

SECOND QUARTER 1998  
GROUNDWATER MONITORING REPORT  
NEW GENICO FACILITY  
OAKLAND, CALIFORNIA

For: Conner-Bak, LLP  
444 De Haro Street, Suite 121  
San Francisco, California 94107

Attention: Mr. Tommy A. Conner

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July 29, 1998



July 29, 1998  
File No. 12-3047-60

Mr. Tommy A. Conner  
Conner-Bak, LLP  
444 De Haro Street, Suite 121  
San Francisco, California 94107

**SUBJECT: Second Quarter 1998 Groundwater Monitoring Report, New Genico Facility,  
3927 East 14th Street, Oakland, California**

Dear Mr. Conner:

Kleinfelder, Inc. (Kleinfelder) is pleased to provide for you the Second Quarter 1998 Groundwater Monitoring Report for the New Genico facility (New Genico) located at 3927 East 14th Street, Oakland, California (site; Plate 1). (Note that 14<sup>th</sup> Street has been renamed "International Boulevard" for consistency with previous reports; however, we will continue to refer to the site as 14<sup>th</sup> Street.) This report discusses field procedures, observations, and results of the second quarter 1998 groundwater monitoring event. Work was conducted in accordance with Kleinfelder's proposal dated June 18, 1998.

Kleinfelder performed groundwater monitoring and sampling on June 30, 1998, collecting groundwater samples from four groundwater monitoring wells at the site (HMW-1 through HMW-4). Monitoring well locations are shown on Plate 2.

### **BRIEF BACKGROUND**

A release from an underground storage tank (UST) previously located on-site resulted in impacts to soil and groundwater. The UST was removed previously, along with some of the impacted soils. In accordance with Alameda County Health Care Services Agency (ACHCS) and California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), requirements, monitoring activities have been performed since August 1996 and are continuing at the site. A release from USTs formerly located across the street at the Motor Partners facility has also impacted soil and groundwater, and it appears that there is some commingling of plumes.

All of the wells are completed in the first continuous water-bearing zone encountered beneath the site. Wells HMW-1 through HMW-3 are constructed with 2-inch diameter polyvinyl chloride

(PVC) casing. HMW-4 was a "pre-constructed" well using 0.6-inch inner diameter PVC casing that was installed using direct push technology on November 18, 1998.

## **FIELD WORK**

Kleinfelder was not under contract in time to perform the monitoring concurrent with Motor Partners' monitoring event on June 26, 1998. Kleinfelder performed the sampling event on June 30, 1998, the day after receipt of written authorization. Kleinfelder measured water levels in the Motor Partner wells as well as the New Genico wells located on 40th Avenue (MW-2, MW-3, and MW-4) to facilitate contouring of the water levels proximate to the site.

Kleinfelder measured depths to water (Table 1) and collected groundwater samples on June 30, 1998, from the four monitoring wells in accordance with the protocol presented in Appendix A, with the exception that measurements of "redox" potential (reduction/oxidation potential) and dissolved oxygen were made immediately prior to sampling.

Prior to purging the wells, Kleinfelder remeasured water levels using an electronic measuring device, and in three of the four wells, a translucent bailer was used to monitor for the presence of floating product or a sheen. Kleinfelder noted a sheen on the groundwater in HMW-1 but no measurable thickness of floating product was noted. Neither a sheen nor floating product were observed in monitoring wells HMW-2 and HMW-3. Due to the small diameter of HMW-4, it was not possible to insert a bailer and monitor for a sheen or floating product in this manner. Due to its small diameter, well HMW-4 had to be purged with a peristaltic pump. The other wells were purged with a bailer.

Purging was performed until a minimum of three casing volumes of water were removed from each well. Purge logs and field observation sheets are included in Appendix B.

## **LABORATORY ANALYSES**

Groundwater samples collected during the second quarter 1998 were analyzed for total petroleum hydrocarbons (TPH) quantified as diesel (TPH-d), TPH as motor oil (TPH-mo), and TPH as gasoline (TPH-g) by modified United States Environmental Protection Agency (EPA) Method 8015; benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tert-butyl ether (MtBE) by EPA Method 8020. A trip blank was analyzed for TPH-g, BTEX, and MtBE. The four samples were also analyzed by the laboratory for the bioremediation indicator parameters that were specifically requested by ACHCS. These analyses include:

- ferrous iron:
- nitrate. and
- sulfate.

Samples were collected in laboratory supplied containers. The groundwater samples were submitted to American Environmental Network (AEN) of Pleasant Hill, California, for chemical analysis. AEN is a laboratory certified by the State of California to perform the above-mentioned analyses.

## RESULTS

### Groundwater Gradient

Table 1 and Table 2 present the water-level data for June 1998 for the New Genico facility and those Motor Partners' wells whose depths-to-water were measured by Kleinfelder on June 30, 1998, respectively. Plate 2 presents the groundwater piezometric contours for June 30, 1998, using the data collected by Kleinfelder.

As illustrated in Plate 2, the groundwater flow direction beneath the site was southerly on June 30, 1998. The magnitude of the hydraulic gradient was approximately 0.014 foot per foot. This flow direction and hydraulic gradient are generally consistent with previous findings. Groundwater levels declined an average of 1.6 feet since last quarter in the site's four groundwater monitoring wells.

### Floating product

A sheen was observed in HMW-1 this quarter; there was no measurable quantity of floating product. Neither a sheen nor floating product were observed in any of the other site wells. Historic data with respect to the presence/absence of floating product or a sheen was not available at the time of preparation of this report.

### Groundwater Analyses

This quarter's groundwater chemistry data for the site are presented in Table 3. Historic data, also presented on Table 3, were obtained from Groundworks Environmental, Inc.'s *First Quarter 1998 Groundwater Monitoring Report* (April 10, 1998), ATC Associates, Inc.'s *Fourth Quarter 1997 Groundwater Monitoring Report*, 3927 East 14th Street, Oakland, California (January 8, 1998), and Artesian Environmental's *Groundwater Sampling Point Installation and Sampling Report* (January 30, 1998).

Laboratory reports from AEN are included in Appendix C. The values of the groundwater parameters measured prior to sampling (pH, temperature and specific conductivity) are presented on Table 4.

The following summarizes the June 1998 analytical results for the 3927 E. 14<sup>th</sup> Street facility:

- TPH-d was not reported in any of the wells this quarter.
- TPH-mo was only reported in well HMW-1, and its concentration declined markedly from last quarter.
- TPH-g concentrations were within the range of recent historic concentrations for HMW-1, HMW-2 and HMW-4. TPH-g remained non-detect (ND) in HMW-3 for the second consecutive quarter.
- Benzene concentrations were within the range of recent historic concentrations for HMW-1, HMW-2 and HMW-4. Benzene remained ND in HMW-3 for the second consecutive quarter. Benzene concentrations are in excess of its Maximum Contaminant Level (MCL) of one microgram per liter ( $\mu\text{g/L}$ ) in HMW-1, HMW-2 and HMW-4.
- Toluene, ethylbenzene and total xylenes concentrations were within the range of recent historic concentrations for HMW-1, HMW-2 and HMW-4, and remained ND in HMW-3 for the second consecutive quarter. Toluene in HMW-1 was the only one of these constituents that was reported above its MCL.
- Reported MtBE concentrations using EPA Method 8020 declined in HMW-1 to approximately 13% of the concentration reported last quarter. Reported MtBE concentrations declined in HMW-2 and HMW-4 to approximately 50% of the concentrations reported last quarter and remained ND in HMW-3. Concentrations reported in HMW-1 and HMW-2 exceeded the California Drinking Water Advisory Level of 35  $\mu\text{g/L}$ .

Last quarter MtBE was reported in HMW-1 at 1,200  $\mu\text{g/L}$ . The ACHCS requested that when similarly "elevated" concentrations of MtBE are reported as a result of EPA Method 8020 analyses, confirmation analyses should be performed by GCMS. Due to the relatively low levels reported this quarter, additional analysis by GCMS was not performed.

Historically, when site samples reported to contain MtBE were re-analyzed using GCMS; the result was ND. Historical reports of detected MtBE using USEPA Method 8020 analyses were therefore suspected to be "false positives".

### **Bioremediation Indicator Parameters**

Selected bioremediation indicator parameters were either measured in the field (dissolved oxygen and redox potential) or analyzed by the analytical laboratory (nitrate, sulfate, and ferrous iron). Results for upgradient wells and wells located proximate to the former UST location were compared to wells located downgradient of the former UST location to see if any general trends were discernible.

