still getting 3 gpm. Pulling
out and tripping in would
take ~~the~~ about the same
time or more than the loss
of time from the lower efficiency
17:15 Slow pump to 33 strokes/min
with a discharge of 2 gpm and
an effectiveness of 16.5 strokes/
gal. We had just reached
3 well volumes.
17:25 Parameters rather stable: pH-7.22
Temp-19.0 C.Cond: 673 Eh 74.
Start sampling.

DR 10/14/88

17:45 Finish sampling, start packing:

A1-MW3-06 10/16/88 17:30 342-402

Start lowering pipe - add 50'. to zone 7. Screen is from 426-446' BWH and the packers at 423'3" and 447'9". Pull and set on well head.

18:00 ~~with~~ Ready to pump the zone tomorrow.

Steve & Jeff leave, we agreed that they could come in latter since most of the work is up to me until we finish sampling

18:10 I leave site

8 hr.

DR 10/16/88

MON 10/17/88

7:50 I arrived onsite. Jeff had also just arrived. Go to site

8:10 Start calibrating the YSI. The pH was off by 1.0 unit in the HTC with the 10 Buffer. Soak in dilutted HNO_3 for about 30 min.

8:30 Paul arrives onsite, said that he was at Dixon and Steve was there washing off the pipe rods to bring over.

8:40 Jeff returns and Steve arrives a few minutes latter with the extra rods for the pipe. The pH is at 10.00 and 10.89 for HTC. Leave it at that.

DR 10/17/88

8:58 Started pumping at 47 strokes/min at 3 gpm, with an efficiency of 15.6 strokes/gal

9:03 Water appears very murky.

9:15 Took parameters. The Eh is too high at 317 mV. It dropped to 225 mV in 10 min. But it is still too high for the depth we're at. Even assuming that the water is intrusive, which all parameters point that zone 4 to zone 7 are all the same type of water (at least, maybe the other zones as well) it is still too high a reading.

9:30 A fine white sand settles at the bottom of the cell, giving the

DR 10/17/88

water a cloudy look. The sand is similar to the 30 crushed SiO_2 that we were using in the filter, but no sand was put in the filter this time.

9:50 Steve returns. I called Gregg Wilson, but he wasn't in, so I left a message.

10:00 Exceed the 3 well volumes and the conductivity & Eh hadn't stabilized, so I turned down the pump rate to 33 strokes/min with a discharge of 1.75 gpm and an efficiency of 18.8 strokes/gal.

10:10 Start sampling A1-MW3-07

DR 10/17/88

10:25 Ramesh arrives to see how things are going and gives Jeff some instructions. Finish sampling

10:30 Steve starts lowering the pipe and adds another 45' of pipe into the well, for a total of 470' of pipe above the top packer. The well screen is from 470-490 - (bottom zone) TD is 502 (measured 10/13/88 by Paul Azavido). The packers are set at 468'3" an 492'9"

10:50 Finish packing the samples

A1-MW3-07 10/17/88 10:00 426'-441

10:53 Hit bottom. The pipe is sticking

DR 10/17/88

up over the well head a good 6-7'. According to the count there should be exactly 500' of pipe and the bottom should be setting at 499'9" 2.25' above TD. The bottom is apparently setting some 9' above TD. Pull out the top joints and remove 10' of pipe. The packers were setting at 458'3" & 483'1" Just to make sure that we counted the pipe right, we'll count the pipe after it has been pulled.

11:21 Start pumping at 48 strokes/min The discharge was 1.4 gpm

DR 10/17/88

and the efficiency was 34.3 strokes/gal. The pump seems to be wearing out. There appears to be a lot of sediment.

11:25 The pump stops pumping any material.

11:30 Call Gary and Ray, to see if we could abandon the final sample. - I contended that it wasn't cost effective to trip out and in for a sample we might not get. They agreed.

11:35 Steve starts pulling the pipe from the well.

11:50 Finish pulling the pipe. There was 460' ~~[illegible]~~ above the packer, thus, the total ~~[illegible]~~ depth was

DR 10/17/88

500'. The amount of pipe was correct. If there was 500' of pipe and the bottom was measured at 502', there must have been a lot of suspended sediment so that when the pipe was lowered the packer compressed down to 12' of sediment and stopped. Started packing. I called Greg and the lab said that he had left and was on his way. Steve and Jeff wanted to go to eat, but I said that Greg was on his way and asked them to wait.

12:15 Called Karen to find out

DR 10/17/88

how many Chain of Custody forms
she filled and what numbers
She said she used 50, 51, 52
as we had agreed.

12:30 Steve and Jeff finished
loading the pipe onto the rig,
~~and~~ so Steve took the rig to
decon. I started packing the
YSI & then the rest of the equipment.

13:00 I went to pick up the compressor
from the school yard and picked
up some ice (6 bags)

13:40 Finished packing all the ~~water~~
equipment, Greg still hadn't
arrived, so we left a message
on the Truck and went to
eat.

14:30 Returned to the site,
Greg still hadn't arrived.
Hooked up the Baker Tank
and take it to decon. We
immediately started ~~onto~~
pumping out the tank; and
then went to pick up the
compressor and the car from
the site.

15:15 Went to the school yard and
hooked up the other Baker
Tank and returned it to
decon with Jeff conveying.

15:30 Return to decon. I began
sorting out the equipment
into two groups, one for
Karen's crew for A1-MW4

and one for us for A1-MW1.
Steve asked how much pipe
should we take. I figured
the whole 500' needed - will
try to finish off the well before
that pipe is needed for the
deep well. If Karen & John
need it we'll transfer it over
to them. Steve started decomm
700' of stainless steel - all
the S.S. pipe.

16:30 Began emptying the second
mobile tank.

17:00 We sanded the filter, this
should aid in getting cleaner
water and reduce the wear
on the cups. Hopefully,

~~we won't~~ the cups will last
for all 6 zones. Called Greg
Wilson at the lab. He explained
that he was with someone else
and was told we'd be at A1-
MW1 or MW4. He left the
materials but couldn't find
us, and didn't have the
time to look as the other guy
needed to make deliveries as
well. He said he'd come the
next day as early as possible.

17:45 Took the one tank to A1-MW1
an put it into position
and set up barricade

18:30 Took the second tank and
positioned it in the A1-MW4

area. Steve left.

18:40 We barricaded the area and Jeff left. I returned to decon and continued organizing the equipment. All the equipment was loaded and ready to move. We finally did it as planned.

17:00 Put cooler in the cab of the truck, checked temp - 1°C and locked it in. Left site.

16:

17:0

DR 10/17/88

10/18

~~44~~ Tues

7:00 Steve, Jeff, Paul onsite

7:10 I arrive, start loading

7:30 On to site, unload pipe set up table, unload,

8:00 ~~Eng~~ Look up that we need to ~~mod~~ take a blank - both wells, ~~[illegible]~~

8:15 Karen arrives, Steve goes to Dixon to pick up 5' length & some tools.

8:40 Steve returns, Karen leaves. check samples - Temp - 0°C

9:00 Make up lable & get ready for equipment blank

9:15 Take equipment blank A1-MW1-01 10/18/88 10:00

10:00 Start running pipe ~~[illegible]~~ bottom assembly & 5' screen (6') 10' pump (3 10') total 25' 1". Run 190' of pipe in the well. Base bate 11" above well head. top packer at 189' 1"

11:03 Start pumping. ~~[illegible]~~ 48 strokes/min } Bottom at 214 2"

11:10 Increase to 50 strokes/min discharge 4.5" efficiency 11

11:15 Parameters - W.L. fell by ~3' to 187.11

Well Volume; 30 ft' casing 30.6 + 2 casings 51 8.6 of water of which 1 annulus Vol - 5.84 3 annulus 17.52

Total: 99.12 ~100

11:30 Gregg arrived - slow pump to 26 strokes/min 2 gpm eff 13. Brings Travel Blank including it as A1-MW3-08 cooler 1°C

11:45 Make up lables & paperwork for A1-MW3-08 10/17/88 13:00 Travel Blank. A1-MW1-02. Gregg brought filters. Was getting edgy.

12:50 Gregg left. 11:55 - Started sampling, filtered both A1-MW1-01 & 02, and started packing

12:20 Finish loving pipe -- added 45' Total of 135' of pipe above the packer - screen 235 - 255, packers 234' 1", 259' 2"

~~Finish~~ A1-MW1-02 10/18/88 to 12:00 153 - 193

~~Ea~~

:40 Finish packing samples - Tens

Dani Renan

Weeds 10/17/88 (cont)

18:25 Bucket brigade the drum (was full.)
18:45 - The Eh probe seems not to be working its stuck around -40 and moves erradically in DI water falls to -29.
The original probe has XLi in probe - can't do anything in DI water goes to 231 - (what it is supposed to be, but in the purged water only goes down to -150
- John & Paul go to decon - rebuild ~~the~~ & decon the second pump and wash it with CH_3OH, ~~&~~ steam ~~clean~~ & rinse. Send the other (3/4-2") filter & DI it (~~wasted~~ decoded in the morning) Return.
19:20 Slow to 36 strokes at 2.8 gpm civil 20 st/gal
17:50 Still no progress on Eh probe. John & Paul go to get some food
20:10 Parameters ~~seemed to have stabilized~~ are still changing slowly
John & Paul return - eat.
20:30 Parameters ~~too~~ seem to have stabilized to some extent - some jumps
20:35 Start sampling A1-MW4-09 10/17/86 20:00 520-540
20:45 Start lowering ~~pump~~ pipe - add 80' to next zone 600-620 - packers are at 598'9" and 623'9"
the pump is at 610 ft. - pumping 620 of head.
21:10 Start pump adjust rate -
21:15 Pumping at 46 strokes/min discharge: 3gpm 15.33
21:50 Check still sump rate & discharge.
John & Paul go to move Baker tank to decon & empty it.
22:20 Parameters jump - st
22:25 Slow pump rate to 36 strokes/min 2 gpm 18 st/gal.
22:30 Pump motor starts lowering - Sped up to 3gpm
22:40 Gas runs out - John & Paul arrive - refill the ~~gas~~ compressor -
27:45 Start sampling.
23:00 Finish sampling ~~[illegible]~~ pull pipe and put a cap on and lower pipe - Boom down rig and move tank off site
23:40 Return. Load up truck - 23:45 John & Paul leave
24:00 Leave 16 hrs

Dani Renar

Thurs 10/20/88

Thursday: 10/20/88

7:00 Paul John arrive set up ~~put~~ add 90' ~~to~~ ~~go to~~ next 692-712 - pump at ~~[illegible]~~ 700'
8:15 try pumping - it works
8:30 I arrive - get truck - everyone mad.
8:45 Peter set up YSI - very quick calibration - Argue over tank. I wanted to move it like I said yesterday - got into big fight. ~~Steve~~ Steve said he'd get the connections.
[illegible]:05 Start generator -
[illegible]:12 Start pump - pumping at 2.75 gpm. 44 strokes eff 16
9:15 Water arrives - very rusty & sedimentaceous - John returns
9:30 Pump motor picking around - try to adjust the screws at ~ 44 strokes ~ 2.05 gpm eff ~17
9 Conductivity meter off - Steve goes to get soldering iron - Returns
9:45 I solder. Steve & John went to check the other rig.
10:00 Take parameters - check rate - 43 strokes/min 2.27 gpm eff 19.5
10:30 Compressor ran out of gas - John & Steve went to get some.
10:45 Steve & John return. Tell ~~[illegible]~~ Carpenter
10:50 Take water level - 173.85 - the same. Start pump
10:55 Check flow rate - same 43, 2.2 gpm
1:12 Start sampler
:30 Finish sampling put samples in cooler - go to get trucks
Start pulling pipe -
[illegible] Return - figure pipe lengths - 28 black pipe
:10 Finish pulling pipe ~~set~~ start building bottom assembly.

Dani Renan

Thur 10/20/88 (cont)

12:20 Start running pipe - Specs on drawing. 23 black pipe

12:50 Start Calibrating YSI

13:50 Finish running pipe - 190' above packer 15" stickup
190 + pump (310) + 125' stainless + ~~488~~ 23 black pipe (488)
~~top packer~~ 807' 7" - top packer 806' 4"

13:58 Start pump - stop & measure W.L. 173.79, may have gone down some in the 1 min of pumping

13:57 Start again - Water arrives - very muddy not rusty

~~14:00~~ 14:00 Stop Pumping at 49 strokes min discharge 1.2 gpm - 40.9

14:10 Slowed down - less discharge speed back up -
- 47 str/m - 1.2 gpm eff 40.8
John & Steve went to get food.

14:30 - Well vol - 12.2 for the lower pipe -
27.1 for packer to packer } 56.3
29.2 annulus
3 well vol 181.1

14:40 Gregg arrives start filling out C-o C. for 07-11.

15:00 Gregg takes samples - C-o-C 60, 61
Steve checks discharge - 54 strokes/gpl 1.5 gpm eff 34
Very sedimentaceous - dope like some mica (pyrite?).

15:45 Put one way valve in the exit to the out flow

15:50 Start rebuilding 2nd pump

16:00 Finish rebuilding 2nd pump - pull pipe and replace pump - also will ensure that we have 190'

16:15 Finish pulling, - 190'

16:25 Call Gary give up date —

16:39 Start pumps - 54 strokes/min

17:00 ~~Pull pipe~~ Stop pumping - Pull pipe -

17:20 Go to decon to clean the other screen

Dani Renan

Thurs 10/20/88 (cont)

18:00 Paul comes by says ~~they~~ ~~their waiting~~ they finished for the pulling
18:10 Put the screen on start lowering suggest that we rebuild the other pump - ~~the~~ John says no - we barely pumped anything + ~~[illegible]~~
I told John to run the pipe while he did the pump - he gave me the pipe wrenches - -
The pump was very tight and I dented the barrel.
18 30 Couldn't get the ~~pump~~ rod undone. Then Steve came to do it.

~~[illegible]~~ 0 18:50
19:18 - Start pumping. Water - 19:20
pumping at ~~[illegible]~~ stir/min 2 gpm eff 24

19:50 51 - 1.2 gpm eff 42.5
21 - ~~Still~~ at 1.5 gpm -
20-10 Sample. John & Paul return with flow
20:35 Start lowering pipe: add 140' to 949'-969' zone..
20:55 ~~Start pumping~~ Finish packing ~~& mother~~ Remove the check valve -
Start pumping - nothing - the outflow is pulling a small vacuum. Figure the screen is plugged - we have to pull it
21:10 Go call Gary. not in.
21:20 Gary ~~return~~ beeps me call back - Tell him the situation he agrees to end the sampling.
Return load up truck - take down rig - and move off site - will pull pipe & move equipment & tomorrow
22:00 Take rig to down - ~~[illegible]~~ Steve & Jon leave site
22:30 I leave

Dani Renan

Fri 10/21/88

930 Wake up
5100 Start working on notes
8:00 G. to site, ~~st~~ Steve & John arrive
8:30 ~~Pass~~ by site - Steve and John pulling pipe - Go to decon
~~7:30~~ arrange the materials -
9:30 Go to site take back compressor - They finish extracting & coating pipe - rig down
~~9:45~~ Return hook up tank and the remainder of material - Take to decon.
10:00 Sign sheets John & Steve are finished, agree to go for punch
10:35 Call Gregg - he's out - on his way - rush back to decon he don't there
11:10 ~~Go~~ to restaurant - Tell them I'll be back and return
11:20 Call again they say that Gregg was delayed will be back in an hour & half. Went to ~~[illegible]~~ and say good bye.
12:00 Returned to decon did some paper work
13:00 Paul was ready to leave - ~~said good bye~~ discussed some of the problems and said good bye
13:30 Gregg arrived transferred sample - to him.
14:30 Gregg left -
Talked with Bart & David from GSI.
15:30

Sat	5
Sun	8
Mon	12
Tues	15
Weds	16
Thurs	14
Fri	8

Left site, Home did paper work
8 hrs

Dave Reman

Weds 10/19/88

7:00 Kim, ~~Steve~~ John & Paul move to site
Steve & Jeff ~~on site~~ unload rig, spent pipe in decon. John decons the pipe loads it onto rig. Move to site
8:30 I arrived ~~Steve~~ Jeff had already left. Steve hooking up truck to rig - we undo the filters, & decon the tubing
9:00 Steve Craves, I go to site A1-MW4.
John asks about scheduling. We want to call Gary. Gary said to plan to fish on Monday. Talked to Steve Dickey - said OK. Asked where to move everything.
called Gregg he's out - on his way?

[illegible]:00 Back on site set up YSI & calibrated it. But we just started a new zone. (04)

Dani Renan

Sat 10/22/88
3 hrs - Notes
Sun. - 10/23/88
4 hrs Notes

~~9:30 1050 Pat + Osmond [illegible]~~

10/24 Mon - Fished out screen 8:00 - 11:00 down rigged - returned - Deconed
Site 15:00 - 18:00 clean up 10 hrs pipe - 1200 Transferred to storage
washed truck.

10/25 Tues. -
Site 8:00 - 14:00 Pat left Inventory of equipment finished deconing
15:30 Left [illegible] 10:50 - 1200
18:00 Note 10 hr 8 hr Baker tanks

10/26 Weds. - Continued w/ notes, sampling summary. Got C-o-custodies
11:00 in order 6
Cale

10/27 Thurs - Finished up the ~~[illegible]~~ sampling summary &
13:00 Went to Steve it to Steve -
Returned & Started inventory

10/28 Fri - Finished Inventory called Gary - called Hadan
called Robert Lang

Dani Benau

Tues 10/18/88 (cont)

13:05 Start pumping 52 strokes/min discharge 4.5 gpm eff 11.5
13:15 ~~Well~~ Took parameters - slight fall in water level water is beginning to clear up.
Well vol. 25' of pipe 25.7; annular 29.2 tot. 54.9
3 well vol - 164.7
13:40 Slow to 27 strokes/min discharge 2 gpm eff - 13.5
~~Steve~~ Steve & Jeff go get food
13:55 They return - eat
14:15 Parameters have stabilized
14:18 Start sampling - A1-MW1-03 10/18/88 14:00 235-255
14:40 Finish sampling, start packing. Steve starts lowering pipe - adds 60'
~~14:57~~ Stand Total 295' string above packer. screen 297-317
packers are at 294'1" and 297'2".
14:55 All ready to begin pumping W.L. - 184.23
14:57 Start pumping, Water 14 58
15:03 pumping at 50 str/m discharge 4.5 gpm eff 11 st/gal
Water very sedimentaceous with rust coloured particals
15:15 Karen comes to pick up the ~~tos~~ compressor hose.
They should start pumping the first zone soon.
15:32 Slow to 28 st/m discharge 2+ eff ~14
Counted pipe - 110 outside Steve brought 510' total is 505
above the packer => 395 in the hole - He said he brought 20 joints is 405'.
15:58 Start Sampling A1-MW1-04 10/18/88 16:00 297-317 => 295'
16:05 Finish sampling, start packing. Steve starts lowering the pipe by another 50'. The screen is a 40' screen and from 338-378. Place the packers at 344'1" and 369'2". The screen filter is sitting from 357 to 364, in the lower ~~third~~ half - since the VOC are sinkers.

Tues 10/18/88 (cont)

16:38 Start pumping A1-MW-05 - 48 str/m 4.5 gpm eff - 10.6
16:44 Water - very rusty amber

17:20 Slow pump to 28 str/m 2 gpm eff ~ 14
17:35 Steve & Jeff go to A1-MW4 to pick up 80' of pipe total 500' -

Pipe floated most of the way down.
18:12 Start pumping - 48 strokes/m 3.7 gpm.. eff 13
18:30 Still the water is a dark reddish brown - rusty. And appears to be very sedimentaceous.
18:40 Water starts to lighten.
18:50 Slow to 30 strokes/m 2 gpm eff -- 15
19:00 slight rise in water level

19:40 Start pumping WL. 184.43

22:20 Left site
45 hrs.

Dani Renan

Winds 10/19/88 (cont)

14:35 Take water level - 172. (?)
14:38 Start pumping - John & Paul go to get something to eat.
& Return - In case Robert Lanning wants to chart.
14:40 Water arrives - very rusty -
Pump rate is 46 strokes/min discharge 3-5 gpm 13.1
14:45 Paul & John left again fixed canopy & round table -
~~[illegible]~~
15:00 Took parameters - WL - 172.95 - after no drop. parameters
rather stable
15:30 Slowed pump to 32 strokes/min discharge 2 gpm eff 16 st/gal
15:50 John & Paul return. - Pipe into tank flies out.

Start Sampler - A1-MW4-07 10/19/88 1600 432-452
:10 Add ~~[illegible]~~ 45' to stems
:25 Finish adding: Start packing took 3 bl bottles of SV for
collector - water very clear
:33 Start pumping at 44 st/min - discharge - 3 gpm eff ~11.5
:52 Take first measurement. - Pipe comes and more
7:15 Very high conductivity still clearing. Thirst turns expanded
(VOC smoke
7:35 Slowed pump to 36 st/m discharge 2 gpm eff 18 strokes/gal
7:45 ~~[illegible]~~ Clean well & force water through well
7:50 Start sampling A1-MW4-08 10/19/88 1800 476-496
9:05 Start lowering pipe - add 45 feet - 520 feet of pipe -
We hope it will pump. - Screen from 520-540 - packers at 518' 7"
& 543 7" - Pump is at 530 i.e. pumping 540' of head

Start pumping - 44 st/m 3.5 gal 12.6 st/gal
9:25 Water - very sedimentaceous arrives dark brown shit -
pumps at 44 st/m 2.75 eff - 16 st/gal

Dani Renan

2166-03828

PHASE 3 GROUNDWATER SAMPLING

LOCKHEED AERONAUTICAL SYSTEMS COMPANY

Burbank, California

October, 1988
Part II of III

Prepared by:

The MARK Group, Engineers & Geologists, Inc.
Santa Ana, California

88-03128.18

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

2166-03828

TABLE OF CONTENTS
LOCKHEED AERONAUTICAL SYSTEMS CO.

Phase 3 Groundwater Sampling
Part II of III

Appendices: (continued)

APPENDIX B-2	DAILY FIELD NOTES, CREW NO. 2
APPENDIX C	CALIBRATION LOGS, CREW NO. 1 (CREW NO. 2 IN APPENDIX B-2)
APPENDIX D-1	WELL PURGING AND SAMPLING, MULTIPLE-SCREEN WELLS
APPENDIX D-2	WELL PURGING AND SAMPLING LOGS CLUSTER WELLS
APPENDIX E	SAMPLE TRANSFER CHAIN OF CUSTODY

APPENDIX B2

DAILY FIELD NOTES
CREW NO. 2

Book 1 of 1, Crew 0.2
9/26/88 – 10/19/88

Karen Kinsella
The MARK Group
Santa Ana, CA
(714) 546-0602

88-03128.13

LASC PHASE 3 GROUNDWATER SAMPLING

TEAM 2

INDEX

C1-CW5	9	A1-MW3-02	73
C1-CW4	12	A1-MW3-03	73
C1-CW6	16	A1-MW4-02	75
B6-CW5	19	A1-MW4-01	76
B6-CW4	20	A1-MW4-03	77
B6-CW6	21	A1-MW4-04	79
B6-CW8	24	A1-MW4-05	80
B6-CW9	28	A1-MW4-06	80
B6-CW7	34	A1-MW4-07	81
A1-CW3	39		
A1-CW1	43		
A1-CW2	48		
C1-MW1-01	53		
C1-MW1-02	54		
C1-MW1-03	56		
C1-MW1-04	60		
C1-MW1-05	62		
C1-MW1-06	64		
B1-MW9-03	68		
B1-MW9-04	68		
B1-MW9-05	69		
B1-MW9-06	70		
A1-MW3-01	72		

Sept. 26 1988

1030 Set up on site, Area 8
Ramesh Shah, Paul Asado, Milton Tiffin,
Jeff Miller from URS,
2 rigs from Howard with
John Steve, operators
Donny left to get compressor, rest of gear

1045 Tailgate safety mtg. given
by Paul
~~Ramesh left~~

Well C-1-CW5 open

1100 Steve sounded bottom of
well, 384 ft. depth (CW5)
Paul brought drilling
sequence construction features
sheet

CW4 – drilling depth 665
screened interval 652-662
filter pack interval 643-665
grout interval 1-643

CW5 – tdd – 391
si – 376-386
fpi – 366-391
gi – 1-366

CW6 – tdd – 253
si – 232-252
fpi – 223-253
gi – 1-223

1112 Donny arrived back

1114 Depth of CW4 measured as 660 ft

1116 John & Steve left for restroom. Donny backed air compressor into position

1135 Water dept measured in CW5 as 228.25 ft

CW4 as 230.94

1200 Left site to get packing tubes for containment. This need was expressed by Paul A.

12:20 Returned to SITE. Paul reportedly argued with Dani re final D1 rinse. He wants it done at the decon center. Doni calibrated pH, sp. Cond meters.

Already tripping downhole.

1300 Put up canopy

1343 Doni left, started pumping

1345 Water arrived

14:42 Paul reported HNu readings of 0.0 so far

Calculated amt of H_2O for 3 well/anulus vol. removal

6 ft. casing × 1.1 gal/ft = 6.6

10 ft anulus × 1.47 " " = 14.7

21.3 g

× 3 = 63.9

+ 2.4 gal pipe vol

min of 66.3 gal needed

1415 Dampers left to get 2nd rig. Ramesh left

1423 Paul reported 0 on HNu

1443 24 strokes/min pump Efficiency at 1.6 gpm

1500 Paul left for lunch

1520 Still 24 strokes/min pump Efficiency

Paul returned from lunch

Steve & John arrived with 2nd rig, began setting up.

1527 Ramesh arrived.

1530 Paul & Ramesh left site

Started tripping down the hole on CW4 with 2nd rig.

Ron Helgorson stopped by

16:35 Sampling took place. Dani returned.

Calculations show approximate 9.5 volumes of casing (between packers) plus screened anulus

interval were removed, subtracting 2.4 gal for volume of tail intake pipe below pump.

1653 Dani took water level 231.50 water depth in CW4.

9-27-88

Arrived at site at 0920
Loaded van & took off to C-1 Site (Area 8)

Steve & John pulled the pipe from CW4. Screen was installed backwards, apparantly, causing lack of flow to pump.

Further calculations yielded exact pipe lengths to install in well. Footage yesterday was OK. See well diagrams for footage details.

pH meter was calibrated
sp. cond. meter was checked with DI water - OK.
Dani had to resolder sp cond. plug, as connections apparantly broke loose in transit.
URS Personnel present - Paul, Jeff Mitton.

1050 Paul arrived back at site
Steve & John began putting pipe etc. into well.

1100 I left site for storage area

1120 Returned to site

Dan's opened well C-1-CW6
Measured depth to groundwater with electronic sounder.
225.94 ft

1200 Stickup on CW4 measured as 1 ft 4"
Pipe is all in the well, pump installed

1224 Pump rate 40 strokes/min
Discharge 3.25 gpm
Efficiency: 12 strokes/gal

1234 Paul reported HNu reading of 0.0

1245 Pump rate 40 strokes/min
Discharge 3.4 gpm
Efficiency: 12 strokes/gal

1253 Paul reported 0.0 HNu reading

1330 Took samples. 3x rinsed all bottles without preservative.
Checked pH of metals samples

1355 Final water level measurement.

6 ft casing × 1.02 gal/ft = 6.12
+ 10 ft annulus × 1.46 gal/ft = + 14.60
volume 20.12 gal

+
36 gal vol
(six for 261 ft
3/4 in pipe

Pump rig crew returned from lunch

1400 Began removing pipe from CW5

Left to phone Dan & let him know we would start on CW6 when decon was complete

1430 Returned to site. Everyone gone but Milton T.

1500 Paul returned

1508 Paul & Milton left site

Calculation of Purge Volume

9.4' betw. packers × 1.02 gal/ft = 9.59 gal

20' filter pack in screen interval × 1.46 gal/ft = 29.20 gal

Total = 38.8 gal

3x total = 116.4 gal

Kusetly 9/27/88 C1-CW6

1555 Rig back from decon w/ Steve & John
1600 Paul, Jeff back
Steve sounded bottom of C-1-CW6, 25 ft.
Started setup of rig, lowering of pipe

1637 Pipe set
1648 Started pump
Water at 1649
There is so much water cascading down sides of casing that sounder will not work. Couldnt measure depth to water

1720 Pump crew began pulling pipe from CW4
40 strokes/min pump rate
3.1 gpm discharge
Efficiency: 12.9 strokes/gal
Steve & John took rig used for CW4 back to decon area

1745 Well water chemical parameters seem pretty well stabilized
Jeff concurred. Sampling

C1-CW6 9/27/88 KJ/KK ~17

proceeded.
Samples C-1-CW6 and a duplicate set, C-1-CW7 were taken. See chain of custody sheet L00039 for details of samples obtained. Samples were entered into chain of custody forms and placed in ice chest with ice, at 4°C.

1810 Finished sampling, everyone dismantled setup. Pump crew left, URS people left.

1830 Doni arrived, finished decamp, took Baker tank back to decon
Returned to get compressor, take back to decon. Left samples in locked van at decon area. Plenty of ice in cooler.

2000 Left decon area after unloading vehicles

18 KJ Kusilla 9/28/88 Mobilize.

Sept. 28, 1988

7:20 Arrived at decon area, after having picked up ice. Checked ice in sample container. Still ~ 0°C. Replenished ice.

Paul, Mill, Jeff present from URS

Steve, John from Howard.

Had short meeting re logistics, safety

10:30 (approx) Steve Dickey arrived to let us know QA/QC inspection would take place today.

Activities to this point are essentially set-up decon removing pipe from last well done yesterday at area 8

Called Dani, need well keys. He hasn't arrived yet.

1145 Dani arrived

Steve Dickey arrived with the 4-person QA/QC team.

Steve & John were still decon-

B6-CW5 19

1210 Paul said QA/QC [illegible] team wants us to run an equipment blank including black pipe.

KCL Std. 1.4 millimhos according to Greg. Traceable to EPA primary standard (?) He has the documentation

1200 Packed up equip to move to Area

1218 Measured depth on B-6-CW is 355 ft

[Dani took notes of operations from this point for rest of day]

Sept. 29 1988 —

0907 Dropped samples (COC # 100030) at lab. Verified 4°C temp at drop off.

1030 Arrived onsite. Present were Dani Steve & John (Howard Drilling), Jeff from URS.

Milt (URS) arrived with ice. Dani was taking samples. Put ice in chest, with thermometer.

Wrapped labeled samples put into chest. Verified 4°C temp.

Prepared labels, bottles for next round of sampling

Went to decon area for more ziplock bags, tap water, ice chest with more sample bottles

1200 Left to get lunch

1215 Returned, finished doing labeling.

Did schematics for three cluster wells in Area 3.

1310 Dani left to get lunch

John & Steve arrived from decon with pipe

Begun setting rig up at B-6-CW6

Dani & I both verified pipe tally.

1323 Dani left to get his potato chips

1328 Dani returned

Steve reported that he slipped in the decon pit Monday, carrying 5 lengths of black pipe, and hurt his back. It was mild at first but has become increasingly painful. We all advised him to report it as soon as practicalt

[Groundwater and Wells, 2nd Ed.
F.G. Driscoff
from Johnson Division
Signal Environmental Systems Inc.
P.O. Box 64118
St. Paul Minnesota 55164
(612) 636-3900]

Basic Ground-Water Hydrology
USGS Water-Supply Paper 2220
1983

Paul's recommendations above for basic hydrogeology references

1400 Steve & Dani left to check on repair of 3d screen.

1430 Steve returned; he and John finished installing pipe and setting pump.

1453 Dani returned.

1455 Pump started. See "Water Purging & Sampling Log" for further details on purging & chemical parameter measurements on well B-6-CW6.

1518 Measured stickup on well as approx. 11 in (0.9 ft)
Correction - 22 in (1.8 ft)
Since 225 ft of pipe is used,
Top of pump is at 223.20 ft
Top of screened interval is at 215, but water is at 220.95 ft
See well schematic for details.

1533
Pump rate: 40/min
Discharge rate: 3 gpm
Efficiency: 13 strokes/min

1350 Chemical parameters look stabilized. Sampling commenced

1616 Finished sampling. Took an extra semi-volatile sample for lab calibration. Completed Chain of Custody # 10003.1

October 3, 1988

6:30 arrived at site, Area 5

Began decon, setup activities.

0700 Pump crew arrived, began set-up.

Decided to pump intermediate depth well 1st, i.e. B-6-CW 8.

Checked depth of water in large Baker Tank: still ~3' of room left

0800 Left with John to get fittings hose, drop parts for welding. Was able to get cap welded to fitting while we waited. Jeff arrived about 8:00

0950 Returned to site, began setup.

1000 (approx)

1018 John sounded well B-6-CW 8 370 ft

1040 Gary arrived

1050 Gary left

1103 Calibrated Beckman φ21 pH meter

At 26.6°C 7.00 standard gave a 7.00 reading

10.00 std. read as 10.00

1111 Calibrated conductivity meter (YSI Model 33), using 1000 µmho conductivity calibration soln

Meter reads 1010 (approx)

Calibration factor, cf

$$cf = \frac{1000}{1010} = 0.9901$$

1140 Bottles for samples labeled, stored in plastic bags in ice chest to cool before sampling

Well B-6-CW8 designated for sampling K0010.

360 feet of stainless steel pipe used in well

1205 John and I left to get fitting for air compressor hose at Ukiuna makers, which Dan had forgotten to get. Looked for the used 55 gal drums; but couldn't locate them

1308 Returned to Area 5

John, Paul and Steve Porter (URS) went to get 2 drums

1348 Paul reported that he got a 1.2 ppm reading on the HNu. Reading of 3 at the wellhead. He and Steve

TEST SITE

Knisille 10/3/88 B6-CW8

1453

(2 x 18.5) strokes/min pump rate

2.75 gpm

Calculated pump efficiency

13.5 strokes/gal

1425 Water level measurements during pumping may be slightly questionable as electronic sounder is not operating as responsively as could be desired

1505 Samples taken

Extra Semi-Volatile sample taken for lab calibration.

1 purge volume is calculated as

81 gal

1.02g x 12.2 ft of casing below packer

1.46g x 10.0 ft of screened anulus

27.0 gal

Since 210 gal were purged from well before sampling, 7.8 "casing volumes" were removed

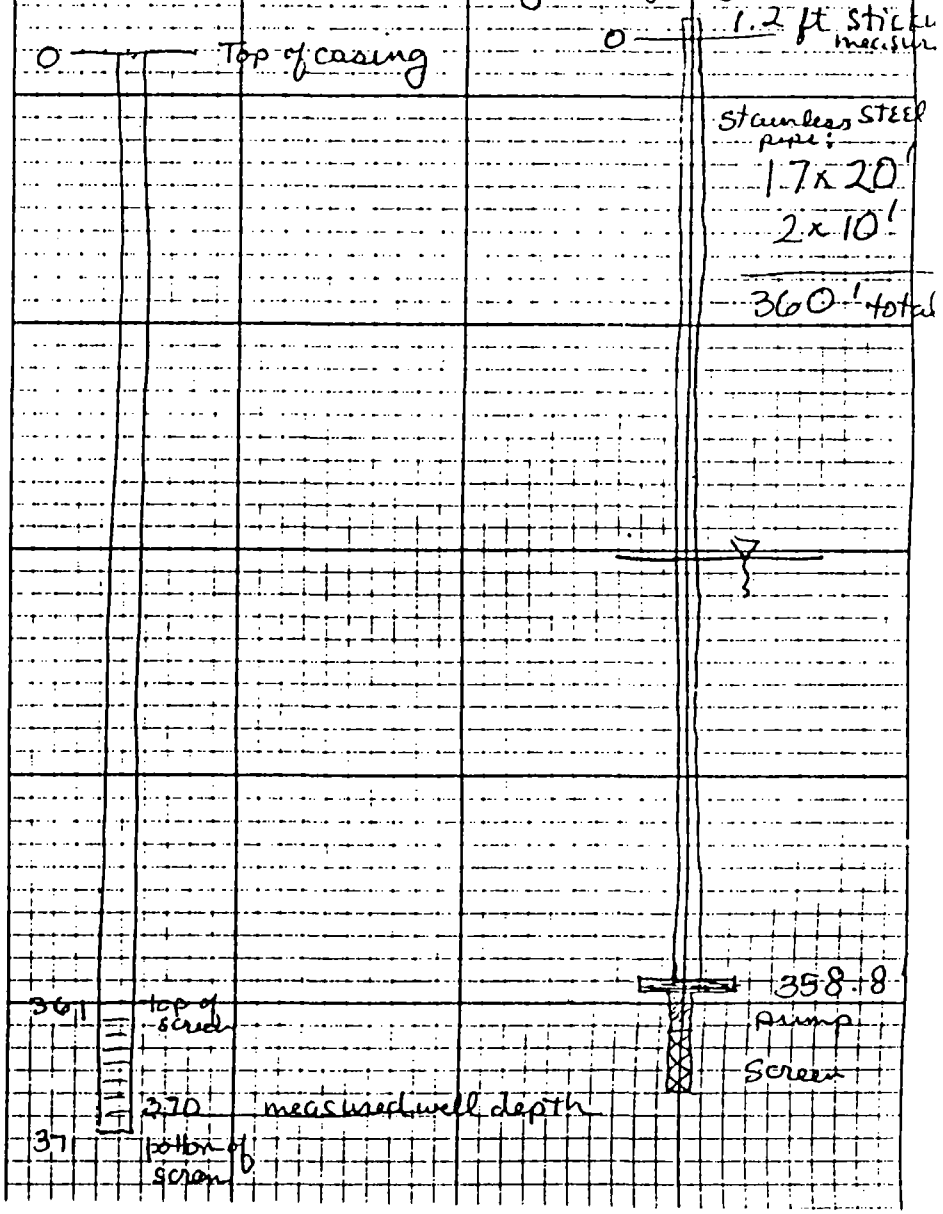
Note: See Water Purging & Sampling Log for details of purging

See Chain-Of-Custody form for details of samples taken

Samples taken in order listed on Chain-of-Custody Record.

1535 Ice chest temp checked: 4°C

Details of Pipe/Pump/Screen locations in B6-CW8 during purging



28 J Kuller 10/3/88 B6-CW9

1638 Opened B-6-CW9
Measured water depth
222.64'

1650 Bottom sounded: 261'
John decon'd ppe, pump, screen, etc.

1700 Packed rig over B-6-CW9, started setting up pipe
Dani came by to discuss logistics

Amt. of water per effective casing volume:
20 ft × 1.46 gal/ft = 29.2 gal

1853 Started purging

1808 A security officer stopped by to let us know we'd have to vacate by 2000 or so for security reasons.

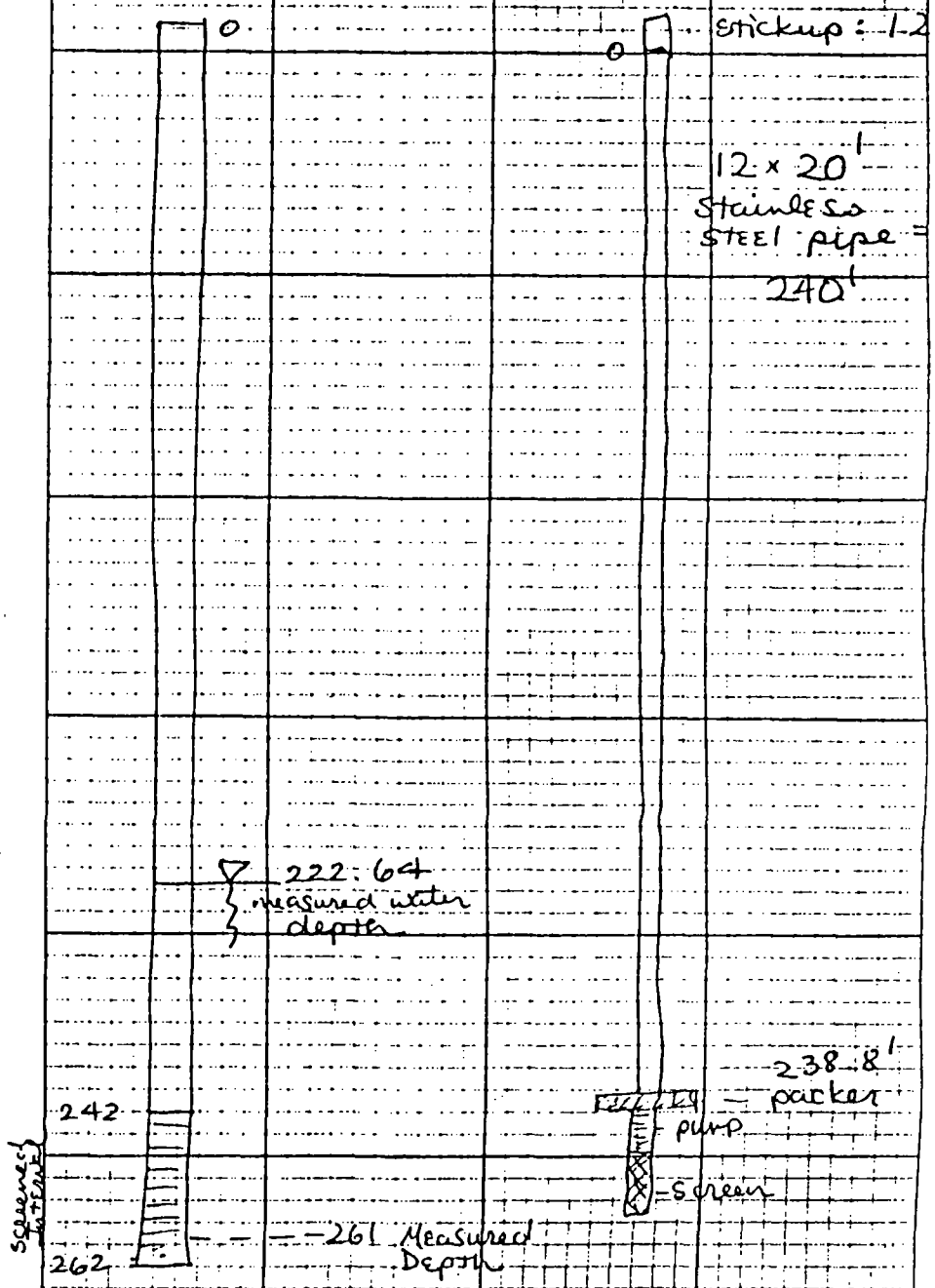
Water lever sounder wet and not working again, so water level not easily obtained.

1820 21.5 strokes/30 sec. pump rate
2.5 gpm discharge
Pump efficiency = 17.2 strokes/gal

1845 Air compressor began running rough missing. Failed John

B6-CW9 Kuller 10/3/88 29

Sketch of Pipe/Pump/Screen Locations for B-6-CW9



30 Kusilh 10/3/88 B6-CW9

restarted it. Several attempts were made to start it and KEEP it running, without success. Began shutting down operation, removed pump, covered open drum & wellhead.

1915 Left site at 7:15 (1915)

LASC Oct 4, 1988

0700 Arrived at Area 5, having picked up ice & drinks on way in. Dani left truck locked, so we can't pick up a new compressor until he arrives. Steve & John on site. John left as I arrived.

0730 Washed & rinsed glassware, began instrument calibration:

Beckman Φ 2 pH:

At 15.8°C: 7.00 buffer gave a value of 7.07 pH; 10.00 buffer at 15.7°C read 10.11. Both are close or identical to values listed for those temps on buffer pkg.

YSI Conductivity Meter Model 33

At 17.5°C, read 795 μmhos

Correction factor = $\frac{795}{1000}$ = $\frac{1000}{795}$ = 1.2579

0750 Dani showed up, went to get other air compressor for use here. He'll go to get another compressor.

Eaton SA 250 with Eh electrode checked. Temp, Eh values look reasonable.

0803 Took water level measurement on B6CW 522.78'

Dani returned with other air compressor

0811 Started pumping

0820 Pump rate: 38 strokes/min
Discharge rate: 2.4 gpm
Pump efficiency: 15.8 strokes/gal

0840 Checked sample ice chest.
Plenty of ice. Temp read -4°C
Added more ice.

0852 Pump rate: 39 strokes/min
Discharge rate: 2.6 gpm
Pump efficiency: 15 strokes/gal
Jeff arrived onsite

Water level values may be approximate during purging.
Paul could not get one sounder to work, got 2nd had same problems with it, also. Water may be running down casing. Sourced from pipe joints? Not sure.

0915 Ramesh arrived.
Paul is getting readings from headspace samples on the HNu

0926 Impossible to get an accurate or even approximate reading on the electronic sounder. Apparently too wet.
Paul left with Ramesh

1035 Sampling completed. See Chain of Custody Record for

details of sampling. Samples taken in order listed on COC Record. Sample ID No. K-0011

At time of sampling there was a considerable amount of exsolved gases coming up as bubbles with the water. This did not decrease with decrease of flowrate through pump to the minimal level possible. Samples taken from this reduced discharge stream.

Sample bottles were stored in ice chest before as well as after sampling.

Ice checked - plenty. Temp reads °0 C.

Calculation of "Effective casing + anulus volume"

Casing below packer (at 358.8') to measured depth (261)

22.8' x 1.02 gal/ft = 22.78 g
20 ft (casing) x 1.46 gal/ft = 29.20
51.95 gal

With 268.2 gal removed by purging, Approximately 5.2 "effective casing/anulus volumes" were discharged prior to sampling.

KJ Kusella 10/4/88 B-6-CW 7

Started on B-6-CW 7

1110 Checked conductivity of DI water used. Read 0.0 on meter. Cleaned glassware, 1x DI rinse.

1120 Left site with John to pick up lunch for us and for

1200 Returned to site. Prepared Chain of Custody, labeled bottles

1245 Sounded Bottom: 500 ft.

1300 Water Level read: 226.02 (With GMI-6 rental)

1359 Water Level read w/ M-Scope 226.52 ft

1408 Checked batteries on GMI water level sounder — Uses 2-AA batteries

Beckman Φ 21 pH meter uses 2 — 3.6 V Lithium Union Carbide No. L37 (Eveready Lithium)

1555 Gary visited for about 15 minutes & left. Redripped off the Fuly pump and generator.

Jeff came by to see what was going on. He is going back & forth between our site & Dani's.

Pipe is installed. Jalin & I put it in. The installed pump, etc. HNu reading at wellhead was

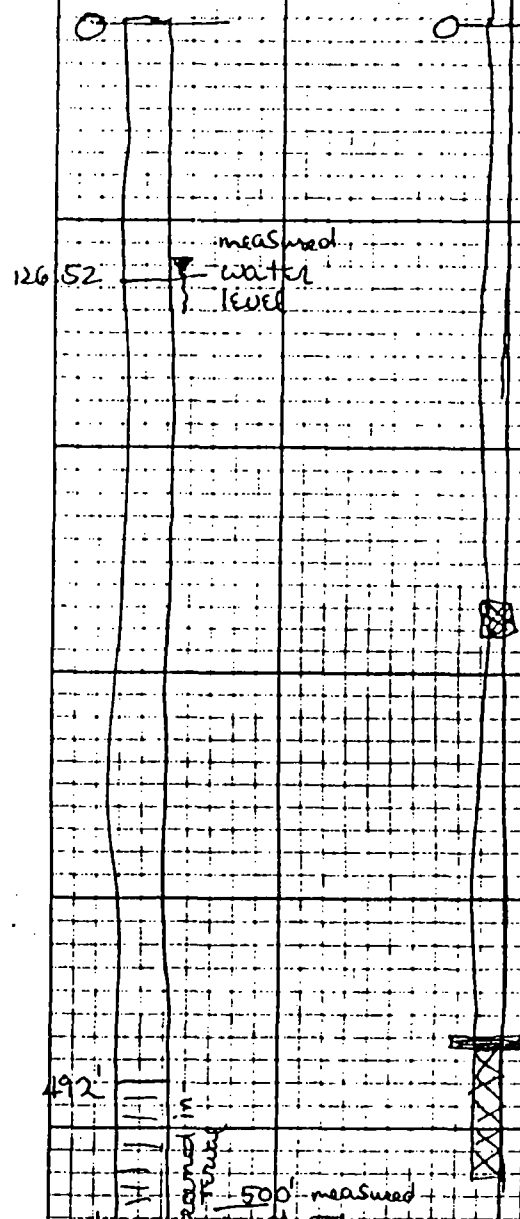
B-6-CW 7 10/7/88 KJ Kusella

The following sample I.D. no. will be used for this well: K0012

Stickup: 1.4 ft.

14 x 20' = 280
1 x 10' = 10
1 x 5' = 5

Stainless Pipe — 295



Sketch of well pump installation details for B-6-CW

1640 Again, could not obtain water levels while pumping, due to wet sounders.

39 strokes/min pump rate
2.75 gpm discharge
Pump efficiency: 14 strokes/gal

1803 Paul just got a reading of 30 on the HNu from a headspace sample.

1733 Paul got a reading of 170 on the HNu on a headspace sample

1800 Samples taken from B-6-CW7. At Paul's insistance a duplicate set of samples was taken, given ID No. KCC13. Lab time given as 2010. A third Semi-Volatile sample was obtained in the duplicate set sampling. See Chain-of Custody for details of samples taken.

1915 Sampling finished, 2 bags ice added to ice chest. Temp. read as 0°C, and plenty of ice was already present. Estimated that duplicate set took an extra hour, or a little less as no bottles or

labels had been prepared. Cleaned up site a little, but will do rest tomorrow.

Note: Water purged from this well was very alkaline, with pH levels consistently in the 9-10 range throughout purging. The HNu readings taken by Paul Azevedo (URS) suggested the presence of some volatile organics in well water, but readings were not generally very high. Color of well water was also unusual - green, to greenish-grey, not very turbid but almost foamy at water-air interface, at times. No odor was noticed.

Wednesday, October 5, 1988 - LASC

0705 Arrived onsite. John, Steve & Jeff were already present. Doni arrived shortly after. Discussed logistics, need for Baker tank.

John pulled pipe from CW7, decontaminated all pipe according to established procedures.

0900 Calibrated Orion pH meter, using 7.0 and 10.0 buffers. Loaded stuff into van, moving & John van to area 2 with Paul.

1015 Two people from GST were taking temp. readings, logging wells at 5' intervals. They were in the deep well, A-1-CW1 and had observed chemical odors. Paul had HNu, took readings, suggested use of respirators.

Paul & John put respirators on and finished removing their probe from the well for them.

Had to go get visqueen for sawhorses, as were out.

Pat Toelkes arrived onsite in my absence. He will make arrangements for Baker Tank deliveries to and had delivered the air

Pat left to get a 2x4, ice, lunch & make phone calls to Baker Tank Co. & Associated Labs.

1200 Paul & John left for lunch & trip to restroom.

Prepared bottles, labels for taking Equipment blank. ID for this blank is KOO14, lab time 1300, 10/5/88.

Paul was still getting low HNu readings in A-1-CW3, which they opened while I was absent.

Bottles for sampling the upcoming Equipment blank are stored in the ice chest. There is a great deal of ice in the chest currently.

1235 Pat returned briefly.

Water level was measured as 188.0 feet.

Steve Dickey visited site. Had questions re cutting of notches in packers.

Discussed question of blind (random) vs. well-ID number sample identification numbers. [illegible] at present

we would continue to use well-numbers as sample ID no's. Steve left.

Pipe was put in the well as per accompanying sketch.