Kleinfelder evaluated the relative dissolved oxygen content of the environment. Dissolved oxygen concentrations were low (less than 0.8 mg/L) in three of the four wells. The high concentration in well HMW-4 (3.7 mg/L) was likely due to the field method used for this well. A peristaltic pump was used to collect this sample and the dissolved oxygen was measured in a sample container. For the other three wells dissolved oxygen was measured in the well. Exposure of the HMW-4 sample to air could have resulted in an increase in dissolved oxygen.

No discernible pattern with respect to the dissolved oxygen contents of groundwater from the various site wells was noted. It appears, however, that bioremediation is nonetheless occurring proximate to, and downgradient of, the former UST location. When bioremediation occurs in relatively anaerobic environments, such as this, the following trends may be observed across the dissolved contaminant plume:

- A decrease in nitrate concentrations;
- A decrease in sulfate concentrations;
- An increase in ferrous iron; and
- Redox potentials become increasingly negative.

The following presents our findings with respect to the selected bioremediation indicator parameters during this quarter:

- Nitrate concentrations were highest in upgradient well MW-3, low in HMW-1 which is located just downgradient of the former UST area, and ND in HMW-2 and HMW-4, located further downgradient of the former UST location, suggesting the occurrence of anaerobic bioremediation;
- Sulfate concentrations were highest in upgradient well MW-3, low in HMW-1 which is located just downgradient of the former UST area, and ND in HMW-2, located further downgradient of the former UST location, suggestive of the occurrence of anaerobic bioremediation. Anomalously high sulfate concentrations were reported in HMW-4, located furthest downgradient of the former UST;
- The highest ferrous iron concentration was reported in HMW-1, located closest to the former UST location. The second highest concentration reported (at the detection level) was reported in HMW-2, located just downgradient of the former UST location. The remaining wells were ND. This pattern suggests the occurrence of anaerobic bioremediation; and
- Redox potential in upgradient well HMW-3 was positive and redox potential in downgradient wells was negative, suggesting the occurrence of anaerobic bioremediation.

## Quality Control Results

A trip blank was stored with the samples collected and submitted to the laboratory for analysis. The trip blank was analyzed for TPH-g, BTEX and MtBE. None of these constituents were detected in the trip blank.

Laboratory quality control (QC) data were evaluated to assess the acceptability of the analytical results. QC results are included with the Certified Analytical Reports (CARs) in Appendix C. Laboratory QC consisted of checking adherence to holding times and evaluating method blanks and blank spikes (BS). All analyses were performed within the required holding times. No compounds were detected in any of the method blanks. BS recoveries were within the laboratory acceptance limits.

The laboratory QC results indicate the data are of acceptable quality.

## **LIMITATIONS**

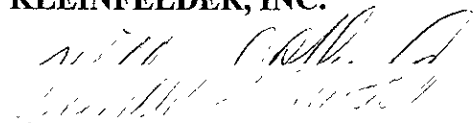
Kleinfelder prepared this report in accordance with generally accepted standards of care which exist in Northern California at this time. Conclusions are based on field observations made by Kleinfelder personnel and quantitative chemical analysis of four groundwater samples and a trip blank provided by AEN laboratory.

It should be recognized that definition and evaluation of geologic and environmental conditions is a difficult and inexact science. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the present subsurface conditions. More extensive studies, including additional subsurface investigations, may be performed to reduce uncertainties. If the Client wishes to reduce the uncertainties of this investigation, Kleinfelder should be notified for additional consultation. No warranty, express or implied, is made.

If you have any questions about the enclosed report or any other aspect of the work, please contact Bill Theyskens at (408) 436-1155.

Sincerely,

**KLEINFELDER, INC.**



William G. Theyskens, C.E.G., C.H.G.  
Project Manager



Neal Siler, R.E.A.  
Environmental Group Manager

Attachments

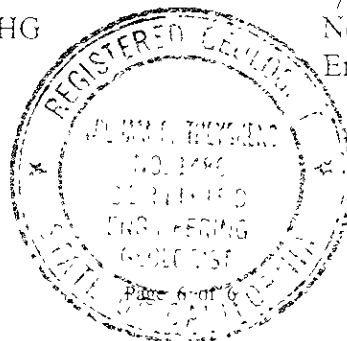


Table 1  
Groundwater Elevations (1)  
New Genico Facility  
1397 East 14th Street Oakland, California

Well	Date	Casing Elevation (feet, MSL)	Depth to Groundwater (feet)	Groundwater Elevation (feet, MSL)	Floating Product (2) (feet)	Corrected Elevation (3) (feet, MSL)
HMW-1	8/22/96	31.25	8.01	23.24	----	23.24
	2/25/97		5.95	25.30	----	25.30
	5/28/97		7.65	23.60	----	23.60
	9/2/97		8.56	22.69	----	22.69
	11/26/97		7.50	23.75	----	23.75
	2/9/98		3.35	27.90	----	27.90
	3/17/98		5.29	25.96	0.01	25.97
	6/30/98		6.63	24.62	0.00	24.62
HMW-2	8/22/96	29.43	8.71	20.72	----	20.72
	2/25/97		6.00	23.43	----	23.43
	5/28/97		7.65	21.78	----	21.78
	9/2/97		8.59	20.84	----	20.84
	11/26/97		6.82	22.61	----	22.61
	2/9/98		3.24	26.19	----	26.19
	3/17/98		4.44	24.99	0.00	24.99
	6/30/98		6.30	23.13	0.00	23.13
HMW-3	8/22/96	31.48	8.10	23.38	----	23.38
	2/25/97		6.00	25.48	----	25.48
	5/28/97		7.74	23.74	----	23.74
	9/2/97		8.60	22.88	----	22.88
	11/26/97		7.50	23.98	----	23.98
	2/9/98		2.34	29.14	----	29.14
	3/17/98		5.23	26.25	0.00	26.25
	6/30/98		6.60	24.88	0.00	24.88
HMW-4	11/26/97	28.80	7.42	21.38	----	21.38
	2/9/98		2.96	25.84	----	25.84
	3/17/98		5.72	23.08	0.00	23.08
	6/30/98		7.40	21.40	0.00	21.40

feet, MSL = feet, relative to Mean Sea Level

"----" = not measured, or data not readily available

- (1) Data prior to 3/17/98 was obtained from reports prepared by ATC Associates Inc. (1/8/98) and Artesian Environmental (1/30/98), and a Field Report/Data Sheet (ATC, 2/9/98)
- (2) Data regarding the presence/absence of floating product prior to March 1998 was not available at the time of preparation of this report
- (3) Corrected elevation is equal to groundwater elevation plus the estimated specific gravity of the floating product (0.83) multiplied by the floating product thickness  
Corrected Elevation = Groundwater Elevation + (0.83 x Floating Product Thickness)



Table 2  
Groundwater Elevations (1)  
Motor Partners Facility  
1234 40th Avenue  
Oakland, California

Well	Date	Casing Elevation (feet, MSL)	Depth to Groundwater (feet)	Groundwater Elevation (feet, MSL)	Floating Product (2) (feet)	Corrected Elevation (3) (feet, MSL)
MW-1	11/26/97	31.44	7.98	23.46	----	23.46
	3/17/98		5.84	25.60	----	25.60
	6/30/98		----	----	----	----
MW-2	11/26/97	31.06	7.24	23.82	----	23.82
	3/17/98		5.05	26.01	----	26.01
	6/30/98		6.35	24.71	----	24.71
MW-3	11/26/97	30.43	7.06	23.37	----	23.37
	3/17/98		5.11	25.32	----	25.32
	6/30/98		6.62	23.81	----	23.81
MW-4	11/26/97	30.37	6.64	23.73	----	23.73
	3/17/98		4.52	25.85	----	25.85
	6/30/98		5.86	24.51	----	24.51
MW-5	11/26/97	30.37	-----	-----	-----	-----
	3/17/98		5.80	24.57	-----	24.57
	6/30/98		----	----	----	----

feet, MSL = feet, relative to Mean Sea Level

"----" = Not measured, or data not readily available

- (1) Data prior to 3/17/98 was obtained from a report prepared by ATC Associates Inc. (1/8/98); 3/17/98 data was obtained from Gary Rogers of Aquatic & Environmental Applications.
- (2) Data regarding the presence/absence of floating product prior to March 1998 was not available at the time of preparation of this report.
- (3) Corrected elevation is equal to groundwater elevation plus the estimated specific gravity of the floating product (0.83) multiplied by the floating product thickness:  
Corrected Elevation = Groundwater Elevation + (0.83 x Floating Product Thickness).