1503 Started pump and shaft snapped at end.

Calibrated YSI 33 specific conductivity meter:
At 27°C, 0.01 M KCl soln registered 1390 µmhos
Soln used is reportedly 1400
Correction factor = 1400/1390
= 1.007194

1515 Paul went back to decon area to get more rods returned in about 10 minutes.

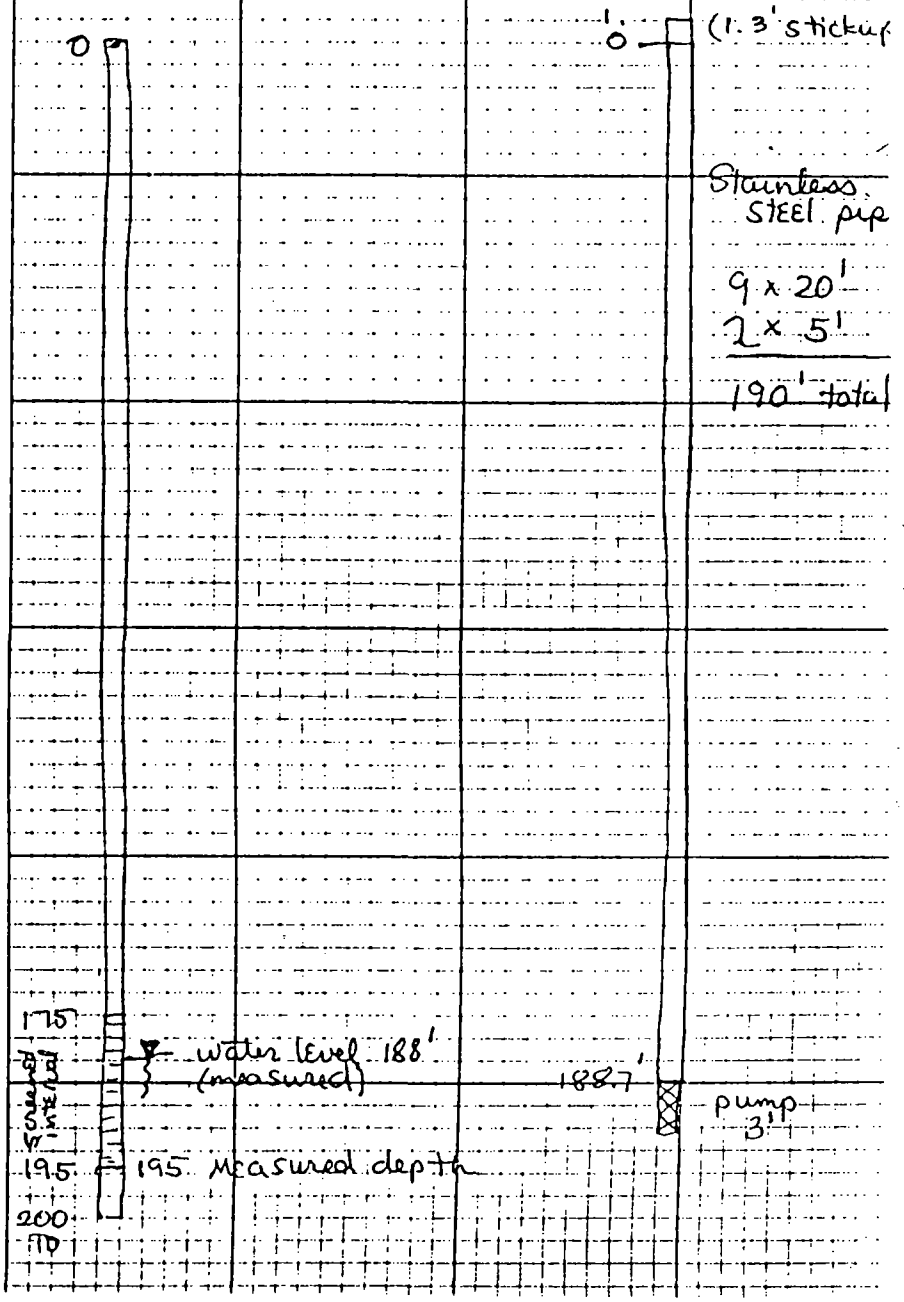
Replacement of rod, reinstallation of pump, starting of pump resulted in another snapped rod.

Pipe was pulled. Nothing was obviously wrong with pump function, according to John.

1615 John & Paul checked for bent rod in pipe. No evidence for that. The rod appeared OK.

Paul & John left to discuss problem with Steve.

Sketch of Well & Pump placement details:
Well A-1-CW3



1632 Paul & John returned, and put pump & pipe back in well.

1650 John got paged on his beeper, so I left to drive him to the phone. Pat arrived, so he stayed to watch equipment.

1710 Returned to site. John & Paul continued tailing in pipe.

1723 Jeff arrived, brought more warning tape and barricades.

1725 Left.

Calculated volume to purge from A-1-

But when pump was turned on, it brought up little water. Water level dropped to >191.15 and after 10 minutes had recovered only to 191.15. Only 4 feet of water in this well.

1805 Turned pump on, at low rate, after lowering pump onto casing, about 9 min.

1810 Water level measured as 192.7. Decision made to not continue pumping, as well was essentially dry.

Cleaned up, packed gear and extended barricaded area.

Dani arrived and we briefly

discussed tomorrow's logistics and pumping rate considerations.

18:50 Left site, putting up final tape barricade.

October 6, 1988 LASC, Thursday

0645 Arrived onsite. Completed Chain of Custody Record for yesterday's equipment blank, some other tail ends of yesterday's paperwork.

0700 John & Steve (Howard Pump) arrived. Pat Loelkes arrived. Jeff (URS) arrived.

0710 John took down specifications for pipe needed for A-1-CW1 (the deep well in Area 2), he and Steve began decon procedures.

0900 Finished decon of pipe, pump screen for next well. I deioniz rinsed black pipe. Loaded pipe onto rig with John. Moved to next site (Area 2).

0935 Arrived at site. Set up.

Calibrated Orion SA250 pH meter at 19.9°C

Standard	Reading
10.00	10.04
7.00	7.02

At 19.6°

Standard	Reading
7.00	7.03
10.00	10.07

1010 Calibrated YSI 33 sp. cond. meter:
At 21.1°C, 1400 µmhos standard (provided by Assoc. Labs) read 1315 on the meter
Deionized water (from Assoc. Labs) read 0.00
Correction Factor = 1.064639

1030 Gary arrived. Much discussion regarding logistics, scheduling, general progress.
Greg from Associated Labs arrived to pick up samples listed on Chain of Custody Record L00035. Did not bring a replacement ice chest.

1115 Left to return to decon. area to get another ice chest.
(Note: Ice was still plentiful in ice chest, temp -4°C when Greg took chest with samples)

1145 Returned to site. Paul & John were taking a short break from tailing in pipe.

1155 They resumed putting pipe in

Note: I checked pipe to be used against my specs (see sketch) & verified that the correct amount was used. Also, I verified that an unnotched packer was used in the well. It was new, also.

1220 Pat arrived to bring more ice, poles for canopy, if needed.

1246 Pump started
1248 First water
1255 Compressor died, pumping ceased.
It is out of gas, although gauge reads ½ full.
Paul & John left to get gas.
Paul took an initial water level reading of 196.18'
Stickup measured as 8" (0.7 ft)

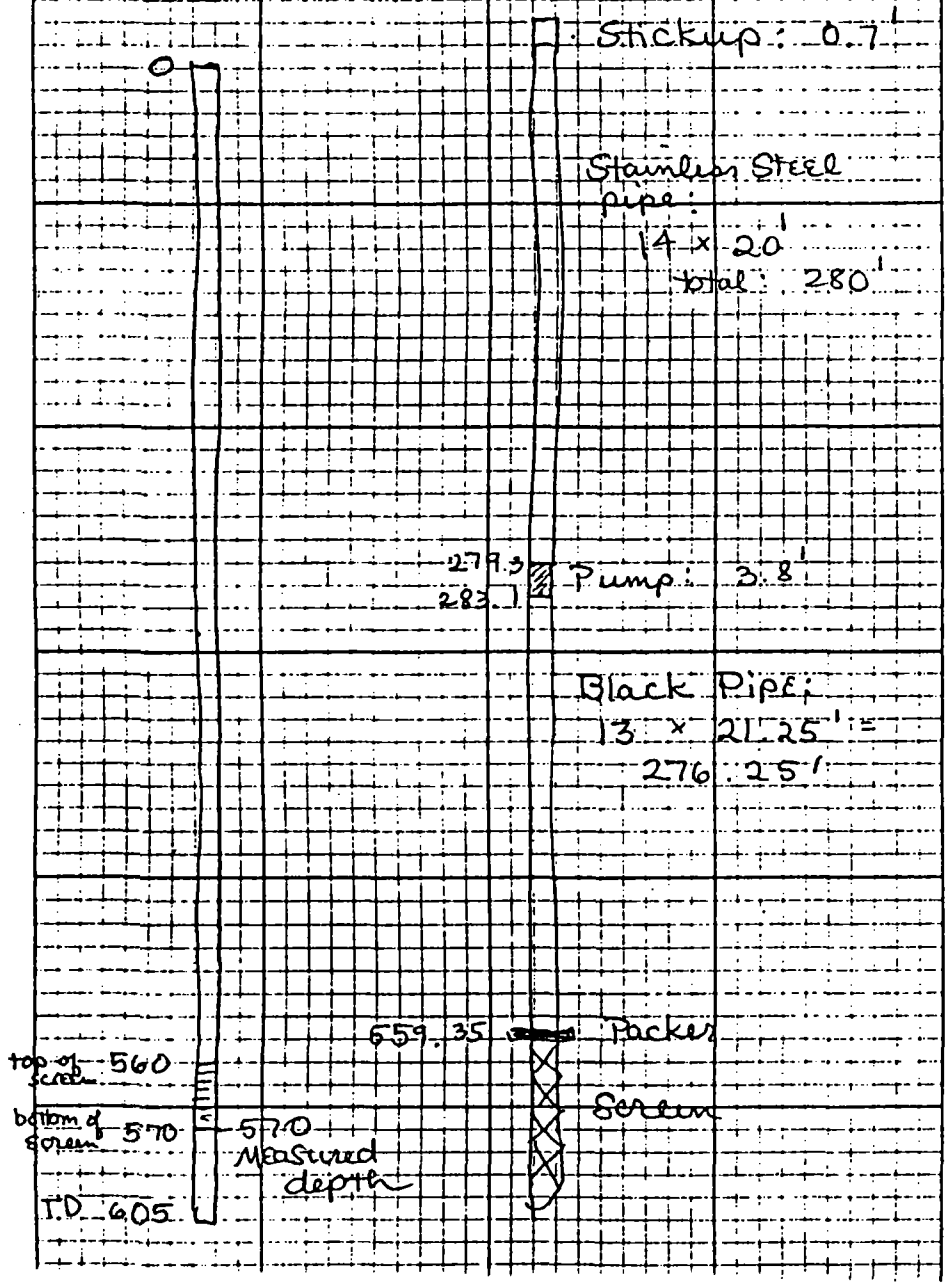
10.65 between packer & bottom of screen
x 1.02 gal/ft. casing
~~15.55 gal~~ 10.86 gal

10 ft. screened annulus
x 1.46 gal/ft annulus
14.6 gallons

10.86 + 14.6 gal = 25.46 gal for 1" effective casing/annulus

KJ Ku[illegible] 10/5/88 A1-CW1

46. Sketch of pipe, pump, screen placement, well details, for A-1-CW1 (Area 2)



A1-CW1 KJ Ku[illegible] 10/5/88

47

3x "Effective c/a volume" = 76.38 gal
5x " " " = 127.30 ga

1340 Kevin & Karen from Lockheed QA/QC team arrived
Gary arrived

1415 Paul and John arrived onsite

1445 Paul reported that HNu recorded a 1 ppm reading at the well head

1530 Gary Halbert & Ray MoRESCO showed up
Samples were taken from well A-1-CW1 at approximately 1500.
Sample ID used was A1-CW1. To take VOC samples, we tried turning off pump and pouring water into VOA bottles. Result was not judged very satisfactory by anyone, and Kevin said he thought we should continue sampling as we had been doing routinely. Sampler water is not normally exposed to any atmosphere!

Gases which sometimes are seen as large bubbles in tubing during discharge are exsolved gases from formation water and this is unavoidable due to pressure changes from aquifer to surface, I guess.

Much discussion and confusion from so many people on-site during sampling activities.

Went to get pizza after sampling completed.

Decon and other activities completed by John & Paul, pipe and pump installed while I was gone

2038 Arrived back on site. Started pumping.

Ate dinner

2100 Pump rate 45/strokes/min
Discharge: 2.5 gpm
Pump efficiency: 18 strokes/gal
Stickup = 6.5" (0.5')

Paul left to make a phone call
John left to go to apartment for a minute

2125 Slight problem with pump, 10 minute hiatus in pumping
Problem solved.

Pumping continued.

pH values began to rise to over 8.0, but then dropped again.

2235 Parameters stable enough to begin

Sampling.

Samples labeled
A1-CW2

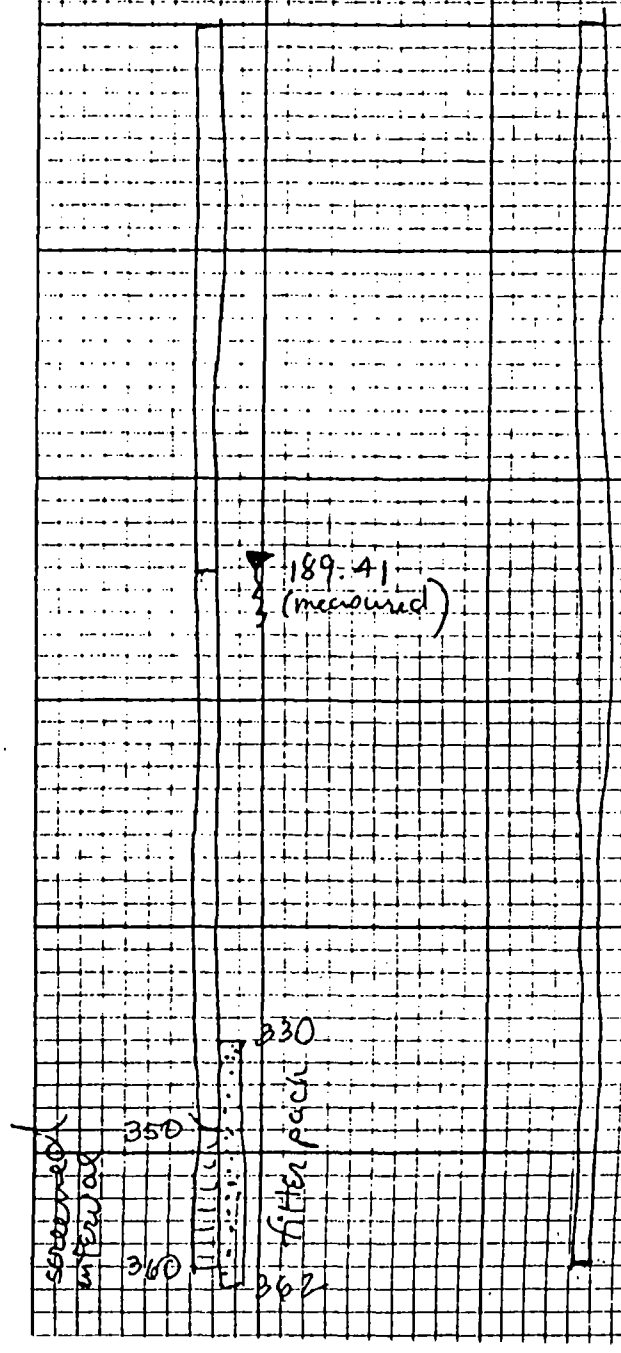
Lab time given as
2130

Cleaned up site.

Took gear back to
the staging area

Drove home.

A-1-CW2 (Area 2)



Oct. 12, 1988, Wednesday

6:50 Arrived at decon area
Paul, John, Pat were present
Got drum, loaded pickup
Moved air compressor to gate
for Area C1.
Discovered we were at wrong gate
Moved compressor, Baker tank, all
gear to main C1 gate.
Pat & I left to get compressor use
restroom. Returned immediately

9:45 Top packer was notched. Paul
left to get a packer from other
crew

1028 Paul returned. Began running
pipe for 1st interval,
C-1-MW1-01.

1125 Calibrated conductivity meter
1400 µmhos standard reads
1260
Corr. factor = 1.111
Calibrated Beckman Ø21 for pH,
as Orion appeared not to be
working.

1137 pump started

1145 pH values seem low, but normal
readings are being obtained in
distilled water

40 ft screened anulus x 1.46 = 58.4
44.6 ft. casing x 1.02 45.49
103.9 gal

3x = 312 gal
5x = 520 "

Using Orion SA250 w/ EH probe (sn 3917) for EH values.

Beckman Φ21 was calibrated using 7.00 & 10.00 solutions from Fisher. (11:35 today)

1315 Pat came in to bring lunch told us Doni was using all the stainless which we will need for zone 03.

1345 Samples taken, labeled C1-MW1-01. Lab time (on label): 1300.

1405 Left to visit restroom with guard. Pat returned.

1415 Returned to site. Started pumping, as John & Paul had gotten pipe in the hole. We're sampling zone 02 now.

1435 Greg arrived to pick up samples. He dropped off another ice chest with several containers of blue ice. Took the samples from

1515 Bill Robinson stopped by re logistics. If we have to finish on Friday, the airport security people may be able to escort us on-site. He left.

1545 Pat left to see if he could get some needed stainless steel pipe from Dani. We need another 3-20 ft. lengths to do next section.

1630 Took a set of samples, labeled C1-MW1-02, from zone 2 of well. Took an extra semi-volatile for lab calibration.

1640 Pat brought in 60 ft. of pipe for our use, already decon'd according to usual method. Paul & John ran it down the well.

1700 Done installing pipe. Not enough time to pump 03 zone before 1800, so we packed up to leave.

No guard was present, so we had to wait until someone let us out, as they had locked us in.

1755 Pat showed up with guard

1800 Left site with John, Paul, were escorted to gate, went back to decon

KJ[illegible]seller 10/13/88 C1-MW1-03
56

Oct 13, Thursday

0700 Arrived on site, having picked up 4 bags of ice

John, Paul also onsite. Discussed day's activities, security guard/safety problem.

0800 Met Paul, John at C1 entry, were escorted to site by guard

0810 Arrived at site. Unpacked, began activities.

0815 Bill Robinson stopped by. We told him we'd need another day to finish all seven zones, and were concerned re safety aspects of being locked in the area

Calibrated YSI 33 sp. cond. meter with Assoc. Labs 1400 µmho solution. Read 1160

Corr factor: 1900/1160 = 1.20690

Calibrated pH meter w/ 7.00, 10.00 buffers (Fisher)

Pump installed & started

Stickup = 7"

Purging C-1-MW1 Zone 03

0900 Tried to increase discharge rate by turning up pump, but it was pumping at maximum discharge rate.

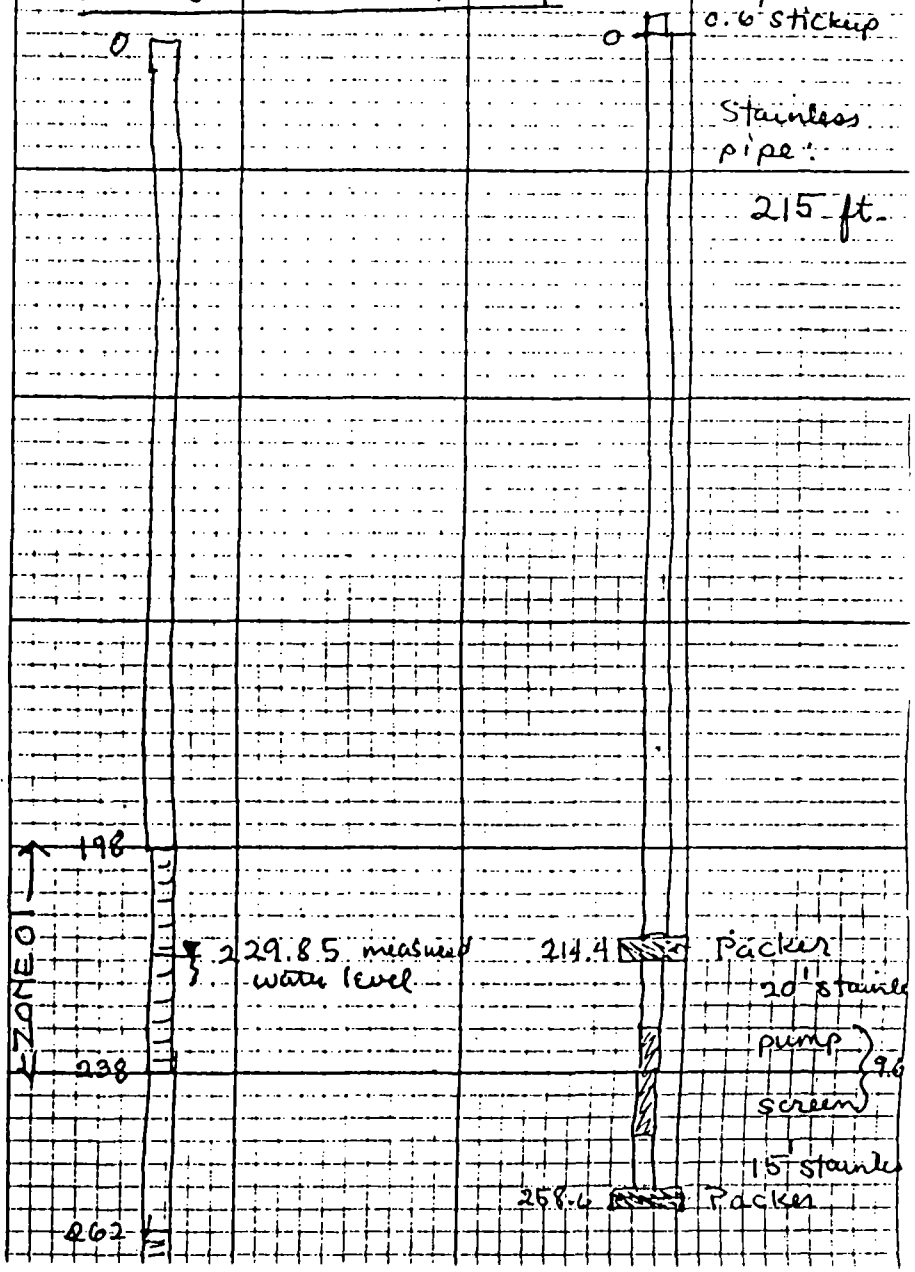
19 strokes / 30 sec

38 strokes / min

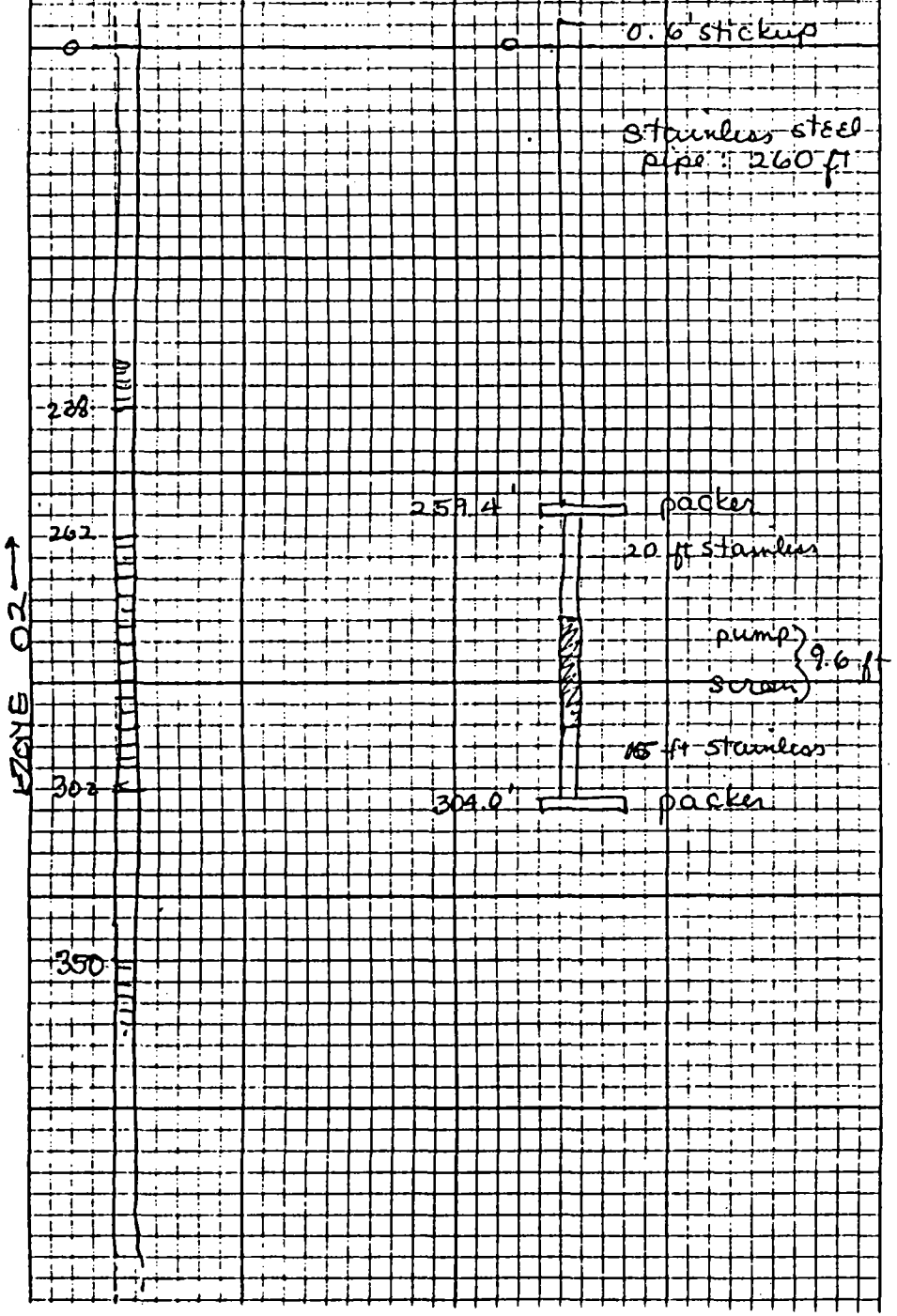
2.5 gpm

~~0925~~ 0940 Paul left to make some phone calls, & to make arrangements for 40 more feet of stainless for our deepest zone.

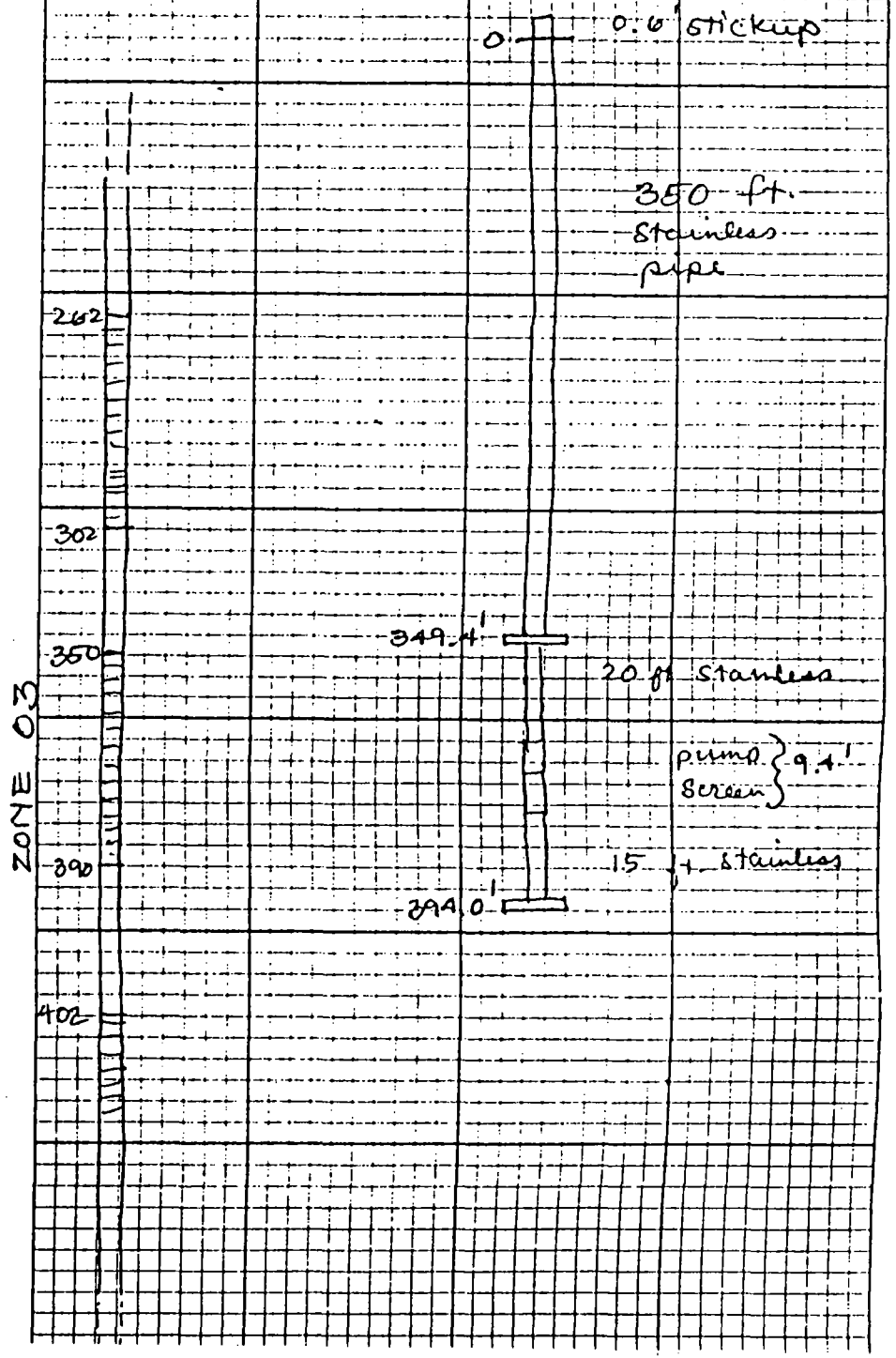
Sketch of pump, screen, water level locations etc. for C-1-MW1-01



58 Sketch of pumping setup for C-1-MW1-02



59 Sketch of pump/screen Setup C-1-MW1-03



C1-MW1-03
C1-MW1-04

1100 Samples taken labeled C1-MW1-03 Lab Time 1030

John began pulling pipe.

1200 Paul returned. John didnt have any replacement cups for the pump. I went over to the site where Dani & Steve were working to get two.

1220 Returned to C1 entrance.

1240 Guard was called. he came & escorted me to our site.

1245 John installed new cups in the pump. He and Paul began installing pipe in the well.

1300 Pat arrived, said Dani wanted us to empty the Baker tank. I accompanied Pat to the decon area for emptying of tank.

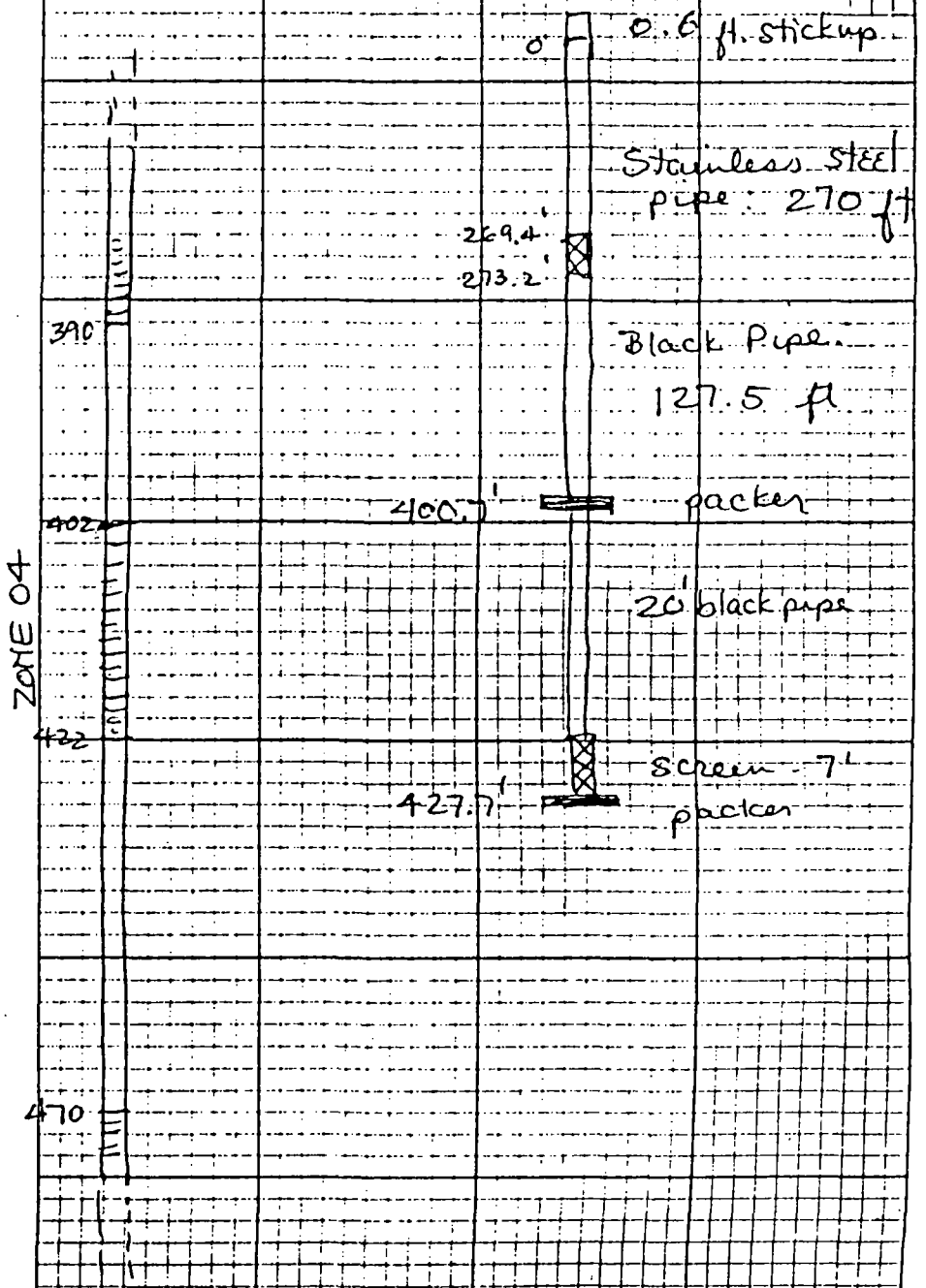
1445 Returned to C1-MW1 site with empty Baker tank.

1453 Started pumping

1610 Took sample set labeled C1-MW1-04 Lab Time 1600

Immediately started adding another 70 ft of pipe to do the next zone, 05.

Sketch of C1-MW1-04 pump/screen schematic



1635 Checked pt meter w/ 7.00 buffer, as values seemed low. At 23.5°C got a reading of 6.54.
Recalibrated with 7.00 & 10.00 buffers.

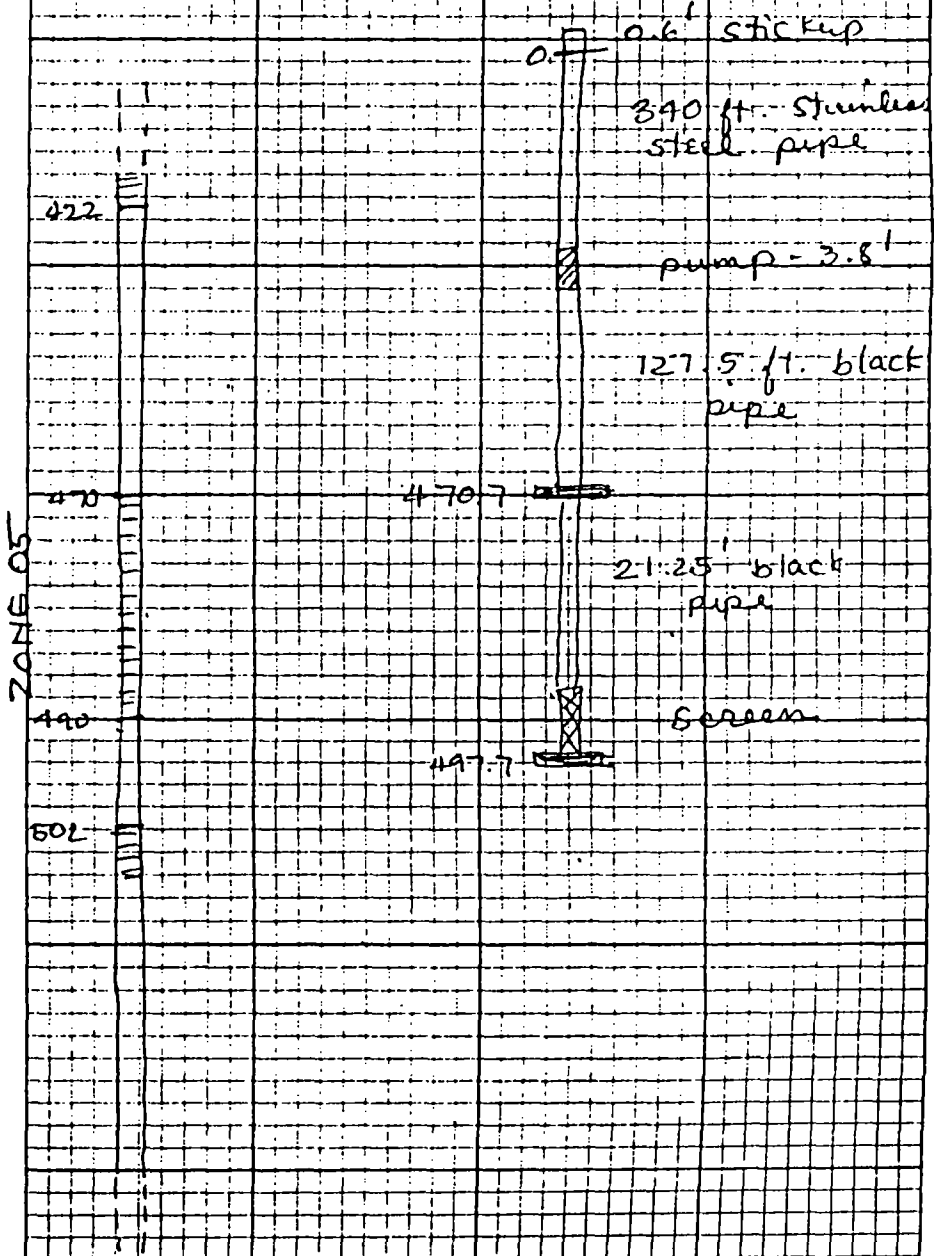
1642 Started pumping the 05 interval.

1655 Measured 0.6' stickup
Finished purging at 1750
Took samples, labeled C1-MW1-05, Lab time 1800
Packed up gear, as needed. It was necessary to pack up more gear than usual, as rain is apparantly predicted for tonight & tomorrow.

1620 Finished demob. were escorted to gate by guard.

1625 Left site.

Sketch of pumping schematic for C1-MW1-05 zone



Oct. 14, 1988, Friday

06:45 Picked up 4 bags ice for samples

0700 Arrived at decon. Tried to soak pH electrodes as they weren't responding well yesterday. All readings taken Wed & Thurs with Beckman pH meter may be considered questionable. Soaked both electrodes in dil. HNO_3 for 15 min, then in 7.00 buffer solution for remainder of time until calibration.

0800 Arrived at CI gate. Jeff and John also arrived. Guard said our escort had not arrived

0820 Jeff left for 5 minutes to phone his office.

0900 Guard arrived, with key. We entered site, with Bill Robinson. Were optimistically expecting to take last sample around 2:00 pm

0913 Began adding another 30' of stainless

0937 Started pump. We pumped for about 10 min, with no discharge at all. There did not appear to be a broken shaft, so John & Jeff began pulling pipe. There seemed to be water in the pipe as it was pulled, so the pump was rein-

0910 Calibration Data

Calibrated YSI conductivity meter. 1400 µmho (Assoc. Labs) soln read 1200 µmho

Corr. factor = 1.1666

Calibrated Orion SA 250 pH meter. It calibrated satisfactorily with 7.00 & 10.00 buffers (Fisher), but there was more erratic movement of values than usual. Checked again on 7.00 buffer, it read 7.04, acceptable.

30 ft. of pipe, taking us back to Zone 05.

1000 Connected pump, turned it on. Still no discharge. Began pulling pipe.

1055 Pulled pipe up to & including pump. Verified that there had been 370 ft. of stainless pipe installed above the pump, as per schematic.

1115 Pulled rest of pipe, screen, packers. Quite a bit of sand & mud on packers, top of screen. Pump cup badly chewed up

1120 Jeff Left site to get new pump cups. John & I left site w/ guard to use restroom, phone.

1140 Met Jeff at gate, returned to site with John, Jeff & guard. John replaced pump cups. John & Jeff began pulling pipe

down the well. Sawhorse brackets (2 of 3) collapsed under weight of pipe, so ends of pipe contacted ground. Gave ends a good rinse w/ DI water prior to reinstallation.

1250 Dani arrived, discussed day's activities.

Greg arrived, picked up yesterday's samples.

1253 Started pump. Water was extremely muddy. Pumping efficiency dropped rapidly.

1325 Pump failed to discharge. Water samples taken for pH, etc. measurement show a great deal of mud & silt in sample.

Dani made decision to quit & pull out, abandoning efforts to sample this well.

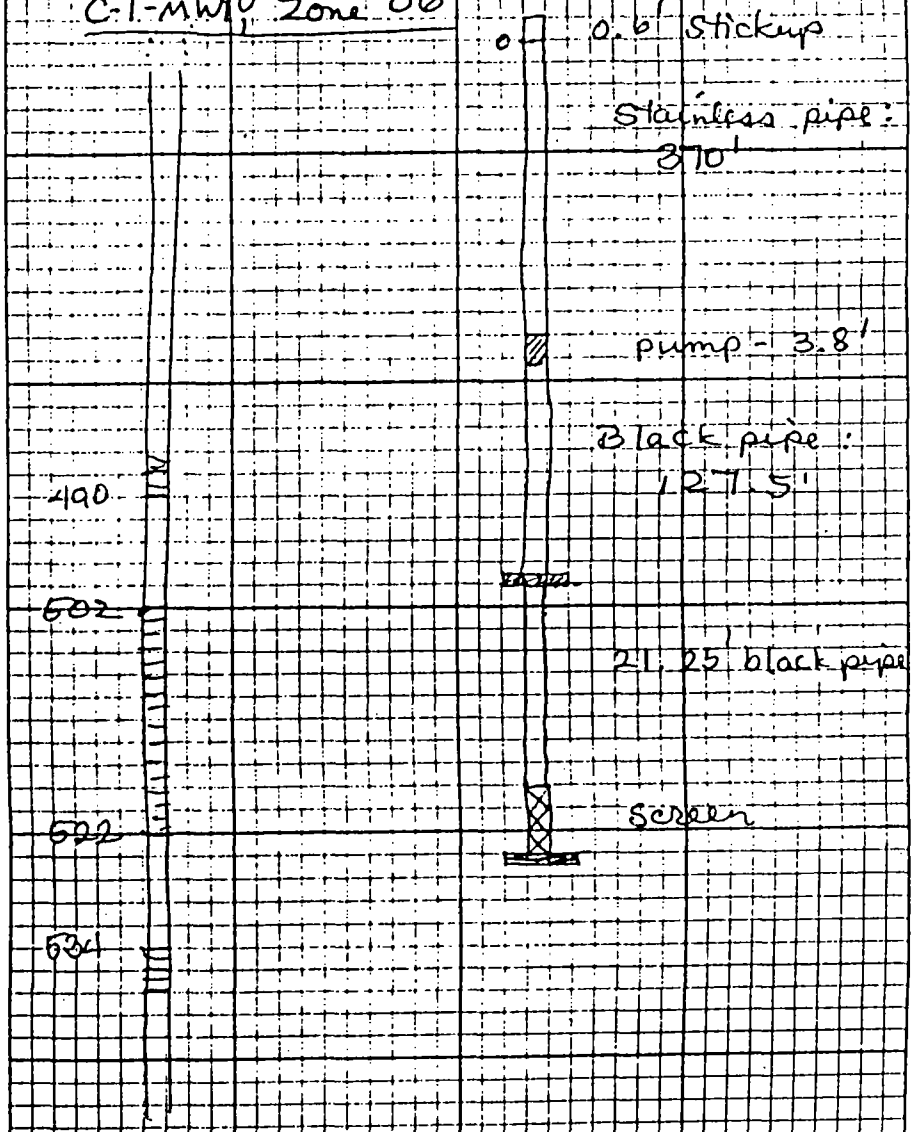
Dani left with the air compressor.

John & Jeff pulled all the pipe, we loaded up most of the gear.

1435 Left site with rig accompanied by guard. Dani still not back. Visqueen, tubes, hose, etc. need to be removed & Baker Tank needs to be [illegible]

outside gate for Dani to return with the pickup truck. John left for the site at Thornton & Winona (Schoolyard site) to deliver pipe.

Sketch of Pump Schematics for Well C-1-MW1, Zone 06



68 K[illegible] 10/14/88 B1-MW9-03 B1-MW9-04

1500 (approx) Dani returned. We packed up everything except visqueen & cardboard tubes for containment pad. Moved Baker Tank to decontamination area. Left to go to school site. Rig was there, but John was not. Drove back to decon area, but saw John & Jeff on Hollywood Blvd. They motioned me to follow, so I drove back to the school.

Dani had instructed John to put 55 additional feet of stainless steel on top, so he did so.

1625 Dani & Jeff arrived onsite, which is B1-MW9.

Assisted in sampling, etc. Called Gary, in response to Dani's pager.

Dani purged & sampled zone 04.

Packed up gear. I took samples home in van with me. Added ice to samples, verified 3°C temp.

1900 Left site to drive home.

Oct. 15, 1988, Saturday

0630 Stopped at market to buy 4 bags ice. Added a bag of ice to sample ice chest. Verified 2°C temp.

0645 Arrived at B1-MW9 site (school), checked Dani's schematic, notes, etc.

0700 John arrived. We went over day's plan.

0710 Jeff arrived. John & Jeff began to add the 70 ft. addtl. stainless to do next zone

Calibrated meters:
YSI model 33, calibrated w/ 1400 µmhos soln (Assoc. Labs) read 1085 µmhos at 15.1°C
Corr. factor = 1.29032

0744 Started pumping. First water v. clear, changed within 5 minutes to reddish brown, very turbid water.

0850 Stickup = 0.6'
Pump rate = 22 strokes/~~min~~ (KOK) 30 sec
Discharge = 3.2 gal/min
Pump efficiency = ~~6.88~~ 13.75 (KOK) strokes/gal

1045 Pump rate: 46 strokes/min
Discharge: 3.5 gpm
Pump efficiency: 13 strokes/gal

KJ Kinsella 10/15/88 B1-MW9-05
70 B1-MW9-06

0915 Samples were taken, Labeled B1-MW9-05 Lab time given as 0900. A third semi-volatile was taken for lab calibration purposes. Refer to Chain-of-Custody Record for list of samples taken.

1000 Ramesh visited site. I told him that I had not been told by Paul to straddle entire 40' screened interval on last well. He believes the way we did it was the correct way, but that in the future, on 40' screened intervals we will straddle the bottom 20 ft. of screen.

1055 Stopped pumping, took 2 sets of samples usual method. One set labeled B1-MW9-06, sample time KJK 1100. Another set labeled B1-MW9-07, sample time given as 1300. A third Semi-Volatile sample bottle was taken with B1-MW9-06 for lab calibration purposes. Samples double bagged, etc. as per normal method, placed in ice chest. Another two

A1-MW3 KJ Kinsella 10/15

bags of ice was added, Began pulling pipe, closed down well. Lock was missing, may be on other rig.

1200 John took rig & all pipe back to decon area for decon.

1215 Packed up rest of gear with Jeff's help, leaving only Dani's table, visqueen. Left for decon.

1225 Arrived at decon. Decon'd all pipe needed for next well, using Alconox, steam cleaner, DI water rinse. Decon'd pump, filter, discharge hose using same method. Loaded on truck.

Jeff went to get lunch, took a 15 minute lunch break.

Dani arrived.

1330 Left for A1-MW3 site, with rig, John, Dani.

Laid out visqueen pad, Jeff arrived, went with Dani to pick up truck, ice, air compressor.

Tried to open well but Jeff & Dani had taken multiple-screen well lock key, and my key appears not to work.

John assembled pump/screen/packer assembly while I made out labels, Chain-of-Custody records for last samples taken.

1425 Still waiting for Dani to return with

Keys.

1430 Dani arrived with Jeff, air compressor.

Put in pipe. I went back to decon briefly to get top end, more hose, returned.

Jeff went back & returned.

Dani calibrated YSI 3500, will use for pH, EH, temp. Will use YSI 33 for sp. cond. as lead is broken on YSI 3500.

Dani calibrated pH.

1544 Started pumping A1-CW1-01

Calibrated YSI 33

1280 µmhos read from 1400 µmhos soln (Assoc. Labs source)

Corr. factor = 1.09375

1525 Discharge hose end slipped off, was put back on & tightened down. Spill of discharge water probably 10 gal or so. Jeff earlier got 0 headspace reading from well water on his HNu, but got readings of 50-100 ppm from top of casing.

1640 Dani left

1713 Sampled Samples labeled A1-MW3-01

Lab time given as 1700.

A second set, duplicate, labeled A1-MW3-02, lab time given as 1900.

Added more pipe to sample second zone.

1 Dani has notes on packer placement in well

1742 Started pumping

1845 Sampled. Samples labeled as A1-MW3-03, Lab time given as 2000.

Put sample in 3x rinsed extra glass 1-L bottle with teflon-lined lid, took to decon area to filter & fill ~~nitrate~~ KOK metals sample bottle, as rig left before sampling finished and there was no electrical outlet to run the vacuum pump.

Oct. 18 1988, Tuesday

0600 left for LASC

0745 Arrived on SITE, at decon
Paul was there.
Began setup, decon procedures.
John is in from Barstow this am, will arrive around 0900.

0815 Visited Dani's site with Paul.
Discussed week's logistics.
Went back to decon area, began pulling together gear needed.

0930 John arrived had gone over to Dani's site and was told, erroneously, that we'd meet there.
John began decon of all stainless black pipe for next well
I left to get replacement sawhorse brackets to replace those damaged last week.
Took compressor to fill with gas, took to site, A1-MW4.
Met John with rig, & Paul at site. Began setting up. I returned to decon area to get van,

leave truck, pick up some items.
Greg arrived at site before I left to drop off DI water, filters.
Returned to site to drop off sawhorse brackets, etc.
Went to buy ice, Gatorade, ziplock plastic bags,

1300 At site. Visqueen pad was set up by John, Paul.
Pipe laid out on sawhorses
Ate lunch. Took an equipment blank, labeled A1-MW4-02, time 1300

1330 Paul left. John continued setting up pipe, etc.
Paul returned.

1340 Paul returned, put up tarp.
Steve came by to deliver filters DI water, pick up ziplock bags.

1350 Paul & John left to get packers from Steve

1355 Paul & John returned. Paul got a 300 ppm HNu reading from the wellhead ⇒ respirators in use on this one, near well

1420 Calibrated Orion SA250 pH meter Sn 3917, using 7.00 (Fisher) and 10.00 (ASP) commercial buffers. Calibrated completely satisfactorily with post-calibration recheck with same buffers.

Calibrated YSI 33, Sn. 16034 spec. cond. meter, at 29.8°C, YSI commercial 1000 µmhos solution registered as 1055 µmhos.

Corr. factor = 1000/1055

= 0.94787

Also using Beckman P21 pH meter with Eh probe to measure Eh.