Table 3  
Groundwater Analytical Results <sup>1</sup>  
New Genico Facility  
3927 E. 14th Street Oakland, California

Well ID No	Sample Date	TPH as Diesel (µg/L)	TPH as motor oil (µg/L)	TPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Methyl tert Butyl Ether (µg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Iron (mg/L)	Oxygen <sup>3</sup> (mg/L)	Potential <sup>4</sup> (mV)
HMW-1	8/22/96	ND	ND	7,400	1,200	170	530	490	----	----	----	----	----	----
	2/25/97	2,000	ND	5,400	760	110	260	260	ND	----	----	----	----	----
	5/28/97	2,000	600	6,600	1,100	100	290	340	130	----	----	----	----	----
	9/2/97	8,700	3,700	4,000	460	40	200	100	ND <sup>2</sup>	2	12	4.20	0.24	-14.4
	11/26/97	4,700	3,000	7,500	1,000	120	270	320	ND <sup>2</sup>	0.6	ND	<0.01	2.0	+105
	3/17/98	ND	16,000	11,000	2,100	290	600	760	1,200	ND	0.8	0.16	0.8 <sup>3</sup>	-60.4
6/30/98	ND	5,900	10,000	1,300	160	390	390	160	0.4	2.0	0.96	0.77	-46.70	
HMW-2	8/22/96	7,400 <sup>4</sup>	2,100	6,300	170	57	370	120	----	2100	2100	----	----	----
	2/25/97	90	ND	8,400	150	35	280	70	ND <sup>2</sup>	ND	ND	----	----	----
	5/28/97	130	200	6,000	170	35	170	67	150	200	200	----	----	----
	9/2/97	4,502	ND <sup>5</sup>	8,000	210	30	160	90	ND <sup>2</sup>	ND	0.5	1.37	0.38	+25.2
	11/26/97	180	ND	1,600	41	7.5	40	10	31	ND	ND	0.03	2.5	+52
	3/17/98	ND	ND	8,600	200	96	410	120	330	ND	0.8	0.01	0.48 <sup>3</sup>	-50.28
6/30/98	ND	ND	7,300	180	52	240	88	170	ND	ND	0.01	0.43	-45.50	
HMW-3	8/22/96	ND	ND	1,300	3	6	8	12	----	ND	ND	----	----	----
	2/25/97	70	ND	150	ND	ND	ND	ND	ND	ND	ND	----	----	----
	5/28/97	ND	ND	80	ND	ND	0.60	ND	ND	ND	ND	----	----	----
	9/2/97	ND <sup>5</sup>	ND <sup>5</sup>	140	ND	ND	2.1	ND	ND	2	53	0.03	0.88	+98.6
	11/26/97	50	ND	70	0.6	0.8	0.8	ND	ND	3.5	50	0.01	1.4	+102
	3/17/98	ND	200	ND	ND	ND	ND	ND	ND	1.1	43	ND	0.63 <sup>3</sup>	91.90
6/30/98	ND	ND	ND	ND	ND	ND	ND	ND	4.0	51	ND	0.25	95.70	
HMW-4	11/26/97	400	ND	1,600	4.2	3.1	1.7	5.9	ND	----	----	----	----	----
	3/17/98	ND	ND	1,300	20	1.4	6.8	3.0	19	ND	8.6	0.12	2.4 <sup>3</sup>	-26.67
	6/30/98	ND	ND	940	17	1.5	18	2	10	ND	18.0	ND	3.7	-21.7
URIP BLANK	3/17/98	----	----	ND	ND	ND	ND	ND	ND	----	----	----	----	----
	6/30/98	----	----	ND	ND	ND	ND	ND	ND	----	----	----	----	----
MCL <sup>6</sup>				1.0	150	700	1,750		35 <sup>7</sup>					

NOTES

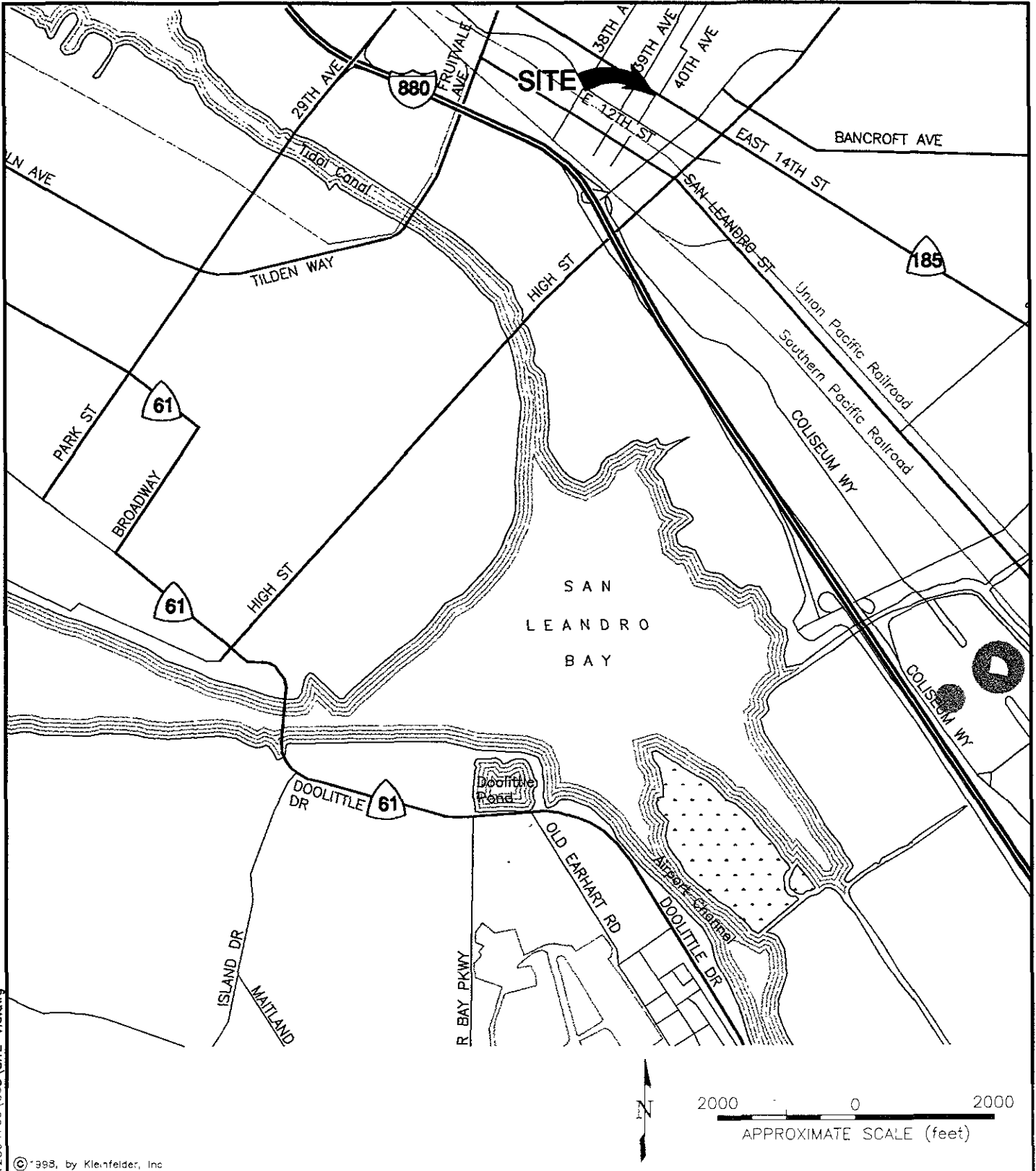
- Well ID No: HMW-1, HMW-2, and HMW-3 are New Genico wells MW-1, MW-2, and MW-3, respectively
- TPH: Total petroleum hydrocarbons
- ND: Not detected above reporting limit
- : Not analyzed
- <sup>1</sup>: Measured in the field
- <sup>2</sup>: Data prior to 3/17/98 was obtained from a report prepared by ATC Associates Inc. (1/8/98)
- <sup>3</sup>: Positive result by initial USEPA Method 8020 analysis; confirmation performed by USEPA Method 8260 reports ND
- <sup>4</sup>: Dissolved oxygen measured prior to purging
- <sup>5</sup>: Laboratory reported concentration for diesel is estimated due to overlapping fuel patterns
- <sup>6</sup>: Samples collected on 10/3/97
- <sup>7</sup>: Maximum Contaminant Level
- <sup>8</sup>: California Drinking Water Advisory Level

Table 4  
Groundwater Parameters Measured Prior to Sampling  
New Genico Facility  
3927 E. 14th Street Oakland, California

Well I.D. No.	Sample Date	pH	Specific Conductivity ( $\mu$ mhos/cm)	Temperature ( $^{\circ}$ F)
HMW-1	8/22/96	----	----	----
	2/25/97	4.55	680	75.0
	5/28/97	7.70	810	70.4
	9/2/97	6.73	1074	73.4
	11/26/97	6.93	966	70.0
	3/17/98	6.16	1,163	67.6
	6/30/98	6.80	1,006	71.6
HMW-2	8/22/96	----	----	----
	2/25/97	4.65	450	72.1
	5/28/97	7.80	480	69.4
	9/2/97	6.82	762	74.8
	11/26/97	6.99	731	69.8
	3/17/98	6.62	741	66.0
	6/30/98	6.88	610	71.6
HMW-3	8/22/96	----	----	----
	2/25/97	5.87	390	63.3
	5/28/97	8.00	400	67.6
	9/2/97	6.97	669	70.9
	11/26/97	6.87	665	67.8
	3/17/98	6.43	734	65.9
	6/30/98	6.96	640	71.6
HMW-4	11/26/97	----	----	----
	3/17/98	6.66	769	66.3
	6/30/98	6.98	690	73.4


NOTES

"----" = Not Measured






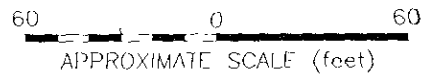
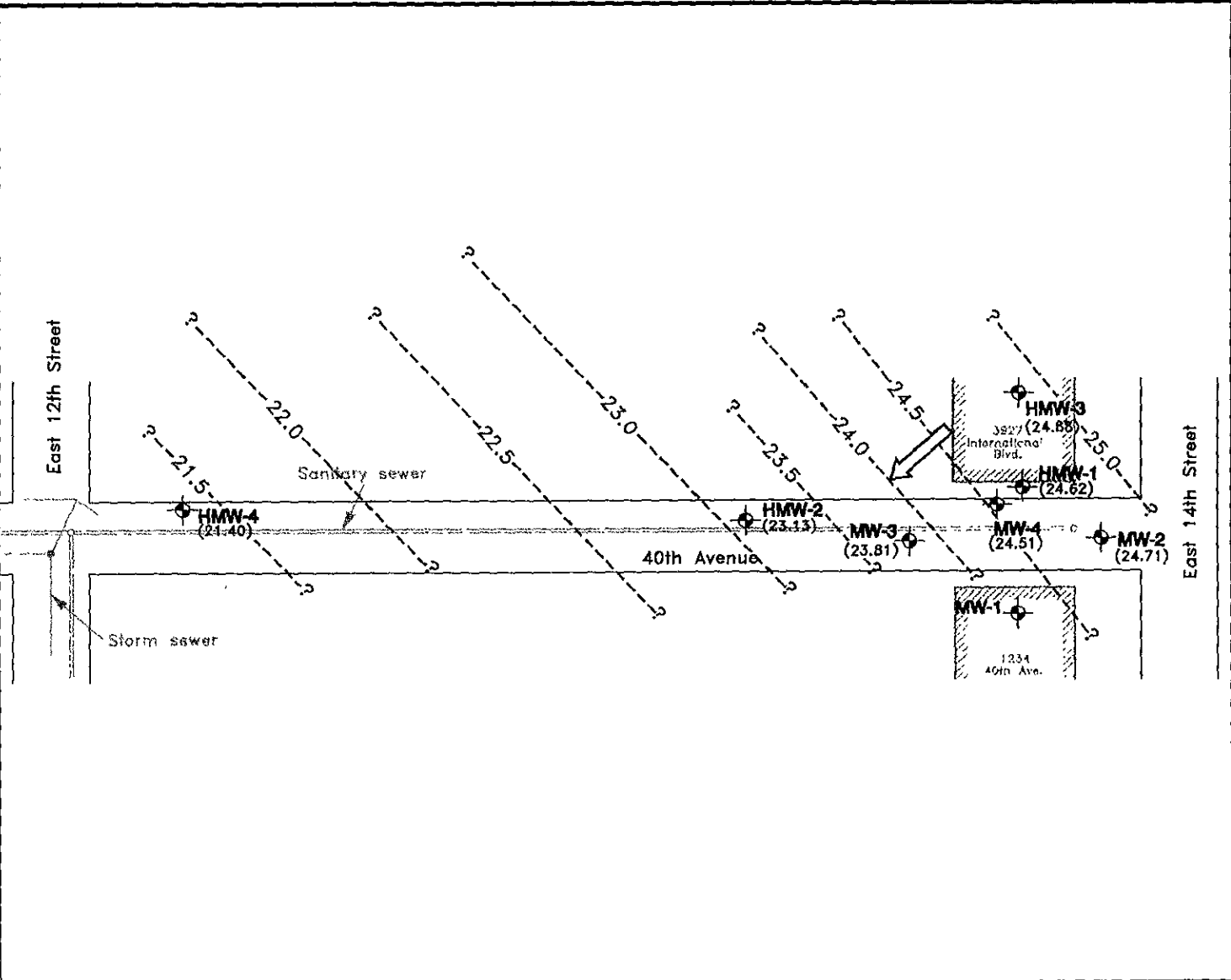
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 <b>KLEINFELDER</b>	<b>SITE VICINITY MAP</b>	PLATE  <b>1</b>
	DRAFTED BY L Sue      DATE 7-13-98 CHECKED BY B Theyskens      DATE 7-13-98	NEW GENICO FACILITY 3927 EAST 14TH STREET OAKLAND, CALIFORNIA  PROJECT NO 12-304760-003


LEGEND

-  PERMANENT GROUNDWATER MONITORING WELL
- (21.4) GROUNDWATER CONTOUR (feet, mean sea level)
-  GROUNDWATER ELEVATION (feet, mean sea level) MEASURED JUNE 1998
-  APPROXIMATE DIRECTION OF GROUNDWATER FLOW



REFERENCE  
Groundworks Environmental, "Figure 2  
Groundwater Elevation Contours - March  
1998," dated 4/9/98

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 <b>KLEINFELDER</b>	<b>SITE PLAN</b>	PLATE
	DRAFTED BY: L. Sue      DATE: 7-13-98 CHECKED BY: B. Theyskens      DATE: 7-23-98	NEW GENICO FACILITY 3927 EAST 14TH STREET OAKLAND, CALIFORNIA  PROJECT NO. 12-304760-003

## APPENDIX A KLEINFELDER FIELD PROTOCOL

### A-1 FIELD PREPARATION

Before performing work in the field, environmental staff review the scope of work, prepare a health and safety plan, coordinate the work to be done with their supervisor, assemble the necessary sample containers, and check, calibrate and clean equipment to be used in the field. When underground utilities may exist at a site where subsurface soil samples are being collected, USA Underground is contacted with the boring locations and the scheduled date of drilling, or a utility locating firm is employed to check the boring locations.

### A-2 DEPTH TO WATER MEASUREMENTS

Depth to water measurements are made in all the wells at the site prior to initiating purging and sampling, including wells that are not to be sampled. The depth to water measurements are made consecutively in as short a time as possible to reduce potential errors due to daily variations in the water table.

Depth-to-water (DTW) is measured in the well to within 1/100 of a foot using a conductivity-based water level indicator. Measurements are taken from the north or marked side of the top of casing of each well. These marks on the casings have been surveyed by a licensed survey relative to mean sea level (MSL). The conductivity probe and cable are rinsed in deionized water before and after measuring the first well, and after each subsequent well. The same water level indicator is used in each well.

### A-3 WELL SAMPLING

The Kleinfelder sampling protocol for wells is as follows:

- The depth-to-water is measured using a conductivity-based water level indicator.
- The volume of water standing in each well is calculated by subtracting the depth-to-water measurement from the total depth of the well and multiplying by the appropriate volume conversion factor.
- A minimum of three well volumes of water is purged from each well using a Teflon bailer. The bailer is decontaminated prior to use in each well by washing with TSP and rinsing with distilled water. Bailer cord is replaced prior to purging each well. Purge water is placed in 55-gallon drums.
- Physical parameters of pH and temperature are monitored for stability during purging.

- Sample bottles, provided by the analytical laboratory are filled from a new sterile disposable bailer at each well.
  