1505 Finished putting in pipe. Air compressor hose missing. Left & found it at Dani's site. Screened interval is 144-184 ft.

1522 Returned & started pumping. Stickup = 9" of pipe. HNu reading on headspace from water sample = 1.2 ppm, at wellhead = 320 ppm.

1620 Sampled first interval. Samples labeled A1-MW4-01, time given as 1100. An extra Semi-Volatile bottle was taken for [illegible]

purposes.

1640 Left site to see if Dani had any short lengths. He didn't. Returned to site.

We decided to add 40' of stainless, although it may put our top packer slightly below the top of the second screened interval (208-228').

John added pipe as requested.

Stickup = 17 in.

1718 Started pumping. Steve came to take more stainless steel pipe. We will not have enough to do the third (next) interval, so will shut down. Steve said Dani intends to do the following intervals at his site and if possible finish that well tonight. If so, Steve will take his rig home tomorrow am and Dani can move to this site to finish it.

1820 Took samples. Labeled A1-MW4-03, with time given as 1600.

Packed up, left site at 1850. Went to Dani's site & discussed logistics of tomorrow's

78 RJ Kinsella 10/18/88 Demobilization

Sampling. Left for home

A1-MW4-04 RJ Kinsella 10/19/88 79

Oct 19, 1988, Wednesday

0730 Arrived at decon area. John was decontaminating all stainless pipe. Paul DI rinsed pipe

I left to get ice while John took rig back to A-1-MW4 site to set up. Called Gary. Went to well site.

Calibrated YSI meter SN 16034, using 1400 umhos soln (from Assoc. Labs)

$\frac{1400}{1240}$ = corr factor = 1.12903

Calibrated pH meter. Only about .04 units drift overnight (since last calibration). Calibrated satisfactorily.

0845 Setup of gear instruments completed. John added 65 ft. of stainless.

Started pumping. We're doing the third zone, screened from 276-296'.

0915 Dani arrived onsite. Left to call Gary re Steve returning to help John, whether to fish screen from well. John left to phone, also.

RJK ~~0950~~ 0955 Started sampling 3d zone. Labeled A1-MW4-04, time given as 1000. Dani & John returned.

1015 Ron Helgerson visited site briefly.

1080 John left site.

80 KJ Kinsella 10/19/88 A1-MW4-05
A1-MW4-06

1130 John & Paul returned to site.

1138 20 strokes/30 sec.
3.3 gpm
Pump efficiency = 12.1 strokes/gal

1200 Sampled the fourth zone (320-340 ft. screened interval)
Samples labeled A1-MW4-05, time given as 1200

Added 45 more feet of stainless steel pipe.
Changed to using Dani's YSI 3500 for all chemical parameters

1227 Started pumping.
Turned pump rate down after 20 minutes or so due to drawdown measured by Paul
Dani left site to see about moving Baker tank.

1300
1325 Greg arrived to pick up samples.
Dani not here, so he had to wait.

1345 Dani returned

1400 Sampled the fifth interval (364-384' screened interval

A1-MW4-07

81

Labeled A1-MW4-06, time given as 1330.
John began adding 45 additional feet of stainless steel pipe.

Dani took over sampling, I left site & drove home.

End of Log

APPENDIX C

CALIBRATION LOGS
CREW NO. 1

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

pH Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/Actual	Project No.	Operator	Comments
8:50 8/16/88	20.1	7	7		8803128.13	DR	Calibrated 7 (CAL)
" "	"	4	4		"	"	Calibrated Slope
" "	"	10	10		"	"	" "
1:00 8/17/88	33.0	7.00	7.00		"	DR	Calibrated CAL
	"	7.00	7.00		"	"	Calib pH ATC 7
	"	4.00	4.02		"	"	Slope - 4.00
	"	4.00	4.00				
8:00 8/20/88	20.1	H_2O (DI)(7)	7.00		"	DR	No calibration needed
"	"	"	7.00				w/ shorting cap
Temp "			- 33.9				w/ shorting cap.
13:30 8/22/88	34.5	7.00	7.01		"	"	Can either be calibrated
	"	"	7.03	Compensated T			for pH or pH ATC.
		4.00	4.00				
		4.00	2.01	~~Compensated~~ ATC			ATC for high or low
		10.00	10.00				pH's can't be corrected
		10.00	12.00	ATC			for ATC.

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Conductivity Meter Calibration Log
Meter No.

	Date	Temp (°C)	~~Standard~~/Actual (Cond.)	~~Standard~~/Actual (C. C.)	Standard/~~Actual~~ (pH)	Project No.	Operator	Comments
9:15	8/16/88	23.2	1.084	1.140	1.00	8803128.13	DR	Standard Quantab
9:45	"	22.1	.944	1.000	1.000	"	"	New Standard.
		~~22.0~~						
Eh. 9:45	"	24.2	Redox	Measured - 238		"	"	—
12:30	8/19/88	34.2 (measured)	1.000	1.000	1.00	"	DR	New Standard Sol
1:15th	8/19/88	34.2	Redox	Meas. 219 - corrected 232		"	"	"
8:00	8/20/88	20.1	~~1.000~~ 0.001	0.001-0.000	~~H_2O~~ (TDI)	"	"	Against Market Water.
8:30	8/22	34.5	0.001	0.001	H_2O (TDI)	"	"	"
	8/22	34.5	Redox	254	corrected 232	"	"	

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

pH Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/Actual	Project No.	Operator	Comments
18:00 8/29/88	25.5	7.00	7.00	–	8803128.13	DR	CAL
	25.5	7.00	7.00	–	"	DR	pH ATC check
	26.1	4.00	4.00	–	"	"	Slope
	26.1	4.00	4.00	–	"	"	Slope ATC check
13: 8/29/88	29.2	7.00	7.00				pH (H_2O DI
	"	7.00	7.00	–	"	"	pH ATC (H_2O DI
							~~pH ATC~~
10:00 9/2/88	29.7	7.00	7.00				pH - standard
	29.9	7.00	7.00				pH - ATC
	29.7	4.00	3.98				pH -
	29.9	4.00	4.00				pH -
15:00 9/6/88	31.0	7.00	7.00	–	"	"	pH stn
	31.0	7.00	7.00	–	"	"	pH ATC
	31.2	4.00	4.00				pH stand
		4.00	3.79				pH ATC
16:00 9/9/88	28.0	7.00 cap	7.00	–	"	"	cap
	27.2	7.00	7.00				pH - stand
	27.2	7.00	7.00				pH ATC
	28.0	10.00	10.00	10.03 (at 25°)			pH stand
							" ATC

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Conductivity Meter Calibration Log
Meter No.

for Temp
Cond.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/Actual	Project No.	Operator	Comments
18:00 8/24/88	26.1	<1 μmhos	.001 mmhos	–	8803128.13	DR	DI Water Mark II
" "	26.1	1000 μmhos	1.000 mmhos (26.1)	–	"	"	standard solution
" "	26.1	"		1.000 (25.0°C)			
Eh " "	29.5	231	226	corrected for temp. 231.85	"	"	–
13:00 8/21	32.0	<1 μmhos	.001-.000 mmhos	H	"		DI Water Mark II
"	"	<1 μmhos	~~.001-.000~~	.000-.001 (25°C)	"		"
Eh. "	"	cap ~~231~~ 001	.001		"		Cap
			199		"		DI water
18: 8/2/88	30.2	~~0.001~~ mμmhos	0.000-0.001 μmhos	0.000 mmhos	"	"	DI water Mark II
	~~30.7~~	"					
Eh	30.2	231 mV	216 mV	223.5 mV			DI water
"	"	0.000 mV	0.000 mV	0.000 mV			
13:00 9/6/88	31.0	<1 μmhos	.001 mmhos		"	"	DI water
Eh "	30.8	231 mV	227 mV	235 mV			stand. sol.
16:00 9/9/88	28.0	<1 μmhos	.001 mmhos	–	"	"	DI water
		-0.000 mmhos	-0.000 mmhos	–	"	"	cap
Eh	27.5	231 mV	231 mV	Zorbell (234.2)	"	"	–

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

pH Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/~~Actual~~	Project No.	Operator	Comments
17:00 9/11/88	27.7	7.00	7.00	Buffer 7.00	8803.128.13	DR	—
" "	"	7.00	7.00	" "	"	"	ATC
	"	7.00	7.03	cup	"	"	Electronic no solution
" "	"	10.00	10.00	Buffer 10.00	"	"	—
"	"	10.00	10.00	" "	"	"	ATC
15:00 9/13/88	28.0	7.00	7.00	Buffer 7.00	"	"	—
"	"	7.00	7.00	" "	"	"	ATC
"	"	7.00	7.03	cup	"	"	electronic no solution
"	"	10.00	10.00	Buffer 10.00	"	"	—
"	"	10.00	10.00	" "	"	"	ATC
9/15/88 1430	27.5	7.00	7.00	Buffer 7.00	"	"	—
"	28.6	7.00	6.98	" "	"	"	ATC
"	"	7.00	7.08	cup	"	"	electronic —
	28.6	10.00	10.00	Buffer 10.00	"	"	—
	"	"	10.00	" "	"	"	ATC

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Conductivity Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/~~Actual~~	Project No.	Operator	Comments
17:00 9/11/88	27.7	> 1 μmhos	0.000 mmhos	DI water	8803128.13	DR	—
"	25.0	"	"	"	"	"	Comp. to 25° ATC
"	27.7	0.01 M. KCl	1400	Lab Solution	"	"	Don't know the standard.
"	"	"	1000 μmhos	1.008 mmhos	old solution	"	—
Eh "	"	231 mV	233 mV	231.3 mV comp for t.	"	"	—
15:00 9/13/88	28.1	> 1 μmhos	0.008 mmhos	DI water	"	"	—
Eh "	25.1	231 mV	230 mV	~ 236.3 comp for	"	"	—
14:30 9/15/88	27.5	> 1 μmhos	0.000 mmhos	DI water	"	"	—
"	"	> "	0.001 mmhos	"	"	"	Comp. to 25°C ATC
"	"	- 0.000	- 0.000	Air	"	"	to Atmosphere,
Eh "	28.4	001	001	Cap	"	"	—
	27.7	231 mV	226	231.9 comp for temp	"	"	

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

pH Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/Actual	Project No.	Operator	Comments
16:00 9/23/88	27.7	7.00	7.00	~~7.00~~ cap	8803126.13	DR	electronic
"	27.7	7.00	7.00	7.00 Buffer	"	"	—
"	27.7	7.00	7.00	7.00 Buffer	"	"	pH ATC
"	27.7	10.00	10.00	10.00 Buffer	"	"	—
"	27.7	10.00	10.66	10.00 Buffer	"	"	pH ATC
12:30 9/23/88	23.1	7.00	6.98	cap	"	"	electronic
	23.1	7.00	7.01	7.00 Buffer	"	"	—
	23.1	7.00	7.00	7.00 Buffer	"	"	pH ATC
	23.1	10.00	10.00	10.00 Buffer	"	"	—
	23.1	10.00	10.00	10.00 Buffer	"	"	pH ATC
12:00 9/26/88	29.5	7.00	7.00	7.00 Buffer	"	"	—
	29.5	7.00	6.98	7.00 Buffer	"	"	pH ATC
	29.5	7.00	7.11	cap	"	"	cap
	29.5	10.00	10.00	10.00 Buffer	"	"	
	29.5	10.00	10.37	10.00 Buffer	"	"	
9/27/88		7.00	7.00		"	KK	
		10.00	10.00		"	"	
		7.00	7.00		"	"	

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Conductivity Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/~~Actual~~	Project No.	Operator	Comments
10:00 9/22/88	29.4	≤ 1 µmhos	0.001 mmhos	DI water	8803128.13	DR	#2
"	"	≤ 0 µmoh	-0.000 mmhos	Air	"	"	2 +
"	"	≤ 1 µmhos	0.001 mmhos	DI water	"	"	2 ATC
Eh	28.00	231 (at 25°)	228 →	231.77 (at 25°)	"	"	2 [illegible]
12:30 9/23/88	29.2	≤ 1 µmhos	0.001 mmhos	DI water	"	"	#2
	29.2	≤ 1 µmhos	0.001 mmhos	DI water	"	"	2 ATC
12:00 9/26/88	29.3	≤ 1 µmhos	0.001 mmhos	DI WATER	"	"	2 +
	29.3	≤ 1 µmhos	0.001 mmhos	DI water	"	"	2 ATC
	28.7	1,000 µmhos	1.019 mmhos	1,000 µmhos sol	"	"	2
	26.7	1,000 µmhos	1.000 mmhos	1,000 µmhos sol	"	"	2 ATC
9/27/88		1000 µmhos	1.012 mmhos	1000 µmhos	"	KK	
Eh 9/27/88	26.8	231 (at 25°)	230 →	232.34	"	DR	2 [illegible]
After ordering leads.							
11:00 9/27/88	27.2	≤ 1 µmhos	0.001 mmhos	DI water	"	"	2
	27.2	≤ 1 µmhos	0.001 mmhos	DI water	"	"	2 ATC
	27.4	1,000 µmhos	1.001	lab sol			2
	27.4	1,000 µmhos	1.000	lab sol.			2 ATC

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

pH Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/~~Actual~~	Project No.	Operator	Comments
14:30 9/28/88	35.5	7.00	7.00	7.00 Buffer	8803128.13	DR	–
	35.5	7.00	7.00	7 Buffer	"	"	ATC
	35.5	7.00	7.00	cap	"	"	electronic
	33.2	10.00	10.00	10 Buffer	"	"	–
	33.2	10.00	10.00	10. Buffer	"	"	ATC
8:30 10/3/88	19.2	7.00	7.00	7.00 Buffer	"	"	–
	19.2	7.00	7.00	7.00 Buffer	"	"	ATC
	19.2	10.00	10.00	10 Buffer	"	"	–
	19.2	10.00	10.00	10 Buffer	"	"	ATC
	19.2	7.00	6.96	cap	"	"	electronic
17:30 10/4/88	21.6	7.00	7.00	7.00 Buffer	"	"	–
	21.6	7.00	7.00	7.00 Buffer	"	"	ATC
	21.6	7.00	6.98	cap	"	"	electronic
	21.7	10.00	10.00	10 Buffer	"	"	–
	21.7	10.00	10.00	10 Buffer	"	"	ATC

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/19/88 Sample Location B-6-MW2 (~~[illegible]~~

Project Name LASC Project No.

Weather Conditions Sunny and hot 31°C

Observations/Comments Pump test packers set 26' 2" apart

Samples Collected By Dave Renan

QUALITY CONTROL

Purging/Sampling Method Hydrostar - new pump w/ 6/1000" screen.

Method to Measure Water Level sounder top packer ~~[illegible]~~ set at 203.825

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. 451 3500 Date Calibrated 8/19/88 13:00

Sp Conductance Meter No. " Date Calibrated " 10:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start ~~203.825~~ 203.78 End

Measuring Point (MP) well head

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor Eh	Turbidity
Pump test only - ~~[illegible]~~ difficulty when bottom packer ~~[illegible]~~ ~220' (top 195')								
15:30	4	~5	6.71/6.40	22.0 k	735/770	murky	148	light
15:35	4	25	6.83/6.65	21.7	759/814	clear	220	light
16:00	2	40	7.00/6.97	21.9	769/821	clear	168	—
16:15	4.5	100	7.06/7.09		751/816	clear	193	

Finish test and calibration: lower pump to 375'

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Conductivity Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	~~Standard~~/~~Actual~~	Project No.	Operator	Comments
19:30 9/29/88	35.4	1 µmhos	1.000 µmhos	DI water	8803120.13	DR	2
	35.4	1 µmhos	1.000 µmhos	DI water	"	"	2 ATC
	33.5	1000 µmhos	1.056 mmhos	YSI Solution	"	"	2
	33.5	1,000 µmhos	1.020 mmhos	YSI sol	"	"	2 ATC
Eh 9/29/88	33.6	231 (at 25°)	216	233.42	"	"	Zobell Sol
8:30 10/3/88	19.2	1 µmhos	0.001 µmhos	DI water	"		2
	19.2	1 µmhos	0.001 mmhos	DI water	"		2 ATC
	19.2	1,400 µmhos	1,215	1 M. sol KCl	"		2
	19.2	1,400 µmhos	1,380	1 M sol KCl	"		2 ATC
Eh 10/3/88	19.4	231 (at 25°)	242	231.2	"	"	Zobell
17:00 10/4/88	21.6	1 µmhos	0.001 mmhos	DI water	"	"	2
	21.6	1 µmhos	0.001 mmhos	DI water	"	"	2 ATC
	~~21.6~~						
Eh 10/4/88	21.8	231 (at 25)	236	232.1	"	"	Zobell

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

pH Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/~~Actual~~	Project No.	Operator	Comments
14:30 10/6/88	20.4	7.00	7.00	7 Buffer	8803128.13	DR.	–
	20.4	7.00	7.00	7 Buffer	"	"	ATC
"	20.4	10.00	9.98	10 Buffer	"	"	
	20.4	10.00	10.00	10 Buffer	"	"	ATC
	20.4	7.00	6.99	cap			electronic
11:30 10/11	23.4	7.00	7.00	7 Buffer	"	"	–
"	23.4	7.00	7.00	7 Buffer	"	"	ATC
"	23.4	10.00	9.99	10 Buffer	"	"	
"	23.4	10.00	10.00	10 Buffer	"	"	ATC
"	23.4	7.00	6.91	cap	"	"	electronic
8:00 10/12	18.0	7.00	7.00	7 Buffer	"	"	–
	19.0	7.00	7.00	7 buffer	"	"	ATC
	18.2	10.00	10.00	10 Buffer	"	"	[illegible]
	~~18.4~~ 18.2	10.00	10.00	10 Buffer	"	"	~~electronic~~ ATC
	18.4	7.00	6.70	cap	"	"	electronic

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Conductivity Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/~~Actual~~	Project No.	Operator	Comments
14:30 10/6/88	22.4	1 µmhos	0.001 mmhos	DI water	8803128.13	DR	2 scale
	22.4	1 µmhos	0.001 mmhos	DI water	"	"	2 ATC
	22.4	1400 µmhos	1,300 µmhos	1 M KCl	"	"	2 scale
	22.1	1400 µmhos	1,421 µmhos	1 M KCl	"	"	2 ATC
Eh 14:30 10/6/88	20.6	231	240 (at 25)	234.2 (at 25)	"	"	Zobell Sol.
11:00 10/11/88	23.6	1 µmhos	0.001 mmhos	DI water	"	"	2
	23.6	1 µmhos	0.001 mmhos	DI water	"	"	2 ATC
	21.9	1400 µmhos	1333	1M KCl	"	"	2
	21.9	1400 µmhos	1415	1M KCl	"	"	2 ATC
Eh							
12:00 10/6/88	26.0	231	233 (at 25)	231.7 (at 25)	"	"	Zobell Sol.
8:00 10/12/88	18.4	1 µmhos	0.001 mmhos	DI water	"	"	2
	18.4	1 µmhos	0.001 mmhos	DI water	"	"	2 ATC

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

pH Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/~~Actual~~	Project No.	Operator	Comments
11:30 10/13/88	21.9	7.00	6.98	7.00 Buffer	9803126.13	DR	—
"	21.9	7.00	7.00	7.00 Buffer	"	"	ATC
"	20.2	10.00	~~[illegible]~~ 3.38	10 Buffer	"	"	—
	20.3	10.00	10.00	10 Buffer	"	"	ATC
Wash probe with an HNO_3 solution ~10 min							
16:00 10/19/88	22.4	7.00	7.00	7 Buffer	"	"	—
	22.4	7.00	7.00	7 Buffer	"	"	ATC
	22.5	10.00	~~[illegible]~~ 9.98	10 Buffer	"	"	—
	22.5	10.00	10.00	10 Buffer	"	"	ATC
15:00 10/15/88	22.5	7.00	7.00	7 Buffer	"	"	—
	22.5	7.00	7.00	7 Buffer	"	"	ATC
"	23.2	10.00	9.98	10 Buffer	"	"	—
	23.2	10.00	10.00	10 Buffer	"	"	ATC
	—	7.00	6.82	cap	—	—	electronic
10:30 10/16/88	25.3	7.00	7.00	7 Buffer	"	"	—
	25.3	7.00	7.00	7 Buffer	"	"	ATC
	25.7	10.00	~~[illegible]~~ 9.98	10 Buffer	"	"	—
	25.7	10.00	10.00	10 Buffer	"	"	ATC
	—	7.00	6.84	cap	"	"	electronic

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Conductivity Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/Actual	Standard/Actual	Standard/Actual	Project No.	Operator	Comments
11:30 10/13/88	21.9	1.00 µmhos	0.001 mmhos	DI water	8803128.13	DR	2
10/13/88	21.9	1.00 µmhos	0.001 mmhos	DI water	"	"	2 ATC
Eh "	23.4	231	234	232 (+25)	"	"	Eh all
8:00 10/14	22.6	1.00 µmhos	0.001 mmhos	DI water	"	"	2
	22.6	1.00 µmhos	0.001 mmhos	DI water	"	"	2ATC
15:00 10/14/88 - Electric lead fore again - wasn't able to solder it together in time							
10:00 10/14/88	28.8	1.00 µmhos	0.001 mmhos	DI water	"	"	2
"	28.8	1.000 µmhos	0.001 mmhos	DI water	"	"	2ATC
"	28.8	1400 µmhos	1406 mmhos	1M KCl	"	"	2
"	28.8	1400 µmhos	1410 mmhos	1M KCl	"	"	2 ATC
Eh 10:30 10/14/88	32.2 ~~[illegible]~~	~~[illegible]~~ 231	241	231 ? (+15)	"	"	Eh all

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

pH Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/~~Actual~~	Project No.	Operator	Comments
8:30 10/12/98	18.2	7.00	6.98	7 Buffer	8803128.13	DR.	–
"	18.2	7.00	7.00	7 Buffer	"	"	ATC
"	18.2	10.00	10.00	10 Buffer	"	"	–
	18.2	10.00	10.92	10 Buffer	"	"	ATC
"	–	7.00	6.88	cap	"	"	electronic
	–						
10:00 10/12/98	21.4	7.00	7.00	7 Buffer	"	"	–
"	21.4	7.00	7.02	7 Buffer	–	"	ATC
"	22.2	10.00	10.00	10 Buffer	"	"	–
"	22.2	10.00	10.86	10 Buffer	"	"	ATC
"	–	7.00	6.93	cap	"	"	electronic
11:30 10/12/98	20.3	7.00	~~6.97~~ 6.97	7 Buffer	"	"	–
	20.3	7.00	7.00	7 Buffer	"	"	ATC
	20.4	10.00	10.00	10 Buffer	"	"	–
	20.4	10.00	10.~~93~~	10 Buffer	"	"	ATC
	–	7.00	6.85	7 - cap	"	"	electronic

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Conductivity Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/~~Actual~~	Project No.	Operator	Comments
8:30 10/12/99	18.6	1 µmhos	0.001 mmhos	DI water	880312913	DR	2
"	18.6	1 µmhos	0.001 mmhos	DI water	"	"	2 ATC
"	18.6	1,400 µmhos	1.211 mmhos	0.01 M KCl	"	"	2
"	18.6	1,400 µmhos	1.387 mmhos	0.01 M KCl	"	"	2 ATC
ER							
8:30 10/12/99	18.5	231 mV	242 mV	233.6 mV (+25)	"	"	Zobell Sol
10:00 10/19/99	18.2	1 µmhos	0.001 mmhos	DI water	"	"	2
	18.2	1 µmhos	0.001 mmhos	DI water	"	"	2 ATC
	22.0	1000 µmhos	.946 mmhos	YSI 3161 sol	"	"	2
	21.9	1000 µmhos	1.002 mmhos	YSI 3161 sol	"	"	2 ATC
ER							
10/19/99	22.1	231 mV	227 mV	231.6 mV (+25)	"	"	Zobell Sol
10:30 10/19/99	18.9	1 µmhos	0.001 mmhos	DI water	"	"	2
	18.9	1 µmhos	0.001 mmhos	DI water	"	"	2 ATC
	19.4	1000 µmhos	.890 mmhos	YSI 3161 sol	"	"	2
	19.4	1000 µmhos	1.000 mmhos	YSI 3161 sol	"	"	2 ATC
ER							
10/19/99	20.4	231 mV	237 mV	231.25 mV (+25)	"	"	Zobell Sol

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

pH Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/~~Actual~~	Project No.	Operator	Comments
13:00 10/20/88	25.6	7.00	6.96	7 Buffer	8803128.13	DR	–
"	25.6	7.00	7.00	7 Buffer	"	"	ATC
	24.8	10.00	10.00	10 Buffer	"	"	
	24.8	10.00	11.04	10 Buffer	"	"	electrode
	–	7.00	6.82	cap	"	"	electrode

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Conductivity Meter Calibration Log
Meter No.

Date	Temp (°C)	Standard/~~Actual~~	~~Standard~~/Actual	Standard/~~Actual~~	Project No.	Operator	Comments
13:00 10/26/00	25.1	1 µmhos	0.001 mhos	DI water	9803128.13	DR	x 2
"	25.1	1 µmhos	0.001 mhos	DI water	"	"	x 2 ATC
"	24.1	1000 µmhos	0.992 mhos	YSI 3160 Sol	"	"	x 2
"	24.1	1000 µmhos	.992 mhos	YSI 3160 sol	"	"	x 2 ATC
Eh	25.5	231 mV	203 mV	202.4 (at 25°)	"	"	Zobell Sol

APPENDIX D1

WELL PURGING AND SAMPLING LOGS
MULTIPLE-SCREEN WELLS

LOG OF BORING No.

DATE DRILLED: EQUIPMENT: WELL A1-MW1

DESCRIPTION: ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
								well head to base plate: 11"	
Bottom Assembly:					15				
3' 10' pump			packers 1.5"		30			Equipment Blank 01 - 10/18/88 10:00	
10' length					60				
6' screen			190' St.						
5' length					90				
25' 1"									
					120				
					150	163			
			40					WL 166	
					180	183		184.40 10/18/88 9:15	
								189' 1"	Sample 02 10/18/88 12:00
		42			210			214' 2"	
				45'	225				
					240	235		234' 1"	
			20			255			Sample 03 10/18/88 14:00
								259' 2"	
					270				
		42		60'					
					300	297		294' 1"	
			20						Sample 04 10/18/88 16:00
						317		319' 2"	
		21		50'	330				
						338		~~334' 1"~~	
								344' 1"	
			40		360			357' 364' screen	Sample 05 10/18/88 18:00
					375	379		369' 2"	
					390				
		63		95					
					420			439' 1"	
						441			Sample 06 10/18/88 20:00
			20		450				
				40		464		464' 2"	
		21			480			469' 1"	
						482			Sample 07 10/18/88 21:00
			20					494' 2"	
						502		TD 502 600 10/18/88	
					510				
					525				
					540				
					570				
					600				

336 ft. of water V = 832 gal

DRILLING CONTRACTOR

DRILLER

BY

DATE

CHK'D BY

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

First two screens at packers at 25' the rest at 45' intervals.

25' packers V = 62 gal Sample 4 gal/min 22 min

45' packers V = 111 gal Sample 4 gal/min - 2 hr 20 min

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

DRAWING NO

3 vol - 10 hr

5 vol - 4 hr

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/18/88 Sample Location A1-MW1 (01)

Project Name LASC Project No. 8803128.13

Weather Conditions Heavily Overcast

Observations/Comments Equipment Blank — no screen

Samples Collected By DR, SDG no packers

QUALITY CONTROL

Purging/Sampling Method —

Method to Measure Water Level —

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump Steam clean w/ ~~Alco~~ Liquinox & final DI rinse

pH Meter No. — Date Calibrated —

Sp Conductance Meter No. — Date Calibrated —

PURGING AND SAMPLING DATA

Water Level (below MP) Start End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity

9:15 - Started taking blank Used 5' pipe & pump
All samples split between the pipe & pump (included VOCs)
Metals sample was collected in 1 l Amber bottle and held in freezer until Gregg arrived w/ filters.

Co-C #: L00055 Lab Time 10:00

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/18/88 Sample Location A1-MW1 (02)

Project Name LASC Project No. 8803 128.13

Weather Conditions Overcast, smoggy

Observations/Comments Sample # A1-MW1-03 | screen 153 - 193

Samples Collected By DR, SDG | packers 189' 1" 214' 2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ 30 crushed SO_2

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 3 well vol 99.12

Method of Cleaning Bailer/Pump Steam clean w/ liquenox & final DI rinse

pH Meter No. YSI 3500 Date Calibrated 10/18/88 10:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/18/88 10:01

PURGING AND SAMPLING DATA

Water Level (below MP) Start 184.40 (9:00) End 184.55 (12:15)

184.20 (11:00)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth w.l.
Start pump 11:03 Water 11:05								
11:15	4.5	45	7.22/7.30	19.9	562/637	bright red rusty	169	187.11
11:30	4.5	90	7.23/7.30	18.8	604/690	light rusty	127	186.80
11:40	4.2	110	7.28/7.37	19.2	624/706	light cloudy	119	185.24
11:45	2	120	7.24/7.35	19.8	628/703	"	123	-
11:50	2	130	7.26/7.36	19.4	625/704	"	124	-

clear well

11:55 Start sampling

Co-C #: L00055 Lab time 12:

Total Discharge 135 Casing Volumes 4.0

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/18/88 Sample Location A1-MW1 (03)

Project Name LASC Project No. 8803128.13

Weather Conditions Clear very smoggy

Observations/Comments Sample # A1-MW1-03 | Screen 235-255

Samples Collected By DR, SDG | packers 234'1" ; 259'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ crushed 30 sil

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated 1 well vol: 54.7 3 well volumes: 164.7 g.

Method of Cleaning Bailer/Pump Steam clean w/ liquinox & final DI rinse

pH Meter No. YSI 3500 Date Calibrated 10/18/88 10:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/18/88 10:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 184.23 (13:00) End 184.23 (14:45)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ water level.
Start	13:05	water - 13:07				rusty		
13:20	4.5	65	7.21/7.34	18.9	652/745	light rusty	165	184.50
13:30	4.5	110	7.22/7.36	18.7	646/742	v. light rusty	142	184.46
13:40	4.5	155	7.24/7.34	19.0	649/738	cloudy	129	184.45
13:50	2	165	7.23/7.33	19.2	658/744	light cloudy	130	184.38
14:00	2	185	7.25/7.34	19.3	655/740	"	124	
14:10	2	205	7.27/7.40	19.0	652/739	"	122	184.38
14:15	2	215	7.27/7.40	19.0	650/739	"	123	184.34

3 1l Semi Volatiles - for Calibrate

14:11 Start Sampling Co-C# L00057 Lab Time 14:00

Total Discharge ~ 215 Casing Volumes 3.9

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/18/88 Sample Location A1-MW1 (04)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, hot, very smoggy (vis - 3mi)

Observations/Comments Sample # A1-MW1-04 | screen 297' - 317'

Samples Collected By DA, SDG | packer 294' 1" 312' 2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" Waterlic ~~filter~~ screen filter w/ 30 coiled 5

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well Vol 54.9 3 well Vol : 164.7

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/18/88 10:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/18/88 10:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 184.23 (14:55) End 184.40 (16:15)

18

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ water lvl
Start pump 14:57		Water	1458			very rusty		
15:10	4.5	50	7.22/7.34	17.0	645/736	mocha	158	184.23
15:20	4.5	95	7.27/7.37	18.8	639/731	"	141	184.41
15:30 (Dan call)	4.5	150	7.25/7.34	18.8	641/734	milky	123	184.41
15:40	2	170	7.27/7.36	19.4	644/736	light mocha	124	—
15:50 (Dan call)	2	190	7.24/7.38	18.7	642/732	cloudy	117	184.35
15:55	2	200	7.26/7.35	19.1	643/731	-	118	—

1555B Start Sampling Geo-C #1 100057 Lab time 16:00

Total Discharge 200 Casing Volumes 3.6

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/18/88 Sample Location A1-MW2 (OS)

Project Name LASC Project No. 6803128.13

Weather Conditions Sunny, warm, very breezy

Observations/Comments Sample of A1-MW1-OS screen: ~~344~~ 338 - 378'

Samples Collected By DR, SDG packers: 344'1", 369'2"

QUALITY CONTROL filter screen: (357 - 364)

Purging/Sampling Method Hydrostar pump w/ 3/4-2" flexible screen filter w/30 slot S.C

Method to Measure Water Level Electric Sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated 1 well vol 59.9 3 well vol - 169.7

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/18/88 10:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/18/88 10:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 184.26 (16:35) End 184.36 (17:50)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ CK	~~Turbidity~~ Water level
Start pump: 16:38 Water: 16:41						very rusty		
16:50	4.5	45	7.28/7.36	18.6	637/726	murky	173	184.49
17:00	4.5	90	7.26/7.41	18.6	630/725	"	135	184.49
clear well 17:10	4.5	135	7.26/7.35	18.5	635/731	very cloudy	128	—
17:20	4.5	180	7.27/7.36	18.4	634/730	lightly cloudy	117	184.46
17:30	2	200	7.28/7.36	18.6	637/729	near clear	115	184.43
17:35	2	210	7.28/7.36	18.6	636/730	clear	114	184.

17:40 Start sampling C.o.C.#: 600057 Lab time: 18:0

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/18/88 Sample Location A1-MW1 (OC)

Project Name LASC Project No. 8803128.13

Weather Conditions Cool - sunset, smoggy

Observations/Comments Sample A1-MW1-06 | screen: 441' - 461'

Samples Collected By DR, SDG | packers: 439'1", 464'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ 50 crushed S.

Method to Measure Water Level Electric Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol 54.9 3 well vol 164.7

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/18/88 10:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/18/88 10:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 184.32 (18:05) End 184.42 (19:35)

184.35 (18:10)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start pump 18:12		Water	18:15			very rusty		
18:30	3.7	55	7.12/7.16	18.4	C34/732	very rusty	154	184.57
18:40	3.8	93	7.28/7.40	18.4	C34/732	rusty	128	184.57
18:50	3.8	131	7.28/7.36	18.4	C35/733	light rusty	122	184.51
clear cell 19:00	2 (2.9)	160	7.30/7.39	18.5	C36/730	cloudy	114	184.46
19:05	2	170	7.29/7.39	18.5	C33/730	light cloudy	116	184.45

18:10 Start Sampling C-o-C # L00056 Lab time 20:00

Total Discharge 180 gal. Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/18/88 Sample Location A1-MW1 (07)

Project Name LASC Project No. 8803 17.8.13

Weather Conditions Dark, cool, light breeze

Observations/Comments Sample# A1-MW1-07 | screen 482 - 502 (TD - 500)

Samples Collected By DR, SDG | packers 469'1", 499'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4" 2" double screen filter w/ 30 crushed S.C

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated 1 well vol 54.9 3 well vol 164.

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/18/88 10:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/18/88 10:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 184.43 (19:40) End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth - water level
Start pumping 19:40			Water 19:45			very rusty		
~~20:00~~	4	60	7.32/7.43	19.1	631/727	cloudy	163	184.54
20:10	4	100	7.28/7.36	18.4	631/727	"	124	184.54
20:20	4	140	7.32/7.47	18.4	632/729	lightly cloudy	96	184.54
20:30	2 (3)	170	7.30/7.39	18.5	632/727	"	97	184.49
20:40	2	190	7.30/7.39	18.5	632/726	nearly clear	96	

well dry

20:40 Start Sampling C-o-C # L00056 Lab Time: 21:00

Total Discharge Casing Volumes 2

Method of Disposal of Discharge Water

Sheet ___ of ___

LOG OF BORING No.

DATE DRILLED: EQUIPMENT: WELL A-1-MW2

DESCRIPTION: ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
					130				
					160	158			
			40		190	198		W.L. 192' 190.80 8/22/86 190.73 8/23/86 [illegible]	
					220			214' 2.5"	
		22							
					250				
			20		280	270		269' 3"	
						294		294' 2.5"	
					310				
		12							
					340				
			40		370	352		359' 3"	
						392		384' 2"	
					400			~~floating~~	
		36						~~[illegible]~~ 424' 3" – floating at ~428'	
			20		430	428		8/23/86 9:15	
						448		~~[illegible]~~ 449' 2"	
		12			460	460		449' 5" ~~[illegible]~~ ~~[illegible]~~	
			20			480		476' 3" ~~TD~~ – 8/22/86.	
		24			490			~~[illegible]~~ ~~[illegible]~~	
								TD 514'	
					520				
					550				
					580				
					610				
					640				
					620				
					700				

DRILLING CONTRACTOR _____ DRILLER _____

BY _____ DATE _____ CHK'D BY _____

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/23/88 Sample Location A1-MW2 (0201)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, Humid

Observations/Comments Sample 0201 | ~~Taken~~ Field Blank - H_2O cal/≥0.00

Samples Collected By DR, TAH | Taken at A1-MW2 site

QUALITY CONTROL

Purging/Sampling Method —

Method to Measure Water Level —

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/22/88

Sp Conductance Meter No. — Date Calibrated

PURGING AND SAMPLING DATA

Water Level (below MP) Start End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity
Field Blank -								

C-o-C#: L00005 Lab time 09:30

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/23/88 Sample Location A-1 MW2 (0202)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny - Humid / partially cloud | screen 158 - 198

Observations/Comments Sample 0202 | packers 189'3" 214' 2.5"

Samples Collected By Dave Renan Todd A Howard

QUALITY CONTROL

Purging/Sampling Method Hydrostar w/5' Johnson double screen ~~[illegible]~~ sand filter new cups & [illegible]

Method to Measure Water Level Sounder.

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well Vol = 20 gal

Method of Cleaning Bailer/Pump

pH Meter No. VSI 3500 Date Calibrated 8/22/88

Sp Conductance Meter No. " Date Calibrated 8/22/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 190.73 (14:00) End 190.56 (C)

Measuring Point (MP) Well head

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor Eh	Turbidity O2
Start pump: 15:05		water: 15:06						
15:07	4.3	43.5	6.90	26.3	793/780	light Br.	113	
15:10	4.3	35	6.85/6.84	22.2	783/842	cloudy	95	
15:15	4.3	59	6.86/6.85	22.0	794/852	v.l. cloudy	93	
15:20	4.3	80	6.88/6.88	22.9	877/902 (?)	"	89	
15:25	4.3	102	6.85/6.84	20.6	760/834	"	68	
15:30	4.3	120	6.86/6.85	21.7	773/830	"	63	
15:35	4.3	148	6.84/6.83	21.3	759/824	clear	61	
15:40	4.3	162	6.85/6.85	21.9	758/810	"	57	
15:45	4.3	183	6.86/6.85	23.6	739/778	"	55	
15:50	4.3	204	6.88/6.88	20.8	695/763	"	53	
16:00	4.3	247	6.89/6.89	20.7	684/749	"	53	
16:10	4.3	268	6.91/6.91	20.8	6.80/7.40		54	

Total Discharge ~270 Casing Volumes ~13 lab time 16:

Method of Disposal of Discharge Water

C-O-C #: L00006

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/23/88 Sample Location A-1 MW-2 (#0203)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny - Humid (~ 30°C) clear

Observations/Comments Sample #0203 | Screen 270 - 290

Samples Collected By Dani Renan / Todd A. Howard | Packer 269'3" - 294'2.4"

QUALITY CONTROL

Purging/Sampling Method Hydrostar w/ 5" Johnson bubble screen sand filter

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well Vol. = 50 gal

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/22/88

Sp Conductance Meter No. " Date Calibrated 8/22/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 190.56 (?) End 190.72

Measuring Point (MP) well head.

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor Eh	Turbidity	dep
Start pump 17:20 water 17:22									
17:25	4	20	7.35/7.45	22.2	540/579	clear	84		
17:30	4	40	7.25/7.33	22.0	554/586	"	89		190.72
17:35	4	60	7.24/7.24	21.6	548/587	"	90		
17:40	4	80	7.20/7.24	21.1	538/584	"	72		
17:45	4	100	7.20/7.24	22.0	580/610	"	74		190.7
17:50	4	120	7.23/7.24	22.8	552/581	"	70		
18:00	4 clear	180	7.22/7.28	21.8	555/592	"	64		
18:10	4	200	7.23/7.28	21.0	542/590	"	65		
18:15	4 clear	220	7.24/7.33	20.8	543/588	"	66		190.72
18:20		240	7.24/7.33	21.0	553/598		66		

C-O-C#: 100006 bals time 18:3

Total Discharge ~ 250 Casing Volumes 5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/23/88 Sample Location A1-MW2 (0204)

Project Name LASC Project No. 8803128.13

Weather Conditions slightly cloudy (22°C)

Observations/Comments Sample # 0204 | Screen: 352 - 392 (40')

Samples Collected By Doni Renan / Todd Howard | Packers: ~~359~~ - 380
359'3" - 384'2.5"

QUALITY CONTROL

Purging/Sampling Method Hydrostar w/ 5' Johnson double screened sand filter

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well Vol = 50

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/22/88

Sp Conductance Meter No. " Date Calibrated 8/22/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 190.91 End 190.82

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity	Eh	depth
Start pump 19:26										
19:28			7.45/7.55	23.8	562/384	clear water from upper				
19:30						rusty				
19:30	3.5	35		23.9	starting	some grains to clear		123		
19:40	3.5	52	7.39/7.55	22.2	549/588	light cloudy		108	190.	
19:45	3.5	70	7.36/7.54	21.5	550/594	"		85		
19:50	3.5	87	7.35/7.55	19.6	532/597			61		
20:00	3.5	122	7.33/7.47	19.8	535/598			47		
20:10	3.5	157	7.34/7.48	20.8	555/604			40	190.9	
20:15	3.5	175	7.34/7.44	21.1	551/598			36		

C-o-C #: L00006 Lab Time: 20:30

Total Discharge 186 Casing Volumes 3.5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/23/88 Sample Location A1 - MW 2 (0205)

Project Name LASC Project No. 8803128.13 (0206)

Weather Conditions Clear Night (21°C)

Observations/Comments Sample # 0205 | Screen 428 - 448

Samples Collected By Dani Reuman/Todd Howard | Packers 424' 3" - 449' 2"

QUALITY CONTROL

Purging/Sampling Method Hydro stop w/ Johnson double screen sand filter

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/22/88

Sp Conductance Meter No. " Date Calibrated 8/22/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 190.92 End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity
Time	21:16	Water	21:20			rust		
21:25	33							
21:30	1. ~~35~~	35						
21:35	1/3			pumping	total dis	rust		
21:40	NO			Close				

Can't get a sample from this zone

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

LOG OF BORING No.

DATE DRILLED: EQUIPMENT: WELL A-1 MW3

DESCRIPTION: ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
								~ stickup - 7'	
					30			10H to plate 1' 9"	
					60				
					90				
					120				
					150			10/16/88	
			40		180	168 / 189.52		MWL 172 / 189' 7" (188' 3")	Samples 01 10/15/88 17:00
		11			210	208		214' (212' 4")	02 10/15/88 19:00
			20			219		~~220'~~ 218' 3"	
				30	240	239		~~244~~ 243' 4"	Sample 03 10/15/88 20:00
		24							
			20		270	263		259' 3"	
				40		283		284' 3"	Sample 04 10/16/88 12:00
		11							
			20	35	300	294		293' 3"	Sample 05 10/16/88 15:30
						314		318' 1"	
					330				
		48		80					
					360	362		373' 3"	Sample 06 10/16/88 17
			40		390	402		398' 1"	
		24	~ 50'		420			423 3"	
			20			426			Sample 07 10/17/88 10:00
					450	446		448' 4"	
		24	45					468' 3"	Sample 08 10/17/88 13:00
			20		480	470			
						490		493' 4"	
		12						TD 502	
					510			-502 panel 10/18/88 1500:)	
					540				
					470				
					600				

DRILLING CONTRACTOR

DRILLER

BY

DATE

CHK'D BY

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

First two screens - packers at 25'
third screen packer at 45'
4-7th screen packers at 25'

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/15/88 Sample Location A-1-MW3-01

Project Name LASC Project No. 88-03128.13

Weather Conditions Cool, clear, breezy

Observations/Comments Purge vol = 61 gal 3x = 183 gal screen: 168-208'

Samples Collected By

QUALITY CONTROL

Purging/Sampling Method Pumped with Hydrostar piston pump, screw

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. Date Calibrated

Sp Conductance Meter No. Date Calibrated

PURGING AND SAMPLING DATA

Water Level (below MP) Start ~~185.4~~ (1540) End 189.5 (1730)
K 189.4

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity	Wa Le
Pump Started: 1544			First water: 1546						
1548	4.1	8.2	7.33	20.1	700/766	H. reddish brown	113	mod	
1602	3.6	58.6	7.20	19.3	680/744	v. lt. reddish brown	114	low mod	
1615	3.6	105.4	7.19	19.2	675/738	v. lt. grayish brown	108	slight	
1630	3.6	159.4	7.17	19.1	670/733	"	113	almost clear	
1645	3.6	213.4	7.17	19.0	640/700	almost colorless	109	almost clear	
1655	–	249	7.19	18.9	650/711	"	106	"	
1700	–		7.18	18.9	650/711	"	101	"	

Sampled at 1713
Took 2 sets (one for a duplicate)
A1-MW3-01, lab time 1700
A1-MW3-02, lab time 1900

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/15/88 Sample Location A-1-MW3-03

Project Name LASC Project No. 88-03128.13

Weather Conditions cool, clear, breezy

Observations/Comments Purge vol = ~~61 gal~~ 54.29 gal (KJK), 3x = ~~183~~ 162.9 (KJK) gal screen: 219-239

Samples Collected By K. Kinsella

QUALITY CONTROL

Purging/Sampling Method

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/15/88

Sp Conductance Meter No. YSI 33 Date Calibrated 10/15/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity
Started Pump: 1742 First water: 1743								
1748	2.5	12.5	7.40	19.0	630/289	reddish brown	140	high-mod
1800	3.2	50.9	7.34	~~20~~ 19.1	640/	lt. yellowish brown	128	mod.
1815	3.6	104.9	7.24	KJK 18.8	625/	"	114	sl.
1825	3.5	139.9	7.23	18.7	620/	v. lt. yellowish brown	111	v. sl
1837	–	181.9	7.25	18.6	620/	"	108	"
1842			7.24	18.6	630/	"	104	"

Sampled at 18:45, labeled A1-MW3-03
Lab-time: 2000

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/16/88 Sample Location A1-MW3 (04)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, Hot

Observations/Comments Sample A1-MW3-04 | screen 263-283

Samples Collected By DR, SDG | packer - 259' 5", 283' 11"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter

Method to Measure Water Level Electric Sounder.

Pump Lines or Bailer Ropes: new (cleaned) dedicated 1 well vol: 54.7 3 well vol: 162.6

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/16/88 10:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/16/88 10:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 189.52 (10:45) End

189.49 (11:00)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start pump 11:00		Water				light rusty		
11:10	3.2	30	6.79/6.81	20.2	608/683	milky rusty	157	189.53
11:20	3.2	62	7.03/7.04	19.3	601/680	very cloudy	123	189.53
11:30	3.3	95	7.08/7.09	19.2	602/685	light cloudy	111	-
11:40	3.5	130	7.14/7.15	22.2	660/635	very light cloudy	101	189.50
11:50	3.5	165	7.15/7.16	19.2	603/675	near clear	98	189.51
11:55	2	175	7.15/7.16	19.7	603/679	"	103	189.50
12:00	2	185	7.15/7.16	19.7	608/679	v clear	104	189.43

clear well

Took 3 SV-1l

Start sampling 12:03 C-o-C # 600053 Lab time 12:00

Total Discharge ~190 Casing Volumes 3.5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/16/88 Sample Location AL-MW3 (05)

Project Name LASC Project No. 8803128.13

Weather Conditions Clear, light breeze

Observations/Comments Sample # AL-MW3-05 | screen 294 - 314

Samples Collected By DR, SDG | packers 293'3", 317'9"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated 1 well vol. 54.2 3 well vol 162.6

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/16/88 10:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/16/88 10:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 189.30 (14:28) End 189.36 (16:10)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start pumping 14:28			Water 14:32			milky rusty		
14:40	3.3	33	7.20/7.21	19.1	545/618	rusty milky	132	189.37
14:50	3.3	66	7.23/7.24	19.2	553/622	very cloudy	111	189.37
15:00	3.2	98	7.19/7.28	19.1	554/627	light cloudy	97	
15:10	3.2	130	7.18/7.28	19.2	556/629	v. light cloudy	91	189.37
15:20	3.2	162	7.20/7.29	19.0	554/630	very clear	87	
15:30	2	188	7.17/7.26	19.1	563/636	"	96	189.37
15:35	2	192	7.12/7.25	19.1	560/634	"	89	-

15:35 Start sampling C-o-C #: 600053 Lab time 15:30

Total Discharge 195 Casing Volumes ~ 3.6

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/16/88 Sample Location A1-MW3 (06)

Project Name IASC Project No. 6803128.13

Weather Conditions Sunny, warm, hot, light breeze

Observations/Comments Sample # A1-MW3-06 | screen : ~~373' 3"~~ 362' - 402'

Samples Collected By DR, SDG | packers, 373' 3" ; 397' 9"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol 54.2 3 vol - 162.6

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/16/88 10:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/16/88 10:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 189.36 (16:16) End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ Depth
Start pump 16:18		Water 16:23				solid brown		
16:30	3	30	7.12/7.18	19.1	603/684	dark mocha	120	189.39
16:40	3	60	7.18/7.27	19.0	604/684	mocha	98	189.39
16:50	3	90	7.13/7.21	18.5	596/679	very cloudy	95	-
17:00	3	120	7.14/7.22	18.8	594/676	light cloudy	79	189.40
17:10	3	150	7.14/7.21	18.8	596/677	"	77	-
17:20	2.5	175	7.14/7.21	18.9	594/674	"	74	189.40
17:25	2	185	7.14/7.22	19.0	594/673	"	74	-

17:25 Start sampling C.o.C #: L00053 Lab time 17:30

Total Discharge ~185 Casing Volumes 3.4

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date ~~10/15/88~~ 10/17/88 Sample Location A1-MW3(07)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, Warm, Smoggy

Observations/Comments Sample # A1-MW3-07 screen: 426-446

Samples Collected By DR, SDG packers: 423'3", 447'9"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated 1 well vol 57.2 total - 162.6

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/17/88 8:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/17/88 8:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 149.81 (8:57) End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~	Turbidity
Start 8:58		water: 9:03				very rusty		
9:15	3	50	~~6.97~~ 6.95/6.97	19.2	~~588~~/606	cloudy	317	189.50
9:30	3	95	7.20/7.36	19.0	593/674	light cloudy	188	189.53
9:40	3	125	7.20/7.28	19.00	598/678	nearly clear	170	189.53
9:50	3	155	7.25/7.32	19.2	603/683	"	144	—
10:00	3	185	7.25/7.32	19.0	600/680	clear	137	189.50
10:05	1.75	193	7.25/7.32	19.3	604/681	"	136	189.50
10:10	1.75	202	7.25/7.30	19.3	603/681	"	137	189.50

10:10 Start Sampling C-o-C # 100054 Lab time 10:00

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/17/88 Sample Location A1-MW3-(08)

Project Name LASC Project No. 8803128.13

Weather Conditions Hot and very smoggy

Observations/Comments Sample A1-MW3-08 | screen 470 - 490

Samples Collected By DR SDO | packer 458' 3" 483' 1" (?)

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4 + 2" double screen filter

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated 1 well vol 54.2 3 well vol 162.6

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/17/88 8:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/17/88 8:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 189.14 (11:20) End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity
Start 11:21		Water 1/:						

Too much sediment - Bottom pipe hit bottom at 490' or 478'
Pulled out cap entirely worn off.
12:30 Called Gary & Ray - said we could kick it off.