- Samples are immediately labeled and placed in an iced sample container. At the end of each day, the samples are delivered to the analytical laboratory, under chain-of-custody control.

# KA KLEINFELDER

## RECORD OF WATER LEVEL MEASUREMENTS

Date: 6/30/98 Weather: Cool/Foggy AM Sheet 1 of 1  
 Project: HASAWANUSAILER Submitted By: KEL Date: \_\_\_\_\_  
 Project No.: 12-3047-60 Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_

Instrument Number: \_\_\_\_\_

Well Number	Time (opened/measured) (24-hr)	Sensitivity Setting (est. %)	Measuring Point (M.P.)	Measurement		Replicate Measurements (if requested)		Notes	(locked? <input type="checkbox"/> )
				TD1	DTM <sub>2</sub>	3			
HMW-1			FOC	19.13 <del>14.20</del>	6.63 7.4				
HMW-2			          v	17.50	6.3				
HMW-3				16.27	6.30	6.6			
HMW-4				14.20	7.40				
MW-2				19.63	6.35				
MW-3				21.45	6.62				
MW-4				24.05	5.86				

M.P.: TOC, GS, Cover ring, Other: \_\_\_\_\_ All Wells Locked -- YES / NO



# KA KLEINFELDER

## WELL DEVELOPMENT & SAMPLING LOG

WELL NO: Hmw-1

Date: 6/30/98

Weather: CDol / P999

Sheet 1 of 1

Project: Hausauer

Submitted By: KSL

Date: 6/30/98

Project No.: 12-3047-60

Reviewed By: \_\_\_\_\_

Date: \_\_\_\_\_

Purpose of Log

Development

Sampling

Equipment & Decontamination	Purging Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other:		
	Sampling Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other:		
	Test Equipment	Water Level		pH		Conductivity		Turbidity	
	Meter No.								
	Calibration Date/Time	NA							
	Decontamination Methods	Wash		Rinse I		Rinse II		Rinse III	
	TSP	DI	Steam	DI	Steam	DI	Steam	DI	Steam
	Alconox	Tap	Hot	Tap	Hot	Tap	Hot	Tap	Hot
	Other:	Other	Cool	Other	Cool	Other	Cool	Other	Cool
	Vol. (gal):								
Source:									
Decon. Notes:									

Well Security: good fair poor      Well Integrity: good fair poor      Locked: yes no

Development / Purge Record	Purge Volume (CV)	T.D.	-	DTW	*	Factor	* I.C.V	=	2.19 gal
	Well Diam.: $\phi$ 2" $\square$ 4"	19.13 ft.	-	6.63 ft.	*	$\begin{matrix} 2=0.175 \\ 4=0.663 \end{matrix}$	* 12.5	=	6.56 gal
	Free Product?: Odor:	no <u>yes</u>	Floating Product:		none	sheen	<u>film</u>	feet thick	
	Time (24-hr)								Replicate Goals
	Gallons Purged	0	2.19	4.38	6.56				(dev. only)
	Surged (minutes)	$\uparrow$							$\pm 0.10$
	pH	S	6.8	---	---				$\pm 1^\circ\text{C}$
	Temperature ( $^\circ\text{C}$ )	T	<del>6.8</del> 7.2	---	---				$\pm 10\%$
	Cond. ( $\mu\text{mhos/cm}$ )	A	1006	---	---				$\pm 10\%$
	Salinity (%)	R			8.5%				$\pm 10\%$
Turbidity (NTU's) <u>DO</u>	T			0.77 mg/l				<50 NTUs	
Color	$\downarrow$							Colorless	
Depth to Water <u>Redox</u>				4.67				$\pm 0.01'$	
Reference Point:	TOC	Other:							

Sample #	Time	Quantity	Volume	Type	Preserv.	Filtration	Analysis	Lab
Hmw-1-W	14:45	1	500ml	Plast	---		NO <sub>2</sub> , SO <sub>4</sub>	AEN
		1	250ml	"	---		Ferrous iron	
		3	40 ml	VOA	HCL		TPH, BTEX, HCB, E	
		2	1L	Ambe	---		TPH(g)(d), mg	
trip								

Other Observations: oily film, purge = 4 gals, wait for 80% recharge 9:13

Final Check: VOAs free of bubbles? yes / no / NA      Well Locked? yes / no / NA

# KA KLEINFELDER

## WELL DEVELOPMENT & SAMPLING LOG

WELL NO. HMW-2

Date: 6/30/98 Weather: Cool Sheet 1 of 1  
 Project: Hansauer Submitted By: KEL Date: 6/30/98  
 Project No.: 12-3047-60 Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_

Purpose of Log  Development  Sampling

Equipment & Decontamination	Purging Equipment	Bailer	<input checked="" type="checkbox"/> Disposable Bailer	<input checked="" type="checkbox"/> Suction Pump	<input type="checkbox"/> Submersible Pump	<input type="checkbox"/> Dedicated Pump	Other:		
	Sampling Equipment	Bailer	<input checked="" type="checkbox"/> Disposable Bailer	<input type="checkbox"/> Suction Pump	<input type="checkbox"/> Submersible Pump	<input type="checkbox"/> Dedicated Pump	Other:		
	Test Equipment	Water Level		pH		Conductivity		Turbidity	
	Meter No.								
	Calibration Date/Time	NA							
	Decontamination Methods	Wash		Rinse I		Rinse II		Rinse III	
	TSP	DI	Steam	DI	Steam	DI	Steam	DI	Steam
	Alconox	Tap	Hot	Tap	Hot	Tap	Hot	Tap	Hot
	Other:	Other	Cool	Other	Cool	Other	Cool	Other	Cool
	Vol. (gal):								
Source:									
Decon. Notes:									

Well Security: good fair poor Well Integrity: good fair poor Locked: yes no

Purge Volume (CV) T.D. - DTW × Factor × 1 C.V. = 1.96 gal  
 Well Diam.:  $\varnothing$  2" □ 4" 17.50 ft. - 6.3 ft. ×  $\frac{2-0.175}{4-0.663}$  × 11.2 = 5.88 gal  
 Free Product?: Odor: no yes Floating Product: none sheen film \_\_\_\_\_ feet thick

Development / Purge Record	Time (24-hr)						Replicate
	Gallons Purged	0	1.96	3.92	5.88		Goals
	Surged (minutes)	↑					(dev. only)
	pH	S	6.89	6.87	6.88		±0.10
	Temperature (°C)	T	22	22	22		±1°C
	Cond. (µmhos/cm)	A	600	610	610		±10%
	Salinity (‰)	R				4.6%	±10%
	Turbidity (NTU's)	T				0.43 ng/l	<50 NTUS
	Color	↓					Colorless
	Depth to Water	<u>Redox</u>				45.5	±0.01'

Reference Point: TOC Other:

Sample Log	Sample #	Time	Quantity	Volume	Type	Preserv.	Filtration	Analysis	Lab
	HMW-2-W	1340	1	500 ml	Mixed	-		NO <sub>2</sub> /SO <sub>4</sub>	AEN
			1	250 ml	"	-		Ferrous Iron	
			3	40 ml	VOA	HCl		RTca/MTBE	
			2	1 l	Amber	-		TPH (9 Vol) mg	

Other Observations: \_\_\_\_\_

Final Check: VOAs free of bubbles? yes / no / NA Well Locked? yes / no / NA

# KA KLEINFELDER

## WELL DEVELOPMENT & SAMPLING LOG

WELL NO. Hmw-3

Date: 6/30/98

Weather: cool

Sheet 1 of 1

Project: Hausauer

Submitted By: FEL

Date: 6/30/98

Project No.: 12-3047-60

Reviewed By: \_\_\_\_\_

Date: \_\_\_\_\_

Purpose of Log

Development

Sampling

Equipment & Decontamination	Purging Equipment	Bailer	Disposable Bailer	<u>Suction Pump</u>	Submersible Pump	Dedicated Pump	Other:		
	Sampling Equipment	Bailer	<u>Disposable Bailer</u>	Suction Pump	Submersible Pump	Dedicated Pump	Other:		
	Test Equipment	<u>Water Level</u>		<u>pH</u>		<u>Conductivity</u>		<u>Turbidity</u>	
	Meter No.								
	Calibration Date/Time	<u>NA</u>							
	Decontamination Methods	<u>Wash</u>		<u>Rinse I</u>		<u>Rinse II</u>		<u>Rinse III</u>	
	TSP	DI	Steam	DI	Steam	DI	Steam	DI	Steam
	Alconox	Tap	Hot	Tap	Hot	Tap	Hot	Tap	Hot
	Other:	Other	Cool	Other	Cool	Other	Cool	Other	Cool
	Vol. (gal):								
Source:									
Decon. Notes:									

Well Security:	good	fair	poor	Well Integrity:	good	fair	poor	Locked:	yes	no	
Purge Volume (CV)	T.D.	-	DTW	x	Factor	x	1 C.V.	=	<u>1.69 gal</u>		
Well Diam.: $\square 2" \square 4"$	<u>16.27 ft.</u>	-	<u>6.6 ft.</u>	x	$r=0.175$ $r=0.663$	x	<u>9.67</u>	=	gal		
Free Product?:	Odor:	no	yes	Floating Product:	none	sheen	film		feet thick		
Time (24-hr)	<u>1450</u>	<u>1455</u>	<u>1460</u>	<u>1505</u>					Replicate Goals		
Gallons Purged	<u>0</u>	<u>1.69</u>	<u>3.38</u>	<u>5.08</u>					(dev. only)		
Surged (minutes)	<u>↑</u>								±0.10		
pH	<u>S</u>	<u>6.98</u>	<u>6.97</u>	<u>6.96</u>					±1°C		
Temperature (°C)	<u>T</u>	<u>22.5</u>	<u>22.0</u>	<u>22.0</u>					±10%		
Cond. (µmhos/cm)	<u>A</u>	<u>650</u>	<u>650</u>	<u>640</u>					±10%		
Salinity (‰)	<u>R</u>			<u>2.7</u>					<50 NTUs		
Turbidity (NTUs) DO	<u>T</u>			<u>0.25 mg/L</u>					Colorless		
Color	<u>↓</u>								±0.01'		
Depth to Water <u>Redox</u>				<u>9.7</u>							
Reference Point:	<u>TOC</u>		Other:								

Sample #	Time	Quantity	Volume	Type	Preserv.	Filtration	Analysis	Lab
<u>Hmw-3-W</u>	<u>1315</u>	<u>1</u>	<u>500 ml</u>	<u>Plast</u>	<u>-</u>		<u>NO<sub>3</sub> SO<sub>4</sub></u>	<u>AEH</u>
		<u>1</u>	<u>250 ml</u>	<u>"</u>	<u>-</u>		<u>Ferrous Iron</u>	
		<u>3</u>	<u>40 ml</u>	<u>VOM</u>	<u>HCL</u>		<u>BTex MTBE</u>	
		<u>2</u>	<u>1L</u>	<u>Anko</u>	<u>-</u>		<u>TPH<sub>15</sub>xd(X<sub>mc</sub>)</u>	<u>Y</u>

Other Observations: \_\_\_\_\_

Final Check: VOAs free of bubbles? yes / no / NA

Well Locked? yes / no / NA

# KA KLEINFELDER

**WELL DEVELOPMENT & SAMPLING LOG** WELL NO. HW-4  
 Date: 6/30/98 Weather: cool Sheet 1 of 1  
 Project: Hausauer Submitted By: KEC Date: 6/30/98  
 Project No.: 12-3047-60 Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Purpose of Log  Development  Sampling

Equipment & Decontamination	Purging Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u>peristaltic pump</u>		
	Sampling Equipment	Bailer	Disposable Bailer	Suction Pump	Submersible Pump	Dedicated Pump	Other: <u>✓</u>		
	Test Equipment	<u>Water Level</u>		<u>pH</u>		<u>Conductivity</u>			
	Meter No.								
	Calibration Date/Time	<u>NA</u>							
	Decontamination Methods	<u>Wash</u>		<u>Rinse I</u>		<u>Rinse II</u>		<u>Rinse III</u>	
	TSP	DI	Steam	DI	Steam	DI	Steam	DI	Steam
	Alconox	Tap	Hot	Tap	Hot	Tap	Hot	Tap	Hot
	Other:	Other	Cool	Other	Cool	Other	Cool	Other	Cool
	Vol. (gal):								
Source:									
Decon. Notes:									

Development / Purge Record	Well Security: good fair poor	Well Integrity: good fair poor			Locked: yes no	
	Purge Volume (CV)	T.D.	-	DTW	$\times .6$ Factor $\times 1$ C.V. = <u>0.28 gal</u>	
	Well Diam: $\square 2" \square 4"$	<u>14.2 ft.</u>	-	<u>7.40 ft.</u>	$\times .041$ $\times 6.8$ = <u>gal</u>	
	Free Product?: Odor: no yes	Floating Product: none sheen film			feet thick	
	Time (24-hr)	<u>1215</u>	<u>1220</u>	<u>1225</u>	<u>1230</u>	Replicate Goals
	Gallons Purged	<u>0</u>	<u>0.28</u>	<u>0.56</u>	<u>0.84</u>	(dev. only)
	Surged (minutes)	<u>↑</u>				$\pm 0.10$
	pH	<u>S</u>	<u>7.16</u>	<u>6.96</u>	<u>6.98</u>	$\pm 1^\circ\text{C}$
	Temperature (°C)	<u>T</u>	<u>23</u>	<u>23</u>	<u>23</u>	$\pm 10\%$
	Cond. (µmhos/cm)	<u>A</u>	<u>680</u>	<u>690</u>	<u>680</u>	$\pm 10\%$
Salinity (‰)	<u>R</u>	<u>8.8 mg/L</u>	<u>9.3 mg/L</u>		$< 50$ NTUs	
Turbidity (NTUs) DO	<u>T</u>	<u>98.4 %</u>	<u>3.7 mg/L</u>		Colorless	
Color	<u>↓</u>				$\pm 0.01'$	
Depth to Water <u>Redox</u>		<u>-21.7</u>				
Reference Point:	<u>TOC</u>	<u>Other:</u>				

Sample #	Time	Quantity	Volume	Type	Preserv.	Filtration	Analysis	Lab
<u>HW-4-W</u>	<u>1235</u>	<u>1</u>	<u>500 ml</u>	<u>Wash</u>	<u>-</u>		<u>NO<sub>3</sub> SO<sub>4</sub></u>	
		<u>1</u>	<u>250 ml</u>	<u>1"</u>	<u>-</u>		<u>Ferrous iron</u>	
		<u>3</u>	<u>40 ml</u>	<u>VOA</u>	<u>HCL</u>		<u>RTX MIBE</u>	
		<u>2</u>	<u>1 L</u>	<u>Make</u>	<u>-</u>		<u>TBHQ (SD) no</u>	

Other Observations: Volume calculated for 1" dia well

Final Check: VOAs free of bubbles? yes / no / NA Well Locked? yes / no / NA

# American Environmental Network

## Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

PAGE 1

KLEINFELDER, INC.  
1362 RIDDER PARK DR.  
SAN JOSE, CA 95131

REPORT DATE: 07/20/98

DATE(S) SAMPLED: 06/30/98

DATE RECEIVED: 07/01/98

ATTN: BILL THEYSKENS  
CLIENT PROJ. ID: 12-3047-60  
CLIENT PROJ. NAME: HAUSAUER  
C.O.C. NUMBER: 397

AEN WORK ORDER: 9807002

### PROJECT SUMMARY:

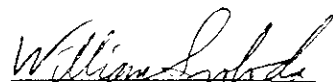
On July 1, 1998, this laboratory received 5 water sample(s).

Client requested sample(s) be analyzed for chemical parameters. Portion for ferrous iron was subcontracted to a DOHS certified laboratory; subcontract report is included. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Reviewed by



## KLEINFELDER, INC.

SAMPLE ID: HMW-1-W  
 AEN LAB NO: 9807002-01  
 AEN WORK ORDER: 9807002  
 CLIENT PROJ. ID: 12-3047-60

DATE SAMPLED: 06/30/98  
 DATE RECEIVED: 07/01/98  
 REPORT DATE: 07/20/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
#Sample Filtration	0.45 um	-		Filtr Date	07/01/98
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	1,300 *	5 ug/L		07/10/98
Toluene	108-88-3	160 *	5 ug/L		07/10/98
Ethylbenzene	100-41-4	390 *	5 ug/L		07/10/98
Xylenes, Total	1330-20-7	390 *	20 ug/L		07/10/98
Purgeable HCs as Gasoline	5030/GCFID	10 *	0.5 mg/L		07/10/98
Methyl t-Butyl Ether	1634-04-4	160 *	50 ug/L		07/10/98
#Extraction for TPH	EPA 3510	-		Extrn Date	07/02/98
TPH as Diesel	GC-FID	ND	0.2 mg/L		07/07/98
TPH as Oil	GC-FID	5.9 *	1 mg/L		07/07/98
#Anion Sample Prep.		-		Prep date	07/01/98
Nitrate as Nitrogen	EPA 300	0.4 *	0.2 mg/L		07/01/98
Sulfate	EPA 300	2 *	1 mg/L		07/01/98

Reporting limits for diesel/oil elevated due to high levels of non-target compounds. Samples run at dilution.