C-O-C-# L00054 Lab Time 12:00
(Listed on C-O-C ?)

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

LOG OF BORING No.

DATE DRILLED: EQUIPMENT: WELL A1-MW4

DESCRIPTION: ELEVATION: 1062

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
								Equip [illegible]	
					100				
						144		(Equip blank is Sample 02)	
								154.55 (170' pipe to start)	
						184	174.55 193.6	Sample 01	
					200	208	209	(Add 40') (Total 210 Sample 03	
						228	233.6		
						276	274	(Add 65') (total 275') Sample 04	
					300	296	293.6		
						320			
						340		(Add 45) (total 320') Sample 05	
						364		(Add 45 (total 365') Sample 06	14:
						384			
					400				
						432	429		
						452	454.6	(Add 65) (total 430') Sample 07	16:0
				45		476	473' 9"		
					500	496	498' 9"	Sample 08	18:00
				45		520	518' 7"		
						540	543' 7"	Sample 09	20:00
				80					
					600	600	598' 9"		
						620	623 9"	Sample 10	22:00
						692	688' 9"		10/26/88
					700	712	713' 9"	Sample 11	1[illegible]:00

DRILLING CONTRACTOR _____ DRILLER _____

BY _____ DATE _____ CHK'D BY _____

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

DRAWING NO

LOG OF BORING No.

DATE DRILLED: EQUIPMENT: A1 - MW4 (cont)

DESCRIPTION: ELEVATION: 8 of 2

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
					800	808		800' 4"	
						828		880' 11"	Sample 12 10/20/88 20:00
					900				
						949			Sample 13 10/20 21:00
						969			
					1000	1017			Sample 14 10/20 21:00
						1037			
					1100				
						1157			Sample 15 10/20 21:00
						1177			
					1200			TD 1190 10/18/88 TO 1201	
					1300				

DRILLING CONTRACTOR _____ DRILLER _____

BY _____ DATE _____ CHK'D BY _____

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/18/88 Sample Location A-1-MW4-01 (144-184' screened interval)

Project Name LASC Project No. 88-03128.13

Weather Conditions Hot, very smoggy, otherwise clear, breezy

Observations/Comments Packers at: top: bottom: Purge vol = 33.2 gal 3x = 99.7

Samples Collected By KJ Kinsella - Labeled A1-MW4-01

QUALITY CONTROL

Purging/Sampling Method Pumped with Hydrostar piston pump, w/screen

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed.

pH Meter No. Orion SA250, sn. 3917 Date Calibrated 10/18/88

Sp Conductance Meter No. YSI 33, sn 16034 Date Calibrated 10/18/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 174.55 (1300) End

Measuring Point (MP) Top of casing

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity
Pump started: 1522			First discharge: 1523					
1525	3.7	7.4	6.84	20.5	600/569	reddish brown	183	mod.
1535	3.7	44.4	7.36	19.3	575/545	v. lt. red brown	183	slight
1545	—	81.4	7.31	19.2	585/555	v. lt. gray	181	v. sl.
1555	3.7	118.4	7.42	19.4	590/559	colorless	178	almost clear
1605	3.3	151.4	7.55	19.3	575/545	"	175	"
1610	—	167.9	7.43	19.3	580/550	"	167	"
1615	—	184.4	7.48	19.3	575/545	"	167	"

Sampled at 1620.
Samples labeled A1-MW4-01, time 1100
(Extra 625 taken for lab calibration)

COC 460058

Total Discharge 184.4 gal Casing Volumes 5.6

Method of Disposal of Discharge Water Baker Tank

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/18/88 Sample Location A-1-MW4-03 (208-228' screened interval)

Project Name LASC Project No. 88-03128.13

Weather Conditions Cool, clear, breezy

Observations/Comments Purge vol = 54.3 gal 3x = 162.9

Samples Collected By KJ Kusella - Labeled A1-MW4-03, time given as 1600

QUALITY CONTROL

Purging/Sampling Method Pumped w/ Hydrostar piston pump w/screen

Method to Measure Water Level

Pump Lines or Bailer Ropes: new (cleaned) dedicated

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed

pH Meter No. Orion SA250, Sn 3917 Date Calibrated 10/18/88

Sp Conductance Meter No. YSI 33, Sn 16034 Date Calibrated 10/18/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start End

Measuring Point (MP) Top of casing

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity
Pump started: 1718		First discharge: 1719						
1722	3.6	10.8	7.21	19.0	590/559	red brown	139	low-mod.
1733	3.5	49.3	7.34	18.6	580/550	lt. red brown	125	low
1747	3.7	101.1	7.48	18.5	575/545	"	131	sl.
1757	3.2	133.1	7.42	18.5	565/536	v. lt. red brown	122	v. sl.
1807	3.7	170.1	7.50	18.5	555/526	v. lt. grey brown	118	almost clear
1815	–	199.7	7.52	18.4	550/521	colorless	116	"

Sampled at 1820

Samples Labeled A1-MW4-03, time given as 1600

C.o.C. - 100058

Total Discharge 199.7 gal Casing Volumes 3.7

Method of Disposal of Discharge Water Baker Tank

Sheet of

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/19/88 Sample Location A1-MW4-04

Project Name LASC Project No. 88-03128.13

Weather Conditions Cool, overcast, drizzling slightly, v. sl. breeze

Observations/Comments Purge vol = 54.3 gal
3x vol = 162.9 gal

Samples Collected By KJ Kiselle

QUALITY CONTROL

Purging/Sampling Method Pumped w/ Hydrostar piston pump, w/screen

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed

pH Meter No. Orion SA 250, sn 3917 Date Calibrated 10/19/88

Sp Conductance Meter No. YSI 33 sn 16034 Date Calibrated 10/19/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start _____ End _____

Measuring Point (MP) _____

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity	Wat Lev
Pump started: 0847			First discharge: 0848						172.
0850	3.3	6.6	670	18.9	595/671	reddish brown	-23	low mod.	
0905	3.5	59.1	7.51	18.7	530/598	lt. reddish brown	-7	slight	
0920	3.3	108.6	7.53	18.6	525/593	v. lt. red brown	-16	v. sl	172.
0935	3.7	164.1	7.60	18.5	525/593	v. lt. yellow brown	-12	almost clear	
0945	3.3	197.1	7.66	18.4	525/593	"	6	"	
0955	—	230.1	7.63	18.4	525/	"	14	"	

1000 Sampled, labeled A1-MW4-04, time given as 1000

C-o-C # - 100059.

Total Discharge 230.1 gal Casing Volumes 4.2 x

Method of Disposal of Discharge Water Baker Tank

Sheet 1 of 1

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/19/88 Sample Location A1-MW4-05 (320-340' screened interval)

Project Name LASC Project No. 88-03128.13

Weather Conditions Cool, overcast, light breeze

Observations/Comments Purge vol. = 54.3 gal; 3x vol = 162.9 "

Samples Collected By KJ Kinsella Lab time given as 1200

QUALITY CONTROL

Purging/Sampling Method Pumped with Hydrostar piston pump, w/screen

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed

pH Meter No. Orion SA250, SN 3917 Date Calibrated 10/19/88

Sp Conductance Meter No. YSI 33 SN 16034 Date Calibrated 10/19/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 173.95 End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity	
Pump started: 1027			First discharge: 1028						
1030	3.9	7.8	7.45	19.3	520/587	reddish brown	55	mod	173.[illegible]
1040	3.6	43.8	7.38	18.7	505/570	"	46	low mod	
1055	3	88.8	7.47	18.8	510/576	lt. yellowish brown	34	low	
1110	3.5	141.3	7.62	19.0	510/576	"	30	sl.	
1120	3.5	176.3	7.58	19.1	520/587	v. lt. yellowish brown	26	v. sl.	
1130	3.4	210.3	7.50	19.0	520/587	"	18	"	17[illegible]
1140	3.3	243.3	7.56	19.5	520/587	"	6	"	
1150	—	276.3	7.59	19.3	530	"	11	"	174.8[illegible] (?)

Sampled at 1200; Samples labeled A1-MW4-05

C.o.C # 100059.

Total Discharge 276.3 Casing Volumes 5.1

Method of Disposal of Discharge Water Baker Tank

Sheet 1 of 1

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/19/88 Sample Location A1-MW4-06

Project Name LASC Project No. 88-03128.13

Weather Conditions Warm smoggy no clouds, light breeze (364 - 384' screened interval)

Observations/Comments Purge vol. = 54.3 gal 3x = 162.9 gal

Samples Collected By

QUALITY CONTROL

Purging/Sampling Method Pumped with Hydrostar piston pump with screen

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed.

pH Meter No. YSI 3500 SN 13 Date Calibrated 10/19/88

Sp Conductance Meter No. " Date Calibrated "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 173.05 End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity	Water Level
Pump started: 1227			First Discharge: 1228						
1237	3.5	31.5	7.30	19.1	633	reddish brown	-41	mod.	173.0
1252	2.6	70.5	7.43	19.1	613	H. yellowish brown	-60	slight	173.8
1308	2.6	112.1	7.46	20.0	609	v. lt. grey brown	-61	slight	
1323	2.6	151.1	7.43	19.2	613	"	-65	"	
1338	2.6	190.1	7.44	19.1	613	"	-78	v. sl.	173.8
1348	—	216.1	7.44	19.2	613	"	-69	v. sl	

Sampled at 1400. Labeled as A1-MW4-06, time 1330

C.o.C # 600059

Total Discharge 216.1 gal Casing Volumes 4

Method of Disposal of Discharge Water Baker Tank

Sheet 1 of 1

MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/19/88 Sample Location A1-MW4 (07)

Project Name LASC Project No. 8803128.03

Weather Conditions Sunny, warm, smoggy, light breeze

Observations/Comments Sample # A1-MW4-07 screen 432'-452'

Samples Collected By DR, JL packers 429' ; 454'

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 2-3" double screen filter.

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated 1 well vol 54.3 3 well vol 162.9

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/19/88 10:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/19/88 10:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 172.98 End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ water level
Start pump 14:36		water 14:40				very muddy		
15:00	3.5	70	7.18/7.30	18.7	539/616	light dusty	-61	172.95
15:10	3.5	105	7.23/7.34	18.7	529/607	mocha	-60	172.95
clear cell - 15:20	3.5	140	7.28/7.40	18.6	527/601	"	-60	172.95
15:30	3.5	175	7.29/7.42	18.6	525/601	light mocha	-60	
dirty cell - 15:40	2	195	7.32/7.51	17.0	530/603	light murky	-59	
15:49	2	205	7.31/7.46	19.0	531/603	clear	-57	172.98
15:55	2	210	7.30/7.44	19.0	532/603	clear	-54	

3 x 12 SV - for Calibrat

15:58 - Start Sampling. C-o-C # L00061 Lab Time 16:00

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/19/86 Sample Location AI-MW4(08)

Project Name LASC Project No. 8603128.13

Weather Conditions

Observations/Comments Sample # AI-MW4-08 | screen: 476-496

Samples Collected By DR, J | packers: 473' 9" 498' 9"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/2-3" double screen filter

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated 1 well vol: 59.3 3 well vol 162.9

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/19/86 10:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/19/86 10:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 172.00 (16:30) End 178.05 (18:45)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity Water level
Start pump 16:37 water 16:37						rusty		
16:52	3.5	90	7.26/7.40	18.7	544/626	rusty brown	-44	172.96
17:05	3.5	87.5	7.31/7.46	18.7	850/973	"	-44	"
clear all 17:15	3.5	122.5	7.29/7.49	18.6	1089/1193	light rusty	-44	"
17:25	3.5	157.5	7.35/7.58	18.6	1058/1215	"	-66	172.96
clear all 17:35	2	177	7.41/7.58	18.8	1083/1237	murky	-61	"
17:45	2	197	7.41/7.58	18.7	1080/1235	"	-67	172.94

17:50 Start Sampling C-o-C# 100061 Lab time 18:00

Total Discharge 200 Casing Volumes 3.7

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/19/88 Sample Location A1-MW4-09

Project Name LASC Project No. 8803128.13

Weather Conditions Sunset, cool, smaggy

Observations/Comments Sample # A1-MW4-09 | screen: ~~518'2"~~ 520 - 540

Samples Collected By DR, JL | packers: 518'7" - 543'9"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 2-3" double ~~filter~~ screen filter.

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol - 543 3 well vol 162.7

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/19/88 10:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/19/88 10:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 173.04 (18.25) End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ water level
Start pump 18:29		Water 18:25				very brown		
18:40	3	40	7.56/7.75	18.6	1163/1321	light rusty	-37	173.00
18:50	3	70	7.44/7.61	18.6	1151/1321	"	-44	173.00
clear cell 19:00	3	100	7.40/7.57	18.6	1146/1385	murky	-39	173.00
19:10	3	130	7.47/7.67	18.6	1161/1327	"	-41	"
19:20	3	160	7.50/7.73	18.6	1178/1347	"	-41	-
clear cell 19:30	1.8	178	7.56/7.78	18.7	1196/1367	"	-31	173.00
19:45	1.5	200	7.59/7.81	18.7	1200/1370	"	-37	-
20:00	1.3	215	7.64/7.92	18.7	1206/1378	cloudy	-38	-
20:10	1.3	230	7.65/7.88	18.7	1213/1384	light cloudy	-38	173.00
20:30	1+	250	7.68/7.90	18.7	1208/1377	mostly clear	-~~28~~ 29	-

20:35 Start Sampling C.O.C. L00061 Lab time: 20:00

Total Discharge ~ 255 Casing Volumes ~ 4.7

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/19/88 Sample Location A1-MW4-10

Project Name LASC Project No. 8803128.13

Weather Conditions Dark, cool

Observations/Comments Sample # A1-MW4-10 | Screen 600-620

Samples Collected By DR, JL | Packers 578'9" ; 523'9"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/2-3" double screen filter

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated 1 well vol 54.3 3 well vol 162.9

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/19/88 10:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/19/88 10:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 173.44 (21:05) End
rising slowly

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~	~~Turbidity~~
~~21~~ Start	21:15	Water	21:20			dark brown	ok	water head
21:35	3	45	7.44/7.49	18.4	1206/1386	light rusty br.	-15	173.44
21:50	3	90	7.55/7.59	18.5	1205/1383	"	-11	173.38
clear odd - 22:00	3	120	7.51/7.55	18.5	1206/1382	murky	-11	173.38
22:10	3	150	7.58/7.55	18.6	1207/1384	"	-007	—
clear odd - 22:20	3	180	7.58/7.62	18.6	1204/1380	"	-20	
22:30	2	200	7.60/7.64	18.6	1218/1398	"	+007	
22:40	3	230	7.60/7.64	18.5	1217/1395	"	007	—

22:45 Start Sampling C-o-C # 100060 Lab Time 22:00

Total Discharge 230 Casing Volumes 4.2

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date ~~LAS~~ 10/20/88 Sample Location A1-MW4 (#1)

Project Name LASC Project No. 8803128.13

Weather Conditions Overcast - cool

Observations/Comments Sample # A1-MW4-11 | screen: 692-712'

Samples Collected By DR | packers: 688' 9", 713' 9"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 2-3" double screen filter

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol 54.3 3 well vol 162.9

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/20/88 9:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/20/88 9:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 173.83 End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eu	~~Turbidity~~ Depth
Start 9:12	Water	9.15				very rusty		
								~~173.8~~
	2.75							173.8
9:30	2.5	37.5	7.40/7.74	18.6	-	rusty	-56	173.8
10:00	2.20	108	7.53/7.82	18.7	1249/1417	light rusty	-4	173.[illegible]
clear cell 10:15	2.2	136	7.59/7.90	18.7	1221/1397	"	-3	173.[illegible]
10:30	2.2	169	7.64/7.91	18.7	1220/1391	"	007	173.[illegible]
Compressor dies - 10:50 resume								
clear cell 10:55	2.2	170	7.64/7.96	18.9	1220/1391	murky	3	-
11:00	2.2	181	7.66/7.98	18.8	1229/1400	"	4	-
11:10	2.2	203	7.65/7.92	18.7	1220/1395	"	5	-

11:12 Start Sampling Co-C#: L00060 Lab Time 11:00

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/20/88 Sample Location A1-MW4 (12)

Project Name LASC Project No. 8803128.13

Weather Conditions Very smoggy, light breeze

Observations/Comments Sample # A1-MW4-12 | screen: 808'-828'

Samples Collected By DR, SDG | packer: 806' 4", 832' 11"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump changed 3/4-2" with 30 cowled SO_2 to 2-3" double screen filter without sand.

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated | 1 well vol. 54.3 gal 3 well vol 181.1

Method of Cleaning Bailer/Pump Steam clean w/ Alconox and final DI wash

pH Meter No. YSI 3500 Date Calibrated 10/20/88 13:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/20/88 13:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 173.99 (13:15) End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ water level
Start pump 13:53 restart: 13:57 water 14:00						dark muddy		
14:15	1.2	18				muddy		173.95
15:15	1.2	90	7.33/7.56	20.9	1227/1331	mocha	30	173.95
15:30	1.5	112.5	7.37/7.55	20.3	1236/1362	"	27	173.95
15:45	1.5	135	7.28/7.43	20.8	1256/1395	light mocha	23	-
16:00 - Pull pump - 130' - replace pump - resume pumping at 16:40 - water at 16:45								
17:00	1.5	159.	Decid to pull the pipe & change screen. - Start again at 19:15					
19:30	2	179	7.42/7.62	18.9	533/610	mocha	-9	174.40
19:40	1.5	194	7.34/7.48	18.6	530/607	light yellow-mocha	-24	
19:50	1.2	206	7.36/7.49	18.7	533/608	"	-39	174.35
20:00	1.5	221	7.29/7.41	18.7	528/609		31	
20:10	1.5	236	7.30/7.42	18.7	530/606		34	174.35
20:12 - Start sampling								

Qa-c #: 200062 LAB TIME: 20:00

Total Discharge 236 Casing Volumes 4

Method of Disposal of Discharge Water

Sheet ___ of ___

LOG OF BORING No.

DATE DRILLED: EQUIPMENT: WELL 01 MW1

DESCRIPTION: ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG			TESTS
					30					
					60					
					90	112				
			40		120					
								138		
					150	152		151.54	8/22/88	
								151.57	8/24/88	
		42			180			189' 2"	20:30	Sample 01
			20			204				
					210	214		215' 11"		
		21								
					240	235		239' 2"	7:30	151.425 8/30/88 7:00
			40					255' 11"		Sample 02
					270	270				
		63			300					
					330	338		~~334' 2"~~		
			20					349' 2"	9:00	" 03
					360	358		~~360' 11"~~		
		42						~~370~~ 11" Resistance		
					390					
			20			400		399' 2"		
								424' 2"	12:00	04, 05
					420	420		425' 11"		
		21							421' 2"	
			20			441		~~444' 2"~~	457' 11"	15:30 06
					450	461		~~465' 11"~~		
		21			480			TD 475		
								TD 482'	8/22/88	
					510					
					540					
					570					
					600					

DRILLING CONTRACTOR _____

DRILLER _____

CHK'D BY _____

BY _____ DATE _____

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

First 3 screens - packers @ 25'

4th - packer @ 45'

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/29/88 Sample Location B-1-MW1 Sample 01

Project Name LASC Project No. 8803128.13

Weather Conditions Partially Clouded - Relatively low smog light breeze

Observations/Comments Sample B-1-MW1-01 | Screen 194 - 214

Samples Collected By DRui Renau | Packers 189'2" - 215'11"

QUALITY CONTROL

Purging/Sampling Method Hydrostar w/ small 6/1000 screen - no sand

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. VSI 3500 Date Calibrated 8/29/88 - 18:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 151.60 End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity O_2	
Start pump 19:40									
19:43	4.5	9	6.75/6.76	21.4	7.39/7.96	cloudy	135	-	
19:46	4.5	24	6.95/6.96	21.1	7.33/8.03	"	128	95	
19:50	4.5	45	7.02/7.02	20.2	7.31/8.14	clear	124	82-107	
19:55	4.5	67	7.13/7.13	19.9	7.33/8.16	"	121	100-103	
20:00	4.5	90	7.13/7.13	20.2	7.35/8.13	"	121	60-64	152
20:10	4.5	135	7.13/7.14	17.3	7.22/8.15	"	111	61-65	
20:15	4.5	157	7.07/7.08	19.5	7.32/8.18	"	110	63-64	152
20:20	4.5	180	7.14/7.14	17.8	7.32/8.14		109	62-65	

Start sampling 20:20

C-o-C #: 609007 Lab time: 20

20:45 Head space 22 ppm (PID)

Total Discharge ~180 Casing Volumes 3.5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/30/88 Sample Location B-1-MW1 (Sample 02)

Project Name LASC Project No. 8803128.13

Weather Conditions Clear, smoggy

Observations/Comments Sample B-1-MW-01 | Screen 235 - 275

Samples Collected By Dani Renan THH | Packers 239'2" - 255'11"

QUALITY CONTROL

Purging/Sampling Method Hydrostar w/ small 0/1000 screen - no sand

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/29/88 18:00

Sp Conductance Meter No. " Date Calibrated "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 151.40 (7:45) End 151.40 (8:40)

151.4

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity O_2	Temp
Start pumping 7:46			Water 7.48						
~~7:50~~	4.25	17	7.35/7.45	20.2	736/812	murky	136	46	
7:55	"	38	7.27/7.36	20.3	729/810	"	138	36	
8:00	"	60	7.25/7.32	19.5	728/817	cloudy	121	54	157.
8:10 check	"	103	7.23/7.31	20.3	732/811	clear	128	57	
8:20	"	145	7.23/7.31	19.9	729/813	clear	120	57	151.
8:25 check	"	162							

8:25 Start Sampling

8:45 Head space - 25 ppm PID (HS)

C-o-C #: 100008 Lab time 8:30

Total Discharge 170 Casing Volumes > 3

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/30/88 Sample Location B-1-MW1 (sample 03)

Project Name LASC Project No. 8803128.13

Weather Conditions Clear / Smogy - hot

Observations/Comments Sample B1-MW1-03 | Screen 338' - 358'

Samples Collected By DR, TMH | Packers 334'2" - 360'11"

QUALITY CONTROL

Purging/Sampling Method Hydrostar w/ Small 6/1000 screen - no sand

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/29/88 18:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 151.50 (9:30) End 151.60 (10:40)

Measuring Point (MP) Well head

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ O_2	dy
Start pumping: 9:36			Water	9:38					
9:38	4.25 [illegible]	9	7.17/7.22	19.7	735/831	Rusty	124	57	151.
9:44	>3.5 [illegible]	34	7.17/7.23	19.7	727/818	light cloudy	103	52	
9:50	>3.5	52	7.22/7.28	17.7	727/815	"	93	54	151.
9:55	>3.5	70	7.22/7.29	20.0	746/822	clear	95	57	
10:00	>3.5	85	7.22/7.28	20.0	733/815	"	94	54	151.8
10:10	"	120	7.22/7.28	20.8	754/821	"	90	55/35	close valve
10:20	"	155	7.22/7.28	20.8	751/819	"	90	30	151.
10:25	"	182	7.21/7.27	20.2	738/817	"	96	30	"

10:30 Start Sampling

Head Space - C-o-C #: L00008 Lab time 10:00

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/30/88 Sample Location B1-MW1 (04, 05) Samples

Project Name LASC Project No. 8803128.18

Weather Conditions Clear, very smoggy - hot

Observations/Comments Samples B1-MW1-04, and 05 | Screen 400'-420'

Samples Collected By DR, TAH (05 dup. of 04) | Packer 399'2" 425'11"

QUALITY CONTROL

Purging/Sampling Method

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/29/88 18:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 151.65 End 151.65 (13:15)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ DO	dpth
Start pumping 12:00 Water 12:02									
12:00	4.								
12:05	4 gpm	12	6.87/6.87	20.9	727/814	rusty	119	28	
12:07	"	28	6.93/6.96	20.1	728/815	"	114		
12:10	3	40	7.14/7.15	19.8	742/838	murky	110	27	151.
12:20	2.75	70	7.21/7.28	20.4	741/818	cloudy	87	31	151.2
12:30	"	98	7.18/7.22	21.9	768/819	clear	76	27	151.7
12:40	"	125	7.18/7.24	22.4	775/820	"	62	30	
12:50	"	153	7.19/7.22	23.2	787/817	"	55	34	151.7
12:55		165	7.18/7.24	23.6	788/815	"	53		

slow down - weak well

13:00 - Start sampling Lab times: 04 - 12:00

13:25 Head space PID (HV): 11 ppm 05 - 13:00

C.o.C #: L00008 / L00009

Total Discharge 170 Casing Volumes 3+

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/30/88 Sample Location B1-MW1 (06)

Project Name LASC Project No. 8803128.13

Weather Conditions Clear, smoggy - hot (33°c)

Observations/Comments Sample B1-MW1-06 | Screen 441 - 461

Samples Collected By DR, TAH | Packer: 431'2" 457'11"

QUALITY CONTROL

Purging/Sampling Method

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/29

Sp Conductance Meter No. " Date Calibrated

PURGING AND SAMPLING DATA

Water Level (below MP) Start 151.575 16:00 End 151.75

Measuring Point (MP) WH

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ O_2	Depth
Start: 15:57		Water 16:00							
16:00	4	0	7.12/7.13	20.4	732/816	vcv	102	27	151.
16:05	3.5	20	7.02/7.01	19.7	744/832	lightly rusty	86	26	
16:10	3.5	38	6.99/6.98	20.5	735/815	rusty	89	31	151.
Clean cell 16:20	3.5	75	7.05/7.06	20.4	738/813	light rusty	79	31	
clean cell 16:30	3.	90	7.07/7.08	20.6	746/814	cloudy	70	34	151.
16:40	3	120	7.09/7.10	22.6	771/813	clear	73	32	
16:50	3	150	7.09/7.10	20.2	729/809	"	72	37	151.
17:00	3	180	7.08/7.10	20.3	735/813	"	70	37	

Sample Time 16:30 C-o-C # L00009 Lab time 16:3

Total Discharge ~ 180 Casing Volumes > 3

Method of Disposal of Discharge Water

Sheet ___ of ___

LOG OF BORING No.

DATE DRILLED: EQUIPMENT: WELL 3-1-MW2

DESCRIPTION: ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
					10				
					20				
					30				
					40	100			
			40		50				
					60	140		W.L 134' 145.69 14:05 9/6/88	
		22			70	150		WL 145.27	
			20		80	170		9/6/88 17:00 W.L.	Sample 01, 02
					90			174' 4"	
		69			100				
			20		110	224		224' 2" 9/6/88 19:00	Sample 03
					120	249		249' 1"	
		69			130				
					140	319		319' 2"	Sample 04
			20		150	338		339' 1"	
		42			160				
					170	380		379' 2"	Sample 05
			20		180	400		404' 2"	
		21			190	420		401' 2" 434' 1"	Sample 06
			20		200	440		3" TD 452 8/22/86	
		21			210			TD - 462	
					220				
					230				
					240				
					250				
					260				

DRILLING CONTRACTOR _____ DRILLER _____ CHK'D BY _____ BY _____ DATE _____

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED

PROJECT NO

All screens - packers set at 25'

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/6/88 (taken 9/7/88) Sample Location ~~MW~~ B1-MW2-01 (02)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny smoggy warm (36°C) smoggy (vis ~2 mi)

Observations/Comments Samples B1-MW2-01, 02 Screen 150-170

Samples Collected By DP, SDG 02 = dup Packers 149'2", 174'0"

QUALITY CONTROL

Purging/Sampling Method Hydrostar ~~typeboiff~~ pump w/ 3/4-2" double screen w/ N_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump 1 well vol. ≈ 55 gal

pH Meter No. YSI 3500 Date Calibrated 9/6/88 15:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 145.56 End 145.60

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ DO	
Head space ppm									
~~Start~~ purging 16:54			Water	16.55					
~~16:57~~	4.5	4	6.65/6.64	26.1	813/844	light rusty	187	-	
50-100 17:00	9.5	23	6.72/6.91	21.9	826/878	clear	175	-	145.7
17:10	3.5 chk	60	7.03/7.03	21.4	825/892	clear	160		145.7
20-50 17:20	3.5 chk	95	7.08/7.09	23.7	857/882	"	156		
17:30	3.5	130	7.12/7.13	24.5	844/865	"	149		145.7
clear call — 17:40	3.5	165	7.10/7.11	20.6	828/893	"	148		
17:45	3.5	185	7.08/7.09	20.5	816/894	"	147		

17:45 - Sample lab time 01 - 1700
02 - 18:3

C-o-C #: 10000~~25~~15

Total Discharge 190 Casing Volumes 3+

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/6/88 later 9/7/88 Sample Location B1-MW2-03

Project Name LASC Project No. 8803/28.13

Weather Conditions Cool, breezy (19:00)

Observations/Comments Sample B1-MW2-03 | screen 229-249

Samples Collected By DR, PAA | packer 224'3", 249'1"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen w/ 5.0

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol. ≅ 55 gal

Method of Cleaning Bailer/Pump

pH Meter No. VSI 3500 Date Calibrated 9/6/88 15:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 145.54 (19:00) End 145.67 (20:30)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ DO	depth
Pumping started 19:12									
19:15	3.5	18	7.28/7.28	20.4	776/832	rusty muddy	156		145.7
19:20	3.5	35	7.17/7.17	19.8	766/855	cloudy	149		145.71
19:30	3.5	70	7.18/7.18	20.0	770/855	lightly cloudy	143		145.70
19:40	3.5	105	7.18/7.19	20.5	779/853	clear	138		"
19:50	3.5	140	7.23/7.25	19.9	768/856	"	134		145.7
20:00	3.5	175	7.20/7.21	20.1	767/854	"	133		145.7

clear cell.

20:05 Start sampling

C-o-C # L00015 Lab time 20:00

Total Discharge 185 Casing Volumes 3+

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/8/88 Sample Location B1-MW2-(04)

Project Name LASC Project No. 8803128.13

Weather Conditions Heavy Overcast w/ eye burning smog

Observations/Comments Sample # B1-MW2-04 | screen 318 - 338

Samples Collected By DR, SDG | packer 314'2" - 339'1"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen w/ SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump 1 well Vol ≈ 55 gal

pH Meter No. VSI 3500 Date Calibrated 9/7/88 13:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 145.67 (8:00) End 145.85

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ DO	dep
start pump 8:05		water 8:08				red rusty			
8:10	3	15	7.12/7.11	19.9	770/858	bright rusty	148		145.9
clear call → 8:20	2	35	7.04/7.04	20.3	782/864	light rusty	128		145.8
8:30	1.5	50	7.28/7.29	20.4	802/882	murky-cloudy	120		
8:40	1.6	65	7.27/7.28	20.7	806/883	cloudy	113		145.8
clear call 8:50	1.5	80	7.27/7.28	21.2	817/885	light cloudy	121	12.8	
9:00	2.5	130	7.32/7.33	20.5	779/857	near clear	129	13.4	145.9
9:20	~ 2.5	155	7.26/7.26	20.1	774/858	clear	123		
9:30	< 2.5	180	7.24/7.25	20.7	783/856	"	113		145.9
9:40	≈ 2.5	200	7.24/7.25	20.2	768/852	"	107		145.91
9:45			7.23/7.24	20.8	783/866	"	108		

9:45 - start samples

Head space sample 11 ppm. C.o.C #: L00016 Lab time 9:00

Total Discharge ~ 200 Casing Volumes ~ 4

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/8/88 Sample Location B1-MW2-(05)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny overcast, hot

Observations/Comments Sample # B1-MW2-05 | Screen 380-400

Samples Collected By DR, SOG | packers 379'2", 404'1"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen w/ SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol ≈ 55 gal

Method of Cleaning Bailer/Pump

pH Meter No. VSI 3500 Date Calibrated 9/7/88 12:00

Sp Conductance Meter No. " Date Calibrated 9 " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 145.76 End 145.76

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ DO - dy
start pump 11:03		Water 11:07						
11:10	1.5	7	7.17/7.18	20.6	770/851	bright cloudy	145	145.
11:20	1.5	22	6.92/6.92	20.7	795/871	"	125	145.8
11:30	1.5	37	7.07/7.08	20.4	790/872	light cloudy	99	145.8
11:40	2	57	7.22/7.23	20.2	795/880	cloudy	78	145.8
11:50	2.25	60	7.21/7.22	20.0	787/873	light cloudy	69-80	
12:00	2.25	82	7.21/7.22	20.1	787/869	"	70	145.8
12:15	2.25	115	7.21/7.22	20.6	782/869	clear	58	145.
12:30	2.5	~~140~~ 150	7.22/7.23	20.2	788/870	"	63	
12:45	2	180	7.26/7.27	20.8	799/872	"	121	
13:00	1	200	7.23/7.24	21.3	804/872	"	103	145
13:20	1	220	7.23/7.23	20.8	790/864	"	114	
1320 - Sample.		Head Space: 6				LAB TIME 12:10		AS

clear cell

Total Discharge 220 Casing Volumes ~4

Method of Disposal of Discharge Water

C.o.-C # 100016

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/8/98 Sample Location B1-MW2 (06)

Project Name LASC Project No. E803128.43

Weather Conditions Sunny, Hot

Observations/Comments Sample of B1-MW2-06 | screen: 421 - 441

Samples Collected By DR, SDG | packer 409'2" - 434'1"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen w/ SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated well vol ≈ 45 g

Method of Cleaning Bailer/Pump

pH Meter No. VSI 3500 Date Calibrated 9/7/98 13:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 145.74 (14:11) End 145.72

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~	~~Turbidity~~	
Start pump 14:16		Water 14:23					EU		
									145.
14:25	2	10	7.18/7.13	20.5	788/867	murky out	114		145.
14:30	1.25	23	7.00/7.00	20.8	791/866	"	111		
14:45	1.25	43	7.14/7.20	21.0	797/867	light rusty	96		145
15:00	1.25	60	7.20/7.20	20.9	796/870	cloudy	98		145
15:15	1.25	93	7.22/7.22	20.5	791/871	light cloudy	58		145.
15:30	1.5	115	7.22/7.23	20.7	794/870	"	62		145
16:00	1.5	160	7.23/7.23	20.9	794/866	"	48		145
16:15	1.25	185	7.23/7.24	20.4	791/867	"	38		145.
16:35	1.25	~190	7.23/7.24	21.8	812/870		35		
16:40 Sample									

C-o-C # C00016 Lab time 15:00

Total Discharge ~ 200 Casing Volumes > 4

Method of Disposal of Discharge Water

Sheet ___ of ___

LOG OF BORING No.

DATE DRILLED: EQUIPMENT: WELL - B1 - MW3

DESCRIPTION: ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
					30			B1-MW3-01 - Equipment Blank 9/13/88 11:30	
					60				
					90				
						102			
			40		120			WL 116	
								WL 127 - 9/22/88	
						142		124' 2"	128.40 9/13/88 13:00
					150			154' 1"	Sample 02 9/13/88 14:30
		37						170' 0"	131.74 (19.45)
					180	174			
			20			194		194' 11"	Sample 03 9/13/88 20:30
					210				
		42							
					240	236		234' 2"	
			20			255		259' 1"	Sample 04 9/14/88 8:00
					270				
		42							
					300	298		299' 2"	
			20			318		319' 1"	Sample 05 9/14/88 10:30
		31			330			334' 2"	
			20			339			
					360	359		359' 1"	
		63			390			Start of casing	Sample 06 9/14/88 ~~12:35~~ 12
					420	422		419' 2" 409' 2"	Sample 07 9/14/88 10
			20			442		444' 1" 434' 1"	
		12			450			TD 450' - 8/22/88	
								TD 454	
					480				
					510				
					540				
					570				
					600				

DRILLING CONTRACTOR _____ DRILLER _____

BY _____ DATE _____ CHK'D BY _____

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

All screens - packers at 25'

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/13/88 Sample Location B1-MW3(01)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny

Observations/Comments Sample # B1-MW3-01 | Alt location - equipment blank

Samples Collected By DR, SDG

QUALITY CONTROL

Purging/Sampling Method —

Method to Measure Water Level —

Pump Lines or Bailer Ropes: new cleaned dedicated —

Method of Cleaning Bailer/Pump —

pH Meter No. — Date Calibrated —

Sp Conductance Meter No. — Date Calibrated —

PURGING AND SAMPLING DATA

Water Level (below MP) Start _____ End _____

Measuring Point (MP) _____

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity

Equipment Blank - H_2O; mak II cond ≥ 1 µmhos

C-o-C # 100021 Time 11:30

Total Discharge _____ Casing Volumes _____

Method of Disposal of Discharge Water _____

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/13/88 Sample Location B1-MW3(02)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny - breeze

Observations/Comments Sample B1-MW3-02 | screen 102'-142'

Samples Collected By DR, SDG | packers 129'2" 154'1"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/3/4-2" double screen filter w/.30 SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/13/88 15:00

Sp Conductance Meter No. " Date Calibrated 9/13/88 15:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 122.60 (13:30) End 122.60 (19:30)

122.43 (15:40)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start pump - 15:40 16:15 sky water - 16:17								
16:20	2	10	7.16/7.16	22.4	787/833	cloudy	127	>130
16:30	2	30	7.16/7.16	21.8	778/834	"	119	>130
16:40	1.25	35	7.17/7.17	23.4	810/835	near clear	119	>130
17:00	1.25	47	7.15/7.16	21.8	776/833	"	119	>130
17:30	1.25	85	7.23/7.23	22.9	772/817	"	130	>130
18:50	5	90	7.26/7.27	21.1	752/822	"	142	"
19:00	5	140	7.22/7.20	20.1	741/818	"	126	"
19:05	5	165	7.24/7.25	20.0	742/824	"	119	"
19:10	5	190	7.24/7.25	20.0	742/822	"	116	"
19:15	5	215	7.24/7.25	20.0	742/823	"	114	"

clear all —

Sample - 19:15 C-o-C #: 100021 Lab time 14:30

Total Discharge 220 Casing Volumes 4

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/14/88 Sample Location B1-MW3 (03)

Project Name LASC Project No. 8803128.13

Weather Conditions Dark, Cool, Windy

Observations/Comments Sample # B1-MW3-03 | screen 174-194

Samples Collected By DR, RAL | packers 170'0", 194'10"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ 30 SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/13/88 15:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 127.55 (20:00) End 127.55 (21:20)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start pump		Water						
20:10	5	50	7.20/7.21	19.7	737/8.24	rusty light rusty	121	127.65
20:15	5	75	7.22/7.23	19.6	7.33/8.21	cloudy	103	"
20:20	5	100	7.23/7.24	19.6	7.30/817	"	100	"
20:30	5	150	7.23/7.24	19.5	729/819	near clear	101	127.67
20:35	5	175	7.24/7.24	19.5	729/818	"	102	"
20:40	5	200	7.24/7.24	19.4	727/818	"	105	"
20:45	3	225	7.24/7.24	19.5	732/820	"	98	"
20:50	3	230	7.24/7.24	19.6	730/818	"	92	"
21:00	2	250	7.24/7.25	19.8	733/816	"	88 - 85	"

Start Sampling 21:00

C-o-C #1 L00021 Lab time 20:30

Total Discharge ~260 Casing Volumes ~5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/14/88 Sample Location B1-MW3(04)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, Cool

Observations/Comments Sample B1-MW3-04 | Screen 236' - 256'

Samples Collected By DR, SDG | packers 234'2", 259'1"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ 30 SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/13/88 15:00

Sp Conductance Meter No. " Date Calibrated 9/13/88 15:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 127.60 (07:41) End 127.62 (9:15)

Measuring Point (MP) Well head

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity depth
Start pumping 7:47 Water 7:44								
7:55	4	20	7.36/7.35	19.0	712/731	rusty light rusty	128	127.62
8:00	4	40	7.30/7.31	19.2	698/788	cloudy	104	
8:10	4	80	7.31/7.32	19.2	694/785	light cloudy	97	127.62
8:20	4	120	7.32/7.33	19.1	691/788	"	102	
8:30	4	160	7.32/7.33	19.2	692/781	"	99	
8:40	>3	185	7.32/7.33	19.2	690/789	new clear	97	
clear 8:45	>3	210	7.32/7.33	19.2	—	"	115	
8:50	>3	235	7.36/7.36	19.2	692/781	moderately	93	127.62
			7.33/7.34	19.2	695/787	"	96	—
8:55 Start sampling								

C-o-C # L00022 Lab time 08:00

Total Discharge 240 Casing Volumes >4

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/14/88 Sample Location B1-MW3 (05)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, smogy, light breeze

Observations/Comments Sample # B1-MW3-05 | screen 298 - 318

Samples Collected By DN, SDG | packers 294'2", 319'1"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ 30 crushed SO_2

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/13/88 15:00

Sp Conductance Meter No. Date Calibrated

PURGING AND SAMPLING DATA

Water Level (below MP) Start 128.11 End 128.08

Measuring Point (MP) Well Head

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ dep. Th
Start Pump 9:43			Water 9:45			very rusty		
9:50	4	20	6.99/6.99	19.4	721/812	light rusty	91	128.12
9:55	4	40	7.10/7.11	19.5	710/798	light rusty	79	
10:00	4	60	7.16/7.16	19.5	708/796	pinkish rusty	73	128.10
clear cell 10:10	4	100	7.29/7.29	19.5	701/789	mocha	64	128.07
clear cell - 10:20	3.5	135	7.30/7.36	19.6	702/787	"	68	128.08
10:30	3	165	7.32/7.40	19.6	700/784	light mocha	66	128
10:40	3	195	7.28/7.37	19.7	702/784	very light mocha	67	128.0[illegible]

Start Sampling 10:40

C-o-C# L00022 Lab time 10:30

Total Discharge ~ 200 Casing Volumes ~ 3.5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/14/88 Sample Location B1-MW3-(06)

Project Name ~~Sunny, breeze~~ LASC Project No. 8803128.13

Weather Conditions Sunny, smogy, breeze

Observations/Comments Sample # B1-MW3-06 | screen 339-359

Samples Collected By | packers 334'2"; 359'1"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ 30 crushed SiO_3

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/13/88 15:00

Sp Conductance Meter No. " Date Calibrated "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 128.15 (11:15) End

128.13 (1145)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start pump 11:45		Water 16:48				rusty		
11:50	4.5	22	7.40/7.40	22.0	724/780	dark rusty	112	128.15
12:00	4.5	45	7.19/7.19	21.4	723/781	rusty	126	
12:00	4.0	45	7.17/7.17	20.5	716/787	"	116	128.16
12:10	4.0	85	7.20/7.21	21.0	716/780	"	118	128.16
clear cell 12:20	4	125	7.25/7.25	20.2	706/780	light rusty	92	128.1
clear cell 12:30	3	155	7.17/7.17	21.1	721/782	cloudy	93	128.1
12:40	3	183	7.17/7.18	20.8	715/781	light cloudy	76	128.1
12:45	3	195+	7.14/7.15	20.7	713/781	near clear	73	128.1

Start sampling 12:50

C-o-C # L00022 Lab time 12:3

Total Discharge > 200 Casing Volumes ~ 3.5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/14/88 Sample Location BI-MW3-(07)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, smogy, breezy.

Observations/Comments Sample # BI-MW3-07 | screen: 422 - 442

Samples Collected By DR, SDG | packer: 409' 2", 434' 1"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ 30 cuft/S.D.

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/13/88 15:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 128.09 End

Measuring Point (MP) well

	Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity def ft
	Start	1503	Water	15:08					
clear all	15:10	3	15	717/7.18	20.9	810/784	rusty	109	128.11
	15:25	3	30	7.31/7.32	21.3	733/789	muddy	91	128.11
	15:30	3	60	7.19/7.20	21.7	729/782	"	93	
clear all	15:40	3	90	7.20/7.20	22.3	753/793	light muddy	91	128.0
	15:50	3	120	7.37/7.38	20.6	714/783	"	96	128.0
clear all	16:00	3	150	7.21/7.21	22.4	737/780	murky	79	128.0
	16:05	3	165	7.33/7.33	20.4	720/789	cloudy	70	128.0
	16:10	3	180	7.21/7.22	20.5	714/786	"	73	
	16:20	3	210						

Start sampling 16:20.

C.o.C #: 400023 lab time 16:00

Total Discharge ~ 220 Casing Volumes 5

Method of Disposal of Discharge Water

Sheet ___ of ___

LOG OF BORING No.

DATE DRILLED: EQUIPMENT: WELL B-1 MW-4

DESCRIPTION: ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
					10				
					20				
						80			
			40					WL 105' 113.76 9/12/88 7:30	
					120	120		116.15' 8/22/88	116.55 9/11/88 15:30
		40							113.90 " 18:15
					150	162		154' 2"	
			20						Sample 01 9/11/88 19:00
					180	182		184' 1"	
		32							
					210	214		211' 2"	
			20						Sample 02 9/12/88 9:00
					240	234		236' 1"	
		63			270				
						294		294' 2"	
					300				Samples 03 9/12/88 10:00
			20			312		319' 1"	top - 04 11:00
					330				
					360				
		94							
					390				
						411		419' 2"	
			20		420	431		434' 1"	Sample 05 9/12/88 13:30
		21						TD 440' 8/22/88	
					450			TD - 452'	
					460				
					570				
					540				
					570				
					600				

DRILLING CONTRACTOR _____ DRILLER _____

BY _____ CHK'D BY _____ DATE _____

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

All screens - packers at 55'

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/11/88 Sample Location B1-MW4 (01)

Project Name LHSC Project No. 8803128.13

Weather Conditions Sunny, clear

Observations/Comments Sample B1-MW4-01 | screen 162'-182'

Samples Collected By DR, SDG | packer: 159'2" - 184'1"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ 30 SO_2

Method to Measure Water Level Sonic

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/11/88 17:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 113.75 (18:20) (varies) End 113.21 (19:15)

Measuring Point (MP) WH

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ EK	~~Turbidity~~ Depth
Start pump 18:19			Water 18:20					
18:25	~~5.4~~ gpm	25	6.84/6.85	21.7	703/758	mock	173	113.60
18:30	4.5 gpm	~~40~~	7.15/7.16	21.0	682/742	light mock	164	113.50
18:40	4.5 gpm	95	7.24/7.25	20.8	671/732	cloudy	155	113.35
18:50	4.5	140	7.30/7.31	20.6	658/722	"	139	113.27
19:00	2.5	175	7.30/7.31	20.4	657/722	light cloudy	139	113.2

dewatered

Sample - 19:00

C-o-C # 200019 lab time - 19:00

Total Discharge ~ 180 Casing Volumes > 3

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/12/88 Sample Location B1-MW4 (02)

Project Name LASC Project No. 8803128.13

Weather Conditions Heavy Overcast

Observations/Comments Sample B1-MW4-02 | screen 214-234

Samples Collected By DR, SDG | packers 211'2' 236'1"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ 30 SOC

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/11/88 17:00

Sp Conductance Meter No. Date Calibrated

PURGING AND SAMPLING DATA

Water Level (below MP) Start 116.54 End 116.55 (9:35)

Measuring Point (MP) WH

	Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
	Start pumping		8:20	Water					
	8:25	4.5	22	7.04/7.05	20.1	772/852	dark rusty	158	116.56
	8:30	4.5	45	7.32/7.33	20.8	672/735	light brown	134	116.56
clear cell	8:40	4.0	95	7.43/7.44	20.4	587/649	cloudy	127	116.56
	8:50	4.0	135	7.53/7.54	20.3	561/619	light cloudy	116	116.56
dev. cell	9:00	4.	175	7.49/7.50	20.2	558/617	" slight cloudy	115	116.56
	9:10	3	205	7.52/7.53	20.1	538/620	"	111	116.56
	9:15	3	220	7.50/7.51	19.9	556/619	"	111	116.55

Start sampling 9:15

C-o-C # 200019 Lab time 09:00

Total Discharge 275 Casing Volumes ~ 4

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/12/88 Sample Location B1-MW4 (03)04)

Project Name LASC Project No. 8803128.13

Weather Conditions

Observations/Comments Sample # B1-MW4-03, 04 | screen 297'-317'

Samples Collected By DR, SDG | packers 294'2" - 319'1"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ 30 SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated (B1 MW4-04 is a dup of 03

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/11/88 17:00

Sp Conductance Meter No. Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 116.69 (10:15) End 116.70 (11:35)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Water Start pump 10:15			Water 10:17 - dark brown					
10:20	4	20	7.40/7.44	20.0	754/832	dark brown	130	116.70
10:25	4	40	7.37/7.38	20.4	625/688	light brown	75	~~116~~
10:30	4	60	7.41/7.42	20.3	574/655	cloudy	58	116.6
10:40	4	100	7.49/7.50	20.2	572/633	"	28	116.6
10:50	4	140	7.48/7.50	20.1	565/626	"	15	
11:00	4	180	7.51/7.52	20.1	559/621	"	4	
11:10	4	220	7.51/7.52	20.0	558/620	"	1	116.6
11:20	4	260	7.51/7.52	20.0	557/619	"	-8	116.7
11:25	2	280	7.55 7.56	20.1	558/619	"	-14	116.7
11:30			5.54/7.55	20.1	558/618	"	-14	116.7
11:30 Start sampling						Lab times	03 - 10:00	
			C-o-C# L00019 / L00020				04 11:00	

clean cell

clean cell.

clean cell

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/12/88 Sample Location B1 - MW4 (05)

Project Name LASC Project No.

Weather Conditions

Observations/Comments Sample # B1-MW4-05 | screen 411 431'

Samples Collected By | packers 409' 2", 431' 1"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4 - 2" double screen filter w/ 30 SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/11/88 17:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 116.70 End 116.70

Measuring Point (MP) WH

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity depth
Start pump 12:43 Water 12:43								
12:50	3.5	17	7.63/7.64	20.7	580/635	muddy brown	72	116.70
13:00	3.5 dried	52	7.54/7.55	20.5	578/636	murky	27	116.6
13:10	4	92	7.56/7.57	20.4	586/646	cloudy	16	116.7
13:20	4	132	7.57/7.59	20.2	591/652	light cloudy	11	116.6
13:30	4	172	7.53/7.54	20.6	594/653	"	8	116.7
13:40	2	192	7.51/7.52	20.8	598/651	"	6	116.4

clear cell

Start Sampling 13:45

C-o-C # L00020 Lab time 13:30

Total Discharge ~ 200 gal Casing Volumes ~ 3.5

Method of Disposal of Discharge Water

Sheet ___ of ___

LOG OF BORING No.