ND = Not detected at or above the reporting limit  
 \* = Value at or above reporting limit

## KLEINFELDER, INC.

SAMPLE ID: HMW-2-W  
 AEN LAB NO: 9807002-02  
 AEN WORK ORDER: 9807002  
 CLIENT PROJ. ID: 12-3047-60

DATE SAMPLED: 06/30/98  
 DATE RECEIVED: 07/01/98  
 REPORT DATE: 07/20/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
#Sample Filtration	0.45 um	-		Filtr Date	07/01/98
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	180 *	3 ug/L		07/10/98
Toluene	108-88-3	52 *	3 ug/L		07/10/98
Ethylbenzene	100-41-4	240 *	3 ug/L		07/10/98
Xylenes, Total	1330-20-7	88 *	10 ug/L		07/10/98
Purgeable HCs as Gasoline	5030/GCFID	7.3 *	0.3 mg/L		07/10/98
Methyl t-Butyl Ether	1634-04-4	170 *	30 ug/L		07/10/98
#Extraction for TPH	EPA 3510	-		Extrn Date	07/02/98
TPH as Diesel	GC-FID	ND	0.05 mg/L		07/06/98
TPH as Oil	GC-FID	ND	0.2 mg/L		07/06/98
#Anion Sample Prep.		-		Prep date	07/01/98
Nitrate as Nitrogen	EPA 300	ND	0.2 mg/L		07/01/98
Sulfate	EPA 300	ND	1 mg/L		07/01/98

ND = Not detected at or above the reporting limit

\* = Value at or above reporting limit

## KLEINFELDER, INC.

SAMPLE ID: HMW-3-W  
 AEN LAB NO: 9807002-03  
 AEN WORK ORDER: 9807002  
 CLIENT PROJ. ID: 12-3047-60

DATE SAMPLED: 06/30/98  
 DATE RECEIVED: 07/01/98  
 REPORT DATE: 07/20/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
#Sample Filtration	0.45 um	-		Filtr Date	07/01/98
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5 ug/L		07/10/98
Toluene	108-88-3	ND	0.5 ug/L		07/10/98
Ethylbenzene	100-41-4	ND	0.5 ug/L		07/10/98
Xylenes, Total	1330-20-7	ND	2 ug/L		07/10/98
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05 mg/L		07/10/98
Methyl t-Butyl Ether	1634-04-4	ND	5 ug/L		07/10/98
#Extraction for TPH	EPA 3510	-		Extrn Date	07/06/98
TPH as Diesel	GC-FID	ND	0.05 mg/L		07/07/98
TPH as Oil	GC-FID	ND	0.2 mg/L		07/07/98
#Anion Sample Prep.		-		Prep date	07/01/98
Nitrate as Nitrogen	EPA 300	4.0 *	0.2 mg/L		07/01/98
Sulfate	EPA 300	51 *	1 mg/L		07/01/98

ND = Not detected at or above the reporting limit

\* = Value at or above reporting limit



## KLEINFELDER, INC.

SAMPLE ID: HMW-4-W  
 AEN LAB NO: 9807002-04  
 AEN WORK ORDER: 9807002  
 CLIENT PROJ. ID: 12-3047-60

DATE SAMPLED: 06/30/98  
 DATE RECEIVED: 07/01/98  
 REPORT DATE: 07/20/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
#Sample Filtration	0.45 um	-		Filtr Date	07/01/98
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	17 *	0.5	ug/L	07/13/98
Toluene	108-88-3	1.5 *	0.5	ug/L	07/13/98
Ethylbenzene	100-41-4	1.8 *	0.5	ug/L	07/13/98
Xylenes, Total	1330-20-7	2 *	2	ug/L	07/13/98
Purgeable HCs as Gasoline	5030/GCFID	0.94 *	0.05	mg/L	07/13/98
Methyl t-Butyl Ether	1634-04-4	10 *	5	ug/L	07/13/98
#Extraction for TPH	EPA 3510	-		Extrn Date	07/06/98
TPH as Diesel	GC-FID	ND	0.05	mg/L	07/07/98
TPH as Oil	GC-FID	ND	0.2	mg/L	07/07/98
#Anion Sample Prep.		-		Prep date	07/01/98
Nitrate as Nitrogen	EPA 300	ND	0.2	mg/L	07/01/98
Sulfate	EPA 300	18 *	1	mg/L	07/01/98

ND = Not detected at or above the reporting limit  
 \* = Value at or above reporting limit

## KLEINFELDER, INC.

SAMPLE ID: TRIP BLANK  
AEN LAB NO: 9807002-05  
AEN WORK ORDER: 9807002  
CLIENT PROJ. ID: 12-3047-60

DATE SAMPLED: 06/30/98  
DATE RECEIVED: 07/01/98  
REPORT DATE: 07/20/98

---

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	07/13/98
Toluene	108-88-3	ND	0.5	ug/L	07/13/98
Ethylbenzene	100-41-4	ND	0.5	ug/L	07/13/98
Xylenes, Total	1330-20-7	ND	2	ug/L	07/13/98
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	07/13/98
Methyl t-Butyl Ether	1634-04-4	ND	5	ug/L	07/13/98

ND = Not detected at or above the reporting limit  
\* = Value at or above reporting limit

AEN (CALIFORNIA)  
QUALITY CONTROL REPORTAEN JOB NUMBER: 9807002  
CLIENT PROJECT ID: 12-3047-60Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spikes(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analyses.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix method and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behaviour, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standard samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrument performance.

0 - Surrogate diluted out.

1 - Interference.

2 - Instrument result outside of established laboratory QC limits.

WORK ORDER: 9807002

QUALITY CONTROL REPORT

PAGE QR-2

ANALYSIS: Extractable TPH

MATRIX: Water

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank      LAB ID: BLKW-0702-1      INSTR RUN: GC C:\980701000000/18/  
 INSTRUMENT: HP 5890      PREPARED: 07/02/98      BATCH ID: DSLW070298-1  
 UNITS: mg/L      ANALYZED: 07/06/98      DILUTION: 1.000000  
 METHOD:

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
Diesel	ND		0.05						
Motor Oil	ND		0.2						
n-Pentacosane (surr)	96.1			100	96.1	60	130		

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Laboratory Control Spike      LAB ID: LCDW-0702-1      INSTR RUN: GC C:\980701000000/20/18  
 INSTRUMENT: HP 5890      PREPARED: 07/02/98      BATCH ID: DSLW070298-1  
 UNITS: mg/L      ANALYZED: 07/06/98      DILUTION: 1.000000  
 METHOD:

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
Diesel	1.30	ND	0.05	2.00	65.0	60	130		
n-Pentacosane (surr)	101.2	96.1		100	101	60	130		

SAMPLE TYPE: Laboratory Control Spike      LAB ID: LCSW-0702-1      INSTR RUN: GC C:\980701000000/19/18  
 INSTRUMENT: HP 5890      PREPARED: 07/02/98      BATCH ID: DSLW070298-1  
 UNITS: mg/L      ANALYZED: 07/06/98      DILUTION: 1.000000  
 METHOD:

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
Diesel	1.31	ND	0.05	2.00	65.5	60	130		
n-Pentacosane (surr)	103.1	96.1		100	103	60	130		

LABORATORY CONTROL DUPLICATES

SAMPLE TYPE: Laboratory Control Sample Duplicate      LAB ID: LCRW-0702-1      INSTR RUN: GC C:\980701000000/21/19  
 INSTRUMENT: HP 5890      PREPARED: 07/02/98      BATCH ID: DSLW070298-1  
 UNITS: mg/L      ANALYZED: 07/06/98      DILUTION: 1.000000  
 METHOD:

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
Diesel	1.30	1.31	0.05					0.766	20
Motor Oil	ND	ND	0.2					0	
n-Pentacosane (surr)	101.2	103.1		100	101	60	130		