DATE DRILLED: EQUIPMENT: WELL B-1-MW5

DESCRIPTION: ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
								Equipment Blan. Sample 01	15:00
					30				
					60				
					90	96			
			40		120			WL 128'	
						132		134.76' 8/22/88 135.21 7/1/88 15:00	
		24			150	160		159' 3"	7/8/88
			20		180	180		184' 2" Sample 02	8:00
					210				
		106			240	252		249' 3"	7/8/88
					270	272		274' 2" Sample 03	10:30
			20		300	276 316		299' 3" Sample 04	12:00
		48			330			319' 2"	
					360	351		349' 3" Sample 05	14:30
			20			324		374' 2"	
		24			390			Floating 380	
			20		420	419 422		419' 8" Sample 06	16:00
		34				442		444' 0"	
					450			TD 452' — 452 8/22/88	
					480				
					510				
					540				
					570				
					600				

DRILLING CONTRACTOR _____ DRILLER _____

CHK'D BY _____ DATE _____ BY _____

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/9/88 Sample Location B1-MW5-(01)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, Hot

Observations/Comments Sample B1-MW5-01 / Equipment Blank taken at B1-MW5

Samples Collected By

QUALITY CONTROL

Purging/Sampling Method –

Method to Measure Water Level –

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated –

Sp Conductance Meter No. Date Calibrated

PURGING AND SAMPLING DATA

Water Level (below MP) Start End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity

Equipment Blank w/ Mark II grade water, cond ≤ 1 µmhos

C-o-C#: 200017 Lab time: 15:00

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/9/88 Sample Location B1-MW5-(02)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, Hot

Observations/Comments Sample B1-MW5-02 | screen 160'-180'

Samples Collected By DP, SDG | packers 159'3", 184'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/3/4-2" double screen with SiO_2

Method to Measure Water Level Sounder Sample 01 was equipment blank

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump 1 well vol ≈ 55

pH Meter No. YSI 3600 Date Calibrated 9/9/88 1600

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 135.21 (15:15) End 134.48

134.47 (18:30)

Measuring Point (MP) WH

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~	~~Turbidity~~ Eh	O_2	dep
Start pump - 18:30			Water - 18:33							
						Not 2 min				
18:35	stop	-	6.95/6.96	20.6	667/736	cloudy		156		134
18:50	4	60	7.23/7.26	19.9	686/764	highly cloudy		132		134
100 ppm WH. ~~19:00~~ 18:50	4	80	7.29/7.28	20.1	696/771	near clear		137		"
19:00	4	100	7.26/7.32	19.9	687/765	clear		132		
19:10	3.5	135	7.29/7.36	20.1	692/765	"		134		
19:15	3.5	150	7.30/7.37	20.0	689/766	"		143		
19:20	3.5	170	7.30/7.37	20.1	689/764	"		141		
19:25	3.5		7.30/7.37	19.9	688/764	"		~~132~~ ~~134~~ 136		134

19:25 - Sample

C-o-C#: L00017 Lab time: 1

Total Discharge ~ 180 Casing Volumes ~ 3.5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/10/88 Sample Location ~~MW~~ B1-MW5 (03)

Project Name LASC Project No. 8803/28.13

Weather Conditions Foggy, Cool (vis ~2mi)

Observations/Comments Sample B1-MW5-03 | Screen 252 - 272

Samples Collected By DR, SDG | Packers 249'3" 274'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen w/ SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. 451 3500 Date Calibrated 9/9/88 16:00

Sp Conductance Meter No. Date Calibrated

PURGING AND SAMPLING DATA

Water Level (below MP) Start 134.58 End 134.56 (10:45)

Measuring Point (MP) W.H

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	~~Color~~	~~Odor~~	Turbidity
Start Pump 9:48 Water: 9:50								
9:52	4.5	9	6.97/6.98	19.7	664/727	pink rusty	246	
9:55	"	22	7.17/7.19	19.9	676/752	dark cloudy	207	134.57
10:00	"	45	7.28/7.31	20.2	686/757	cloudy	213	154.57
10:10	5	95	7.35/7.38	20.1	682/757	light cloudy	209	154.57
10:20	4 (w.l.)	140	7.39/7.40	20.1	684/758	v. light cloudy	202	154.56
10:30	4 check	180	7.34/7.37	20.1	684/758	near clear	202	154.56

clear all

10:30 sample

C-o-C #: 100017 Lab time 10:30

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date ~~8/10~~ 9/10/88 Sample Location ~~LASC~~ B1-MW5(04)

Project Name LASC Project No. 8803128.13

Weather Conditions Smogy, Hot (ms ~ 2mi)

Observations/Comments Sample B1-MW5-04. Screen 296 - 316

Samples Collected By DR, SDG packers 294'3" - 299'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" flexible screen fitter w/s.d.

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well Vol ~ 55

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/9/88 16:00

Sp Conductance Meter No. " Date Calibrated "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 154.52 (10:45) End 154.91 (12:40)

Measuring Point (MP) WH

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start purging 10:00 water: 10:13								
10:15	4.5		7.35/7.35	21.0	670/734	dark rusty	215	154.93
10:20	4	25	7.36/7.38	21.1	671/724	"	209	
10:33	4	65	7.45/7.48	20.9	649/707	rusty	201	154.92
10:40	3.5	100	7.44/7.48	21.5	655/704	cloudy	204	154.96
clean all 10:50	3.5	135	7.42/7.54	20.6	644/707	"	197	~154.9
12:00	3.5	170	7.43/7.46	21.0	654/712	cloudy	205	
12:10	3.5	205	7.42/7.45	20.4	658/723	light cloud	198	
12:20	3.5	240	7.41/7.45	20.4	658/725	"	199	154.[illegible]

Sample at 12:20

C-o-C #: 100018 Lab time: 12:00

Total Discharge ~240 Casing Volumes ~4

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/10/88 Sample Location ~~LASC~~ B1-MW5 (05)

Project Name LASC Project No. 8803128.13

Weather Conditions Smoggy, hot

Observations/Comments Sample # B1-MW5-05 | screen 354'-374'

Samples Collected By DR, SDG | packers 349'3", 371'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/3/4-2" double screen filter w/S.O.

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well [illegible]

Method of Cleaning Bailer/Pump

pH Meter No. YSI - 3500 Date Calibrated 9/9/88 16:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 135.17 (13:05) End 135.15 (14:10)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ DO	dep
Start pump 13:05			Water 13:07						
13:10	4	20	7.29/7.31	21.5	669/722	dark rusty	200		135.[illegible]
13:15	4	40	7.09/7.10	21.6	681/730	light rusty	175		135.1
13:20	4	60	7.18/7.19	20.9	666/725	pink rusty	163		135.1
13:32	4	80	7.35/7.38	20.4	665/731	muck	151		135.1
13:40	4	120	7.33/7.37	20.6	673/737	cloudy	164		135.1
13:50	4	160	7.38/7.42	20.2	674/743	"	152		135.1
14:00	>3	190	7.35/7.39	20.6	677/745	"	158		135.15

clear cell

clear cell

Start sampling 14:05

C-o-C # 100018 Lab time: 14:30

Total Discharge ~ 200 Casing Volumes > 3.5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/10/88 Sample Location B1-MW5 (06)

Project Name LASC Project No. 8803178

Weather Conditions Sunny, hot, breeze

Observations/Comments Sample # B1-MW5-06 | Screen 122-142

Samples Collected By | perfs 419'1", 444'0"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ $S.O_2$

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol = 55 gal

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/9/88 16:00

Sp Conductance Meter No. " Date Calibrated "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 135.24 End 135.22 (16:10)

Measuring Point (MP) WH

	Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity DO	depth
Head space	start pumping		14:50	Water	14:54					
	14:55	3	15	7.45/7.44	20.9	604/660	dark rusty	171		135.2
	15:00	3	85	7.25/7.27	20.6	642/702	"	172		135.2
2.8 gpm clear all	15:10	3	45	7.42/7.47	20.4	636/702	light rusty	154		135.2
	15:20	3	76	7.58/7.63	20.8	655/716	cloudy	158		135.2
clear all	15:30	3	105	7.40/7.44	20.5	670/734	light cloudy	164		135.2
	15:40	3.5	135	7.40/7.42	20.2	666/736	"	153		135.2
	15:50	3.5	170	7.35/7.39	20.5	670/736	"	155		135.2

15:55 start sampling

C-o-C #: 200018 Lab time 16:30

Total Discharge 180 Casing Volumes 3+

Method of Disposal of Discharge Water

Sheet ___ of ___

LOG OF BORING No.

DATE DRILLED:

EQUIPMENT: WELL 8-1-MW6

DESCRIPTION:

ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG			TESTS
					30					
					60					
					90	82				
			40					WL. 107'	111' 3"	
					120	122		112.44 8/29/86		Sample 01 8/31/88 14:30
								136' 4"		
		38			150					Sample 02 8/31/88 16:30
			20			160		159' 5"		
					180	180		184' 4"		112.45 (11:00)
										109.75 (12:00)
										WL. 109.3 (1900) 8/31/88
					210					(1430)
		106			240					
					270					
						286		284' 5"	20:00	Sample 03 8/31 20:30
			20		300	306		309' 4"		
		40			330					Sample 04 8/31 22:00
						354		349' 5"		
			20		360	374		374' 4"		
		24			390					
						398		394' 5"		Sample 05 9/1 2:00
			20							
					420	418		419' 4"		
		24						TD 442'		
					450			TD 445 - 8/29/88		
					480					
					510					
					540					
					570					
					600					

DRILLING CONTRACTOR

DRILLER

BY

DATE

CHK'D BY

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/31/88 Sample Location B1-MW6 (01)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, Hot -(32°c), very smoggy (vis ~3 mi)

Observations/Comments Sample # B1-MW6-01 | Screen: 82 - 122

Samples Collected By DR, TAH | Packers 111'5" ; 136'4"

QUALITY CONTROL

Purging/Sampling Method Hydrostar w/ 3/4 - 2 double screen w/ SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 3 well vol = 75 gal

Method of Cleaning Bailer/Pump

pH Meter No. VSI 3500 Date Calibrated 8/29/88 - / 8/31/88 15:00 w/ H_2O

Sp Conductance Meter No. " Date Calibrated 8/29/88 - / " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 112.45' (11:00) End 109.75

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ O_2 ±10	depth
start pumping		14:03	Water - 14:05						
1405	4	10	6.84/6.85	20.5	919/1012	clear	161	122	
1410	4	30	6.99/7.00	21.0	947/1030	"	153	123	
14:15	4	50	7.04/7.04	22.5	955/1024	"	150	168	
14:20	4	70	7.05/7.05	21.0	944/1028		141	220	
14:25	5	100	7.05/7.06	20.8	943/1029		134	220	sh - 4.11
14:30	5	125	7.05/7.05	20.9	938/1025		132	95	pul
14:35	5	150	7.04/7.04	20.9	938/1026		128	95	
14:40	5	175	7.05/7.05	20.9	938/1024		126	95	

start sampling 14:40 Logged Time: 1430

Head Space - 120 ppm C-o-C#: L00010

Total Discharge 180 Casing Volumes >5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/31/88 Sample Location B1-MW6 (O2)

Project Name LASC Project No. 8803129.13

Weather Conditions Sunny, Hot (30°C) Smoggy

Observations/Comments Sample: B1-MW6 + O2 | Screen 160-180

Samples Collected By DR, TAH | Packers: 159'5", 174'4"

QUALITY CONTROL

Purging/Sampling Method Hydrostar w/ 3/4-2" double screen w/ SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well rod ~ 50 yd

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/29/88 | 8/31/88 13:00 H_2O/D

Sp Conductance Meter No. " Date Calibrated 8/29/88 | 8/31/88 " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 109.75 End 109.30 (14:3)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ O_2	dopt
Start Pumping		15:40	Water.. 15:42						
	52 str.								
15:43	5 check	10	7.03/7.02	21.6	638/1009	rusty	124		
15:45	5	25	6.76/6.79	21.8	966/1038	"	85 100		
15:50	5	50	6.88/6.88	21.3	944/1027	light rusty			
15:55	5	75	6.93/6.93	21.8	954/1018	"	50	104	10[illegible]
clear cell 16:00	5 check	100	7.10/7.14	20.8	933/1020	murky	35	117	
clear cell 16:05	5	125	6.96/6.98	21.9	937/1004	cloudy	39	104	
16:10	5	150	7.16/7.17	21.2	950/1030	"	27		109.[illegible]
16:15	5 check	175	7.09/7.08	21.6	940/1010	slightly cl	27	130	
16:20	5	200	7.12/7.13	21.4	939/1010	clear	27	—	
Start Sampling		16:20							

Waited till water cleared.

Head Space - 0 ~~C-o-C~~ Sample Time 16:3[illegible]

Total Discharge 200 Casing Volumes ~ 4

Method of Disposal of Discharge Water

C-o-C #: L00010 Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/31/88 Sample Location B1-MW6 (03)

Project Name LASC Project No. 8803128.13

Weather Conditions Cool, Very Smogy

Observations/Comments Sample # B1-MW6-03 | Screen - 286 - 306

Samples Collected By DANI RENAN | Packers 284'5", 309'4"

QUALITY CONTROL

Purging/Sampling Method HYDROSTAR w/ 3/4-2" screens w/ SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3800 Date Calibrated 8/29/88 | 8/31/88 13:00 w/ D1-14.0

Sp Conductance Meter No. " Date Calibrated "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 110.93 End 111.20

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ O_2	depth
Start Pumping 20:17 Water									
20:20	5	..	660/660	21.7	719/774	very rusty	81	78	
20:25	5	25	6.77/6.77	20.3	711/783	rusty	39	64	
20:30	5	50	6.78/6.77	20.2	783/866	"	18	—	111.0
20:35	5	75	676/676	20.3	~~676/668~~	cloudy	04	79	
clean cell 20:40	5	100	684/681	20.4	795/876	"	-08	-	
20:45	5	125	693/693	20.1	791/872	"	-22	85	111.15
change rate clean cell 20:50	4	145	702/7.03	20.3	789/870	light cloudy	-22	.	
20:55	4	165	711/7.15	20.2	781/861	v. lightly cloudy	-35		
21:00	4	185	7.04/7.06	20.4	785/863	"	-29 -31	83	
21:10	~4	200	7.10/7.13	20.3	780/860	nearly clear	-32		111.17
21:20		215	7.15/7.19	20.5	776/852	clear	~~84~~ 33		

21:20 Start sampling (1:40) Head space 100 ppm | Time 20:30

Total Discharge 220 Casing Volumes 4

Method of Disposal of Discharge Water

C-o-C# L00010

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/31/88 Sample Location ~~M~~ B-1-MW6 (04)

Project Name LASC Project No. 8803128.13

Weather Conditions Cool, Smogy

Observations/Comments Sample # B1-MW6-04 | Screen 354 - 374

Samples Collected By DAN RENAN | Packers 349'5", 374'4'

QUALITY CONTROL

Purging/Sampling Method HYDROSTAR w/ 3/4-2" screens w/ $S.O_2$

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. VSI 3500 Date Calibrated 8/29/88 | 8/31/88 4300 H_2O-01

Sp Conductance Meter No. Date Calibrated " | "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 112.525' (11:15) End 112.55 (12:05)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ O_2	depth
Start Pumping 22:20			Water 22:22						
22:25	4.5	10	6.99/6.99	20.3	875/972	Dark Brown Sediments	05		
22:30	4.5	35	7.08/7.12	20.1	868/961	Murky Murky	-14	55	
22:35	4.5	57	7.02/7.06	20.2	893/787	"	-07		
22:45	4.5 check	92	7.18/7.22	20.1	901/995	"	-09	48	112
clear cell 22:55	4.5	137	7.24/7.31	20.0	907/1006	"	-07		
23:05	4.5	182	7.26/7.34	20.0	913/1012	cloudy	-06	56	112
clear cell 23:15	4.5	227	7.29/7.37	20.0	913/1011	slightly cloudy	05		
slow down purge rate 23:15	~2.5	250	7.30/7.39	20.0	913/1012	v. lightly cloudy	07	69	
23:30	~2.5	275	7.28/7.38	20.0	913/1012	"	11		
clear cell 23:45	~	300	7.35/7.47	20.0	914/1013	nearly clear	06		

24:00 Head space - 60 ppm TIME 22:00

Total Discharge ~300 Casing Volumes 2 6

Method of Disposal of Discharge Water

C-o-C# 200011

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date ~~8/31/88~~ 9/1/88 Sample Location B1-MWG-(05)

Project Name LASC Project No. 6803128.13

Weather Conditions Cool, clear

Observations/Comments Sample # B1-MW6-05 | screen 398 - 418

Samples Collected By DANI RENAN | packers 394'5", 419'4"

QUALITY CONTROL

Purging/Sampling Method Hydrostar w/ 3/4-2" double screen w/ SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/29/88 | 8/31/88 13:00 DI/H_2O

Sp Conductance Meter No. " Date Calibrated " | "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 112.575 End after pullout

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity O_2	depth
Start pumping. 12:45			Water	12.49					
12:50	3	-	7.32/7.42	20.1	912/1010	very dr. br.	21		
1:00	3	30	7.28/7.36	20.2	911/1007	rusty dr. br.	24	55	112.6
1:10	3.5	~~40~~ 55	7.25/7.33	20.3	912/1007	"	26		
1:20	2.5	~~60~~ 80	7.27/7.35	20.3	911/1004	"	28	57	
increase speed 1:30	2.5	110	7.27/7.35	20.2	905/1000	murky	32		112.6
clear cell 1:45	3	150	7.25/7.34	20.1	908/1007	cloudy	26	60	
200	2.5	195 chet	7.28/7.38	20.1	910/1008	cloudy	16		112
2:15	2.5	230	7.28/7.37	20.1	911/1008	cloudy	8	75	
Wash cell 2:30	2.5	260	7.31/7.41	20.1	911/1008	"	4		112.

Start sampling at 2:30 TIME 0200

9/1/88 0300 Head space: 0 C-oC# L00011

Total Discharge 270 Casing Volumes ~5

Method of Disposal of Discharge Water

Sheet ___ of ___

LOG OF BORING No.

DATE DRILLED:

EQUIPMENT: WELL B-1 - NW7

DESCRIPTION:

ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT. N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
					30				
					60				
					90				
						101		112.85 -	18:00
			40		120			WL 112 / WL 123.15 8/22/88	123.70 9/15/88 14:30 / 123.85 " 15:30
								129' 3"	
		21			150	141		154' 2" / 159' 3"	Sample - 01 9/15/88 17:00
						162			
			20		180	182		184' 2"	Sample - 02 9/15/88 19:00
		52			210				
			20		240	234		229' 3"	Sample 03 9/15/88 21:00
						254		254' 2"	
					270				
		53							
					300	307		304' 3"	Sample 04 9/16/88 8:30
			20						
					330	327		329' 2"	
		10				337		339' 3"	
			20		360	357		359' 2"	~~Sample 05 9/16/88~~ clogged
		53			390				
			20		420	410		409' 3"	Sample CC 9/16/88
						430		434' 2"	
		21			450			TD - 451 / TD 453 - 8/22/88	
					480				
					510				Sample TB 9/16/88 11:00
					540				
					570				
					600				

DRILLING CONTRACTOR

DRILLER

BY

DATE

CHK'D BY

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/15/88 Sample Location B1-MW7-(01)

Project Name LHSC Project No. 8803128.13

Weather Conditions Sunny, light breeze

Observations/Comments Sample # B1-MW7-01 | screen 101 - 141

Samples Collected By DR, SDG | packers 129'3", 134'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/30 cycles SO_2

Method to Measure Water Level Sounder.

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol ~ 45 gal

Method of Cleaning Bailer/Pump

pH Meter No. VSI 3500 Date Calibrated 9/15/88 14:30

Sp Conductance Meter No. " Date Calibrated 9/15/88 14:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 123.05 End ~122.0

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ En	~~Turbidity~~ depth
Start pumping 15:55 Water 15:56						rusty		
16:03	4.5	>90	7.23/7.28	21.9	652/704	milky rusty	121	>130
16:20	4.5	142	7.30/7.37	21.7	660/701	cloudy	126	>130
16:30	4.5	157	7.36/7.51	21.7	648/690	light cloudy	101	> "
16:35	2.5	168	7.30/7.42	22.1	647/684	"	100	"
16:40	2.5	~180	7.37/7.53	21.6	649/691	"	97	"
16:45	2.5	~205	7.30/7.43	22.5	660/687	"	96	"

clear call

clear call

Start sample 16:45

C-o-C #: 100024 Lab time 17:00

Total Discharge 210 Casing Volumes ~ 5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/15/88 Sample Location B1-MW7 (02)

Project Name LASC Project No. 8803128.13

Weather Conditions Light breeze, cool

Observations/Comments Sample # B1-MW7-02 | screen 162 - 182

Samples Collected By DR, SDG | packers 159', 184'

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ 30 crushed SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol ~ 55 gal

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/15/88 14:30

Sp Conductance Meter No. " Date Calibrated 9/15/88 14:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 122.85 (16:00) End ~123.50

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~
Start pumping - 18:00 Water - 18 01						rusty		
18:05	4	20	7.30/7.45	20.3	621/680	rusty	115	123.69
18:10	4	40	7.26/7.37	20.7	634/685	"	114	124.10
clean cell 18:20	3	70	7.30/7.46	20.0	622/682	cloudy	98	124.20
18:30	3	100	7.28/7.43	20.0	626/685	cloudy	101	124.3
clean cell 18:40	3	130	7.35/7.53	19.8	620/684	"	98	124.2
18:50	2.5	155	7.30/7.42	19.8	621/684	"	95	124.2
clean cell 19:00	2	175	7.36/7.52	19.9	622/685	"	94	123.9
19:05	2	185	7.33/7.41	19.9	623/684	"	95	123.7
~~14~~								
19:05	Start Sample							

C-o-C #: L00024 Lab time: 19:00

Total Discharge ~190 Casing Volumes ≥ 3.5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/ /88 Sample Location B1-MW7 (03)

Project Name LASC Project No. 8803128.13

Weather Conditions dark, clear, light breeze, cool

Observations/Comments Sample # B1-MW7-03 | screen : 234' - 254'

Samples Collected By DR, SDG | packer : 227'3", 254'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ 30 coarse

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol ~ 55 gal

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/15/88 14:30

Sp Conductance Meter No. " Date Calibrated 9/15/88 14:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 123.25 (19:45) End 123.27 (21:30)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~	~~Turbidity~~
Start pump 18:40 Water - 19:50						rusty		
20:00	4	40	7.31/7.31	19.7	624/690	- rusty	115	123.3
20:10	4	80	7.28/7.29	19.7	621/687	light rust	103	123.2
clear cell 20:20	4	120	7.36/7.37	19.8	624/689	murky	95	123.4
20:30	2	150	7.34/7.35	19.8	623/689	"	96	123.
clear cell 20:40	2	170	7.38/7.39	19.8	622/689	"	92	123.
20:45	2	180	7.33/7.34	19.8	622/689	"	95	123.
20:50	2	190	7.33/7.34	19.8	622/689	"	95	"

Start sampling 20:50

C.o.C #: L00024 Lab time 21:00

Total Discharge ~190 Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/16/88 Sample Location B1-MW7 (04)

Project Name LHSC Project No. 8803128.13

Weather Conditions Foggy Cool

Observations/Comments Sample # B1-MW7-04 | screen 307-327

Samples Collected By DR, SDG | packer 304'3" - 329'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter, w/30 SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol ~ 55 gal

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/15/88 14:30

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 123.67 (7:45) End 123.72 (8:50)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start pumping		7:45	Water	7.47		rust		
7:55	4	40	7.34/7.38	20.0	573/660	rusty	101	123.72
8:00	4	60	7.28/7.24	20.1	577/638	milky rust	64	123.74
8:10	4	100	7.27/7.28	20.1	573/635	murky	31	123.74
dry well - 8:20	4	140	7.30/7.31	20.1	577/637	cloudy	-007	123.74
8:25	4	160	7.30/7.31	20.1	573/636	"	-24	123.74
dry well - 8:30	3	175	7.31/7.32	20.1	570/631	milky clay	-34	123.74
8:35	3	190	7.34/7.35	20.1	571/637	"	-40	123.74
8:40	2	200	7.38/7.39	20.1	570/630	"	-40	123.73

840 Start Sampling

C-o-C #: L00025 lab time 08:30

Total Discharge ~ 210 Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/16/88 Sample Location B1-MW7(OS)

Project Name LASC Project No. 8803128.13

Weather Conditions Foggy, cool, light breeze

Observations/Comments Sample # B1-MW7-05 | screen: 337-357

Samples Collected By DR, SDG | packers: 334'3", 359'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter w/ 30 crushed SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol ~ 55 gal

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/15/88 14:30

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 123.72 (9:10) End 123.72

Measuring Point (MP) WH

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~	~~Turbidity~~
Start pumping - 9:15			Water - 9:18			muddy		
9:25	3.5	35	7.70/7.67	19.8	614/685	muddy	15	123.77
9:30	3.5	50	7.48/7.49	20.0	600/686	"	12	123.77
9:40	3.5	85	7.42/7.43	20.1	598/662	milky brown	2	123.77
9:50	3.5	120	7.39/7.40	19.9	589/662	light muddy	6	123.

10:00 - Pump clogged - pull pipe

Abandon the sampling of the Well

C-o-C #: — Lab Time 10:00

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/16/88 Sample Location B1-MW7-TB

Project Name LASC Project No. 8803128.13

Weather Conditions Foggy, cool

Observations/Comments Travel Blank DI water

Samples Collected By DR

QUALITY CONTROL

Purging/Sampling Method —

Method to Measure Water Level —

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. — Date Calibrated

Sp Conductance Meter No. — Date Calibrated

PURGING AND SAMPLING DATA

Water Level (below MP) Start End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity

Travel Blank - DI Water

Lab Time — 11:00

C-o-C #: 100025

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

LOG OF BORING No.

DATE DRILLED: EQUIPMENT: WELL B-1 - MW2

DESCRIPTION: ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT-N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
								Equipment blade 9/2/88 10:30	Sample 01
					30				
					60				
					90				
						95		W.L. 101'	
			40		120			W.L. 112.10" 119' 3" 9/2/88 10:30	9/2/88 02
						135		144' 2" 12:00	
		21			150				
			20			156		159' 3"	
					180	176		179' 2" 17:00	
		42							
					210			214' 3"	Sample 03
			20			218			
					240	238		239' 2" 19:00	
		52			270				
						290		289' 3"	
			20		300			8:30	9/3/88 04
						310		314' 2"	
					330				
		53							
					360	363		359' 3"	
			20			383		384' 2" 10:30	9/3 05
		21			390				
						414		379' 3" 13:30	9/3 06
			20		420	424		424' 2"	
		28							
					450			TD 452' 453' 5" - 9/2/88	
					480				
					510				
					540				
					570				
					600				

DRILLING CONTRACTOR

DRILLER

CHK'D BY

BY

DATE

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/2/88 Sample Location B1-MW8 (01)

Project Name LHSC Project No. 8803128.13

Weather Conditions Sunny, Hot, smoggy (Vis ~ 1 mi)

Observations/Comments Sample B1-MW8-01 | ~~Field~~ Equipment Blank

Samples Collected By DE, TAH, SDG | Taken at B1-MW8

QUALITY CONTROL

Purging/Sampling Method –

Method to Measure Water Level –

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump –

pH Meter No. – Date Calibrated –

Sp Conductance Meter No. VSI 350 Date Calibrated –

PURGING AND SAMPLING DATA

Water Level (below MP) Start End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity

Equipment Blank w/ Water Mark II Type Cond - ≤ 1 µmhos

C-o-C#: 600012

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/2/88 Sample Location B1-MW8 (O2)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, Hot (40°C) Very Smoggy (vis ~4mi)

Observations/Comments Sample B1-MW8-02 | Screen 95-135

Samples Collected By D.R, TAH, S.D.G | Packers 119'3" 149'3"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" chal-G screen w/ SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol ≈ 6.0 gal

Method of Cleaning Bailer/Pump

pH Meter No. YSI - 3500 Date Calibrated 9/2/88 11:00

Sp Conductance Meter No. " Date Calibrated 9/2/88 11:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 112.10' (10:00) End

111.95 (11:35)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ O_2	
Start pump 11:45 Water 11:46									
11:47	5	15	6.83/6.85	26.6	862/842	light rusty	169		
11:50	5	25	6.95/6.95	23.4	819/857	"	177		116.7
11:55	3.5	50	7.11/7.12	21.7	666/717	cloudy	155	84	
12:00	3.5	60	7.20/7.20	21.1	618/650	light cloudy	140		115.2
12:10	3.5	95	7.35/7.35	21.5	604/654	cloudy	114	65	
12:20	3.5	120	7.17/7.19	20.7	603/660	v. lightly cloudy	99		
12:30	3.5	150	7.27/7.27	21.7	626/668	"	98	64	115.
12:40	3.5	180	7.28/7.29	20.8	613/671	nearly clear	89		114.
12:50	2.5	210	7.32/7.33	22.8	669/679	clear	89		114.2
13:00	2.5	240	7.32/7.32	22.1	638/680	"	89		

13:00 - Start sampling

clean space PID = 0 Time: 13:00

clear cell -

Total Discharge ~250 Casing Volumes > 4

Method of Disposal of Discharge Water

C-o-C # L00012 Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/2/88 Sample Location B1-MW8-(C3)

Project Name LASC Project No. 8803128.13

Weather Conditions Partially cloudy (~40°) hot and smoggy.

Observations/Comments SAMPLE B1-MW8-03 | Screen 156-176

Samples Collected By PR, TAH, SDG | Packers 159'3"; 179'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w 3/4-2" double screen w/S.O.

Method to Measure Water Level sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well for 1 ≈ 80

Method of Cleaning Bailer/Pump

pH Meter No. YSI 5600 Date Calibrated 9/2/88 11:00

Sp Conductance Meter No. " Date Calibrated 9/2/88 11:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 112.10 (16:15) End 112.25 (17:25)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ O_2	depth
Start pumping		16:16	Water			very rusty			
16:20	4	40	7.38/7.39	21.4	725/653	"	167		113.
16:30	4	60	7.12/7.12	20.7	765/740	murky	153	42	113.
16:40	3.5	90	7.12/7.12	20.7	668/733	cloudy	118		113.0
16:50	3.5	125	7.20/7.08	20.8	657/724	"	101	44	
17:00	3.0+	160	7.14/7.14	21.2	663/719	clear	101		112.9
17:10	3.	170	7.15/7.16	20.7	662/721	"	101	–	112.9

clear cell

17:15 Sample

Head space PID (Hx) = 1.5 ppm Lab Time 17:00

C-o-C #: 200013

Total Discharge 200 Casing Volumes ~ 4

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/2/88 Sample Location B1-MW 8 (04)

Project Name LASC Project No. 8803128.13

Weather Conditions Partially cloudy, strong breeze

Observations/Comments Sample # B1-MW8-04 | Screen 218 - 238

Samples Collected By DR, SDG, | Packer 214' 3" 239' 2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar w/ 3/4-2" double screen w/ SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 Well Volume ≅ 50 gal

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/2/88 11:00

Sp Conductance Meter No. " Date Calibrated 9/2/88 11:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 112.54 End 112.61

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor / Eh	Turbidity / DO_2	dep
Start pump 18:02		Water 18:03							
1805	~4	10	7.22/7.24	20.3	555/613	very rusty	89		112.
1810	3.4	25	7.09/7.09	20.4	562/620	"	88	36	112.
1820	3	60	7.19/7.22	20.3	556/614	rusty	81		112
1830	3	90	7.24/7.27	20.3	557/614	"	77		112.
clear out 1840	3.5	120	7.31/7.35	20.0	565/626	light rusty	70		112.0
1850	3.5	150	7.34/7.40	20.3	568/639	"	69	42	
1900	2.5	175	7.35/7.41	20.0	568/682	murky	64		112.
1910	2.5	200	7.35/7.40	19.6	566/634	murky	63		112.
1920	2.5	~~220~~ 225	7.36/7.42	20.1	599/662	murky	~~[illegible]~~ 63		112.
1930	2	~~200~~ 245	7.39/7.44	19.8	568/~~682~~ 629	murky	~~[illegible]~~ 60		112.0
							Lab time	~~19:00~~ 20:00	
Sample 19:30			C.o.C #: L00013						

Total Discharge 250 Casing Volumes >4

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/3/88 Sample Location ~~M~~ B1-MW8 (A5)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny

Observations/Comments Sample ID# B1-MW8-05 | screen 290-310

Samples Collected By DR, SDG | packers 289'3", 314'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar w 3/4-2" double screen w/ SiO_2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump 1 well Volume ~55

pH Meter No. YSI 3500 Date Calibrated 9/2/88 11:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 112.52' (9/1/88 21:00) End 112.45 (8:45)

112.50' (7:10)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ O_2	depth
Start pumping: 7:20 water 7.22									
7:25	4	20	7.66/7.67	19.7	601/670	v. turbid. light rusty	124		
7:30	4	60	7.56/7.57	20.0	606/676	murky	120	189	112.-
7:40	4	100	7.52/7.56	19.8	606/677	cloudy	107	[illegible]	
7:50	3.8	135	7.54/7.55	19.8	607/678	cloudy	99	186	112
8:00	3.5	170	7.53/7.53	20.1	609/675	murk	88	124	112
8:10	3	200	7.52/7.53	20.2	606/673	" ~~cloudy~~	84		112.
8:20	3	230	7.55/7.56	20.2	605/672	cloudy	79		112
8:30	3	260	7.53/7.54	20.1	604/674	"	78		112.

Sample: 8:30

Head space 0 - indeterminate

C.o-C#: 200014 Lab Time 8:30

Total Discharge 260 Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date ~~8/~~ 9/8/88 Sample Location B1-MW8-(06)

Project Name LASC Project No. 88 03128.13

Weather Conditions Sunny & hot (26°c) no wind

Observations/Comments Sample ID # B1-MW8-06 | screen 368-383

Samples Collected By DR, SDG | packers 359'3" 384'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar & 3/4-2" double screen w/S. O2

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well Vol ≈ 55 gal

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/2/88 11:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 112.37 End 112.25

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ O2	Depth
Start purging 9:22 water 421									
9:25	3.7	10	7.55/7.52	20.4	432/480	olive br. v. turbid ~~cloudy~~	106		
9:30	3.5	25	7.48/7.49	21.4	431/466	"	105	126	112.[illegible]
9:40	3.5 drop	60	7.36/7.37	21.9	419/451	dr. br.	35		
9:50	3.0+	90	7.43/7.44	20.8	420/461	"	-007		112.3
10:00	3+ [illegible]	120	7.43/7.43	20.8	449/474	br	-69	126	
10:10	3+	150	7.39/7.38	20.8	437/478	br	-92		112
10:20	3+	180	7.46/7.46	21.5	457/495	br	-98		112.[illegible]
10:30	3+	210	7.48/7.50	~~21.7~~ 21.7	~~477~~ 476/505	br	-84		
clear cell 10:40	3	240	7.60/7.61	21.0	471/510	light br	-66		112.[illegible]
10:50	3	270	7.52/7.52	21.2	483/528	cloudy	-62		112.[illegible]
11:00	3	300	7.55/7.56	22.1	503/539	"	-53		112.
11:10	3	330	7.55/7.56	21.7	493/531	light clear	-57		

Lab Time 10:30

11:15 Samples

Total Discharge 340 Casing Volumes ~6

Method of Disposal of Discharge Water

C-n-CH L00014

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/3/88 Sample Location B1-MW8-07

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny very hot. (33°c)

Observations/Comments sample # B1-MW8-07 | Screen 404-424

Samples Collected By DR, SDG | Packers 399'3" - 424.4"

QUALITY CONTROL

Purging/Sampling Method Hydrostar w/ 3/4-2" double screen w/ SIG

Method to Measure Water Level sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol ≈ 55 gal

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/2/88 11:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 112.22 (12:25) End 112.20

Measuring Point (MP) well cleaned

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ DO	dep
Start pump 12:25		Water 12:28							
12:30	3.5	10	7.55/7.56	21.7	414/449	light br emulsion	26		11.
12:40	3.5	45	7.33/7.33	20.8	410/454	Yellow-br emul	-5	126	112..
12:50	3.5	80	7.24/7.24	21.8	416/451	"	-37		112.
13:00	3.5	115	7.38/7.38	22.5	479/507	"	-41	44	112.3
13:15	3.0	160	7.39/7.39	23.3	552/574	cloudy	-49		112.
13:30	3.	190	7.53/7.53	22.4	552/583	"	-46		
13:45	3	225	7.38/7.39	21.3	569/615	light cloudy	-42		112.
1400	3	240	7.46/7.47	22.6	571/612	"	-32		112..
14:15	~3.5	270	7.46/7.46	21.8	588/632	"	-37		112.

clear cell

14:15 Start Sampling Last Time 13:3

C-o-C #: L00014

Total Discharge 280 Casing Volumes 5

Method of Disposal of Discharge Water

Sheet ___ of ___

LOG OF BORING No.

DATE DRILLED: EQUIPMENT: WELL B-1-MW9

DESCRIPTION: ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
								2 inches To well head 8"	
					130				
						35			
			40		160			W.L - 162	171.64 10/13/88 10:30
175'						178		164' 2"	Sample 01 10/13/88 13:35
3' 10"					190				
6									
184 in									
		86			220				
st st.	175'				250				
pump	3' 10"					264		263' 2"	
block	85'		20		280	284		289' 6"	Sample 02 10/13/88 15:30
	285' 2"								
		48			310				
st st	240'							326' 2"	
pump	3' 10"				340	332			Sample 03 10/13/88 17:00
block	85'		20			352		354' 6"	
	328' 2"	34	55		370				
st st.	295'		20		400	396		383' 2"	Sample 04 10/14/88 10:00
bl + pump	88' 10"					406		409' 6"	
	383' 2"	48			430				
			70						
st st	265				460	454		453' 2"	Sample 05 10/15/88 0900
bl + pump	88' 10"		20			474		479' 6"	
	453' 2"	24			490			493' 2"	
			40			498			Sample 06 10/15/88 1100 (Duplicat set # B1-MW9-07 taken)
			20		520	518		519' 6"	
		24							
								TD 542	
					550				
					580				
					610				
					640				
					670				
					700				

DRILLING CONTRACTOR

DRILLER

CHK'D BY

BY

DATE

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED

PROJECT NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/13/88 Sample Location B1-MW9-(01)

Project Name LASC Project No. 8803128.13

Weather Conditions Partially overcast, light breeze

Observations/Comments Sample # B1-MW9-01 | screen 138 - 178

Samples Collected By DR SDG | packer - Bottom - 184' 2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well volume: 22 gal

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/13/88 11:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/13/88 11:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 171.45 (12:40) End 171.55 (13:30)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ Depth
Start pump 12:42		Water 12:44						
12:50	3.75	~35	6.84/6.86	20.1	850/943	near clear	187	171.96
12:55	4.	55	6.88/6.89	20.2	850/941	"	176	171.9
13:00	4	75	6.92/6.95	20.2	858/952	clear	161	171.9
13:05	2.25	90	6.92/6.97	21.2	859/936	"	156	
13:10	2.25	100	6.92/6.95	20.6	858/942	"	150	171.75
13:15	2.25	112	6.94/6.98	20.8	860/943	"	144	
13:20	2.25	125	6.92/6.96	20.7	857/941	"	139	171.73

13:20 Start sampling

Take 3 ID. SV for calibration C-o-C #: L00046. Lab time 13:30

Total Discharge 130 Casing Volumes ~5.9

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/13/88 Sample Location B1-HW9 (02)

Project Name LASC Project No. 8803128.13

Weather Conditions Partally cloudy, light breeze

Observations/Comments Sample # B1-HW9-02 | Screen 264 - 284

Samples Collected By DR | packer 263'2", 289'6"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated 3 well volume = 170.39 (1 well volume 56.23)

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/13/88

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/13/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 171.33 (14:35) End 171.51 (16:05)

171.30 (14:45)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ Depth
Start 14:48	water : 14:50					rusty		
~~15:15~~	4							
15:15	4	100	6.96/7.00	20.2	799/881	cloudy	114	171.55
15:20	4	120	6.94/6.98	20.2	801/882	"	60	
15:30	4	160	6.98/6.96	20.1	-	clear	3	
15:40	3	190	6.93/6.97	20.6	801/878	"	-12	171.50
15:45	3	205	6.94/6.98	20.3	796/878	"	-26	
15:50	3	225	6.95/7.01	20.0	799/882	"	-36	171.50
15:55	3	240	6.93/7.00	20.4	799/879	"	-38	

Start sampling 15:55

C-o-C #: 100047 lab time 15:30

Total Discharge ~ 240 Casing Volumes ~ 4.2

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date ~~8/2~~ 10/13/88 Sample Location B1-MW9 (03)

Project Name LASC Project No. 8803128.13

Weather Conditions Partially overcast

Observations/Comments Sample # B1-MW9-03 | screen 332-352

Samples Collected By DR, JKM | packers 328'2", 354'6"

QUALITY CONTROL

Purging/Sampling Method

Method to Measure Water Level Electric sounder.

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well 3 Well Volume 56.23 170.39

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/13/88 11:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/13/88 11:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 171.38 (16:35) End 171.58 (17:55)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start pump	16:35	Water	16:37			very rusty		
	4.25					very rusty		
16:55	4.25	65	6.96/7.04	20.1	830/926	murky	-23	171.65
17:05	4.25	107.5	6.97/7.01	19.8	815/909	very cloudy	-46	171.68
17:15	4.25	150	6.98/7.03	19.6	811/907	cloudy	-50	171.62
clear cell — 17:20	4.25	171.5	7.03/7.09	19.6	810/904	light cloudy	-53	171.62
17:25	2+	182	7.03/7.11	19.7	809/904	"	-53	171.60
17:30	2+	195	7.03/7.09	19.7	811/906	near clear	-61	171.60
17:35	2	215	7.03/7.09	19.7	812/905	clear	-62	171.58

17:40 Start sampling

C-o-C #: 100049 Lab time 17:00

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/14/88 Sample Location B1-MW9 (04)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, muggy, light breeze

Observations/Comments Sample # B1-MW9-04 | screen: 386-406

Samples Collected By DP, KJK | packer: 383' 2"; 409' 6"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 1/4-2" double filter screen.

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol 52.22 3 well vol 170.3

Method of Cleaning Bailer/Pump Steam-clean & final DI Rinse

pH Meter No. YSI 3500 Date Calibrated 8/14/88 16:00

Sp Conductance Meter No. YSI3500 Date Calibrated 8/14/88 16:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 171.38 (17:10) End

Measuring Point (MP)

	Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
	Start pump	17:10	Water	17:18 -			rusty		
	17:15	4.5	10	7.15/7.16	19.7	812/906	very dirty	196	
	17:25	4.5	~~[illegible]~~	7.13/7.19	19.6	833/931	light dirty	122	171.85
clear well -	17:35	4.5	100	7.22/7.23	19.6	810/906	very cloudy	100	171.86
	17:45	4.5	185	7.18/7.18	19.5	802/900	"	62	171.82
clear well -	17:55	4.5	190	7.18/7.19	19.5	801/902	cloudy	42	171.85
clear	18:00	2	200	7.22/7.23	19.5	800/898	cloudy	42	171.80
	18:05	2	210	7.20/7.21	19.5	801/899	light cloudy	23	171.79
	18:10	2	220	7.20/7.21	19.4	800/897	very light cloudy	-12	171.79
	18:20	2	240	7.20/7.21	19.4	800/898	near clear	-32	171.81
	18:25	2	250	7.20/7.21	19.4	800/898	"	-35	171.81

Start Sampling. C-o-C #: 100050. Lab time: 18:00

Total Discharge ~ 250 Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/15/88 Sample Location B-1-MW9-05

Project Name LASC Project No. 88-03128.13

Weather Conditions Cool, clear

Observations/Comments 3x purge vol = 175 2 gal

Samples Collected By KJ Kinsella, Sample Time: 9:15, Lab Time 0900

QUALITY CONTROL

Purging/Sampling Method Pumped w/ Hydrostar pump

Method to Measure Water Level Electronic

Pump Lines or Bailer Ropes: new (cleaned) dedicated

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed.

pH Meter No. Orion SA250, Sn 3917 Date Calibrated 10/15/88

Sp Conductance Meter No. YSI 33, Sn. 16034 Date Calibrated 10/15/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start _____ End 171.62

Measuring Point (MP) Top of casing

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity	Wtr Lev
Started pump: 0744 First water: 0745									
0747	2.5	5	6.67	19.0	755/974	v.v. pale greenish	109	clear	
0755	2.2	17.6	6.76	18.6	775/1000	reddish brown	110	high	
0805	2.5	42.6	6.78	18.3	390/503	lt. reddish brown	91	slight	
0820	2.3	77.1	6.70	18.8	730/942	"	98	"	171.8
0835	3.1	123.6	6.79	18.5	760/980	v.lt. yellowish brown	97	"	
0845	3.2	155.6	6.76	18.9	780/1006	colorless	96	clear	
0855	3.2	187.6	6.65	19.2	785/1013	"	94	"	171.8
0905	3.3	220.6	6.76	18.9	780/1006	"	86	"	
0910	–	237.1	6.78	19.2	780/1006	"	90	"	

Total Discharge 237.1 Casing Volumes 4.1

Method of Disposal of Discharge Water Baker Tank

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/15/88 Sample Location B-1-MW9-06

Project Name LASC Project No. 88-03128.13

Weather Conditions Cool, Clear, breezy

Observations/Comments 3x purge vol. = 172.2 gal

Samples Collected By KJ Kinsella. Duplicate set # B1-MW9-07 also taken

QUALITY CONTROL

Purging/Sampling Method Pumped w/ Hydostar piston pump w/ screen.

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed.

pH Meter No. Orion SA 250, sn. 3917 Date Calibrated 10/15/88

Sp Conductance Meter No. YSI 33, sn 16034 Date Calibrated "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 171.58' (0955) End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity
Pump started: 0958		First water: 0959						
1002	3.9	~~50.7~~ 11.7	7.06	19.5	795/1026	Red brown	101	high
1011	3.5	43.2	6.97	19.7	795/1026	"	93	mod.
1020	3.5	74.7	6.96	19.6	790/1019	lt. red brown	93	low mod.
1030	3.5	109.7	7.01	19.7	795/1026	"	93	"
1041	3.5	148.2	6.98	19.5	795/1026	v. lt. gray brown	92	sl.
1051	3.4	182.2	7.00	19.8	795/1026	v. lt. yellow brown	92	almost clear

Sampled at 1100
Lab Time given as 1100
Took duplicate set, Labeled B1-MW9-07

Total Discharge 182.2 gal Casing Volumes 3.2

Method of Disposal of Discharge Water Baker Tank

Sheet of

LOG OF BORING No.

DATE DRILLED: EQUIPMENT: WELL 8-6-MW1

DESCRIPTION: ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
					150			Surface to well head - 8" (not included in calc calculations below)	Sample 01 - Equipment 10/11/88 09:00
					160				
					170				
						200			
			60		220			WL 221'	
						240		239.60	10/11/88 10:25
		32			250				
			70		280	272		268' 10"	
						292		295' 4"	Sample 02 10/11/88 14:00
		42			300				
			70		340	334		338' 10"	Sample 03 10/11/88 15:50
		10				354		355' 4"	
			70		370	364		358 10"	
						384		385' 4"	Sample 04 10/11/88 17:
					400				
		95			430				
Stk st.	260'				460				
pump	3' 10"					474		476' 4"	
black	212' 6"		70		490	490		502' 10"	Sample 05 10/12/88 11:00
	476' 4"	21							
					520	520		516' 4"	
st. st	200' -		70			540		542' 10"	Sample 06 10/12/88 13:0
pump	3' 10"				550				
black	212' 6"								
	518' 4"	84			580				
St. St.	405'				610				
pump	3' 10"					624		621' 4"	
No bl.	212' 6"		70		640	644		647' 10"	Sample 07 10/12/88 15:00
	621' 4"	21						TD 653'	10/11/88 10:30
					670			TD - 665'	
					700				

DRILLING CONTRACTOR

DRILLER

CHK'D BY

BY

DATE

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/11/88 Sample Location BG-MW1-01

Project Name LASC Project No. 8803128.13

Weather Conditions Warm, smoggy, (vis ~3mi)

Observations/Comments Equipment Blank | screen: –

Samples Collected By DR | packers: –

QUALITY CONTROL

Purging/Sampling Method – 5 foot length, ¼ pump.

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated

Sp Conductance Meter No. YSI 3500 Date Calibrated

PURGING AND SAMPLING DATA

Water Level (below MP) Start End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity

Pump had some of the ~~gas~~ hydrocarbon from the other wells. Looks like - pipe dope.

10:00 ~~Lab~~ Take Equipment Blank

C-o-C L00042 Lab Time 9:00

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/11/88 Sample Location B6-MW1-(02)

Project Name LASC Project No. 8883128.13

Weather Conditions Warm, smoggy, light Breeze

Observations/Comments Sample B6-MW1-07 | screen - 272-292'

Samples Collected By DR, SDG | packers 268'10"; 295'4" (-8" well head)

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter

Method to Measure Water Level electric sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated Well vol. - 58.72 3 well vol: 270.1

Method of Cleaning Bailer/Pump Steam clean, pump with CH_3OH & brush - DI rinse

pH Meter No. YSI 3500 Date Calibrated 10/11/88 11:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/11/88 11:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 239.60 End 239.58 (14:15)

239.64 (12:40)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start 12:48		Water 12:50				rusty		
12:55 -	4.5	20	6.72/6.71	19.7	696/776	rusty	167	239.81
13:00	4.5	45	7.00/6.99	19.5	669/751	"	133	239.79
13:10	4.5	90	6.99/6.99	19.5	667/746	"	126	239.77
13:30	4.5	180	7.08/7.09	19.5	645/722	light rusty	103	—
13:40	4.5	225	7.08/7.09	19.5	648/725	"	99	239.75
13:50	2.5	250	7.13/7.14	19.8	650/725	"	97	239.69
13:55	2.5	265	7.12/7.13	19.6	650/726	"	97	239.69

C of C L00042 Lab Time 14:00

Total Discharge ~ 270 Casing Volumes ~ ~~325~~ 4.8

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/11/88 Sample Location BG-MW1 (03)

Project Name LASC Project No. 8803128.13

Weather Conditions Warm, smoggy

Observations/Comments Sample BG-MW1-03 | screen 334-354

Samples Collected By DR, SDG | packers 328'10" ; 355'4" (-8" well)

QUALITY CONTROL

Purging/Sampling Method Hydro star pump w/ 3/4 + 2" double screen filter.

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated 1 well vol - 86.72 gal

Method of Cleaning Bailer/Pump Steam clean, DI final rinse

pH Meter No. YSI 3500 Date Calibrated 10/11/88 11:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/11/88 11:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 239.58 (14:35) End 239.59

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start	14:39	Water	14:39					
								239.69
14:45	4.5	25	7.48/7.38	19.6	649/730	very rusty	131	239.69
14:50	4.5	45	7.10/7.10	19.4	649/728	"	86	239.6
15:00	4.5	90	7.10/7.11	19.5	646/725	"	69	239.6
15:15	4.5	157.5	7.10/7.11	19.5	648/727	light rusty	55	239.6
15:30	4.5	225	7.11/7.12	19.5	651/730	"	57	239.6
15:35	2	235	7.20/7.21	19.7	650/725	"	52	-
15:40	2	245	7.14/7.14	19.7	648/726	very cloudy	61	239.5
15:45	2	250	7.14/7.15	19.7	650/726	cloudy	63	

start sampling 15:45

Took 3 SV 10 C of C L00042 Lab Time 15:30

Total Discharge ~ 260 Casing Volumes ~ 3.4.6

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/11/85 Sample Location B6 - MW1 (04)

Project Name LASC Project No.

Weather Conditions ~~B6 MW1 04~~ Mild; smoggy light breeze

Observations/Comments Sample B6-MW1-04 | screen: 364 - 384

Samples Collected By DR, SDG | packers: 358'10"; 385'4" (-8" in well)

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol. - 56.72

Method of Cleaning Bailer/Pump Steam clean, DI final rinse

pH Meter No. YSI 3500 Date Calibrated 10/11/88 11:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/11/88 11:0

PURGING AND SAMPLING DATA

Water Level (below MP) Start 239.53 16:30 End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity depth
Start 16:35		Water						
					~~very rusty~~	rusty		239.64
16:40	3.5	15	7.39/7.40	19.7	646/724	very rusty	127	239.64
16:45	3.5	35	7.20/7.21	19.4	644/725	bright rusty	107	239.64
17:00	3.5	87	7.12/7.13	19.4	645/724	light rusty	63	239.64
17:15	3.5	110	7.14/7.15	19.4	647/727	~~dark~~ murky	48	239.64
clear cell 17:30	3.5	163	7.20/7.20	19.4	653/736	dark cloudy	36	239.64
clear cell 17:45	3.5	215	7.22/7.22	19.4	651/732	cloudy	37	239.63
clear cell 17:55	1.25	227	7.25/7.25	19.6	654/732	light cloudy	37	239.58
clear cell 18:00	1.25	235	7.24/7.24	19.6	655/731	"	37	239.5

18:30 Start Sampling

G of C 100043 Lab time 17:30

Total Discharge ~240 Casing Volumes 4.2

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/12/88 Sample Location BG-MW1-(05)

Project Name LASC Project No. 8803128.13

Weather Conditions Foggy Cool.

Observations/Comments Sample BG-MW1-05 | screen 479-499

Samples Collected By DR, SDG | packers 476'4"; 502'10" (-8" + well L

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ double screen filter (3/4-2")

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol. 45.72 (4.2)

Method of Cleaning Bailer/Pump Steam clean w/ final DI Rinse

pH Meter No. YSI 3500 Date Calibrated 10/12/88 8:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/12/88 8:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 239.69 (9:10) End 239.65 (11:45)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start pump 9:13		Water 9:15				very rusty		
								239.71
9:45	2.5	75	632/631	20.1	652/712	very rusty	110	239.75
10:00	2.2	108	673/674	20.1	662/735	light rusty	-21	239.75
clean cell - 10:15	2.2	141	692/693	20.2	665/734	light rusty	-56	239.75
10:30	2.2	172	692/693	20.1	661/732	"	-69	"
clean cell - 10:45	2.0	202	7.00/7.00	19.8	658/733	very light rusty	-76	239.74
11:00	2.0	252	7.02/7.01	19.8	660/737	cloudy	-86	239.71
11:15	2.0	262	6.97/7.01	19.7	660/738	"	-87	"

17:15 - Start sampling

C of C L00043 Lab time 11:00

Total Discharge ~ 265 Casing Volumes ~ 34.7

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/12/88 Sample Location BG-MW1 (OG)

Project Name LHSC Project No. 8803128.13

Weather Conditions Light Breeze ~~Smogy~~.

Observations/Comments Sample # BG-MW1-OG | screen: 520-540

Samples Collected By DR, SDG | packers: 516'4"; 542'10" (-8" in well head)

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" double screen filter

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well volume 55.72 (+4.2)

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/12/88 8:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/12/88 8:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 239.65 (11:50) End 239.63 (13:30)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start pump 11:50 Water. 11:56						very rusty		
								239.73
12:05	2.75	40	7.07/7.16	19.5	650/731	very rusty	-38	239.75
12:15	3.75	78	7.00/7.07	19.6	654/734	"	-36	
12:30	3.75	135	6.98/7.09	19.6	656/736	"	-74	239.75
12:40	3.75	173	6.98/7.04	19.5	656/735	rusty	-79	239.75
12:50	3.75	210	7.00/7.09	19.5	654/733	light rusty	-82	239.74
13:00	3.75	240	6.98/7.05	19.7	655/734	"	-84	239.74

clear all

clear all

Start sampling: 13:00

C-of C 100043 . Lab time 13:00

Total Discharge ~240 Casing Volumes ~~2d~~ ~4.3

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/12/88 Sample Location BG - MW1 (07)

Project Name LASC Project No. 8803128.13

Weather Conditions Light breeze, very snoggy

Observations/Comments Sample # B1-MW1-07 | Screen: 624 - 644

Samples Collected By DR, SDG | packers: 621'4" - 647' 10" (-8" [illegible])

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4-2" Marble screen filter.

Method to Measure Water Level Electric Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well volume 55.72 (4.2) ~120 for 3

Method of Cleaning Bailer/Pump Steam clean & Final DI rinse

pH Meter No. YSI 3500 Date Calibrated 10/12/88 8:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/12/88 8:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 239.60 (14:05) End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ EA	~~Turbidity~~ depth
Start pump 14:06		Water 14:12						
	3.0					very rusty		
14:20	3.5	30	7.40/7.62	19.9	649/725	light rusty	-77	239.6
14:30	3.5	65	7.15/7.27	19.7	628/708	"	-95	-
clear well 14:40	4.0	100	7.05/7.09	19.7	613/684	"	-73	237.6
14:50	4.0	140	7.00/7.08	19.8	623/694	"	-79	
15:00	3.0	170	6.99/7.04	19.8	628/689	rusty	-88	239.63
15:10	2.0	190	696/7.04	19.7	632/706	light rusty	-100	
15:15	2.0	200	696/7.04	19.7	635/708	"	-108	239.0
15:20	2.0	210	696/7.04	19.7	636/709	"	-110	239.6

15:20 Start sampling

C&C 600044 Lab Time 15:00

Total Discharge ~ 220 Casing Volumes 3.9

Method of Disposal of Discharge Water

Sheet ___ of ___

LOG OF BORING No.

DATE DRILLED: EQUIPMENT: WELL B-6 - MW2

DESCRIPTION: ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
					60				
					90				
					120				
					150				
					180	174		WL 204.00 8/21/88	
			20					WL 194.3 187	
					210	214		WL 203.9 203.74 8/15/88. 12:20	Sample 010 10/20/88 21
		21						221'2" 203 - Refusal - for 4".	
					240	235		234.3 8/16/88 203.74	Sample 01
			20			255		261'2" 8/20/88 8/17/88 203.74	10/20/88 1
		21			270	276		274.3' 8/18/88 203.74	
			20			296		8/20/88 203.86 8/19/88 203.88	10/20/88
					300			301'2" Sample 0105 01 06	13. 14:
		42							
					330	338		334.3' 8/20/88 8:40 203.86	
			20			358		361'2" Sample 0104 8/20/88	10
		21			360			Top 374.3"	
			20		390	379		8/19/88 17:30 203.78"	
						399		401'2" Sample 0103 8/19/88	1
		42			420				
						441			
			20		450	461		Sample 0102 8/17/88 18:00	
		9				470			
			20		480	490		Sample 0101 8/17/88 12:00	
		32			510				
								TD 522	
					540				
					570			Sample 010TB Travel Blank	
					600				

DRILLING CONTRACTOR _____ DRILLER _____

BY _____ DATE _____ CHK'D BY _____

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

SAMPLES TAKEN : 8/17, 8/19, 8/20

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/16/88 Sample Location B-6-MW2

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny (25°C at 10:30)

Observations/Comments

Samples Collected By Dani Benan

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3560 Date Calibrated 8/16/88

Sp Conductance Meter No. " Date Calibrated "

PURGING AND SAMPLING DATA

Water Level (below MP) Start End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH ATC	Temp (°C)	Sp Cond (µmhos/cm) ATC	Color Eh	Odor	Turbidity
1200	190		7.27	20.4	.630	127	R-Br	✓

No sample taken.

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/17/88 Sample Location B-6-MW2-(0101)

Project Name LASC Project No. 8803128.13

Weather Conditions SUNNY WARM - HOT

Observations/Comments SAMPLE # 0101 Screen at 470-490 below WH

Samples Collected By Dave Renan packer at 468-492

QUALITY CONTROL

Purging/Sampling Method Hydrostar at 2 gpm

Method to Measure Water Level ~~[illegible]~~ 203'10.7" After 1 hr of pumping 9:00

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3560 Date Calibrated 8/16/88

Sp Conductance Meter No. " Date Calibrated "

PURGING AND SAMPLING DATA

Water Level (below MP) Start End 203.74'

Measuring Point (MP) WH. 702.46

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh ±1	~~Turbidity~~ O_2	
9:30-1000	2 gpm	~	-	±5	-	±15	-	-	
1000	3/4	~ 130	7.41/7.48	20.1	575/635	Dirty cloudy	9.3	-	203
10:15	3/4	~ 140	7.43/7.48	19.9	570/630	"	20		
10:30	~~3/4~~ 1	~ 150	7.43/7.48	19.9	570/630	cloudy	18		cos.
11:00	1.5 gpm	~ 180	7.42/7.48	19.8	569/632	"	1	-	203
11:15	1.5 gpm	~ 210	7.43/7.49	19.8	567/633	"	-10	-	
11:30	1.5	~ 230	7.43/7.50	19.8	567/634	"	-10	-	
11:45	1.5	~ 255	7.44/7.50	19.9	566/633	"	-4	-	
12:00	1.5	~ 275	7.44/7.50	19.9	569/633		-10		203.7

12:15 Begin Sampling

Lab time 12:00

C-o-C # L00001

Total Discharge ~ 280 Casing Volume 4.5

Method of Disposal of Discharge Water Baker Tanks

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/17/88 Sample Location B-6-MW2 (0102)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny & hot. (35°c)

Observations/Comments Sample # 0102 : Screen at 441-461' below surface

Samples Collected By Dave Renan | Top Packer set at 439' 1¾"

QUALITY CONTROL

Purging/Sampling Method Hydrostar

Method to Measure Water Level Sounder through well plate

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. VSI 3500 Date Calibrated ~~8/17~~ 8/16/88

Sp Conductance Meter No. " Date Calibrated "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 203.74 End

Measuring Point (MP) well head.

Time	Pump Rate (gpm)	Discharge (gallons)	pH ±1	Temp (°C)	Sp Cond (µmhos/cm) ±5	Color	Odor	Turbidity	
15:25	2	20	7.37/7.40	21.5	570/630/620	Sand w/sed	65	–	203.74
15:35	2	40	7.30/7.31	21.2	582/630	" "	63	–	203.74
15:45	2	60	7.27/7.28	20.9	577/632	light Brown	61	–	–
WASTED 16:00	2.5	~~90~~ 82	7.29/7.30	20.7	575/634	cloudy	48	–	203.74
16:15	2.5	~~105~~	7.35/7.36	20.7	578/633	"	40	–	–
16:30	1.5	127	7.36/7.37	20.6	577/630	sl. cloudy	35	–	203.73
16:45	1.5	150	7.36/7.37	20.6	576/630	"	33	–	
17:00	1.5	172	7.37/7.38	20.3	571/632	"	26	–	203.73
17:15	1.5	195	7.38/7.39	20.3	572/630	"	24	–	
17:30	1.5	217	7.40/7.41	20.3	565/625	"	23		203.73
17:45	1.5	240	7.40/7.41	20.3	567/625	v. sl. cl.	24		
18:00	1.5	262	7.40/7.41	20.3	567/625	"	23		203.73
18:20	1.5	292	7.41/7.42	20.2	567/625	"	21		"

Total Discharge ~ 300 Casing Volumes Lab time 18

Method of Disposal of Discharge Water

Sheet ___ of ___

COC #: 200001

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/19/88 Sample Location B-6-MW2 (0103)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, very smogy, temp. 26°C (at 17:30)

Observations/Comments Sample No 0103 - Screen at 379 to 399.

Samples Collected By Dani Renan | Packer - top ~~374.3~~ 374'.3" bottom ~~401'6~~ 401'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar - new pump w/ 6/1000 screen

Method to Measure Water Level sounder - top

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/19/88 13:00

Sp Conductance Meter No. " Date Calibrated 8/19/88 12:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start ~~203.78~~ 203.78 End

Measuring Point (MP) W. Head.

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity
Start pump 17:40								
17:45	3.5	17.5	7.24/7.35	22.1	551/583	light rusty	154	
17:50	3.5	35	7.23/7.33	21.0	524/580	"	151	203.78'
17:55	3.5	53	7.21/7.32	20.3	524/580	v. light rusty	138	
18:00	3.5	70	7.23/7.34	20.1	525/585	murky	134	
18:10	3.5	105	7.23/7.41	20.2	537/594	cloudy	127	203.78'
18:20	3.5	140	7.24/7.44	21.0	545/593	"	125	
18:30	3.5	170	7.24/7.36	20.1	541/600	"	120	203.78'
18:45	3.3	226	7.26/7.37	20.0	538/601	"	116	
19:00	3.25	280	7.26/7.37	19.8	538/601	"	112	
19:15	3.2	~320	7.27/7.39	19.7	538/601	"	104	
19:30	3.2	370	7.27/7.39	19.8	537/601		105	203.78

C-o-C # L00002 Lab time 19:00

Total Discharge ~380 Casing Volumes 5.5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/20/88 Sample Location B-6-MW2 (0104)

Project Name LASC Project No. 8803128.13

Weather Conditions Foggy to heavy overcast (temp ~20°C at 8:00)

Observations/Comments Sample # 0104 | SCREEN AT 338 to 358

Samples Collected By DR, TH | Packers set at 334.3" and 361'2"

QUALITY CONTROL

Purging/Sampling Method HYDROSTAR new pump w/ 6/1000 SCREEN

Method to Measure Water Level SOUNDER

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/19/88 13:00

Sp Conductance Meter No. " Date Calibrated 8/19/88 12:00

PURGING AND SAMPLING DATA checked w/ H_2O (DI) 8/20/88 8:00

Water Level (below MP) Start 203.86 End 203.87

Measuring Point (MP) WELL Head

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ C_c	Depth
Start pump at 840									
845	2.5	10	6.75/668	19.6	468/510	light cloud			203.
848	2.5	15	7.17/723	20.1	502/558	murky	155		
8:52	2.5	25	7.32/744	19.9	523/580	light cloud	146		
9:00	2.5	45	7.34/746	20.1	546/607	v. light cloudy	134		203..
9:10	2.5	70	7.32/7.43	20.3	561/620	"	126		
9:20	2.5	95	7.31/7.43	20.3	565/624	"	120		203.8
9:30	2.5	120	7.30/7.42	20.5	571/628	"	118		
9:40	2.5	145	7.32/7.43	20.0	561/624	v. light cloudy	111		203.88
9:50	2.5	170	7.32/7.44	20.2	564/627	"	116		
10:00	2.5	195	7.30/7.42	19.9	564/627	"	104		203.87
10:10	2.5	220	7.28/7.41	20.2	568/628	nearly clear	96		

C-o-C #: L00003 lab time: 10:0

Total Discharge ~230 Casing Volumes ~3.5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/20/88 Sample Location B-6-MW2 (0105 & 0106)

Project Name LASC Project No. 8803128.13

Weather Conditions Smoky some clouds (~30°C)

Observations/Comments Samples 0105 & 0106 (Dup) | Screen at 276 to 296

Samples Collected By DR, TAH | Packers: Top 274 1/3" Bot 301 1/2

QUALITY CONTROL

Purging/Sampling Method Hydrostar new pump w/ 6/1000 in.

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/19/88 13:00 } checked w/ H2O

Sp Conductance Meter No. " Date Calibrated 8/19/88 12:00 } DI at 11:30 8/20/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 203.86 End

Measuring Point (MP) Well head

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ DO	depth
start pumping at 11:36 · WATER AT 38-9									
11:40	~3	5	7.26/7.77	26.4	605/582	cloudy	151		
11:45	3	20	7.26/8.10	23.2	596/624	"	141		203.95
11:50	3	35	7.26/8.10	24.7	616/619	"	145		
11:55	3	50	7.27/7.99	23.1	587/619	light cloudy	127		
12:00	3	65	7.26/7.99	22.0	585/624	"	105		203.96
12:10	3	80	7.23/7.85	21.7	590/634	v. light cloudy	86		
12:20	3	110	7.25/7.70	24.5	603/622	clear	90		203.95
12:30	3	140	7.24/7.64	22.5	589/624	"	85		
12:40	3	170	7.20/7.36	22.8	596/623	"	83		203.95
12:50	3	200	7.23/7.65	24.3	599/619		86		
1:00	3	230	7.24/7.83	26.0	617 618		84		203.95
Sampled at 1:05									

C-o-C # 200003 Lab times 0105 - 13:00 0106 - 14:30

Total Discharge 240 Casing Volumes 3.5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/20/88 Sample Location B-6-MW2 (0107)

Project Name LASC Project No. 8803128.13

Weather Conditions Clear ~ some clouds (~30°C)

Observations/Comments Sample # 0107. | Screen at 235-255

Samples Collected By DR, TAH | Packers: Top 234'3" bottom 261'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar new pump w/6/1000 in screen

Method to Measure Water Level Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/19/88 13:00 } checked w/H2O

Sp Conductance Meter No. " Date Calibrated 8/19/88 13:0 } DI 8/20/88 11:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 203.80' End 203.90 (19:20) after sampling

203.98 (19:00) finish pumping

Measuring Point (MP) Well head

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity
							Eh	Jlpt
Start pumping at 17:14				Water 17:16	619/626		norky	112
17:16			7.38/7.62	25.6				
17:18	3.25	13	7.32/7.50	23.6	625/647	cloudy	108	
17:20	3.25	20	7.24/7.40	22.7	626/660	"	106	
~~17:~~			~~626/660~~					
17:25	3.25	36	7.18/7.27	22.0	623/661	cloudy	102	
17:30	3.25	53	7.15/7.25	21.4	612/660	"	98	203.98
17:35	3.25	70	7.14/7.23	21.0	598/648	lightly cloudy	94	
17:40	3.25	86	7.14/7.20	21.1	585/636	v. lightly cloudy	91	204.0'
17:50	3	100	7.14/7.23	21.0	587/636	"	87	203.98
18:00	3	130	7.15/7.21	21.1	581/631	"	87	
18:10	2.5	143	7.17/7.27	21.5	582/625	"	86	203.98
18:20	2.0	152	7.16/7.22	20.8	570/623	"	86	203.98
18:30	2.0	172	7.19/7.26	20.8	578/630	"	91	203.98
19:00			7.21/7.28	21.3	584/631		115	203.98

change pump rate

change rate again

Total Discharge ~180 Casing Volumes 3

Method of Disposal of Discharge Water LAB Time 11

Sheet ___ of 18

Co-C #: L00004

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 8/20/88 Sample Location B-6-MW2 (0108)

Project Name LASC Project No. 8803128.13

Weather Conditions Clear - some clouds, (~21°C)

Observations/Comments Sample # 0108 | Screen at ~~135~~ -174 - 214

Samples Collected By DR, TAH | Packers: Top - ~~195.0~~ 190.0 Bottom ~~221.7~~ 221.10

QUALITY CONTROL

Purging/Sampling Method Hydrostar - new pump w/ 6/1000 in @ screen

Method to Measure Water Level Sounder - (1 well Volume = 42 gal

Pump Lines or Bailer Ropes: new cleaned dedicated 17' of Water.

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 8/19/88 13:00 | checked w/ DI water

Sp Conductance Meter No. " Date Calibrated 8/19/88 12:00 | 8/20/88 11:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start ~ 203.86 End

Cant measure
Top packer is above WL.

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start pumping at: 18:15 Water -								
18:20	2	10	7.21/7.28	21.4	730/786		102	murky
18:25	2	20	7.21/7.29	21.2	728/788		101	cloudy
18:30	2	30	7.21/7.29	21.1	729/790		101	light cloud
18:35	2	40	7.22/7.28	21.1	740/801		101	"
18:40	2	50	7.19/7.25	20.8	736/803		99	clear
18:45	2	60	7.18/7.23	20.6	738/807		99	"
18:50	2	70	7.18/7.24	20.6	739/810		101	"
check rate 19:00	2	90	7.16/7.23	20.3	736/812		100	"
19:10	2	110	7.15/7.27	20.7	737/816		97	"
19:20	2	130	7.17/7.28	20.2	742/817		112	"
19:30	- Sample -							
19:45								

LAB TIME: 21:00

Total Discharge 150 Casing Volumes 3 +

Method of Disposal of Discharge Water

R&C# L00004 Sheet ___ of ___

Stickup ~ 17"

28 lengths black pipe

= 595'

bottom

pump 3'10"
no rod st. st 20'
black pipe 595
618' 10"

190 st
807' 7"
808
808
833' 9"

Add 140'

947' 7"
947
370 steel
969
973' 9"

Add 65'

1012' 7"
1017
395 stn
1037
1039' 9"

Add 140'

1152' 7"
1157
535 stn
1177
1179' 9"

TD 1190

10/18/88

807 7"
806
806
807' 7"

pump (3 10')
20' st st.
no rod

130

618' 10"

595'

492

23 28 lengths black p

488 9
3 10
492' 7"
126
612 126 612 7
807 7
806' 2"

packer

packer
10'
26' 7"
screen
10'
packer

673.5

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/12/88 Sample Location C-1-MW1-01

Project Name LASC Project No. 88-03128.13

Weather Conditions Hot sl. hazy (smog) clear

Observations/Comments 3x purge vol. = 312 gal

Samples Collected By KJ Kinsella

QUALITY CONTROL

Purging/Sampling Method Pumping w/ Hydrostar pump w/

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed

pH Meter No. Beckman 21, sn 142641 Date Calibrated 10/12/88

Sp Conductance Meter No. YSI 33 sn 16034 Date Calibrated 10/12/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 229.85 End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity
Started pump: 1135			First water:		1137/1263	Reddish brown		mod
1140	3.5		6.31	20.8	810/900	"	-18	"
1145	–	28	6.39	19.2	775/861	"	-27	"
1155	3.2	60	6.19	19.0	695/772	lt. yellow red	14	sl
1210 ~~1240~~	–	108	6.29	22.9	690/767	no color	30	almost clear
1225	3.5	160.5	7.39	19.3	660/733	"	36	"
1240	–	213	7.13	19.4	655/728	"	16	"
1255	3.4	264	7.02	19.3	650/722	"	35	clear
1310	–	315	7.24	19.3	650/722	"	56	"
1325	3.5	367	7.08	19.3	660/733	"	58	"
1335	–	402	7.07	19.5	650/722	"	83	"

Total Discharge 402 gal Casing Volumes 3.9

Method of Disposal of Discharge Water Baker Tank

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/12/88 Sample Location C-1-MW1-02

Project Name LASC Project No. 88-03128.13

Weather Conditions Warm, clear, breezy

Observations/Comments

Samples Collected By KJ Kusalla

QUALITY CONTROL

Purging/Sampling Method Pumped w/ Hydrostar pump w/ filter

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed

pH Meter No. Beckman Ø21, sn 142641 Date Calibrated 10/12/88

Sp Conductance Meter No. YSI 33, sn 16034 Date Calibrated "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 229.81' End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ EH	Turbidity	Wt Lev
Started Pump : 1417			First Water : 1418						
1420	4		7.06	19.6	620/689	reddish brown	104	mod	
1440	3.8	85.8	7.04	19.4	620/689	lt. reddish brown	108	Slight	229
1455	-	142.8	7.13	19.7	620/689	lt. greyish yellow	108	"	
1510	3.6	196.8	7.14	19.6	620/689	v. lt. greyish yellow	123	v.sl.	
1525	-	250.8	7.11	19.3	620/689	v.v. lt. greyish yellow	114	almost clear	
1540	3.8	307.8	7.27	19.5	610/678	colorless	126	"	
1555	-	364.0	7.44	19.2	615/683	"	136	"	
1605	3.6	400.0	7.52	19.1	620/689	"	143	"	
1615	-	436.0	7.52	19.1	615/683	"	136	"	

(Actual Sampling time : 1630)
Lab time : 1600

Total Discharge 436.0 gal Annulus & Casing Volumes 4.2

Method of Disposal of Discharge Water Baker Tank

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10-13-88 Sample Location C-1-MW1-03

Project Name LASC Project No. 88-03128.13

Weather Conditions Overcast, cool, light breeze

Observations/Comments Lab Time: 1030

Samples Collected By KJ Kinsella

QUALITY CONTROL

Purging/Sampling Method Pumping w/ Hydrostar pump with screen

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated

Method of Cleaning Bailer/Pump Steamcleaned, DI water rinsed

pH Meter No. Beckman Φ 21, sn 142641 Date Calibrated 10/13/88

Sp Conductance Meter No. YSI 33, sn 16034 Date Calibrated 10/13/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 229.89' End 229.92'

Measuring Point (MP) Top of casing

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Oder~~ Eh	Turbidity	W LE
Pump Started: 8:24			First water: 8:25						
0827	2.8	5.6	6.27	~~18.3~~ 18.1	580/700	lt. reddish yellow	48.3	sl.	
0845	—	~~560~~ 56.0	6.90	18.3	550/664	"	84	"	
0900	2.5	~~597.5~~ 93.5	6.95	18.4	575/694	v. lt. reddish yellow	63	sl.	229
0920	2.4	141.5	7.51	18.4	560/664	"	40	v. sl.	
0940	—	189.5	7.06	18.5	550/664	"	79	"	
1000	2.5	239.5	7.32	18.7	575/694	v.v. lt. reddish yellow	60	"	229.9
1020	—	289.5	7.03	18.6	575/694	"	25	"	
1040	2.5	339.5	7.21	18.8	530/640	v. lt. yellowish brown	81	almost clear	
1050	—	364.5	7.13	18.9	550/664	"	75	v. slight	

Samples taken at 11:00
(Lab time 1030)

Total Discharge 364.5 gal Casing Volumes 3.5

Method of Disposal of Discharge Water Baker Tank

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10-13-88 Sample Location G1-MW1-04

Project Name LASC Project No. 88-03128.13

Weather Conditions Partially cloudy, cool, breezy

Observations/Comments 1 "purge volume" = ~~56.7~~ ~~59.7~~ 56.7 KGK KGK

Samples Collected By KJ Hinsella

QUALITY CONTROL

Purging/Sampling Method Pumped w/ Hydrostar pump, with screen

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed

pH Meter No. Beckman Φ21, SN 142641 Date Calibrated 10/13/88

Sp Conductance Meter No. YSI 33, SN 16034 Date Calibrated 10/13/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start _____ End _____

Measuring Point (MP) Top of casing

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor Eh	Turbidity	
Started Pump: 1453			First water: 1455						
1457	3.5	7	6.28	20.9	600/724	lt. yellow brown	-42	mod.	
1510	—	52.5	5.92	19.4	575/694	"	53	"	229.94
1520	3.1	83.5	6.02	19.1	590/712	"	22	sl.	
1535	—	120	6.17	19.4	590/712	v. lt. yellow brown	17	sl.	
1545	2.9	159	6.11	19.0	590/712	"	10	v. sl.	229.
1555	—	188	5.79	19.0	595/718	"	12	"	
~~1560~~ 1600		202.5	5.80	18.8	595/718	"	7	"	

Lab time 1600
Samples taken at 1610

Total Discharge 202.5 Casing Volumes 3.5

Method of Disposal of Discharge Water Baker Tank

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10-13-88 Sample Location C1-MW1-05

Project Name LASC Project No. 88-03128.13

Weather Conditions Partly cloudy, cool, windy

Observations/Comments 3x purge vol = 173 gal (2.93 for tailpipe, 56.74 for casing/annulus volume)

Samples Collected By KJ Kuehler

QUALITY CONTROL

Purging/Sampling Method Pumped w/Hydrostar pump w/ screen

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed

pH Meter No. Beckman φ21, SN 142641 Date Calibrated 10/13/88

Sp Conductance Meter No. YSI, SN 16034 Date Calibrated 10/13/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start _____ End _____

Measuring Point (MP) _____

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity	Wet LW
Started pump: 1642 First water: 1644									
1647	2.7	8.1	5.93	20.5	600/724	lt. yellowish brown	46	sl.	
1657	2.5	33.1	6.42	19.0	595/718	mod. brown	-18	high	
1710	2.5	65.6	6.45	18.6	580/700	"	-20	"	
1720	2.7	92.6	7.10	18.6	575/	"	21	"	229.9
1730	2.7	119.6	7.35	18.5	600/724	lt. yellowish brown	-10	sl.	
1740	–	146.6	7.30	18.4	600/724	v. lt. yellowish brown	-33	v.sl.	
1750	–	173.6	7.27	18.6	600/724	"	-45	"	

Lab Time: 1800
Samples Taken: 1800

Total Discharge 173.6 Casing Volumes 3.0

Method of Disposal of Discharge Water Baker Tank

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/14/88 Sample Location C-1-MW1-06 zone

Project Name LASC Project No. 88-031

Weather Conditions Warm, clear, breezy

Observations/Comments

Samples Collected By No samples taken ~~Lab time: 1400~~ *DE

QUALITY CONTROL

Purging/Sampling Method Pumped w/Hydrostar pump, double screen

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated

Method of Cleaning Bailer/Pump –

pH Meter No. Orion SA250, sn 3917 Date Calibrated 10/14/88

Sp Conductance Meter No. YSI 33, Sn. 1603+ Date Calibrated 10/14/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 230.15 (6935) End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity
Started Pump: 0937								
First water: 1254								
Restarted pump: 1253								
1257	3.7	11.1	~~19.9~~ 6.98	19.9	560/653	mod. brown	117	High
1312	2.8	~~[illegible]~~ 53.1	7.13	19.5	520/607	"	105	"

Pump failed at about 1325

No samples taken

Total Discharge ~60 gal Casing Volumes 1

Method of Disposal of Discharge Water Baker tank

APPENDIX D2

WELL PURGING AND SAMPLING LOGS
CLUSTER WELLS

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/7/88 Sample Location P1 - CW1 (Areal - deep)

Project Name LASC Project No. 8803128.13

Weather Conditions Overcast smogy

Observations/Comments screen 580 - 570

Samples Collected By packer 577' 7"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 6/1000 14" screen

Method to Measure Water Level Electric Sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated - 1 well vol. 24.8 (pipe 8.08)

Method of Cleaning Bailer/Pump 3 well vol - 82.5

pH Meter No. YSI 3500 Date Calibrated 10/6/88 14:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/6/88 14:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 157.74 (10/6/88 9:30) End 180.70 (12:15)

160.50 (10/7/88 9:45)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
start pumping 9:50 water 9.62						rusty		
10:00	~2 gpm	10	9.04/9.15	21.4	215/232	very rusty	-79	176.20
10:15	2	40	8.67/8.77	20.2	417/462	black	-58	188.50
10:30	2	60	8.57/8.64	20.4	441/483	"	-139	189.69
10:50	1.5	80	8.37/8.44	20.6	472/513	dark olive	-139	190.40
11:05	~1	95	8.31/8.98	21.0	474/514	"	-138	193.20
11:20	0.8	107 (1.0)	8.28/8.68	20.8	468/512	"	-148	188.42
11:35	0.75	118	8.30/8.61	20.8	471/517	"	-142	186.50
11:45	0.75	125	8.30/8.64	20.8	470/516	"	-139	186.50
11:55	0.75	130	8.26/8.40	20.7	467/515	"	-130	186.05

clear out

clear out

clear out

1200 - start sampling

C.O.C. 0/1000490 Lab time 11:00

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

Area 1 - deep B1-CW1

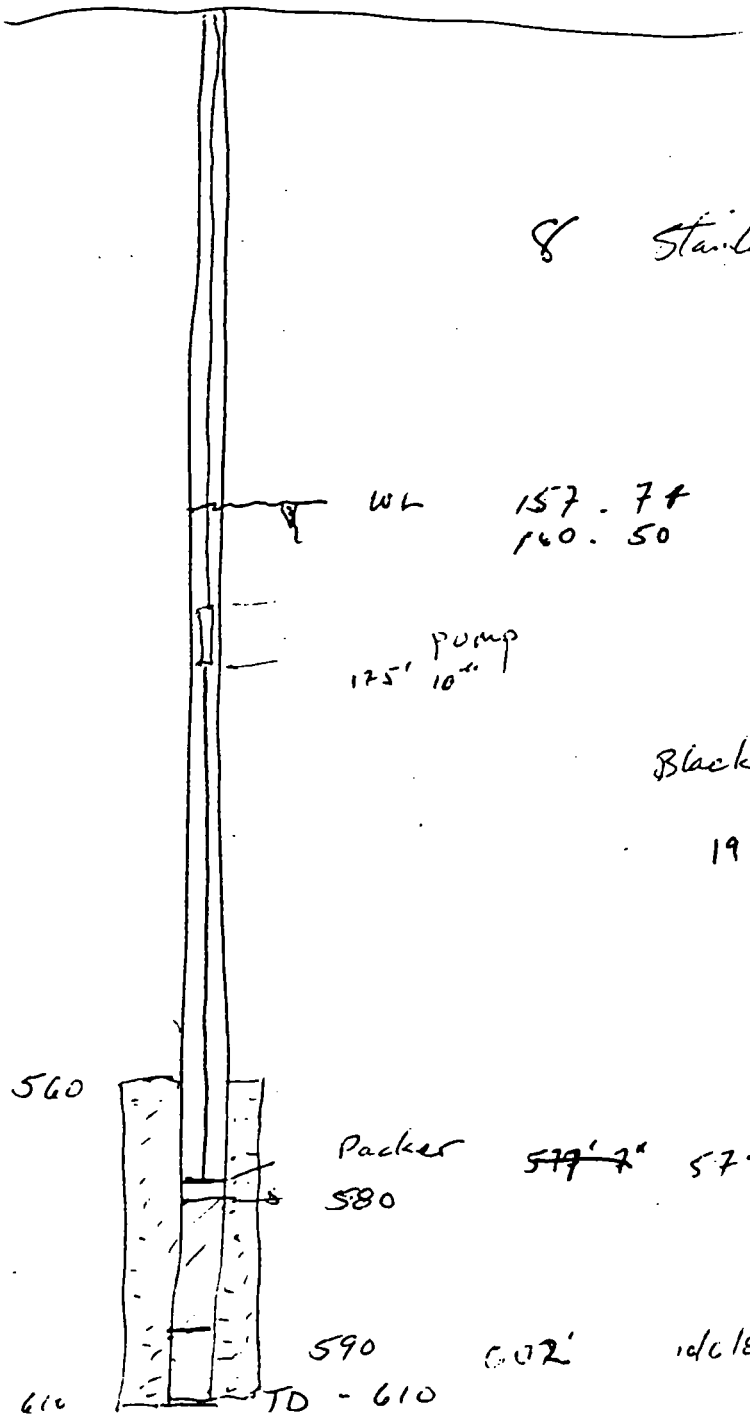
TD drilled 610'

TD measured

Screen 580-590 Gravel Pack 570-610

W.L.

10/7/88



8 Stainless Steel 170'

WL 157.74 10/6/88 9:30
160.50 10/7/88 9:45
+2

3 10"

pump
175' 10"

Black pipe
19 length 403' 9"

170' +2
3' 10"
403 9"
577' 7"
+ 2
579' 7"

560

Packer ~~579' 7"~~ 577' 7"
580

590 602' 10/6/88 9:30

610 TD - 610

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/6/88 Sample Location B1 - CW2, CW4 (dup)

Project Name LASC Project No. 8803128.13 (Area 1 inter)

Weather Conditions Warm - very smoggy (HNU - 0.8) - well head & intersection (14:30)

Observations/Comments Screen: 250 - 260

Samples Collected By DR, SDG Top Packers 248' 10"

QUALITY CONTROL no bottom

Purging/Sampling Method Hydrostar pump w/ double screen filter

Method to Measure Water Level Electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated Well volume 25.82 3 WV - 79.16 g.

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/6/88 14:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/6/88 14:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 155.25 (15:15) End 155.19 (15:30)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start pump 15:33		Water 15:35						
15:40	4 gpm	20	7.88/7.87	19.9	714/799	murky	103	155.52
15:45	4.5	42	7.40/7.50	19.7	718/818	"	75	155.64
15:50	4.5	65	7.33/7.39	19.4	720/813	cloudy	30	155.56
16:00	4.5	110	7.29/7.37	19.3	717/810	light cloudy	-30	155.38
16:10	2	130	7.29/7.34	19.4	718/807	"	-37	155.36
16:20	2	150	7.30/7.35	19.4	719/810	near clear	-55	155.35
16:30	2	170	7.30/7.33	19.3	721/812	murky	-60	155.34
16:40	2	190	7.29/7.32	19.3	722/816	"	-65	155.34
16:50	2	210	7.30/7.31	19.3	722/815	near clear	-66	

16:52 Start sampling

~~clear~~ C.O.C # L00039 Lab time CW2 - 15:00

Took 3 - Semi Volatiles. L00039 Lab time CW4 - 17:00

Total Discharge 210 Casing Volumes ~9

Method of Disposal of Discharge Water

Sheet ___ of ___

Chai

Area I - Intermediate

Duplicate

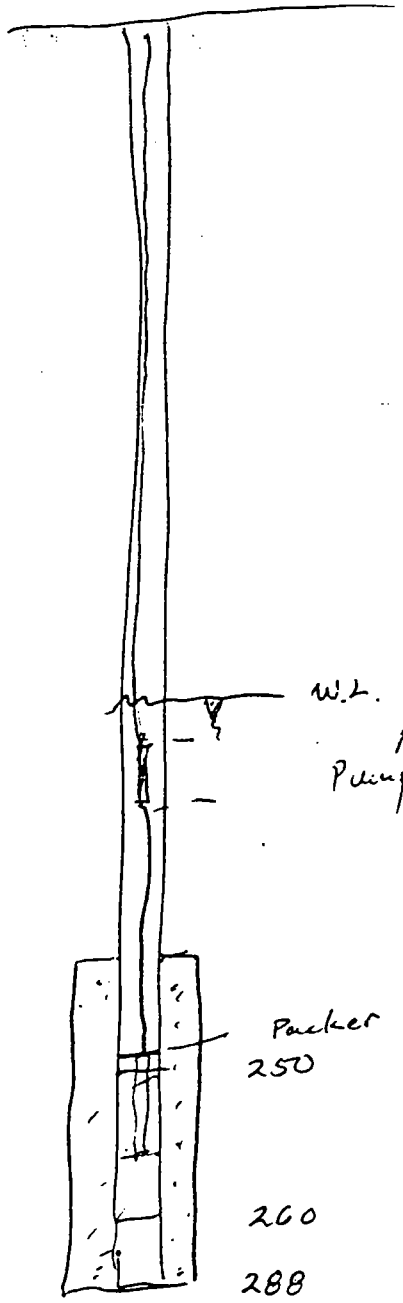
B1 - CW 2

TD drilled: 288

TD measured

Screen: 250-260 Gravel pack: 230-268

W.L.



Stainless Steel

160

W.L. 155.10 10/6/88 9:30

160 155.15 " 15:15

Pump 3' 10"

Black pipe

4 - 85'

Packer - 248' 10"

250

260 262 TD measured 10/6/88 9:30

288

160'
3' 10"
85
248 10"

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/6/88 Sample Location B1-CW3 (Area 1- shallow)

Project Name LASC Project No. 8803128.13

Weather Conditions Cool dark

Observations/Comments - | screen 150-160

Samples Collected By DR SDG | - no packer top pump 152- bottom of screen 157

QUALITY CONTROL

Purging/Sampling Method

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well Vol. - 12.4 3 well 37.2

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 10/6/88 14:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/6/88 14:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 154.14 (1730) End

15

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity
Start 18:25		Water Turn						
							~ -30	
18:30	0.5		8.37/8.37	19.8	405/453	very cloudy	-8	156.95
18:35	0.5	5	7.92/8.07	19.7	779/868	"	-13	157.00
18:50	0.75	17	7.69/7.80	19.8	794/885	light cloudy	-14	157.00
19:05	0.75	19	7.72/7.83	19.8	795/885	"	-13	157.00
19:15	0.75	26	7.68/7.75	19.7	794/889	near clear	-10	157.00
19:30	0.75	38	7.53/7.58	19.7	793/885	"	-5	157.03
19:40	0.6	44	7.44/7.59	19.6	795/889	clear	3	
19:50	0.6	50	7.45/7.58	19.7	795/868	"	7	156.20
20:00	0.55	55	7.44/7.59	19.7	794/888	"	7	156.07

Start purging 20:10

C-O-C-C000.39 Lab Time 19:00

Total Discharge ~60 Casing Volumes 5

Method of Disposal of Discharge Water

Sheet ___ of ___

Area 1 - Shallow

B1 - CWB

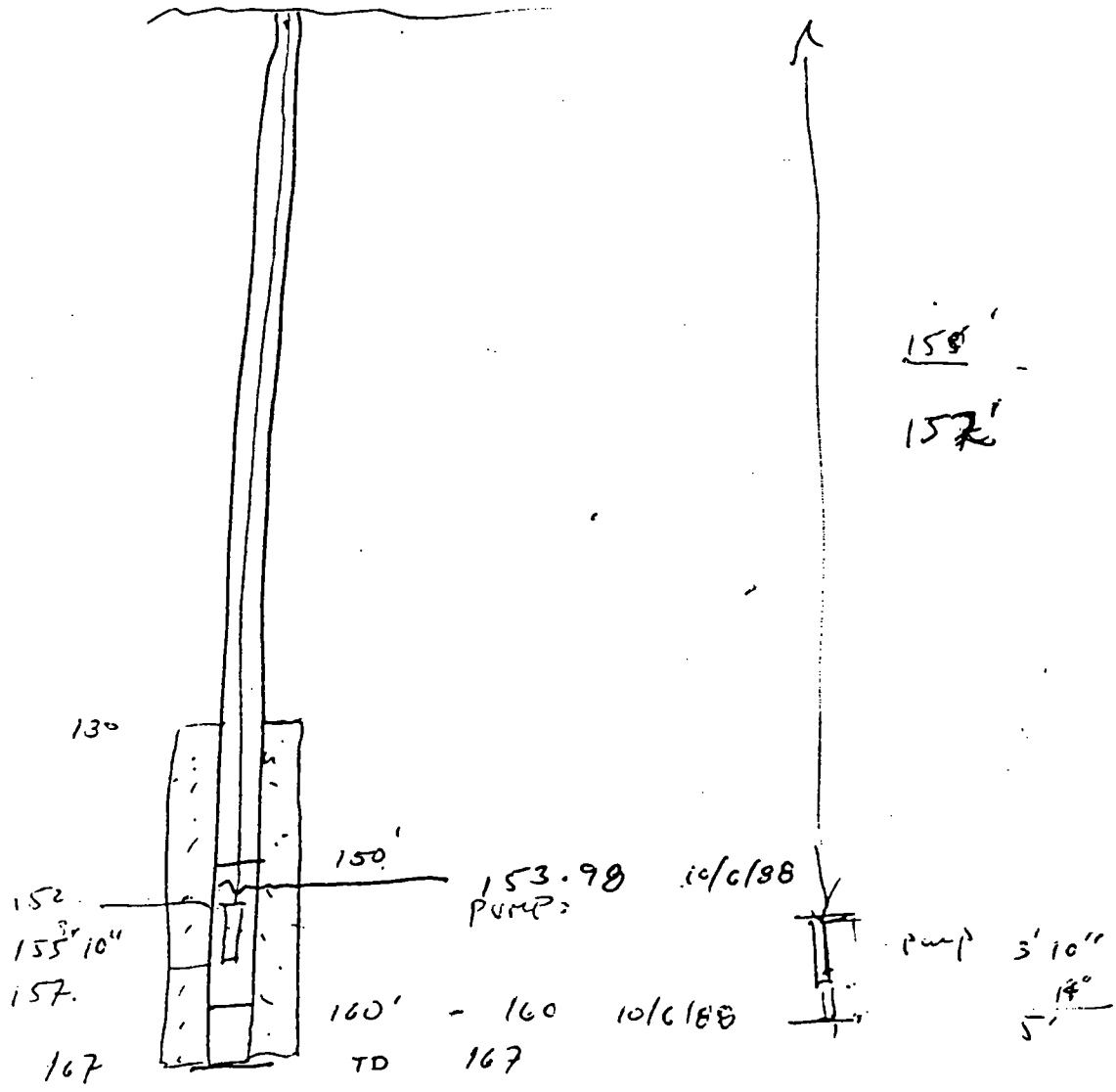
TD drilled: 167

TD measured:

Screen ~~195 - 215~~ 150 - 160

Gravel pack 130 - 167

WL.



THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10-6-88 Sample Location Area 2 A-1-CW1

Project Name LASC Project No. 88-03128.13

Weather Conditions Overcast, cool, sl. breeze

Observations/Comments

Samples Collected By

QUALITY CONTROL

Purging/Sampling Method

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. Orion SA 250 S.N. 3917 Date Calibrated 10/6/88

Sp Conductance Meter No. YSI Model 33 S# 16034 Date Calibrated 10/6/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 196.18 End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm) uncorr/corr	Color	~~Odor~~ Eh	~~Turbidity~~ water level
Pump started: 1246			First water: 1248			v. lt. greenish grey almost clear		
1250			9.33	20.1	291/310		-16	
1328: Water started again								
1344	2.3	36.8	8.25	20.0	380/405	v. lt. greenish grey sl. turbidity	45	
1350	—		8.19	19.7	361/384	"	-6	
1405	2.6	85.1	8.22	19.7	361/384	"	-40	
1420	—	124.1	8.16	19.5	362/385	"	-51	
1428	—	144.9	8.12	19.5	181/193	"	-51	
1435	2.1	159.6	8.19	19.7	360/383	"	-99	
1445	—	180.6	8.21	19.7	355/378	"	-51	
1455			8.22	19.6	358	"	-50	

Lab time 1600

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet of

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10-6-88 Sample Location A-1-CW2

Project Name LASC Project No.

Weather Conditions Cool, clear, light breeze

Observations/Comments

Samples Collected By

QUALITY CONTROL

Purging/Sampling Method

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump

pH Meter No. Date Calibrated

Sp Conductance Meter No. Date Calibrated

PURGING AND SAMPLING DATA

Water Level (below MP) Start 189.41' End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm) uncor/cor	~~Color~~ Color & Turbidity	~~Odor~~ Eh	~~Turbidity~~ Water Level
Started pump: 2038			First water:		2040		-177	
2045	1.1	5.5	7.65	18.3	580	lt. yellow brown, Sl turbid	-101	
2055	1.5	20.5	7.65	18.8	525	"		
2105	2.5	45.5	7.62	18.8	510	"	-83	
2115	—	70.5	7.67	18.8	510	"	-94	
2125	2.25	93.0	7.70	18.8	510	"	-105	
2145	1.75	110.5	7.99	18.6	510	"	-98	
2155	—	128.0	8.05	18.9	510	v. lt yellow brown v. sl turbidity	-83	
2205	—		8.15	18.8	510	"	-93	
2210	—		8.16	18.9	510	"	-102	
2215	1.5	160.5	8.08	18.7	510	"	-222	
2225	—	175.5	7.88	18.6	520	"	-100	
2235	—	190.5	7.75	18.8	540	"	-74	

Lab Time: 2130

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet of

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date _____ Sample Location A-1-CW2, contd.

Project Name _____ Project No. _____

Weather Conditions _____

Observations/Comments _____

Samples Collected By _____

QUALITY CONTROL

Purging/Sampling Method _____

Method to Measure Water Level _____

Pump Lines or Bailer Ropes: new cleaned dedicated _____

Method of Cleaning Bailer/Pump _____

pH Meter No. _____ Date Calibrated _____

Sp Conductance Meter No. _____ Date Calibrated _____

PURGING AND SAMPLING DATA

Water Level (below MP) Start _____ End _____

Measuring Point (MP) _____

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity
2245	—		7.70	18.8	540	"	-73	

Total Discharge _____ Casing Volumes _____

Method of Disposal of Discharge Water _____

Sheet of

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10-5-88 Sample Location Area 2 A-1-CW3

Project Name LASC Project No. 88-03128.13

Weather Conditions Clear, cool

Observations/Comments Could not purge this well; insufficient water in well.

Samples Collected By No samples collected

QUALITY CONTROL

Purging/Sampling Method Pump

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed

pH Meter No. Orion Date Calibrated 10/5/88

Sp Conductance Meter No. YSI 33 Date Calibrated 10/5/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 188.7 End 191.15 (1820)

192.7 (1810)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm) Uncorr/Corr	Color	~~Odor~~ Eh	~~Turbidity~~ Water Level

Started pump: 1737 1st water: 1742

Pumping failed to bring up any significant amount of water. Pump was turned off and water level measured. At this point, the water level had dropped to the point that there was only ~ 2 ft. of water in the well

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet of

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/3/88 Sample Location 36 - CW1 (Area 3 - deep)

Project Name LASC Project No. 8803128.13

Weather Conditions Overcast, partial light breeze

Observations/Comments screen: 580 - 590

Samples Collected By DR, SDG packers - top: no bottom

QUALITY CONTROL

Purging/Sampling Method Hydrostar positive pump w/ 2"-3" double screen filter

Method to Measure Water Level electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated Well volume: 36.8 +

Method of Cleaning Bailer/Pump Steam clean w/ Liquinox and final DI rinse

pH Meter No. YSI 3500 Date Calibrated 10/3/88 - 8:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/3/88 - 8:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start (9/30/88 1:00) End

201.24 (20:00)

186.38 (20:20)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ Dep (ft)
Start pumping		28:24	Water	20:28		rusty		
						clear		201.15
20:40	1.25	12	8.45/8.49	20.2	317/352	mocha	72	200.90
20:00	1.1	34	8.43/8.47	20.2	312/345	mocha	65	
21:30	1.0	67	8.72/8.77	20.2	301/332	"	54	200.90
22:00	1.0	97	8.81/8.87	20.1	300/332	cloudy	58	
22:15	1.0	112	8.85/8.90	20.0	298/331	"	57	~200.90
22:30	1.0	127	8.87/8.91	20.2	298/330	"	56	~

clear at -

22:30 — Start Sampling

3 well vol. = 117 C-o-C #: L000033 Lab Time 20:30

Total Discharge ~ 130 Casing Volumes ~ 3.2

Method of Disposal of Discharge Water

Sheet ___ of ___

L000033

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date ~~21~~ 10/3/88 Sample Location B6 - CW2 (Area 3 - intermed) ~~B6~~

Project Name LASC Project No. 8803128.13

Weather Conditions Slightly overcast (cirrus clouds) Hot (31°C) smoggy (vis ~3mm)

Observations/Comments B6 - CW12 - dup | screen: 330 - 340

Samples Collected By DR, SDG | packers: 229'3", 334'10"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump with 2"-3" double screen filter

Method to Measure Water Level electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated Well vol. - 22.6

Method of Cleaning Bailer/Pump Steam clean w/ Liquinox and final DI rinse

pH Meter No. YSI 3500 Date Calibrated 10/3/88 - 8:30

Sp Conductance Meter No. YSI 3500 Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 198.10 (12:00) 9/30/88 End 198.20 (15:25)

198.18 (14:30)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~	Turbidity EU	depth
Start pumping: 14:30 Water: 14:32									
14:35	4.5	20	7.42/7.52	20.3	745/825	murky		81	198.75
14:40	4.5	45	7.31/7.41	20.0	747/829	"		23	198.25
14:50	4.5	90	7.25/7.34	20.0	750/835	"		-34	
14:55	4.0	110	7.24/7.35	20.0	752/835	"		-54	198.70
clear 15:00	4.0	130	7.24/7.34	20.0	752/834	"		-60	198.7
15:05	4.0	150	7.22/7.32	20.2	752/834	"		-66	198.70
15:10	3.0	180	7.22/7.29	20.1	752/835	"		-70	198.7

Hydrocarbon smell - small black particles in suspension & oil sheen on the surface

L00033 - Lab time B6 - CW2 - 13:00

L00034 - Lab time B6 - CW12 - 15:00 91

Total Discharge ~180 Casing Volumes ~~6.8~~ ~8

Method of Disposal of Discharge Water

Sheet ___ of ___

L00033

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/3/88 Sample Location B6 - CW3 (Area 3 - shallow)

Project Name LASC Project No. 8803128.13

Weather Conditions Warm (~ 20°c) smoggy

Observations/Comments screen: 195 - 215

Samples Collected By DR, SDG No packers -

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ double filter 3/4 - 2"

Method to Measure Water Level electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated Well Volume - 37.2

Method of Cleaning Bailer/Pump Steam clean w/ Liquinox and final DI rinse

pH Meter No. YSI 3500 Date Calibrated 10/3/88 8:30

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/3/88 8:30

PURGING AND SAMPLING DATA

Water Level (below MP) Start 199.20 (8:30) End

199.20 (9:15)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity depth
Start pumping: 9:18		Water 9:19			c	clear		
9:20	3	0	7.26/7.26	20.7	773/852	mostly so cloudy	202	199.58
9:25	3.5	15	7.13/7.14	19.9	770/858	cloudy	193	199.63
9:30	3.5	30	7.14/7.15	20.0	772/858	"	184	199.60
9:40	3.5	65	7.18/7.18	20.0	769/855	"	179	199.65
9:50	3.0	95	7.17/7.18	19.9	769/856	light cloudy	168	199.57
10:00	3	125	7.20/7.22	20.3	772/854	v. lightly cloudy	163	199.54
10:05	3	155	7.16/7.19	20.0	771/855	"	160	"

10:05 - Sample · ~~Fee~~ a little free product on surface

COC: L00033 Lab time 10:00

Total Discharge ~ 160 Casing Volumes ~ 4.3

Method of Disposal of Discharge Water

Sheet ___ of ___

L00033

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/28/88 Sample Location BG-CW10 (Area 4-E.B)

Project Name LASC Project No. 8803128.13

Weather Conditions Hot (~35°C) smoggy.