SAMPLE SURROGATES

SAMPLE TYPE: Sample-Client      LAB ID: 9807002-01E      INSTR RUN: GC C:\980701000000/42/  
 INSTRUMENT: HP 5890      PREPARED: 07/02/98      BATCH ID: DSLW070298-1  
 UNITS: mg/L      ANALYZED: 07/06/98      DILUTION: 1.000000  
 METHOD:

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
n-Pentacosane (surr)	110.8			100	111	60	130		

WORK ORDER: 9807002

## QUALITY CONTROL REPORT

PAGE QR-3

ANALYSIS: Extractable TPH

MATRIX: Water

## SAMPLE SURROGATES

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SAMPLE TYPE: Sample-Client	LAB ID: 9807002-02E	INSTR RUN: GC C\980701000000/43/
INSTRUMENT: HP 5890	PREPARED: 07/02/98	BATCH ID: DSEW070298-1
UNITS: mg/L	ANALYZED: 07/06/98	DILUTION: 1.000000
METHOD:		

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
n-Pentacosane (surr)	105.4			100	105	60	130		

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SAMPLE TYPE: Sample-Client	LAB ID: 9807002-03E	INSTR RUN: GC C\980701000000/87/
INSTRUMENT: HP 5890	PREPARED: 07/01/98	BATCH ID: DSEW070698-1
UNITS: mg/L	ANALYZED: 07/08/98	DILUTION: 1.000000
METHOD:		

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
n-Pentacosane (surr)	65.7			100	65.7	60	130		

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SAMPLE TYPE: Sample-Client	LAB ID: 9807002-04E	INSTR RUN: GC C\980701000000/88/
INSTRUMENT: HP 5890	PREPARED: 07/01/98	BATCH ID: DSEW070698-1
UNITS: mg/L	ANALYZED: 07/08/98	DILUTION: 1.000000
METHOD:		

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
n-Pentacosane (surr)	68.9			100	68.9	60	130		

-----

WORK ORDER: 9807002

QUALITY CONTROL REPORT

PAGE QR-4

ANALYSIS: Major Anions

MATRIX: Water

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank		LAB ID: IC_BLK		INSTR RUN: IC\980701000000/1/				
INSTRUMENT: Dionex ion chromatograph		PREPARED:		BATCH ID: IC070198				
UNITS: mg/L		ANALYZED: 07/01/98		DILUTION: 1.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW HIGH	RPD (%)	RPD LIMIT (%)
Nitrate, NO3-N	ND		0.1					
Sulfate, SO4	ND		0.5					

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Spike-Method/Media blank		LAB ID: IC_LCS		INSTR RUN: IC\980701000000/2/1				
INSTRUMENT: Dionex ion chromatograph		PREPARED:		BATCH ID: IC070198				
UNITS: mg/L		ANALYZED: 07/01/98		DILUTION: 1.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW HIGH	RPD (%)	RPD LIMIT (%)
Nitrate, NO3-N	1.97	ND	0.1	2.00	98.5	80 120		
Sulfate, SO4	9.80	ND	0.5	10.0	98.0	80 120		

SAMPLE TYPE: Spike-Method/Media blank		LAB ID: IC_LCSD		INSTR RUN: IC\980701000000/3/1				
INSTRUMENT: Dionex ion chromatograph		PREPARED:		BATCH ID: IC070198				
UNITS: mg/L		ANALYZED: 07/01/98		DILUTION: 1.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW HIGH	RPD (%)	RPD LIMIT (%)
Nitrate, NO3-N	1.97	ND	0.1	2.00	98.5	80 120		
Sulfate, SO4	9.77	ND	0.5	10.0	97.7	80 120		

LABORATORY CONTROL DUPLICATES

SAMPLE TYPE: Method Spike Sample Duplicate		LAB ID: IC_LCSR		INSTR RUN: IC\980701000000/4/2				
INSTRUMENT: Dionex ion chromatograph		PREPARED:		BATCH ID: IC070198				
UNITS: mg/L		ANALYZED: 07/01/98		DILUTION: 1.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW HIGH	RPD (%)	RPD LIMIT (%)
Nitrate, NO3-N	1.97	1.97	0.1				0	15
Sulfate, SO4	9.77	9.80	0.5				0.307	15

MATRIX SPIKE SAMPLES

SAMPLE TYPE: Spike-Sample/Matrix		LAB ID: MD07002-03A		INSTR RUN: IC\980701000000/7/5				
INSTRUMENT: Dionex ion chromatograph		PREPARED:		BATCH ID: IC070198				
UNITS: mg/L		ANALYZED: 07/01/98		DILUTION: 2.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW HIGH	RPD (%)	RPD LIMIT (%)
Nitrate, NO3-N	6.45	3.96	0.2	2.00	125	75 125		
Sulfate, SO4	71.3	50.9	1	20.0	102	75 125		

WORK ORDER: 9807002

## QUALITY CONTROL REPORT

PAGE QR-5

ANALYSIS: Major Anions

MATRIX: Water

## MATRIX SPIKE SAMPLES

SAMPLE TYPE: Spike-Sample/Matrix		LAB ID: MS07002-03A		INSTR RUN: IC\980701000000/6/5				
INSTRUMENT: Dionex ion chromatograph		PREPARED:		BATCH ID: IC070198				
UNITS: mg/L		ANALYZED: 07/01/98		DILUTION: 2.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
						LOW HIGH		
Nitrate, NO3-N	6.42	3.96	0.2	2.00	123	75 125		
Sulfate, SO4	71.1	50.9	1	20.0	101	75 125		

## MATRIX SPIKE DUPLICATES

SAMPLE TYPE: Spiked Sample Duplicate		LAB ID: MR07002-03A		INSTR RUN: IC\980701000000/8/6				
INSTRUMENT: Dionex ion chromatograph		PREPARED:		BATCH ID: IC070198				
UNITS: mg/L		ANALYZED: 07/01/98		DILUTION: 2.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
						LOW HIGH		
Nitrate, NO3-N	6.45	6.42	0.2				0.466	15
Sulfate, SO4	71.3	71.1	1				0.281	15

## QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9807002  
 INSTRUMENT: E  
 MATRIX: WATER

## Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery	
			Fluorobenzene	
07/10/98	HMW-1-W	01	95	
07/10/98	HMW-2-W	02	96	
07/10/98	HMW-3-W	03	99	
07/13/98	HMW-4-W	04	96	
07/13/98	TRIP BLANK	05	100	
QC Limits:			70-130	

DATE ANALYZED: 07/10/98  
 SAMPLE SPIKED: LCS  
 INSTRUMENT: E

## Laboratory Control Sample Recovery

Analyte	Spike Added (ug/L)	Percent Recovery	RPD	QC Limits	
				Percent Recovery	RPD
Benzene	200	102	1	70-130	20
Toluene	200	102	1	70-130	20
Ethylbenzene	200	102	1	70-130	20
Total Xylenes	600	104	<1	70-130	20

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

\*\*\* END OF REPORT \*\*\*





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## WATER ANALYSIS REPORT

<b>To:</b> Bill Svoboda	<b>Date:</b> July 8, 1998
American Environmental Network	<b>Lab #s:</b> 98-07-0001 thru 07-0004
3440 Vincent Road	<b>Received:</b> July 1, 1998
Pleasant Hill, CA 94523	<b>Tech(s):</b> C. Lawrence
	<b>Lab Supervisor:</b> D. Jacobson
<b>Sample of:</b> monitor well water	<b>Lab Director:</b> G.S. Conrad, Ph.D.
	<b>Sample ID(s):</b> HMW-1-W, HMW-2-W, HMW-3-W, HMW-4-W
<b>Site Location:</b> northern California; Project ID No.: 12-3047-60	

### RESULTS

SAMPLE ID	REDOX	FERROUS IRON
HMW-1-W	---	0.96 mg/l
HMW-2-W	---	0.01 mg/l
HMW-3-W	---	<0.01 mg/l
HMW-4-W	---	<0.01 mg/l

### COMMENTS

These four samples have a considerable range, although there is nothing in the middle of the range, varying from non-detect to verging on very high (i.e., almost 1+ ppm). While the latter three samples suggest low total iron and/or good oxidation or bacterial activity, the first one indicates poor (or at least incomplete) oxidation or bacterial activity.

#### NOTES:

These tests were done according to the Association for Testing Materials (ASTM), and/or conform to standard and accepted protocols as described in Standard Methods for the Examination of Water and Wastewater, 18th ed., © 1992: Ferrous Iron (Fe<sup>++</sup>) - Phenanthroline Method (mod. 3500-Fe D); Mn<sup>++</sup> - PAN Method; Redox - ASTM D 1498.