Observations/Comments Equipment blank

Samples Collected By DR, SG Taken at Area 4

QUALITY CONTROL

Purging/Sampling Method DI water through 2 black pipes, 1 stainless

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump steam clean w/ Liquinox and final DI rinse

pH Meter No. YSI 3500 Date Calibrated

Sp Conductance Meter No. YSI 3500 Date Calibrated

PURGING AND SAMPLING DATA

Water Level (below MP) Start End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity
	Equipment Blank							
15:80	Take samples through 2 black pipes and one stainless steel 10'. The VOC each collected from 1 pipe. All other bottles collected as splits from each pipe							

C-o-C #: 200030 LAB TIME: 15:00

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/28/88 Sample Location B6- CW11 (Area 4 EB)

Project Name LASC Project No. 8803128.13

Weather Conditions Hot (~75°) very smoggy

Observations/Comments Equipment Blank Taken at Area 4

Samples Collected By

QUALITY CONTROL

Purging/Sampling Method DI water through 3 black pipes.

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump Steam cleaned w/ Alconox and final DI Rinse

pH Meter No. YSI 3500 Date Calibrated

Sp Conductance Meter No. YSI 3500 Date Calibrated

PURGING AND SAMPLING DATA

Water Level (below MP) Start End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity
Equipment Blank								
15:45	Take samples through 3 lengths of black pipe. Each VOC collected from 1 pipe. All others as a composite from each pipe.							

C-O-C #: 200030 Lab Time: 16:30

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/29/88 Sample Location BG-CW4 (Area 4 - deep)

Project Name LASC Project No. 8803128.13

Weather Conditions sunny, light smog, no breeze

Observations/Comments screen 510' - 520'

Samples Collected By DR, packers 507'10" 516'5"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4"

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated 1 mill Jal ~ 23

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/28/88

Sp Conductance Meter No. YSI 3500 Date Calibrated 9/28/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 219.99 (8:05) End 220.48 (10:27)

~~220.48 (1027)~~

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
start pump 8:10		Water					free product	
8:15	1.5	15	7.78/8.40	22.6		Hydrocarbon	78	222.30
8:20	1	25	7.92/8.74	21.6	744/796	Black	78	220.95
8:30	0.85	30	8.07/8.99	23.4	787/812	"	32	
8:45	~1	45	7.90/7.91	22.8	830/866	"	-57	221.87
9:00	0.8	55	8.03/8.05	21.5	806/820	"	-49	222.05
clear cell - 9:15	0.7	~65	8.08/8.10	21.9	812/864	black-grey	-34	
9:30	0.8	~75	8.13/8.15	22.7	802/856	"	-28	
9:37	~0.8	~80	8.12/8.14	22.7	819/856	murky grey	-24	228.07
clear cell - 9:45	0.8	~85	8.18/8.20	21.8	800/852	cloudy	-41	221.10
10:00	0.8	~95	8.15/8.17	22.1	800/856	cloudy	-41	222.09

Very black w/ free product. Very strong hydrocarbon odor (crude/diesel)

Cal #: ~~L00071~~ L00031 Lab Time: 10:00

Total Discharge ~100 Casing Volumes 4

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/28/88 Sample Location B6-CW5 (Area 4 - intermed.)

Project Name LASC Project No. 8803128.13

Weather Conditions Hot (35°c) smoggy (vis >5mi)

Observations/Comments screen 345'-355'

Samples Collected By DR, KOK packer 342'6", 348'3"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol ~ 22 gal

Method of Cleaning Bailer/Pump

pH Meter No. YSI 3500 Date Calibrated 9/28/88

Sp Conductance Meter No. YSI 3500 Date Calibrated 9/28/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start End

220.60 (15:15)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity depth
start 17:15		Water 15:16						221.35
		20					111	
17:25	4	40	7.00/6.99	20.2	772/850	grey milky	85	221.29
17:30	3.5	56	7.05/7.05	20.2	770/852	"	40	221.30
17:40	3.5	90	7.05/7.05	20.3	769/847	cloudy	-21	221.29
17:50	3.5	126	7.07/7.07	20.1	766/847	light cloudy	-56	221.27
17:55	2.5	150	7.07/7.08	20.4	770/847	non clear	-58	221.02
18:00	2.5	150	7.07/7.07	20.3	769/847	"	-64	
18:05	2.5	170	7.08/7.09	20.4	768/847	"	-65	221.05

low cell

low pump

Start Sampling 1805 C-C-C-A1 L00030

Free product throughout pumping - hydrocarbon odor (crude/diesel) Lab tbs 18:00

Total Discharge ~~[illegible]~~ 170 Casing Volumes ~ 8

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9-29-88 Sample Location B-6-CW6 (Area 4) shallow

Project Name LASC Project No. 88-03128.13

Weather Conditions Sunny, heavy smog, windy

Observations/Comments Well/anulus volume = 34.8 gal Purge || screen: 215-235

Samples Collected By || packers - no packers

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4"-2" double screen filter.

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new cleaned dedicated Well Volume ~35 gal

Method of Cleaning Bailer/Pump Steam cleaned with Alconox, DI water rinsed

pH Meter No. YSI 3500 Date Calibrated 9/28/88

Sp Conductance Meter No. YSI 3500 Date Calibrated 9/28/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 220.95 (1130) End 220.90 (1608

220.90 (1453)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ Water level
1455 Start Pump	14:55	Water	1458					221.55
1503	3.5	28	7.29/7.30	20.6	868	lt. yellow brown sl. turbid	131	220.40
15:15	3.5	75	7.16/7.17	20.3	795/877	"	96	221.64
15:25	3.0	~~110~~ 105 kgk	7.13/7.14	20.3	~~799~~/880	"	64	221.64
1535	3	135	7.13/7.10	20.4	802/880	v. lt. yellow brown almost clear	51	
1540	3	150	7.16/7.17	20.4	799/880	"	44	
1545	-	180	7.11/7.11	20.4	801/884	"	43	
1550	-		7.11/7.11	20.4	802/880	"	40	

15:55 Start Sampling

C-o-C # L00031

Lab Time 1500

Total Discharge ~200 Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10-4-88 Sample Location B-6-CW7 (Area 5D)

Project Name LASC Project No. 88-03128.13

Weather Conditions Cool, clear, windy, smoggy

Observations/Comments

Samples Collected By KJ Kinella; Sample ID No. K0012
QUALITY CONTROL (Duplicate Sample K0013 taken here)

Purging/Sampling Method Hydrostar piston pump

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed

pH Meter No. Beckman Φ21 Date Calibrated 10/4/88

Sp Conductance Meter No. YSI 33 Date Calibrated 10/4/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 226.02 (1300) End
226.55 (1614)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm) uncorr/Corrected	Color & turbidity	~~Odor~~ Eh	~~Turbidity~~ Water level
Started Pump: 1615			First Water: 1617				115.3	
1622	2.75		11.90	23.7	1800/1258	H. greenish gray v. sl turbidity	-230 ~~116.5~~	
1637	–	55	9.73	20.8	420/528	"	-29	
1646			9.94	20.6	420/528	"	-48	227.32
1655	1.25	77.5	10.02	20.5	445/560	"	-69	
1705	2.75	105.0	9.96	20.9	410/516	"	-58	227.55
1715	–	132.5	9.82	20.7	410/516	"	-50	
1725	–		9.90	20.1	300/377	"	-86	
1735	2.5	182.5	10.01	20.0	405/509	"	-70	227.55
1745	–	207.5	10.05	19.9	410/515	"	-52	
1755			10.09	19.9	410/515	"	-56	
1800			10.10	19.8	405/509	"	-58	

Lab time: 1800

Total Discharge 245 Casing Volumes

Method of Disposal of Discharge Water

Sheet of

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10-3-88 Sample Location B-6-CW8 (Area 5-I)

Project Name LASC Project No. 88-03180.1

Weather Conditions Hot, smoggy, partial high cloud cover

Observations/Comments Sample ID: K0010 Purge vol = 27.04 gal

Samples Collected By K.J. Kinsella

QUALITY CONTROL

Purging/Sampling Method Purge using Hydrostar pump

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: (new) cleaned dedicated New line

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed

pH Meter No. Beckman Φ21 Date Calibrated 10-3-88

Sp Conductance Meter No. YSI 33 Date Calibrated "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 223.65 (1325) (after pumping started) End 222.85 (1510)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ Water level
13:25 started pump		13:28	first water					223.65
13:36			7.38	21.1	620/	lt. grieish brown sl. turbid	-34.5	223.50
1345	2.5	42.5	7.33	21.3	645/	"	23.5	—
1400	-	80.00	7.33	21.6	640/	lt. yellowish brown mod. turbidity	4.5 ~~22.2~~ KOK	223.40
1410	2.75	107.50	7.35	21.7	655/	"	7.3	—
1420	—	135.00	7.35	22.5	680/	"	7.4	223.40
1430	—	162.50	7.34	21.5	655/	"	12.3	—
1435	—	176.25	7.37	21.8	650/	"	6.7	—
1440	-	190.00	7.36	21.5	630/	"	0.5	
1445	-	203.75	7.40	20.7	620/	"	-4.0	
1450	2.5	210.00	7.37	20.9	615/	"	2.0	

Lab Time 1505

Total Discharge 210.0 Casing Volumes 7.8

Method of Disposal of Discharge Water Large Baker Tank

Sheet of

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10-3-88 Sample Location B-6-CW9 (Area 5-S)

Project Name LASC Project No. 88-03 128.13

Weather Conditions Warm, high clouds, smoggy

Observations/Comments ~~Sample No. K0011~~

Samples Collected By ~~KJ Kinsella~~ No Samples collected FJK

QUALITY CONTROL

Purging/Sampling Method Pumped by Hydrostar piston pump

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump Steam cleaned, DI water rinsed

pH Meter No. Date Calibrated 10/3/88

Sp Conductance Meter No. Date Calibrated 10/3/88

PURGING AND SAMPLING DATA

Water Level (below MP) Start 222.64 (1638) End

222.65 (1648)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ Water level
1853 - Started pump			1855 - First water					
1858	2.5		7.30	21.2	610/	lt. brown sl. turbidity	114.3	
1810	–	37.5	7.37	20.3	600/	med. brown mod turbidity	159.3	
1825	2.5	75	7.42	20.2	700/	"	164	221.0
1840			7.42	20.1	595/	"	193.0	221.2

Stopped purging due to equipment failure

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet of

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10-4-88 Sample Location B-6-CW9 (Area 5-S)

Project Name LASC Project No. 88-03128.13

Weather Conditions Cool, clear, smoggy

Observations/Comments 1x effective "casing volume" calculated as 51.98 gal

Samples Collected By Sample ID # K0011, taken by KJ Kuselle

QUALITY CONTROL

Purging/Sampling Method Hydrostar piston pump

Method to Measure Water Level Electronic Sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated

Method of Cleaning Bailer/Pump Steamcleaned, DI water rinsed

pH Meter No. Beckman Φ 21 Date Calibrated 10/4/88

Sp Conductance Meter No. YSI 33 Date Calibrated "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 222.78' (0803) End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm) uncor/corrected	Color+ turbidity	~~Odor~~ Eh	~~Turbidity~~ Water level
Pump started 0811		First water 0812						
0816	2.4		7.27	20.5	605/761	v. H. brown almost clear	137.3	
0830	–	43.2	7.38	19.8	595/748	"	115.3	
0845	2.6	82.2	7.41	19.9	570/717	H. reddish brown Sl. turbidity	163.3	223.13 (?)
0900	–	121.2	7.40	20.0	595/748	"	158.7	(222.98 ok) 222.98 (?)
0910	2.5	146.2	7.43	20.2	590/742	"	170.3	
0920	–	171.2	7.44	20.3	575/723	"	169.7	
0930	–	196.2	7.38	20.3	570/717	v. lt reddish brown sl. turbidity	174.5	
0940	2.4	220.2	7.37	20.3	580/730	v. lt. reddish brown almost clear	174.3	
0950	–	244.2	7.39	20.4	585/736	"	167.0	
1000	–	268.2	7.34	20.4	590/742	"	136.3	

Lab Time: 1050

Total Discharge 268.2 gal Casing Volumes 5.2

"Effective Casing Volume" calculated as approx: 51.95

Method of Disposal of Discharge Water

Sheet of

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/5/88 Sample Location B5-CW1 (Area 6 - deep)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, partially overcast. Very smoggy

Observations/Comments | screen 532'-542'

Samples Collected By DR | packer 532'7"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 2-3" double screen filter

Method to Measure Water Level

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol - 24.8 (+6) 3 vol - 80.4

Method of Cleaning Bailer/Pump 1 to

pH Meter No. YSI 3500 Date Calibrated 10/4/88 17:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 10/4/88 17:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 211.54 End 211.09 (15:50)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity
Start pump 13:15			Water 13:19			black		
13:25	1.25	12.8	922/924	24.0	543/555	yellow brown	3	212.60
clean cell 13:35	1.25	25	8.25/8.27	21.4	548/592	olive	-38	211.55
13:50	~~1.25~~ 1	44	8.06/8.18	23.1	565/589	olive	-42	-
14:00	~~1.25~~ 0.5	~~56~~ 50	8.14/8.16	23.1	563/584	"	-41	211.28
14:30	0.5	65	8.08/8.09	23.4	571/589	"	-36	211.22
clean cell 15:10	0.4	83	8.00/8.01	24.8	579/581	"	-30	
clean cell 15:20	0.4	87	7.95/7.96	22.7	584/588	"	-49	

CoC#: L00036 Lab Time 15:00

Total Discharge ~80 Casing Volumes 3.25

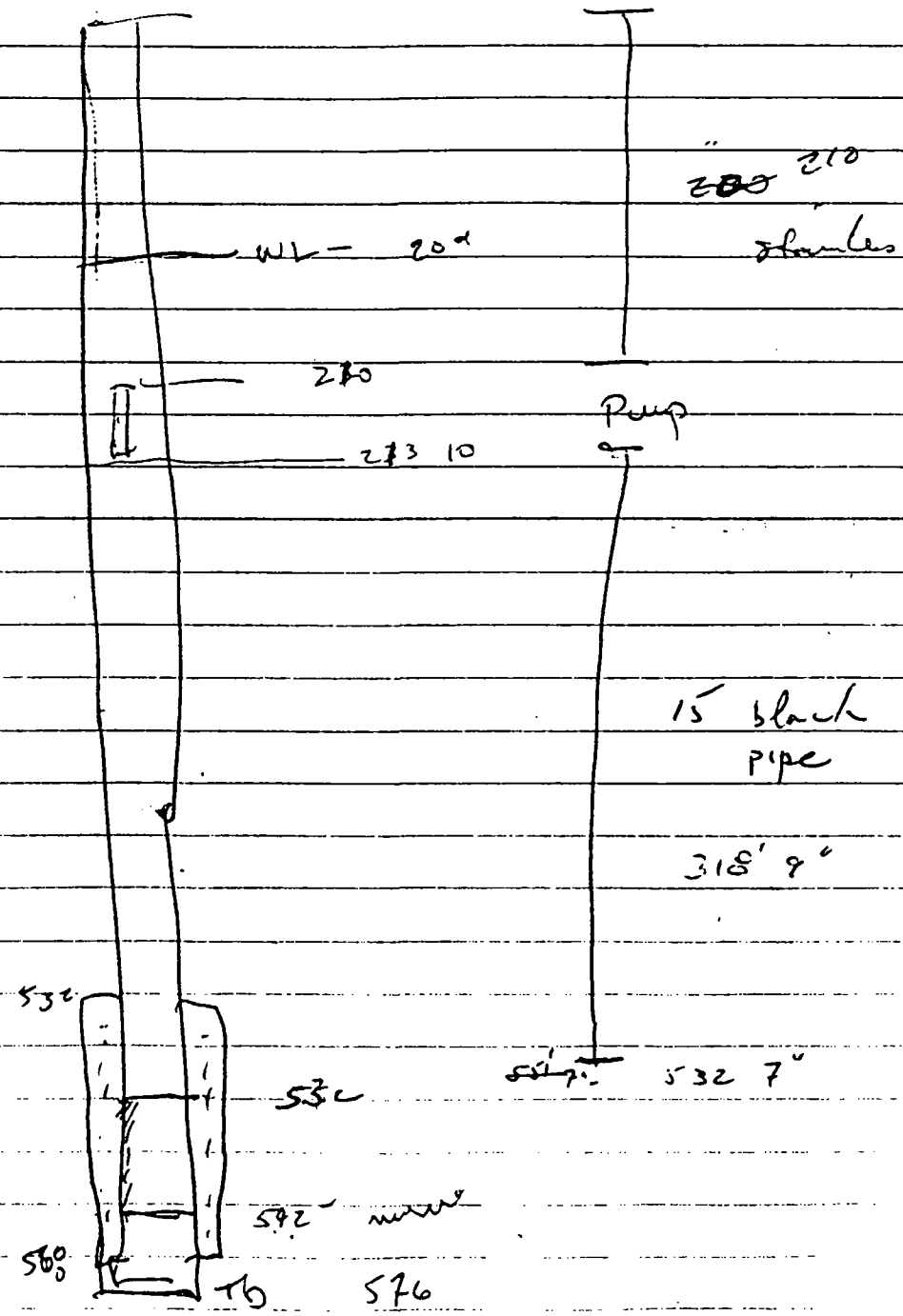
Method of Disposal of Discharge Water

Sheet ___ of ___

BS - CW1

TD - 576 Screen - 542 - 552 Filter 532 - 568

WL ~ 220 TD Mem 542



THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/5/88 Sample Location B5 - CW2 (Area C - inter)

Project Name LASC Project No. 8803128.13

Weather Conditions Overcast, smoggy

Observations/Comments | Screen: 339 - 349

Samples Collected By DR | packers: 338' 6"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ double screen filter (2-3")

Method to Measure Water Level electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well volume 24.8 + 2.7

Method of Cleaning Bailer/Pump 3 well - 77.1

pH Meter No. YSI 3500 Date Calibrated 10/4/88 17:00

Sp Conductance Meter No. YSI 3500 Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 204.11 End

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start pumping 9:10						black		
9:15	4	20	7.48/7.49	18.6	650/745	dark brown	-70	
9:23	4	50	7.45/7.47	18.6	646/740	"	-71	204.57
9:35	4	100	7.42/7.43	18.7	639/730	dark cloudy	-88	
slow. 9:45	2	130	7.43/7.44	19.0	655/631	cloudy	-93	204.58
9:56	2	160	7.45/7.46	19.1	541/613	"	-98	204.38
10:00	2	170	7.43/7.44	19.1	533/606	"	-102	~~204.38~~
10:10	2	190	7.43/7.44	19.2	518/586	"	-105	204.34
10:15	2	200	7.44/7.45	19.4	518/585	"	-108	-
10:20	2	210	7.45/7.47	19.3	505/573	"	-109	-
10:25			7.46/7.47	19.3	507/574	"	-110	-
10:30 Start sampling								

C-o-C #2 L00036 Lab time 10:00

B5-CW4 - 18:00

Total Discharge ~ 230 Casing Volumes ~ 9

Method of Disposal of Discharge Water

Sheet ___ of ___

B5 - CW2 (Area 6 intrused)

TD - 354 screen 339-349 Filter Pack - 332-354

WL - ~ 220

Stick up of ~~15~~ + 1'6"
10"

23 Lengths - 230

~~130~~

204.20'

~~24~~ 228'.6" 229' 2"

~~23~~ 232' 4" 233'

5 Black pup
106 3"

3

339' 6"

337

Top packer

338 10" 336

339

338' 7"

10'

349

350'

354

230
106 3"
3 10
340' 1"

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 10/4/88 Sample Location B5-CW3 (Area 6 - shallow)

Project Name LASL Project No. 8803128.13

Weather Conditions Overcast, cool

Observations/Comments Eastern most well | screen: 209' - 228'

Samples Collected By DR, Jill Miller | packers: - None packers

QUALITY CONTROL

Purging/Sampling Method Hydrostar 300 no screen

Method to Measure Water Level electric sounder

Pump Lines or Bailer Ropes: new cleaned dedicated 1-Well Volume 55.7

Method of Cleaning Bailer/Pump Steam clean w/ Liquinox and final DI rinse

pH Meter No. YSI 3500 Date Calibrated 10/4/88 17:00

Sp Conductance Meter No. YSI 3500 Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 203.50 (16:00) End

203.57 (18:00)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start 18:00		Water 18:02						
18:05	3.5		6.98/7.00	19.9	836/939	cloudy	219	
18:10	3.5	35	7.23/7.24	19.0	840/955	" milky	214	222.44
18:20	3.5	70	7.29/7.30	18.9	851/969	light milky	202	
18:30	3.5	105	7.30/7.30	18.9	842/968	dark cloudy	191	~204.10
clear all 18:40	3.0	135	7.33/7.34	18.9	847/966	" light cloud	186	
18:50	3.0	165	7.33/7.34	18.8	851/969	near clear	184	
19:00	3	195	7.32/7.33	18.8	852/969	"	181	—
19:10	~1	200	7.32/7.33	18.9	853/969	"	179	

Start sample 18:12

COC# 600036 Lab time 19:00

3 well vol - 167 gal

Total Discharge 205 Casing Volumes 4

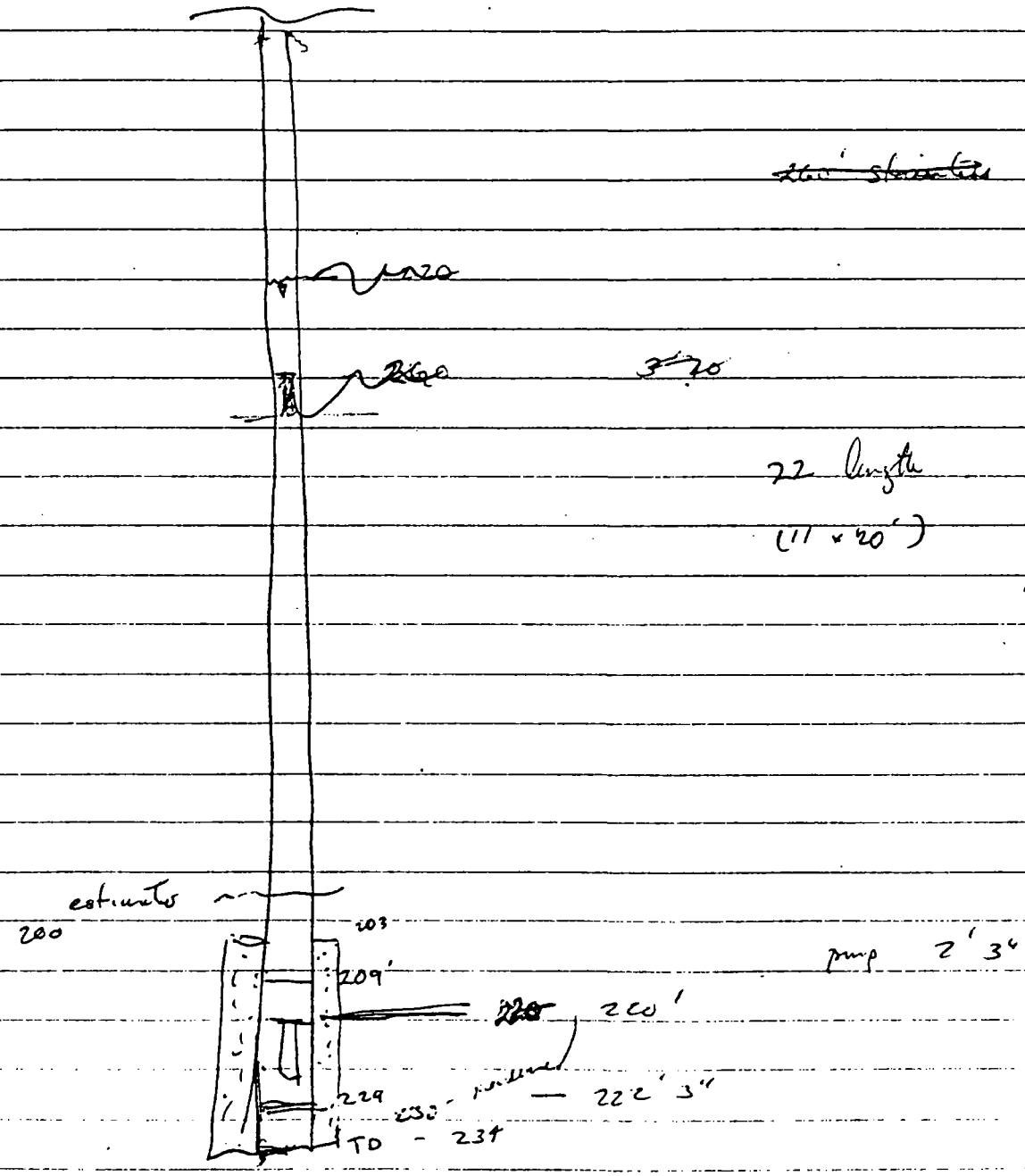
Method of Disposal of Discharge Water

Sheet ___ of ___

B5 - CW3 (Area 6 shallow)

TD comp. - 234 ~~209~~ screen 209 - 229 Entire Pack 203 - 234

~ WL ~ 220



THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/22/88 Sample Location C1-CW3-01 (Area 7-EB.)

Project Name LASC Project No. 8803128.13

Weather Conditions Sunny, Warm, Light Breeze

Observations/Comments Sample C1-CW3-01 | Taken on the surface through

Samples Collected By DR, KK | the pump & one 10' length

QUALITY CONTROL

Purging/Sampling Method DI water through pipes

Method to Measure Water Level —

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump steam clean w/ Alquinox and final DI Rinse

pH Meter No. YSI 3500 Date Calibrated

Sp Conductance Meter No. YSI 3500 Date Calibrated

PURGING AND SAMPLING DATA

Water Level (below MP) Start — End

—

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	Odor	Turbidity
15:00 - Take Equipment Blank								

C.o.C #: 100020 lab Time: 1500

Total Discharge Casing Volumes

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/23/88 Sample Location ~~[illegible]~~ (deep Area 7) - C1-CW1

Project Name LASC Project No. 8803129.13

Weather Conditions Warm, clear

Observations/Comments Sample C1-CW2 | screen: ~~[illegible]~~ 481'-491'

Samples Collected By DR, | packer: ~~[illegible]~~, 478'6"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/

Method to Measure Water Level electric sounder TD - 490

Pump Lines or Bailer Ropes: new cleaned dedicated 1 well vol ≈ ~30 gal

Method of Cleaning Bailer/Pump steam clean w/ Alconox & DI rinse

pH Meter No. VSI 3500 Date Calibrated 9/21/88

Sp Conductance Meter No. " Date Calibrated "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 240.18 (13:00) End

240.12 (17:28)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ Water (Elev
start pump: 17:30			Water:					242.95
17:40	2.5	25	8.49/8.05	18.0	941/500	green	-141 ~~sl. turb~~	242.85
17:50	2.5	50	8.66/8.71	18.7	520	lt. green	-229	242.70
18:00	1.6	67	8.87/8.93	19.4	623	grey brown very turbid	-114	241.50
18:15		82	8.47/8.52	18.6	608	grey brown v. turbid	-78	240.6[illegible]
18:25	3→2.25	105	8.30/8.34	18.1	596	green-grey brown not turbid	-56	241.28
18:35	2.5	130	8.20/8.25	18.1	598	lt. brown sl. turbid	-51	241.22
18:45	2.5	155	8.16/8.20	18.2	598	"	-38	241.15
18:55	2.5	180	8.02/8.06	17.8	522/594	"	-26	242.1
19:05	2.5	205	8.01/8.04	17.8	522/600	"	-18	241.95
19:15	2.5	230	7.87/7.90	17.8	515/593		-16	241.0[illegible]

3/min
2/min

Start sampling 19:25

C-0-CW1 100027 Lab time ~~18:00~~ 16:00

Total Discharge ~250 Casing Volumes ~8

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/23/88 Sample Location (Area 7 intermediate) C1-CW2

Project Name LASC Project No. 8803128.13

Weather Conditions

Observations/Comments Sample C1-CW2 | screen: 382 - ~~382~~ 392

Samples Collected By DR | packers: - ~~380~~ 379' 3"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ well Vol ~ 30 gal

Method to Measure Water Level Electric Sounder. TD - 393'

Pump Lines or Bailer Ropes: new cleaned dedicated

Method of Cleaning Bailer/Pump Steam clean w/ liq. Alconox & DI rinse

pH Meter No. YSI 3500 Date Calibrated

Sp Conductance Meter No. " Date Calibrated

PURGING AND SAMPLING DATA

Water Level (below MP) Start 237.40 (11:00) End 237.28 (16:15)

237.34 (14:00)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
Start pump 14:05 Water - 14:10						clear		
14:20	3	45	7.71/8.50	19.1	-.001/-.001	murky	155	237.97
14:30	3	75	7.50/7.70	18.8	-534/-605	cloudy	41	237.96
14:35	3	90	7.41/7.57	19.2	534/605	light cloudy	80	237.96
14:40	3	105	7.39/7.53	19.1	535/606	near clear	70	
14:45	3	120	7.38/7.54	19.1	537/606	"	58	
14:50	3	150	7.36/7.51	18.8	533/609	"	36	237.94
15:00	3	180	7.39/7.79	18.8	536/609	"	13	
15:05	3	195	7.39/7.69	18.8	534/609	"	3	237.93
15:10	3 check	210	7.38/7.81	18.8	532/609	"	-012	
15:15	3		7.38/7.63	18.8	533/608	"	-27	237.9
15:30	3	270	7.38/7.70	18.8	532/608	"	-48	
15:30	Start sampling			C.o-C# 100027		Lab time 14:30		

clear cell.

Total Discharge 270 Casing Volumes ~ 9

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9/22/88 Sample Location (Area 7 shallow) C1-CW3 (02)

Project Name LASC Project No. 8803/28.13

Weather Conditions Sunny, Warm, Light Breeze TD - 280 (9/22/88 10:

Observations/Comments Sample C1-CW3-02 | screen : 260 - 280

Samples Collected By DR, KK | packers: 259'3", 271'2"

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4" - 2 Double screen filter.

Method to Measure Water Level Electric Sounder

Pump Lines or Bailer Ropes: new cleaned dedicated Well volume ≈ 40 (30 for 1:

Method of Cleaning Bailer/Pump Steam clean w/ liq Alconox and DI Rinse

pH Meter No. YSI 3500 Date Calibrated 9/22/88 16:00

Sp Conductance Meter No. " Date Calibrated " "

PURGING AND SAMPLING DATA

Water Level (below MP) Start 237.79 (16:53) End 237.69 (18:20)

237.74 (17:00)

Measuring Point (MP)

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ Depth Water level
Start pump		16:52 (17:07)	Water	18:09	stop to measure W.L.			
								238.20
17:15	3.5	~35	7.02/7.04	18.7	691/731	mocha	131	238.15
17:23	3.5	60	7.22/7.29	18.7	626/715	cloudy	124	238.14
17:30	3.5	90	7.26/7.38	18.6	613/702	"	114	238.15
17:40	3.5	125	7.26/7.34	18.6	609/698	v. light cloudy	112	238.14
17:45	3.5	142	7.26/7.34	18.7	602/694	"	112	238.14
17:50	3.5	160	7.26/7.35	18.7	605/696	" clear	109	238.14
17:55	3.5	178	7.27/7.36	18.6	611/700	"	104	238.14
18:00	3.5	195	7.27/7.34	18.5	610/700	"	103	238.14
18:05	~20	200	7.27/7.36	18.6	605/696	"	102	237.91
18:10	~20	210	7.28/7.37	18.6	605/692	"	104	237.98

clear cell

Start Sampling 18:10 C-o-C #: 100026 Lab Time 18:00

Total Discharge ~ 220 Casing Volumes 4.5

Method of Disposal of Discharge Water

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date Sept. 27, 1988 Sample Location (Area 8) - C-1-CW4

Project Name LASC Project No. 88-03128.13

Weather Conditions Clear, smoggy, hot

Observations/Comments screen: 652 - 662

Samples Collected By K Kuciella packers 650.5

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4 in. pipe w/ 3/4 - 2" double filter

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated 3 Well Volumes: 70 gal

Method of Cleaning Bailer/Pump Steam cleaning, DI rinse

pH Meter No. ~~9/27/88~~ YSI 3500 Date Calibrated 9/27/88 10:00

Sp Conductance Meter No. YSI 3500 Date Calibrated 9/27/88 10:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 231.20 (1207) End 231.30 (1355)

Measuring Point (MP) 231.33

Time	Pump Rate (gpm)	Discharge (gallons)	pH uncor/corr	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ depth
1208		Start pump				lt. brown v. sl. turbidity		
1210	first water	0	8.60/8.59	29.1	508		148	231.67
1220	3.25	~~3.25~~ 32.5	7.47/7.48	20.0	648	"	95	231.6[illegible]
1230	3.3	65.5	7.37/7.38	21.0	632	"	62	231.64
1240	3.4	99.5	7.29/7.29	21.7	623	"	32	231.64
1250	3.5	134.5	7.24/7.25	19.8	646	v. lt. brown, almost clear	-24	231.64
1300	3.5	169.5	7.24/7.25	19.7	639	"	-47	231.64
1305	—		7.22/7.24	19.7	632	"	-63	—
1310	3.25	202	7.22/7.22	19.1	640	"	-77	231.65
1315	—		7.22/7.20	20.2	641	"	-75	—
1320		234.5	7.22/7.23	19.8	634	"	-80	

C-o-C # 100029 Lab time 1330

Total Discharge 234.5 gal Casing Volumes 11.4

Method of Disposal of Discharge Water

Sheet 1 of 1

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date Sept. 26, 1988 Sample Location (Area 8, intermed.) C-1-CW5

Project Name LASC Project No. 88-03128.13

Weather Conditions Clear, smoggy, hot

Observations/Comments | screen: 376'-386'

Samples Collected By JK | packers: 374'5" (no bottom packer)

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/ 3/4 in pipe w/ 3/4-2" double filter

Method to Measure Water Level Electronic sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated Steam cleaned, DI rinse

Method of Cleaning Bailer/Pump Steam cleaned, DI rinse

pH Meter No. YSI 3500 comb Date Calibrated 9-26-88 12:00

Sp Conductance Meter No. YSI 3500 comb Date Calibrated 9-26-88 12:00

PURGING AND SAMPLING DATA

Water Level (below MP) Start 228.57 End 228.46 (16:45)

Measuring Point (MP) TOC

Time	Pump Rate (gpm)	Discharge (gallons)	pH	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	~~Turbidity~~ Water level
Start 1343	Water at	1345	7.99/8.24	22.8	535	v. lt. grey green mod turbid	161	229.75
1350	2	10						
1402	1.5	28	7.72/7.82	25.8	541	same, but sl. turbid	137	229.37
1418	"	52	7.58/7.81	26.6	571	"	121	229.29
1430	1.6	71	7.56/7.70	24.5	553	"	107	229.27
1440		87	7.51/7.62	21.6	577	lt. yellow brown v. sl. turbid	100	229.26
1451	1.6	105	7.51/7.62	21.6	581	"	98	
1500		119	7.50/7.68	22.1	581	"	81	229.19
1512	1.5	138	7.46/7.63	19.7	581		64	229.17
1520		150	7.48/7.64	21.3	572	"	55	
1530		165	7.48/7.67	19.8	582	"	43	229.15
1540	1.6	181	7.48/7.63	22.5	582		34	
1550		197	7.47/7.63	22.0	580		17	
1555		205	7.48/7.62	22.6	586		15	

Lab Time 1635

Total Discharge 205 gal Casing Volumes 9.5

Method of Disposal of Discharge Water

C-1-CW: 200028

Sheet ___ of ___

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Water Purging & Sampling Log

Date 9-27-88 Sample Location (Shallow Area 8) C-1-CW6

Project Name LASC Project No. 88-03128.13

Weather Conditions Clear, sl. haze, smoggy, warm

Observations/Comments Purge vol = 38.8 gal, 3x = 116.4 gal || screen: 232.2-252

Samples Collected By || packers: 230.7'

QUALITY CONTROL

Purging/Sampling Method Hydrostar pump w/3/4 in pipe, 3/4-2" double filte

Method to Measure Water Level Electriconic sounder

Pump Lines or Bailer Ropes: new (cleaned) dedicated

Method of Cleaning Bailer/Pump Steamcleaned, DI water rinsed

pH Meter No. YSI 3500 Date Calibrated 9/27/88, 1000

Sp Conductance Meter No. YSI 3500 Date Calibrated 9/27/88 1000

PURGING AND SAMPLING DATA

Water Level (below MP) Start 225.68 (1647) End

Measuring Point (MP) TOC

Time	Pump Rate (gpm)	Discharge (gallons)	pH uncor/cor	Temp (°C)	Sp Cond (µmhos/cm)	Color	~~Odor~~ Eh	Turbidity
1648	Started pump		[illegible]	after about 1 [illegible]				
1655	3	18	7.32/7.32	18.5	880	lt. brown med. turbid	78	
1705	3.1	49	7.10/7.11	18.6	926	lt. brown sl. turbid	54	
1715	3.1	80	7.06/7.06	18.5	948	"	54	
1725	3	110	7.02/7.03	18.3	944	"	60	
1735	3	140	7.02/7.02	18.3	955	"	61	
1745		170	7.02/7.02	18.2	952	"	61	

C-C-C#1 200029 Lab Time 1805

Total Discharge 180 Casing Volumes ~ 4.5

Method of Disposal of Discharge Water

Sheet ___ of ___

LOG OF BORING No.

DATE DRILLED: EQUIPMENT:

DESCRIPTION: ELEVATION:

SAMPLE NO / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT-N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
								WELL PLATE - 8.5" Above Mouse WH AREA B - Intermediate Well C1-CW5	
					50				
								26 10' lengths - 260'	
					100				
					150				
					200				
					250			PUMP 3' 10" 5' Top of Pump 259' 4" Top of black pipe: 268' 2"	
					300			5 lengths of black pipe: 106' 3"	
					350				
						366 376 386 391		PACKER FILTER SCREEN GRAVEL PACK TD MEASURED TD 394' - TOP PACKER 374' 5" BOTTOM of FILTER 380' 0"	
					400				

DRILLING CONTRACTOR _____ DRILLER _____

BY _____ DATE _____ CHK'D BY _____

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

DRAWING NO

LOG OF BORING No.

DATE DRILLED: EQUIPMENT:

DESCRIPTION: ELEVATION:

SAMPLE NO. / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT-N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
								AREA 8 · Deep Well	
								C1 - CW4	
					100				
								37 10' length } 373'	
								1 3' "	
					200				
								WATER LEVEL 230.94 9/26/88 11:35	
								231.50 9/28/88 17:00	
								231.20 9/27/88	
					300				
								PUMP 3' 10" TOP OF PUMP:	
					400			20' (2-10' lengths) TOP of BLACK PIPE	
					500			12 lengths of black pipe - 255' 0"	
					600				
					20				
					40	643		TOP PACKER	
						652		FILTER	
					60	662		SCREEN 6' TOP FILTER:	
						665 TD		GRAEL PACK 666 MEASURED DEPTH	
					80			BOTTOM PACKER BOTTOM FILTER	
					700				

DRILLING CONTRACTOR _____ DRILLER _____

BY _____ DATE _____ CHK'D BY _____

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PROJECT NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

DRAWING NO

LOG OF BORING No.

DATE DRILLED: EQUIPMENT:

DESCRIPTION: ELEVATION:

SAMPLE NO. / SAMPLE TYPE	BLOWS PER 6 INCHES	SPT-N	INCHES DRIVEN / INCHES RECOVERED	NUMBER OF RINGS	DEPTH IN FEET	WELL OR PIEZOMETER CONSTRUCTION	GRAPHIC LOG		TESTS
								WELL PLATE 8" above WH	
								AREA 8 - Shallow Well C1-CW6	
					50				
					100			23 10' lengths } 232' 1 2' length }	
					150				
					200				
								223 GRAVEL PACK	
						PUMP SCREEN FILTER		232 TOP PACKER WATER LEVEL 225.94 9/27/88 11:30	
								SCREEN 9' 5" BOTTOM PACKER TOP PACKER: 230.	
					250			252 253 BOTTOM PACKER	
								Measured TD - 251	
					300				
					350				

DRILLING CONTRACTOR _____ DRILLER _____

BY _____ DATE _____ CHK'D BY _____

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

PURGE: well vol - 9.59
annulus 20x 1.47 - 29.4 } ≈ 7 to 39

PROJECT NO

DRAWING NO

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

A1 - MW4 LOWER ZONES

stick up -15" stick up ~17

2 - 4"

808 806' 4"

828 832' 11"

Sample - 12

190'

946' 4"

949

330

969 977' 11"

Sample 13 14

Duplicate

pump 3/10"

65'

1017 1011' 4"

395

1037 1037' 11"

Sample 15

125' stainless

10 rods

140'

617' 7"

488' 9"

23 lengths

1157' 4"

1157

535

1177 1177' 11"

Sample 16

blank

TD 1170

packer

26' 7"

screen

packer

	Area	Drilling Depth	Screened Interval	Filter Pack Interval	Grout interval
BG CW7	5	575	492-502	478-520	478
BG CW8	5	374	361-371	347-374	347
BG CW9	5	263	242-262	230-263	231
B5 CW1	6	576	542-552	532-568	532
B5 CW2	6	354	339-349	332-354	332
B5 CW3	6	234	209-229	203-234	203
C1-CW1	7	575	481-491	470-511	470
C1-CW2	7	394	382-392	373-399	373
C1-CW3	7	284	259-280	254-284	254
C1-CW4	8	665	652-662	643-665	643
C1-CW5	8	391	376-390	366-391	366
C1-CW6	8	253	232-252	223-253	223
B1-CW1	1	615	590-600	570-615	
B1-CW2	1	268	250-260	230-268	
B1-CW3	1	167	150-160	130-167	
A1-CW1	2	610	580-590	520-610	
A1-CW2	2	348	330-340	310-348	
A1-CW3	2	220	195-215	175-220	
B6-CW1	3	605	560-570	540-605	
B6 CW2	3	362	350-360	330 ~~665~~ 362	
B6-CW3	3	200	175-195	155-200	
B6-CW4	4	584	510-520	490-584	
B6-CW5	4	235	215-235	195-235	
B6-CW6	4	355	345-355	325-355	

APPENDIX E

SAMPLE TRANSFER CHAIN OF CUSTODY

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00001

Project No. 88D3128.13 (LASC)

Date 8/17/88

Sample Point: 01

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
12:00	0101	1 L.	SV - 625	—		Amber Glass
12:00	0101	1 L.	SV - 625	—		Amber Glass
12:00	0101	500 ml	Water Quality Param.	—		Plastic
12:00	0101	500 ml	Sulfide	Zn Ac		Plastic
12:00	0101	125 ml	Metals	HNO_3		Plastic
12:00	0101	40 ml	VOC - 624	—		Vial
12:00	0101	40 ml	VOC - 624	—		Vial
12:00	0101	40 ml	VOC - 624	—		Vial
18:00	0102	1 L.	SV - 625			Amber Glass
18:00	0102	1 L.	SV - 625			Amber Glass
18:00	0102	500 ml	Water Quality Param.			
18:00	0102	500 ml	Sulfide	Zn Ac		
18:00	0102	125 ml	Metal	HNO_3		
18:00	0102	40 ml	VOC - 624			
18:00	0102	40 ml	VOC - 624			
18:00	0102	40 ml	VOC - 624			
14:00	01-TB	1 L.	SV - 625			
14:00	01-TB	1 L.	SV - 625			
14:00	01-TB	500 ml	Water Quality Param.			
14:00	01-TB	500 ml	Sulfide	Zn Ac		
14:00	01-TB	125 ml	Metals	HNO_3		
14:00	01-TB	40 ml	VOC - 624			
14:00	01-TB	40 ml	VOC - 624			
14:00	01-TB	40 ml	VOC - 624			

8/18

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Renaud	8/18/88 14:00	Kiey Wilson	ASOC/ATTO LAB
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L 00002 Dave PA

Project No. 8803128.13

Sample Point: 01

Date 8/19/88

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1900	0103	1 l	Semi Volatiles 625	—		
1900	0103	1 l	Semi Volatiles 625	—		
1900	0103	500 ml	Water Qual Parm	—		
1900	0103	500 ml	Sulfides	Zn Ac		
1900	0103	125 ml	Metals	HNO_3		Filtered in field
1900	0103	90 ml		—		
1900	0103	40 ml		—		
1900	0103	40 ml		—		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dave Renner	8/20/88 22:40	[illegible]	ASSOCIATED LABS
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00003 D. Renan

Project No. 8870 178.13	Sample Point: ~~[illegible]~~ 01
Date 8/20/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
10:00	0104	1 l	Semi Volatiles 625	—		
10:00	0104	1 l	Semi Volatiles 625	—		
10:00	0104	500 ml	Water Quality Param.	—		
10:00	0104	500 ml	Sulfides	Zn Ac		
10:00	0104	125 ml	Metals	HNO_3		Filtered in field
10:00	0104	40 ml	VOC 624	—		
10:00	0104	40 ml	VOC 624	—		
10:00	0104	40 ml	VOC 624	—		
13:00	0105	1 l	Semi Volatiles 625	—		
13:00	0105	1 l	Semi Volatiles 625	—		
13:00	0105	500 ml	Water Quality Param.	—		
13:00	0105	500 ml	Sulfides	Zn Ac		
13:00	0105	~~40~~ 125 ml	Metals	HNO_3		Filtered in field
13:00	0105	40 ml	VOC 624	—		
13:00	0105	40 ml	VOC 624	—		
13:00	0105	40 ml	VOC 624	—		
14:30	0106	1 l	Semi Volatiles 625	—		
14:30	0106	1 l	Semi Volatiles 625	—		
14:30	0106	500 ml	Water Quality Param.	—		
14:30	0106	500 ml	Sulfides	Zn Ac		
14:30	0106	125 ml	Metals	HNO_3		Filtered in field
14:30	0106	40 ml	VOC 624	—		
14:30	0106	40 ml	VOC 624	—		
14:30	0106	40 ml	VOC 624	—		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dave Renan	8/20/88 22:10	Greg Wilson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L 00004 D. Renan PA.

Project No. ~~8/20/88~~ 8803128.13	Sample Point: 01
Date 8/20/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
18:30	0107	1 l	Semi Volatiles 625	—		
18:30	0107	1 l	Semi Volatiles 625	—		
18:30	0107	500 ml	Water Quality Param	—		
18:30	0107	500 ml	~~Metals~~ Sulfides	Zn Ac		
18:30	0107	125 ml	Metals	HNO_3		Filtered in the field
18:30	0107	40 ml	VOC 624	—		
18:30	0107	40 ml	VOC 624	—		
18:30	0107	40 ml	VOC 624	—		
21:00	0108	1 l	Semi Volatiles 625	—		
21:00	0108	1 l	Semi Volatiles 625	—		
21:00	0108	500 ml	Water Quality Param	—		
21:00	0108	500 ml	Sulfides	Zn Ac		
21:00	0108	125 ml	Metals	HNO_3		Filtered in the field
21:00	0108	40 ml	VOC 624	—		—
21:00	0108	40 ml	VOC 624	—		—
21:00	0108	40 ml	VOC 624	—		—

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dave Renan	8/20/88 22:10	Greg Witt	ASSOCIATED-LABS
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

400005 Dani Renner PA

Project No. 8803128.13	Sample Point: 02
Date 8/22/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
~~8~~						
0930	0201	1 l	Semi Volatiles 625	—		—
"		1 l	Semi Volatiles 625	—		—
		500 ml	Water Cond. Pan. Tur	—		—
		500 ml	Sulfides	Zn Ac		—
		125 ml	metals	HNO_3		Filtered in the field.
		40 ml	VOC 624	—		—
		40 ml	VOC 624	—		—
930	0201	40 ml	VOC 624	—		—

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Renner	8-23-88 2230	Greg Wilson	ASSOCIATED LABS
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00006 Dani Renaud

Project No. 8803178.13	Sample Point: 02
Date 8/23/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1600	0202	1 l	Semi Volatiles 625	—		
		1 l	Semi Volatiles 625	—		
		500 ml	Water Quality Param	—		
		500 ml	Sulfides	Zn Ac		
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	—		
		40 ml	VOC 624	—		
1600	0202	40 ml	VOC 624	—		
18:30	0203	1 l	Semi Volatiles 625	—		
	0203	1 l	Semi Volatiles 625	—		
		500 ml	Water Qual. Parameters	—		
		500 ml	Sulfides	Zn Ac		
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	—		
		40 ml	VOC 624	—		
1830	0203	40 ml	VOC 624	—		
20:30	0204	1 l	Semi Volatiles 625	—		
20:30		1 l	Semi Volatiles 625	—		
		500 ml	Water Qual. Parameters	—		
		500 ml	Sulfides	Zn Ac		
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC	—		
		40 ml	VOC	—		
20:30	0204	40 ml	VOC	—		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Renaud	8-23-88 2230	Gary Watson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00007

Project No. 8803128.13	Sample Point: B1-MW1-
Date 8/29/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
2030	B1-MW1-01	1l	Semi Volatiles 125	—		
2030	B1-MW1-01	1l	Semi Volatiles 125	-		
"	"	500ml	Metals Quality Parameters	-		
"	"	500ml	Sulfides	ZnAc		
"	"	125	Metals	HNO3 pH2		[illegible]
"	"	40ml	VOC 624			
"	"	40ml	VOC 624	-		
2030	B1-MW1-01	40ml	VOC 624			

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dan Renan	8-30-88 1730	Greg Wilson	ASSOCIATED LABS
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00008

Project No. 8803178.13

Date 8/30/88

Sample Point: B1-MW1

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
8:30	B1-MW1-02	1 l	Semi Volatile 625	—		
		1 l	Semi Volatile 625	—		
		[illegible]	Water Quality [illegible]	—		
		[illegible]	Sulfides	Zn Ac		
		125 ml	Metals	HNO3		[illegible]
		[illegible]	VOC 625	—		
		[illegible]	VOC 625	—		
8:30	B1-MW1-02	[illegible]	VOC 625	—		
10:00	B1-MW1-03	[illegible]	Semi Volatile 625	—		
		[illegible]	Semi Volatile 625	—		
		[illegible]	Water Quality [illegible]	—		
		[illegible]	Sulfides	Zn Ac		
		125 ml	Metals	HNO3		[illegible]
		40 ml	VOC 625	—		
		40 ml	VOC 625			
10:00	B1-MW1-03	40 ml	VOC 625	—		
11:00	B1-MW1-04	1 l	Semi Volatile 625	—		
		1 l	Semi Volatile 625	—		
		[illegible]	Water Quality [illegible]	—		
		[illegible]	Sulfides	Zn Ac		
		125 ml	Metals	HNO3		[illegible]
		40 ml	VOC 624	—		
		40 ml	VOC 624	—		
17:00	B1-MW1-05	40 ml	VOC 624	—		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Renan	8-30-88 1730	Greg Wits	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00009

Project No. 8803128.13	Sample Point:
Date 8/30/88	B1-MW-6

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
13:00	B1-MW1-05	1l	Semi Volatiles 625	—		
		1l	Semi Volatiles 625	—		
		500 ml	Water Quality Parameters	—		
		500 ml	Sulfides	Zn Ac		
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	—		
		40 ml	VOC 624	—		
1300	B1-MW1-05	40 ml	VOC 624	—		
1630	B1-MW1-06	1l	Semi Volatiles 625	—		
1630		1l	Semi Volatiles 625	—		
		500 ml	Water Quality Parameters	—		
		500 ml	Sulfides	Zn Ac		
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	—		
		40 ml	VOC 624	—		
1630		40 ml	VOC 624	—		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Kenan	8-30-88 1730	Greg Wilson	ASSOCIATED LABS
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00010

Project No. 8803128.13	Sample Point:
Date 8/31/88	B1 - MW6

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1430	B1-MW6 01	1 l	Semi Volatiles 625	-		-
		1 l	Semi Volatiles 625	-		-
		500 ml	Water Qual. Parameters	-		-
		500 ml	Sulfides	ZnAc		-
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC - 624	-		-
		40 ml	VOC - 624	-		-
1430	B1-MW6-01	40 ml	VOC - 624	-		-
1630	B1-MW6 02	1 l	Semi Volatiles 625	-		-
		1 l	Semi Volatiles 625	-		-
		500 ml	Water Quality Parameters	-		-
		500 ml	Sulfides	ZnAc		-
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	-		
		40 ml	VOC 624			
1630	B1-MW6-02	40 ml	VOC 624	-		
2030	B1-MW6-03	1 l	Semi Volatiles 625	-		-
		1 l	Semi Volatiles 625	-		-
		500 ml	Water Quality Parameters	-		-
		500 ml	Sulfides	ZnAc		-
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	-		-
		40 ml	VOC 624	-		-
2030	B1-MW6-03	40 ml	VOC 624	-		-

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Renan	9-1-88 1445	[signature]	ASSOCIATED LABS
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00011 RS DR

Project No. 8803128.13	Sample Point: B1-MW6
Date 8/31/88 - 9/1/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
8/31/88 22:00	B1-MW6-04	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	Zn Ac		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
22:00	B1-MW6-04	40 ml	VOC 624	–		–
9/1/88						
0200	B1-MW6-05	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	Zn Ac		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
0200	B1-MW6-05	40 ml	VOC 624	–		–

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Renan	9-1-88 [illegible]	[illegible]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00012 D.R.

Project No. 8803128.13	Sample Point: B1 - MW8-
Date 9/2/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
10:30	B1-MW8-01	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	Zn Ac2		–
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
10:30	B1-MW8-01	40 ml	VOC 624	–		–
13:00	B1-MW8-02	1 l	Semi Volatiles	–		–
		1 l	Semi Volatiles	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	Zn Ac2		–
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC - 624	–		–
		40 ml	VOC - 624	–		–
13:00	B1-MW8-02	40 ml	VOC - 624	–		–

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dawn Renan	9/3/88 15:15	[signature]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00013 PK

Project No. 8803128.T3	Sample Point:
Date 9/2/88	B1 - MW8

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
17:00	B1-MW8-03	1 l	Semi Volatiles 625	-		-
		1 l	Semi Volatiles 625	-		-
		500 ml	Water Quality Parameters	-		-
		500 ml	Sulfides	ZnAc2		-
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	-		-
		40 ml	VOC 624	-		-
17:00	B1-MW8-03	40 ml	VOC 624	-		-
19:00	B1-MW8-04	1 l	Semi Volatiles 625	-		-
		1 l	Semi Volatiles 625	-		-
		500 ml	Water Quality Parameters	-		-
		500 ml	Sulfides	ZnAc2		-
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	-		-
		40 ml	VOC 624	-		-
19:00	B1-MW8-04	40 ml	VOC 624	-		-

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dave Renner	9/3/88 15:15	Greg Wilson	ASSOCIATED LAB
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00014 DR DL

Project No. 88-03128.13

Date 9/3/88

Sample Point: B1 - MW8

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
8:30	B1-MW8-05	1l	Semi Volatiles 625	-		-
		1l	Semi Volatiles 625	-		-
		500 ml	Water quality parm	-		-
		500 ml	Sulfides	Zn Ac		-
		125 ml	metals	HNO3		filtered in the field
		40 ml	VOC 624	-		-
		40 ml	VOC 624	-		-
8:30	B1-MW8-05	40 ml	VOC 624	-		-
10:30	B1-MW8-06	1l	Semi Volatiles 625	-		-
		1l	Semi Volatiles 625	-		-
		500 ml	Water Quality Parameters	-		-
		500 ml	Sulfides	Zn Ac		-
		125 ml	Metals	HNO3		filtered in the field
		40 ml	VOC 624	-		-
		40 ml	VOC 624	-		-
10:30	B1-MW8-06	40 ml	VOC 624	-		-
13:30	B1-MW8-07	1l	Semi Volatiles 625	-		-
		1l	Semi Volatiles 625	-		-
		500 ml	Water Quality Parm	-		-
		500 ml	Sulfides	Zn Ac		-
		125 ml	metals	HNO3		filtered in the field
		40 ml	VOC 625	-		
		40 ml	VOC 625	-		
13:30	B1-MW8-07	40 ml	VOC 625	-		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dave Renan	9/3/88 15:15	Greg Wilson	ASSOCIATED LAB
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00015 DK

Project No. 8803128.13

Date marked 9/6/88 (taken 8/7/88)

Sample Point: B1-MW2

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
17:00	B1-MW2-01	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Qual Parameters	–		–
		500 ml	Sulfides	Zn Ac_2		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC - 624	–		–
		40 ml	VOC - 624	–		–
17:00	B1-MW2-01	40 ml	VOC - 624	–		–
17:00	B1-MW2-01	1 l	Semi Volatiles 625 (calib)	–		–
18:30	B1-MW2-02	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Qual Parameters	–		–
		500 ml	Sulfides	Zn Ac_2		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC - 624	–		–
		40 ml	VOC - 624	–		–
18:30	B1-MW2-02	40 ml	VOC - 624	–		–
20:00	B1-MW2-03	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Param.	–		–
		500 ml	Sulfides	Zn Ac_2		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC	–		–
		40 ml	VOC	–		–
20:00	B1-MW2-03	40 ml	VOC	–		–

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Renner	9-8-88 1800	Greg Wilson	ASSOCIATED LABS
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00016 DE PA

Project No. 8803128.13

Date 9/8/88

Sample Point: B1 - MW2

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
09:00	B1-MW2-04	1l	Semi Volatiles 625	—		—
		1l	Semi Volatiles 625	—		—
		500 ml	Water Quality Parameters	—		—
		500 ml	Sulfides	ZnAc		—
		125 ml	Metals	HNO_3		filtered in the field
		40 ml	VOC - 624	—		—
		40 ml	VOC 624	—		—
09:00	B1-MW2-04	40 ml	VOC 624	—		—
12:00	B1-MW2-05	1l	Semi Volatiles 625	—		—
		1l	Semi Volatiles 625	—		—
		500 ml	Water Quality Parameters	—		—
		500 ml	Sulfides	ZnAc		—
		125 ml	Metals	HNO_3		filtered in the field
		40 ml	VOC - 624	—		—
		40 ml	VOC 624			
12:00	B1-MW2-05	40 ml	VOC - 624	—		—
15:00	B1-MW2-06	1l	Semi Volatiles 625	—		—
		1l	Semi Volatiles 625	—		—
		500 ml	Water Quality Parameters	—		—
		500 ml	Sulfides	ZnAc		—
		125 ml	Metal	HNO_3		filtered in the field
		40 ml	VOC - 624	—		—
		40 ml	VOC 624	—		—
15:00	B1-MW2-06	40 ml	VOC 624	—		—

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dave Renard	9-8-88 1800	Greg Wilson	ASSOCIATED LABS
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00017 DR PA

Project No. 8803178.13

Date 9/9/88 - 9/10/88

Sample Point: B1-MWS

	TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
9/9/88	15:00	B1-MWS-01	1 l	Semi Volatiles 625	–		–
			1 l	Semi Volatiles 625	–		–
			500 ml	Water Quality Parameters	–		–
			500 ml	Sulfides	Zn Ac₂		–
			125 ml	Metals	HNO_3		filtered in the field
			40 ml	VOC - 624	–		–
			40 ml	VOC - 624	–		–
	15:00	B1-MWS-01	40 ml	VOC - 624	–		–
9/9/88	19:00	B1-MWS-02	1 l	Semi Volatiles 625	–		–
			1 l	Semi Volatiles 625	–		–
			500 ml	Water Quality Parameters	–		–
			500 ml	Sulfides	Zn Ac₂		–
			125 ml	Metals	HNO_3		filtered in the field
			40 ml	VOC - 624	–		–
			40 ml	VOC - 624	–		–
	19:00	B1-MWS-02	40 ml	VOC - 624	–		–
9/10/88	10:30	B1-MWS-03	1 l	Semi Volatiles 625	–		–
			1 l	Semi Volatiles 625	–		–
			500 ml	Water Quality Parameters	–		–
			500 ml	Sulfides	Zn Ac₂		–
			125 ml	Metals	HNO_3		filtered in the field
			40 ml	VOC - 624	–		–
			40 ml	VOC - 624	–		–
	10:30	B1-MWS-03	40 ml	VOC - 624	–		–

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dennis Benson	12:40 9/10/88		–
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00018 DR

Project No. 8803128.13	Sample Point: B1-MW5
Date 9/10/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
12:00	B1-MW5-04	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	$ZnAc_2$		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC - 624	–		–
		40 ml	VOC - 624	–		–
12:00	B1-MW5-04	40 ml	VOC - 624	–		–
14:30	B1-MW5-05	1 l	Semi Volatiles - 625	–		–
		1 l	Semi Volatiles - 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	$ZnAc_2$		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC - 624	–		–
		40 ml	VOC - 624	–		–
14:30	B1-MW5-05	40 ml	VOC - 624	–		–
16:30	B1-MW6-06	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	$ZnAc$		–
		125 ml	Metals	HNO_3		Filtered
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
16:30	B1-MW6-06	40 ml	VOC 624	–		–

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dave Renner	18:40 9/10/88		
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00019 DR

Project No. 88013128 13

Date 9/11/88 - 9/12/88

Sample Point: B1-MW4

	TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
9/11/88	19:00	B1-MW4-01	1 l	Semi Volatiles 625	-		-
			1 l	Semi Volatiles 625	-		-
			500 ml	Water Quality Parameters	-		-
			500 ml	Sulfides	ZnAc		-
			125 ml	Metals	HNO_3		filtered in the field
			40 ml	VOC - 624	-		-
			40 ml	VOC - 624	-		-
			40 ml	VOC - 624	-		-
	19:00	B1-MW4-01	1 l	Semi Volatiles - 625	-		-
9/12/88	09:00	B1-MW4-02	1 l	Semi Volatiles 625	-		-
			1 l	Semi Volatiles 625	-		-
			500 ml	Water Quality Parameters	-		-
			500 ml	Sulfides	ZnAc		-
			125 ml	Metals	HNO_3		filtered in the field
			40 ml	VOC - 624	-		-
			40 ml	VOC - 624	-		-
	09:00	B1-MW4-02	40 ml	VOC - 624	-		-
9/12/88	10:00	B1-MW4-03	1 l	Semi Volatiles 625	-		-
			1 l	Semi Volatiles 625	-		-
			500 ml	Water Quality Parameters	-		-
			500 ml	Sulfides	ZnAc		-
			125 ml	Metals	HNO_3		filtered in the field
			40 ml	VOC - 624	-		-
			40 ml	VOC - 624	-		-
	10:00	B1-MW4-03	40 ml	VOC - 624	-		-

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dan Ryan	9/12/88 17:15	Greg Wilson	ASSOCIATED LABS
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00020 DK

Project No. 8903128.13	Sample Point: B1-MW4
Date 9/12/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
11:00	B1-MW4-04	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	ZnAc		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
11:00	B1-MW4 04	40 ml	VOC 624	–		–
13:30	B1-MW4-05	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	ZnAc		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
13:30	B1-MW4-05	40 ml	VOC 624	–		–

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dave Revans	9/12/88 17:15	Greg Wilson	ASSOCIATED LABS
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00021 PR

Project No. 8803128.13				Sample Point: B1-MW3		
Date 9/13/88						
TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
11:30	B1-MW3-01	1 l	Semi Volatiles 625	—		—
		1 l	Semi Volatiles 625	—		—
		500 ml	Water Quality Parameters	—		—
		500 ml	Sulfides	Zn Ac₂		—
		125 ml	Metals	HNO₃		filtered in the field
		40 ml	VOC - 624	—		—
		40 ml	VOC - 624	—		—
11:30	B1-MW3-01	40 ml	VOC - 624	—		—
14:30	B1-MW3-02	1 l	Semi Volatiles 625	—		—
		1 l	Semi Volatiles 625	—		—
		500 ml	Water Quality Parameters	—		—
		500 ml	Sulfides	Zn Ac₂		—
		125 ml	Metals	HNO₃		filtered in the field
		40 ml	VOC - 624	—		—
		40 ml	VOC - 624	—		—
14:30	B1-MW3-02	40 ml	VOC - 624	—		—
20:30	B1-MW3-03	1 l	Semi Volatiles - 625	—		—
		1 l	Semi Volatiles - 625	—		one for calibration
		1 l	~~[illegible]~~ Semi Volatiles 625			
		500 ml	~~[illegible]~~ Water Qual.	—		—
		500 ml	~~[illegible]~~ Sulfides	Zn Ac₂		—
		125 ml	~~[illegible]~~ Metals	HNO₃		filtered in the field
		40 ml	VOC	—		—
		40 ml	VOC	—		—
20:30	B1-MW3-03	40 ml	VOC	—		—

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Renan	9-14-88 1645	Greg Wilson	Associated Labs
~~Relinquished by: (signature)~~	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00022 DR RJ

Project No. 8803178.13	Sample Point: B1 - MW3
Date 9/14/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
08:00	B1-MW3-04	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	ZnAc2		–
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
08:00	B1-MW3-04	40 ml	VOC 624	–		–
10:30	B1-MW3-05	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	ZnAc2		–
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
10:30	B1-MW3-05	40 ml	VOC 624	–		–
12:30	B1-MW3-06	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	ZnAc		–
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
12:30	B1-MW3-06	40 ml	VOC 624	–		–
		~~[illegible]~~				

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dan Revans	9-14-88 1645	Gary Wilson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00023 DR

Project No. 8803128.13	Sample Point: B1 - MW3
Date 9/14/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
16:00	B1-MW3-07	1 l	Semi Volatiles 625	-		-
		1 l	Semi Volatiles 625	-		-
		500 ml	Water Quality Parameters	-		-
		500 ml	Sulfides	Zn Ac2		-
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC -624	-		-
		40 ml	VOC -624	-		-
16:00	B1-MW3-07	40 ml	VOC -624	-		-

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Reeves	9-14-88 1645	Gary Wilson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00024 DR.

Project No. 8803128.13

Date 9/15/88

Sample Point: BI- MW7

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
17:00	BI-MW7-01	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	Zn Ac2		–
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	–		–
	BI-MW7-01	40 ml	VOC 624	–		–
17:00	BI-MW7-01	40 ml	VOC 624	–		–
19:00	BI-MW7-02	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	Zn Ac2		–
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC	–		–
		40 ml	VOC	–		–
19:00	BI-MW7-02	40 ml	VOC	–		–
21:00	BI-MW7-03	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	Zn Ac2		–
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
21:00	BI-MW7-01	40 ml	VOC 624	–		–

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dave Reeves	9-16-88 1345	[illegible]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

4221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00025 DR.

Project No. 8803128.13	Sample Point: B1-MW7
Date 9/16/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
08:30	B1-MW7-04	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	$ZnAc_2$		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
08:30	B1-MW7-04	40 ml	VOC 624	–		–
11:00	B1-MW7-TB	1 l	Semi Volatiles 625	–		TRAVEL BLANK
		1 l	Semi Volatiles 625	–		" "
		500 ml	Water Quality Parameters	–		" "
		500 ml	Sulfides	$ZnAc_2$		" "
		125 ml	Metals	HNO_3		" "
		40 ml	VOC 624	–		" "
		40 ml	VOC 624	–		" "
11:00	B1-MW7-TB	40 ml	VOC 624	–		" "

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dave Renner	9-16-88 1345	[signature]	Associated Labs
~~Relinquished by: (signature)~~	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

Project No. 8803128.13

Date 9/22/88

Sample Point: C1-CW3

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
15:00	C1-CW3-01	1 l	Semi Volatiles 625	-		-
		1 l	Semi Volatiles 625	-		-
		500 ml	Water Quality Parameters	-		-
		500 ml	Sulfides	Zn Ac		-
		125 ml	Metals	HNO_3		filtered in the field
		40 ml	VOC 624	-		48 hr turnaround
		40 ml	VOC 624	-		48 hr turn around
15:00	C1-CW3-01	40 ml	VOC 624	-		48 hr turn around
9						
18:00	C1-CW3-02	1 l	Semi Volatiles 625	-		-
		1 l	Semi Volatiles 625	-		1 for Celebration
		1 l	~~Water Quality Parameters~~	Semi Volatiles 625 -		-
		500 ml	~~Sulfides~~ Water Qu P.	-		-
		500 ml	~~Metals~~ Sulfides	Zn Ac		-
		125 ml	Metals	HNO_3		filtered in the field
		40 ml	VOC	-		48 hr. Turn Around
		40 ml	VOC	-		48 hr Turn Around
18:00	C1-CW3-02	40 ml	VOC	-		48 hr Turn Around

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Karen Kinsell	9-23-88 10:28 pm	Greg Wilson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

Project No. 8803128.13

Date 9/23/88

Sample Point: C1-CW2, CW1

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
14:30	C1-CW2	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	ZnAc		–
		125 ml	metals	HNO_3		filtered in the field
		40 ml	VOC 624	–		48 hrs Turn Around
		40 ml	VOC 624	–		48 hrs Turn Around
14:30	C1-CW2	40 ml	VOC 624	–		48 hrs Turn Around
16:00	C1-CW1	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Water Quality Parameters	–		–
		500 ml	Sulfides	ZnAc		–
		125 ml	metals	HNO_3		filtered in the field
		40 ml	VOC 624	–		48 hrs turn around
		40 ml	VOC 624	–		48 hrs turn around
16:00	C1-CW1	40 ml	VOC 624	–		48 hrs Turn Around

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
[signature]	9-23-88 10:28 pm	[signature]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

Project No. 88-03128.13

Date 9-26-88

Sample Point: C-1-CW5

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1635	C-1-CW5	40 ml	VOC 624	None		1 for calibration
		40 ml	VOC 624	None		"
		40 ml	VOC 624	None		"
		1 l	Semi Volatiles 625	None		—
		1 l	Semi Volatiles 625	None		—
		1 l	Semi Volatiles 625	None		—
		500 ml	Water Quality Parameters	None		—
		500 ml	Sulfides	Zinc Acetate		—
		125 ml	Metals	Nitric Acid		Filtered in field pH checked

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Karen J. Krisella	9-28-88 1213	[illegible]	Associates Lab
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

L00024

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

Project No. 88-03128:13

Date 9-27-88

Sample Point: C-1

CW

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1020	C-1-CW7	40 ml	VOC 624	None		—
		40 ml	VOC 624	None		—
		40 ml	VOC 624	None		—
		1 l	Semi-Volatiles 625	None		—
		1 l	Semi-Volatiles 625	None		—
		500 ml	Water Quality Parameters	None		—
		500 ml	Sulfides	Zinc Acetate		—
		125 ml	Metals	Nitric Acid		Filtered in field pH Checked
1330	C-1-CW4	40 ml	VOC 624	None		—
		40 ml	VOC 624	None		—
		40 ml	VOC 624	None		—
		1 l	Semi-Volatiles 625	None		—
		1 l	Semi-Volatiles 625	None		—
		500 ml	Water Quality Parameters	None		—
		500 ml	Sulfides	Zinc Acetate		—
		125 ml	Metals	Nitric Acid		Filtered in field pH Checked
1805	C-1-CW6	40 ml	VOC 624	None		—
		40 ml	VOC 624	None		—
		40 ml	VOC 624	None		—
		1 l	Semi-Volatiles 625	None		—
		1 l	Semi-Volatiles 625	None		—
		500 ml	Water Quality Parameters	None		—
		500 ml	Sulfides	Zinc Acetate		—
		125 ml	Metals	Nitric Acid		Filtered in Field pH Checked

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Karen J Kinsaller	9-28-88 1213	[signature]	ASSOCIATED LABS
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

KJT L00030

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

Project No. 88-03128.13

Date 9-28-88

Sample Point: B-6-CW10, CW11, CW5

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1500	B6-CW10	40ml	VOC 624	—		
		40ml	VOC 624	—		
		40ml	VOC 624	—		
		1l	Semi-Volatiles 625	—		
		1l	Semi-Volatiles 625	—		
		500ml	Water Quality Parameters	—		
		500ml	Sulfides	Zinc Acetate		
		125ml	Metals	Nitric Acid		Filtered in field pH checked
1650	B6-CW11	40ml	VOC 624	—		
		40ml	VOC 624	—		
		40ml	VOC 624	—		
		1l	Semi-Volatiles 625	—		
		1l	Semi-Volatiles 625	—		
		500ml	Water Quality Parameters	—		
		500ml	Sulfides	Zinc Acetate		
		125ml	Metals	Nitric Acid		Filtered in field pH Checked
1800	B6-CW5	40ml	VOC 624	—		
		40ml	VOC 624	—		
		40ml	VOC 624	—		
		1l	Semi-Volatiles 625	—		
		1l	Semi-Volatiles 625	—		
		1l	Semi-Volatiles 625	—		
		500ml	Water Quality Parameters	—		
		500ml	Sulfides	Zinc Acetate		
		125ml	Metals	Nitric Acid		Filtered in field pH checked

Note: RUSH - 24 hr turn - around required. Phone results to Gary Halbert (MARK), Steve Dickey (WASC)

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Karen J. Kinsella Karen J Kinsella	9-29-88 0907	[signature]	ASSOC-US
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

Project No. 88-03128.13

Date 9-29-88

Sample Point: B-6-CW4
B-6CW6

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1000	B6-CW4	40 ml	VOC 624	—		48 hr turnaround
		40 ml	VOC 624	—		48 hr turnaround
		40 ml	VOC 624	—		48 hr turnaround
		1 l	Semi-Volatiles 625	—		—
		1 l	Semi-Volatiles 625	—		—
		500 ml	Water Quality Parameters	—		—
		500 ml	Sulfides	Zinc Acetate		—
		125 ml	Metals	Nitric Acid		Filtered in field pH checked
1500	B6-CW6	40 ml	VOC 624	—		48 hr turnaround
		40 ml	VOC 624	—		48 hr turnaround
		40 ml	VOC 624	—		48 hr turnaround
		1 l	Semi-Volatiles 625	—		
		1 l	Semi-Volatiles 625	—		
		1 l	Semi-Volatiles 625	—		Extra for lab calibration
		500 ml	Water Quality Parameters	—		
		500 ml	Sulfides	Zinc Acetate		
		125 ml	Metals	Nitric Acid		Filtered in field pH checked

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Kevin J. Kinsella	9-30-88 1630	Greg Wilson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

Project No. 88-03128.16

Date 10-3-88, 10-4-88

Sample Point: B-6

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1505	K0010	40ml	VOC 624	None		48 hr turn around on VOC's
		40ml	VOC 624	"		
		40ml	VOC 624	"		
		1 l	Semi-Volatiles 625	"		–
		1 l	Semi-Volatiles 625	"		–
		1 l	Semi-Volatiles 625	"		Extra sample for lab calibration
		500ml	Water Quality Parameters	"		–
		500ml	Sulfides	Zinc Acetate		–
		125ml	Metals	Nitric Acid		Filtered in field pH Checked
1050	K0011	40ml	VOC 624	None		48 hour turnaround on VOC's
		40ml	VOC 624	"		
		40ml	VOC 624	"		
		1 l	Semi-Volatiles 625	"		–
		1 l	Semi-Volatiles 625	"		–
		500ml	Water Quality Parameters	"		–
		500ml	Sulfides	Zinc Acetate		–
		125ml	Metals	Nitric Acid		Filtered in field pH Checked

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Karen J. Kirsella Karen J. Kirsella	10-4-88 1420	Kris Wilson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00033 DR

Project No. 8803128

Date 10/3/88

Sample Point: Areas 3, [redacted]

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
10:00	36-CW3	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfides	$Zn(Ac)_2$		–
		125 ml	Metals	HNO_3		filtered in the field
		40 ml	VOC 624	–	–	48 hrs turn around
		40 ml	VOC 624	–	–	
10:00	36-CW3	40 ml	VOC 624	–	–	
13:00	36-CW2	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfides	$Zn(Ac)_2$		–
		125 ml	Metals	HNO_3		filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		– 48 hour
13:00	36-CW2	40 ml	VOC 624	–		– turnaround
20:30	36-CW1	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500	Anions	–		–
		500	Sulfides	$Zn(Ac)_2$		–
		125	Metals	HNO_3		filtered in the field
		40	VOC 624	–		
		40	VOC 624	–		48 hour turnaround
20:30	36-CW1	40	VOC 624	–		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Benan	10/4/88 14:30	Greg Wilson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00034

Project No. 8803178

Date ~~9/30/88~~ 9/30/88

Sample Point: Area 6

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
15:00	BC-CW12	1l	Semi Volatiles 625	–		–
		1l	Semi Volatiles 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfide	ZnAc		–
		125 ml	Metals	HNO_3		~~Field~~ Filter in the field
		40 ml	VOC 624	–		48 hr turnaround
		40 ml	VOC 624	–		
15:00	BC-CW12	40 ml	VOC 624	–		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Renan	10/4/88 14:30	Greg Wilson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

L00035

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

Project No. 88-03128.13

Date 10/4/88, 10/5/88

Sample Point: LASC

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1800	K0012	40ml	VOC 624	None		48 hr
		40ml	VOC 624	"		Turnaround
		40ml	VOC 624	"		on VOC's
		1 l	Semi-Volatiles 625	"		—
		1 l	Semi-Volatiles 625	"		—
		500ml	Water Quality Parameters	"		—
		500ml	Sulfides	Zinc Acetate		—
		125ml	Metals	Nitric Acid		Filtered in field pH Checked
2010	K0013	40ml	VOC 624	None		48 hour
		40ml	VOC 624	"		turnaround
		40ml	VOC 624	"		on VOC's
		1 l	Semi-Volatiles 625	"		—
		1 l	Semi-Volatiles 625	"		—
		1 l	Semi-Volatiles 625	"		Extra for lab calib.
		500ml	Water Quality Parameters	"		—
		500ml	Sulfides	Zinc Acetate		—
		125ml	Metals	Nitric Acid		Filtered in field pH Checked
1300	K0014	40ml	VOC 624	None		
		40ml	VOC 624	"		
		40ml	VOC 624	"		
		1 l	Semi-Volatiles 625	"		—
		1 l	Semi-Volatiles 625	"		—
		500ml	Water Quality Parameters	"		—
		500ml	Sulfides	Zinc Acetate		—
		125ml	Metals	Nitric Acid		Filtered in field pH checked

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Karen J Kinsella Karen J Kinsella	10-6-88 11AD	[illegible]	[illegible] LASC
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00036 DR DJT

Project No. 8803128.13

Date 10/4-10/5/88

Sample Point: B5

	TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
10/4/88	19:00	B5-CW3	1 l	Semi Volatiles - 625	–		–
			1 l	Semi Volatiles - 625	–		–
			500 ml	Anions	–		–
			500 ml	Sulfides	$ZnAc_2$		–
			125 ml	Metals	HNO_3		filtered in the field
			40 ml	VOC - 624	–		48 hr turn around
			40 ml	VOC - 624	–		
	19:00	B5-CW3	40 ml	VOC - 624	–		
10/5/88	10:00	B5-CW2	1 l	Semi Volatiles 625	–		–
			1 l	Semi Volatiles 625	–		–
			500 ml	Anion	–		–
			500 ml	Sulfide	$ZnAc_2$		–
			125 ml	Metal	HNO_3		filtered in the field
			40 ml	VOC - 624	–		48 hr turn around
			40 ml	VOC - 624	–		
10/5/88	10:00	B5-CW2	40 ml	VOC - 624	–		
	15:00	B5-CW1	1 l	Semi Volatiles 625	–		–
			1 l	Semi Volatiles 625	–		–
			500 ml	Anion	–		–
			500 ml	Sulfides	$ZnAc_2$		–
			125 ml	Metals	HNO_3		filtered in the field
			40 ml	VOC 624	–		48 hr turn around
			40 ml	VOC 624	–		
	15:00	B5-CW1	40 ml	VOC 624	–		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dave Reeves	10-6-88 1130	[illegible]	[illegible]
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00037 DR. P.J.T.

Project No. 8803128.13

Date 10/4 - 10/5/88

Sample Point: B5

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
18:00	B5-CW4	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfides	$ZnAc_2$		–
		125 ml	Metals	HNO_3		filtered in field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
18:00	B5-CW4	40 ml	VOC 624	–		–

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
[signature]	10-6-88 1130	[signature]	[illegible]
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

Project No. 88-03128.13

Date 10/6/88

Sample Point: LASC

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1600	A1-CW1	40 ml	VOC 624	None		Rush
		40 ml	VOC 624	"		
		40 ml	VOC 624	"		-
		1 l	Semi-Volatiles 625	"		-
		1 l	Semi-Volatiles 625	"		-
		1 l	Semi-Volatiles 625	"		-
		500 ml	Water Quality Parameters	"		-
		500 ml	Sulfides	Zinc Acetate		-
		125 ml	Metals	Nitric Acid		Filtered in Field pH checked
2130	A1-CW2	40 ml	VOC 624	None		-
		40 ml	VOC 624	"		Rush
		40 ml	VOC 624	"		-
		1 l	Semi-Volatiles 625	"		-
		1 l	Semi-Volatiles 625	"		-
		500 ml	Water Quality Parameters	"		-
		500 ml	Sulfides	Zinc Acetate		-
		125 ml	Metals	Nitric Acid		Filtered in Field pH checked

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
[signature]	10/7/88 1605	[signature]	Associated
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00039 DR

Project No. RPP3170.13

Date 10/6/88

Sample Point: B1 - Area 1

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
15:00	B1-GW2	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfides	$ZnAc_2$		–
		125 ml	Metals	HNO_3		filtered in the field
		40 ml	VOC 624	–		48 hour turnaround
		40 ml	VOC 624	–		
15:00	B1-GW2	40 ml	VOC 624	–		
17:00	B1-GW4	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfides	$ZnAc_2$		–
		125 ml	Metals	HNO_3		filtered in the field
		40 ml	VOC 624	–		48 hour turnaround
		40 ml	VOC 624	–		
17:00	B1-GW4	40 ml	VOC 624	–		
19:00	B1-GW3	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfides	$ZnAc_2$		–
		125 ml	Metals	HNO_3		filtered in the field
		40 ml	VOC 624	–		48 hour turnaround
		40 ml	VOC 624	–		
19:00	B1-GW3	40 ml	VOC 624	–		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dave Reman	10/7/88 14:10	[signature]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00040 DR.

Project No. 8803128.13	Sample Point: B1 (Area 1)
Date 10/7/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
11:00	B1-CW1	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500	Anions	–		–
		500	Sulfides	$ZnAc_2$		–
		125	Metals	HNO_3		Filtered in the field
		40	VOC 624	–		48 hr turnaround
		40	VOC 624	–		
11:00	B1-CW1	40	VOC 624	–		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Roman	10/7/88 14:10	Greg Wilson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00042 DR PJT

Project No. 8803178.13	Sample Point: BC - MW1
Date 10/11/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
10:00	BC - MW1. 01	1 l	Semi Volatiles 625	–		
		1 l	Semi Volatiles 625	–		
		500 ml	Anions	–		
		500 ml	Sulfides	Zn Ac2		
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	–		48 hrs
		40 ml	VOC 624	–		turn around
10:00	BC - MW1. 01	40 ml	VOC 624	–		
14:00	BC - MW1 - 02	1 l	Semi Volatiles 625	–		
		1 l	Semi Volatiles 625	–		1 for calibration
		1 l	Semi Volatiles 625	–		
		500 ml	Anions	–		
		500 ml	Sulfides	Zn Ac		
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	–		
		40 ml	VOC 624	–		48 hrs turn -
14:00	BC - MW1 - 02	40 ml	VOC 624	–		around
15:30	BC - MW1 - 03	1 l	Semi Volatiles 625	–		
		1 l	Semi Volatiles 625	–		
		500 ml	Anions	–		
		50 ml	Sulfides	Zn Ac2		
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	–		
		40 ml	VOC 624	–		48 hrs turn -
15:30	BC - MW1 - 03	40 ml	VOC 624	–		around

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Renan	10-12-88 1600	[signature]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH for VOC ONLY	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00043 DK PJT

Project No. 8803.128.13	Sample Point:
Date 10/11 - 10/12/88	BG - MW1

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
10/11/88 17:30	BG-MW1-04	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfides	$ZnAc_2$		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	–		48 hrs turn-around
		40 ml	VOC 624	–		
17:30	BG-MW1-04	40 ml	VOC 624	–		
11:00	BG-MW1-05	1 l	Semi Volatiles 625	–		
	BG-MW1-05	1 l	Semi Volatiles 625	–		
		500 ml	Anions	–		
		500 ml	Sulfides	$ZnAc_2$		
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	–		48 hrs turn-around
		40 ml	VOC 624	–		
11:00	BG-MW1-05	40 ml	VOC 624	–		
13:00	BG-MW1-06	1 l	Semi Volatiles 625	–		
		1 l	Semi Volatiles 625	–		
		500 ml	Anions	–		
		500 ml	Sulfides	$ZnAc_2$		
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC	–		48 hrs Turn-around
		40 ml	VOC	–		
13:00	BG-MW1-06	40 ml	VOC	–		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Renner	10-12-88 1600	[signature]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH for VOC ONLY	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00044 DR: PST

Project No.	Sample Point:
Date	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
15:00	26-MW1 07	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	~~Sa~~ Anions	–		–
		500 ml	Sulfides	Zn Ac2		–
		125 ml	Metals	HNO3		filtered in the field
		40 ml	VOC 624	–		48 hrs Turn -
		40 ml	VOC 624	–		
15:00	36-MW1 07	40 ml	VOC 624	–		Arrow

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Benson	10-17-88 1606	[signature]	Associated Labs
~~Relinquished by: (signature)~~	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)
	VOC ONLY				

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00045

Project No. 88-03128.13	Sample Point: LASC
Date 10/12/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1300	C1-MW1-01	40ml	VOC 624	None		48 hr turn-around on VOC's
		40ml		"		
		40ml		"		
		1 l	Semi-Volatiles 625	"		Extractor lab calibration
		1 l		"		
		1 l		"		
		500ml	Water Quality Parameters	"		
		500ml	Sulfides	Zinc Acetate		
		125ml	Metals	Nitric Acid		Filtered in Field pH Checked

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Karen J Kroeller	10-12-88 1439	[signature]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00046 OR MJH

Project No. 8803128.13	Sample Point:
Date 10/13/88	B1-MW9

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
13:30	B1-MW9-01	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500	Anions	–		–
		500	Sulfides	ZnAc2		–
		125	Metals	HNO3		Filtered in the field
		40	VOC 624	–		48 hrs turn –
		40	VOC 624	–		
13:30	B1-MW9-01	40	VOC 624	–		around

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dan Brown	10-13-88 1430	Greg Wilson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)
		VOC ONLY			

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00047

Project No. 88-03128.13

Date 10/12-13/88

Sample Point: C1-MW1

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1600	C1-MW1-C2	40ml	VOC 624	None		48 hr turnaround
		40ml		"		required on
		40ml		"		all VOC's
		1 l	Semi-Volatiles 625	"		-
		1 l		"		-
		1 l		"		Extra for lab calibration
		500 ml	Water Quality Parameters	"		-
		500 ml	Sulfides	Zinc Acetate		-
		125 ml	Metals	Nitric Acid		Filtered in field pH checked
1030	C1-MW1-C3	40ml	VOC 624	None		48 hr turn-
		40ml		"		around requested
		40ml		"		on VOC's
		1 l	Semi-Volatiles 625	"		-
		1 l		"		-
		500 ml	Water Quality Parameters	"		-
		500 ml	Sulfides	Zinc Acetate		-
		125 ml	Metals	Nitric Acid		Filtered in field pH checked

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Karen [signature]	10 13 88 1330	[signature]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

L00048 GM

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

Project No. 88-03128.13

Date 10/13/88

Sample Point: C-1-MW1

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1600	C1-MW1-C4	40ml	VOC 624	None		48 hr turn-
		40ml		"		around on
		40ml		"		VOC's
		1l	Semi-Volatiles 625	"		-
		1l		"		-
		1l		"		1 extra for lab calibration
		500ml	Water Quality Parameters	"		-
		500ml	Sulfides	Zinc Acetate		-
		125ml	Metals	Nitric Acid		Filtered in field pH checked
1800	C1-MW1-C5	40ml	VOC 624	None		48 hr turnaroun
		40ml		"		on VOC's
		40ml		"		-
		1l	Semi-Volatiles 625	"		-
		1l		"		-
		500ml	Water Quality Parameters	"		-
		500ml	Sulfides	Zinc Acetate		-
		125ml	Metals	Nitric Acid		Filtered in field pH checked

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Karen Kinsella	10/14/88 1245	[illegible]	[illegible]
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00049 DR

Project No. 8803128.13	Sample Point:
Date 10/13/88	B1-MW9

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
15:30	B1-MW9-02	1 l	Semi Volatiles 625	–		
		1 l	Semi Volatiles 625	–		
		500 ml	Anions	–		
		500 ml	Sulfide	$ZnAc_2$		
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	–		
		40 ml	VOC 624	–		
15:30	B1-MW9-02	40 ml	VOC 624	–		
17:00	B1-MW9-03	1 l	Semi Volatiles 625	–		
		1 l	Semi Volatiles 625	–		
		500 ml	Anion	–		
		500 ml	Sulfides	$ZnAc_2$		
		125 ml	Metals	HNO_3		Filter in the field
		40 ml	VOC 624	–		
		40 ml	VOC 624	–		
17:00	B1-MW9-03	40 ml	VOC 624	–		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dan Renan	10/13/88 1:00	[illegible] Wilson	[illegible]
~~Relinquished by: (signature)~~	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

L00050

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

Project No. 88-03128.13

Date 10/14,15/88

Sample Point: B-1-MW9

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1800	B1-MW9-04	40ml	VOC 624	None		48 hr turnaround
		40ml		"		on VOC's
		40ml		"		
		1 l	Semi-Volatiles 625	"		–
		1 l		"		–
		500ml	Water Quality Parameters	"		–
		500ml	Sulfides	Zinc Acetate		–
		125ml	Metals	Nitric acid		Filtered in field pH checked
0900	B1-MW9-05	40ml	VOC 624	None		48 hr turnaround
		40ml		"		on VOC's
		40ml		"		
		1 l	Semi-Volatiles 625	"		–
		1 l		"		–
		500ml	Water Quality Parameters	"		–
		500ml	Sulfides	Zinc Acetate		–
		125ml	Metals	Nitric Acid		Filtered in field pH checked
1100	B1-MW9-06	40ml	VOC 624	None		48 hr turnaround
		40ml		"		on all VOC's
		40ml		"		
		1 l	Semi-Volatiles 625	"		One Extra for
		1 l		"		lab calibration
		1 l		"		
		500ml	Water Quality Parameters	"		–
		500ml	Sulfides	Zinc Acetate		–
		125ml	Metals	Nitric Acid		Filtered in field pH checked

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Karen Kiesel	10-15-88 2100	[illegible]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

200051

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

Project No. 88-03128.13

Date 10/15/88

Sample Point: B-1-MW9
A1-MW3

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1300	B1-MW9-07	40ml	VOC 624	None		48 hr turnaround
		40ml		"		on VOC's
		40ml		"		
		1l	Semi-Volatiles 625	"		—
		1l		"		—
		500ml	Water Quality Parameters	"		—
		500ml	Sulfides	Zinc Acetate		—
		125ml	Metals	Nitric Acid		Filtered in field pH checked
1700	A1-MW3-01	40ml	VOC 624	None		48 hr turnaround
		40ml				on VOC's
		40ml				
		1l	Semi-Volatiles 625			—
		1l				—
		500ml	Water Quality Parameters			—
		500ml	Sulfides	Zinc Acetate		—
		125ml	Metals	Nitric Acid		Filtered in field pH checked
1900	A1-MW3-02	40ml	VOC 624	None		48 hr turnaround
		40ml				on VOC's
		40ml				
		1l	Semi-Volatiles 625			—
		1l				—
		500ml	Water Quality Parameters			—
		500ml	Sulfides	Zinc Acetate		—
		125ml	Metals	Nitric Acid		Filtered in field pH checked

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
[signature]	10-15-88 2100	[signature]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

LW052

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

Project No. 88-03128.13

Date 10/15/88

Sample Point: A1-MW3

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
2000	A1-MW3-03	40ml	VOC 624	None		48 hr turnaround
		40ml				on VOC's
		40ml				
		1 l	Semi-Volatiles 625			
		1 l				
		500ml	Water Quality Parameters			
		500ml	Sulfides	Zinc Acetate		
		125ml	Metals	Nitric Acid		Filtered in field

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Karen J Kiseller	10-15-88 2100	[illegible]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00053 DR [signature]

Project No. 8803128.13	Sample Point: A1-MW3
Date 10/16/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
12:00	A1-MW3-04	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfides	$ZnAc_2$		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
12:00	A1-MW3-04	40 ml	VOC 624	–		–
15:30	A1-MW3-05	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfides	$ZnAc_2$		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
15:30	A1-MW3-05	40 ml	VOC 624	–		–
17:30	A1-MW2-06	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfides	$ZnAc_2$		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
17:30	A1-MW3-06	40 ml	VOC 624	–		–

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dan Renner	10-18-88 1300	Greg Wilson	Associated Labs
~~Relinquished by: (signature)~~	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00054 DR SG

Project No. RA03178.13

Date 10/17/88

Sample Point: A1-MW3

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
10:00	A1-MW3-07	1 l	Semi Volatiles 625	—		—
		1 l	Semi Volatiles 625	—		—
		500 ml	Anions	—		—
		500 ml	Sulfides	Zn Ac2		—
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	—		—
		40 ml	VOC 624	—		—
10:00	A1-MW3-07	40 ml	VOC 624	—		—
13:00	A1-MW3-08	1 l	Semi Volatiles 625	—		—
		1 l	Semi Volatiles 625	—		—
		500 ml	Anions	—		—
		500 ml	Sulfides	Zn Ac		—
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	—		—
		40 ml	VOC 624	—		—
1300	A1-MW3-08	40 ml	VOC 624	—		—

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dario Beman	10-18-88 1300	[illegible]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00055 DR Sb.

Project No.	8803128.13	Sample Point:	A1-MW1
Date	10/18/88		

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
10:00	A1-MW1-01	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfides	ZnAc2		–
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	–		–
		40 ml	VOC 624	–		–
10:00	A1-MW1-01	40 ml	VOC 624	–		–
12:00	A1-MW1-02	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfides	ZnAc2		–
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	–		–
	A1-MW1-02	40 ml	VOC 624	–		–
12:00	A1-MW1-02	40 ml	VOC 624	–		–
						–

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Renan	10-18-88 1300	[signature]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00056 DR. PA

Project No. 8803178.13	Sample Point: A1-MW1
Date 10/18/98	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
20:00	A1-MW1-06	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	~~Sulfides~~ Amines	–		–
		500 ml	Sulfides	$ZnAc_2$		–
		125 ml	Metals	HNO_3		Filtered in the field
		40 ml	VOC -624	–		–
		40 ml	VOC -624	–		–
20:00	A1-MW1-06	40 ml	VOC -624	–		–
21:00	A1-MW1-07	1 l	Semi Volatiles 625			
		1 l	Semi Volatiles 625			
		500 ml	Amines			
		500 ml	Sulfides			
		125 ml	Metals			
		40 ml	VOC 624			
		40 ml	VOC 624			
21:00	A1-MW1-07	40 ml	VOC 624			

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dan Reeves	10-19-98 1400	Greg Watson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00057 DR. DA

Project No. 8803128.13	Sample Point: A1-MW1
Date 10/18/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
14:00	A1-MW1-03	1 l	Semi Volatiles 625	–		
		1 l	Semi Volatiles 625	–		
		1 l	Semi Volatiles 625	–		
		500 ml	Anions	–		
		500 ml	~~Anions~~ Sulfides	Zn Ac2		
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	–		
		40 ml	VOC 624	–		
14:00	A1-MW1-03	40 ml	VOC 624	–		
16:00	A1-MW1-04	1 l	Semi Volatiles 625	–		
		1 l	Semi Volatiles 625	–		
		500 ml	Anions	–		
		500 ml	Sulfides	Zn Ac2		
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	–		
		40 ml	VOC 624	–		
16:00	A1-MW1-04	40 ml	VOC 624	–		
18:00	A1-MW1-05	1 l	Semi Volatiles 625	–		
		1 l	Semi Volatiles 625	–		
		500 ml	Anions	–		
		500 ml	Sulfides	Zn Ac2		
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC 624	–		
		40 ml	VOC 624	–		
18:00	A1-MW1-05	40 ml	VOC 624	–		

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dave Renan	10-19-88 1400	[signature]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00058 DR PA

Project No. 88-03128.13

Date 10/18/88

Sample Point: A1-MW4-01, 02, 03

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1100	A1-MW4	40ml	VOC 624	None		48 hr. Turnaround
	-01	40ml				on VOC's
		40ml				
		1l	Semi Volatiles 625			1 extra for
		1l				lab calibration
		1l				
		500ml	Water Quality Parameters			–
		500ml	Sulfides	Zinc Acetate		–
		125ml	Metals	Nitric Acid		Filtered in field pH checked
1300	A1-MW4	40ml	VOC 624	None		48 hr turnaround
	-02	40ml				on VOC's
		40ml				
		1l	Semi-Volatiles			–
		1l				–
		500ml	Water Quality Parameters			–
		500ml	Sulfides	Zinc Acetate		–
		125ml	Metals	Nitric Acid		Filtered in field pH checked
1600	A1-MW4	40ml	VOC 624	None		48 hr turnaround
	-03	40ml				on VOC's
		40ml				
		1l	Semi-Volatiles 625			–
		1l				–
		500ml	Water Quality Parameter			–
		500ml	Water Quality Parameters	Zinc Acetate		–
		125ml	Metals	Nitric Acid		Filtered in field, pH checked

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Karen Kuller	10/19/88 1405	Greg Wilson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00059 DR DA

Project No. 88-03128.13

Date 10/19/88

Sample Point: A-1-MW4-04

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
1000	A1-MW4	40ml	VOC 624	None		48 hr Turnaround
	-04	40ml				on VOC's
		40ml				—
		1l	Semi-Volatiles 625			—
		1l				—
		500ml	Water Quality Parameters			—
		500ml	Sulfides	Zinc Acetate		—
		125ml	Metals	Nitric Acid		Filtered in field pH checked
1200	A1-MW4	40ml	VOC 624	None		48 hr turnaround
	-05	40ml				on VOC's
		40ml				—
		1l	Semi-Volatiles 625			—
		1l				—
		500ml	Water Quality Parameters			—
		500ml	Sulfides	Zinc Acetate		—
		125ml	Metals	Nitric Acid		Filtered in field pH checked
1330	A1-MW4	40ml	VOC 624	None		48 hr turnaround
	-06	40ml				on VOC's
		40ml				—
		1l	Semi-Volatiles 625			—
		1l				—
		500ml	Water Quality Parameters			—
		500ml	Sulfides	Zinc Acetate		—
		125ml	Metals	Nitric Acid		Filtered in field pH checked

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Karen Kusch	10/19/88 1405	[illegible]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00060 SL S.L.

Project No.	8803128.13	Sample Point:
Date	10/19/88 - 10/20/88	A1-MW4

	TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
10/19/88	22:00	A1-MW4-10	1 l	Semi Volatiles 625	–		–
			1 l	Semi Volatiles 625	–		–
			500 ml	Anions	–		–
			500 ml	Sulfides	ZnAc2		–
			125 ml	Metals	HNO3		filtered in the field
			40 ml	VOC 624	–		–
			40 ml	VOC 624	–		–
	22:00	A1-MW4-10	40 ml	VOC 624	–		–
10/20/88	11:00	A1-MW4-11	1 l	Semi Volatiles 625	–		–
			1 l	Semi Volatiles 625	–		–
			500 ml	Anions	–		–
			500 ml	Sulfides	ZnAc2		–
			125 ml	Metals	HNO3		filtered in the field
			40 ml	VOC 624	–		–
			40 ml	VOC 624	–		–
	11:00	A1-MW4-11	40 ml	VOC 624	–		–
							–

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dave Reman	10-20-88 1500	Greg Watson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

L00061 DR S.G.

Project No. 8803128	Sample Point: A1-MW4
Date 10/19/88	

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
16:00	A1-MW4-07	1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		1 l	Semi Volatiles 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfides	ZnAc2		–
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC - 624	–		–
		40 ml	VOC - 624	–		–
16:00	A1-MW4 07	40 ml	VOC - 624	–		–
18:00	A1-MW4-08	1 l	Semi Volatiles - 625	–		–
		1 l	Semi Volatiles - 625	–		–
		500 ml	Anions	–		–
		500 ml	Sulfates	ZnAc2		–
		125 ml	Metals	HNO3		Filtered in the field
		40 ml	VOC - 624	–		–
		40 ml	VOC - 624	–		–
18:00	A1-MW4-08	40 ml	VOC - 624	–		–
20:00	A1-MW4-09	1 l	Semi Volatiles - 625	–		–
		1 l	Semi Volatiles - 625	–		–
		500	Anions	–		–
		500	Sulfides	ZnAc2		–
		125	Metals	HNO3		Filtered in the field
		40	VOC - 624	–		–
		40	VOC - 624	–		–
20:00	A1-MW4 09	40	VOC - 624	–		–

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Renner	10-20-88 1500	Greg Watson	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

THE MARK GROUP
ENGINEERS & GEOLOGISTS, INC.

Chain Of Custody Record

PA

L00062

Project No. 8807129.12

Sample Point: A1-MW4

Date 10/20/88

TIME	SAMPLE NUMBER	CONTAINER SIZE	ANALYZE FOR	PRESERVATIVE	HOLDING TIME	REMARKS
20:00	A1-MW4-12	1 l	Semi Volatiles 625	—		—
		1 l	Semi Volatiles 625	—		—
		500 ml	Anions	—		—
		500 ml	Sulfide	$Zn(Ac)_2$		—
		825 ml	Metals	HNO_3		filtered in the field
		40 ml	VOC 624	—		—
		40 ml	VOC 624	—		—
20:00	A1-MW4-12	40 ml	VOC 624	—		—

Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:
Dani Reeves	10-21-88 1330	[illegible]	Associated Labs
Relinquished by: (signature)	Date/Time	Received by: (signature)	Receiver represents:

Expected analytical turn around time	24-hr RUSH	48-hr RUSH	7-day RUSH	14-day GUARANTEE	NORMAL (21 days)

1221 East Dyer Road • Suite 110 • Santa Ana, California 92705-5605 • (714) 546-0602

Shipping Copy (White) File Copy (Yellow) Field Copy (Pink)

PARTIALLY SCANNED OVERSIZE ITEM(S)

See document # 2165012
for partially scanned image(s).

(1 of 10) to (10 of 10)

For complete hardcopy version of the oversize document contact the Region IX Superfund Records Center at (415) 536-2000