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Pacific
Groundwater
Group

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Groundwater Monitoring Plan
CleanCare Corporation
Tacoma, Washington

October 14, 1995

Groundwater Monitoring Plan
CleanCare Corporation
Tacoma, Washington

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1.0 INTRODUCTION

The purpose of this Groundwater Monitoring Plan (GMP) is to bring together all groundwater information previously gathered at the site, interpret the information with regard to groundwater transport pathways in the fill aquifer, and lay out a plan for future monitoring of those pathways. This work establishes the groundwater monitoring requirements of Phase II of the RFI Work Plan. The GMP includes the following components:

- A synopsis of previous groundwater reports including the tidal study, groundwater quality report, and the long term water level monitoring report.
- Water table maps showing groundwater flow lines originating at the various Solid Waste Management Units (SWMUs) on-site.
- An assessment of vertical flow on-site and its impacts on monitoring needs.
- A detailed monitoring plan indicating constituents, sampling frequencies, any additional wells that may be required, and approximate costs.
- Recommendations for any further work necessary to assess contaminant sources.

2.0 SUMMARY

Three groundwater memos have been produced on the following topics: long term water levels, tidal influence, and groundwater quality. Eight wells in four pairs were installed in the fill aquifer and sampled. The locations of the wells are shown in Figure 1. The compounds listed in Tables 1 and 2 were detected in the samples. The wells were not found to be tidally influenced.

3.0 SYNOPSIS OF PREVIOUS WORK

This synopsis summarizes all groundwater related investigations completed at CleanCare Corporation in conjunction with the RCRA Facility Investigation (RFI).

3.1 Groundwater Quality

The groundwater quality memorandum, dated June 1, 1994, summarized the monitoring well installation and groundwater sampling completed at CleanCare Corporation between February 1, and March 28, 1994.

3.1.1 Analytical Results

The analytical results of the groundwater sampling are presented in Tables 1 and 2. Action levels from the July 9, 1993 Work Plan revisions are also presented on the tables. Action levels are not cleanup levels necessarily applicable to the site but rather thresholds used to determine whether further work is warranted. Based on these preliminary results we find the following comparisons to action levels established in the work plan:

- Benzene was detected at concentrations above the action level in all monitoring wells except CCW-1a and CCW-4b. In most cases, toluene, ethylbenzene, and total xylenes were detected at concentrations below action levels.
- Tetrachloroethene and trichloroethene were detected at concentrations above action levels in monitoring wells CCW-1a, CCW-2a, CCW-2b, and CCW-3b.
- Vinyl chloride was detected at concentrations above action levels in monitoring wells CCW-1a, CCW-2a, and CCW-3b.
- No chlorinated compounds were detected in CCW-3a, CCW-4a and CCW-4b.
- Lead was detected at concentrations above the action level in wells CCW-3a and CCW-4a.
- Arsenic was detected at a concentration of 1.11 mg/L in well CCW-2b. The background action level for arsenic has not been established.

3.1.2 Monitoring Well Installation

Eight monitoring wells were installed on February 1 and 2, 1994 to meet the requirements of Task IA of the July 3, 1993 RFI work plan. Paired wells (one screened at the water table, one screened deep in the fill aquifer) were installed at the locations shown on Figure 1. The shallow wells (labeled "a") were all completed to a depth of six feet and the deep wells (labeled "b") were completed to depths of 12 - 13 feet. Geologic logs and well construction logs are given in Appendix 1. Soil samples collected during drilling were described in the Preliminary Soil Analysis Memo dated March 18, 1994.

The borings were drilled by Holt Drilling of Puyallup, WA using a hollow stem auger drill rig. The shallow wells were constructed of schedule 40, two-inch PVC casing with two-foot-long, 20-slot screens. The shallow well annuli were backfilled with #10-20 silica sand. The deep wells were constructed with ten-slot screens and backfilled with #20-40 sand. The annulus above the sand was backfilled with bentonite chips for all wells. All wells were fitted with thermo caps and flush-mount protective casings. The flush-mount protective casings were set in concrete.

3.1.3 Groundwater Sampling

Monitoring wells CCW-1a, CCW-1b, CCW-3a, and CCW-3b were sampled on March 4, 1994. The remaining wells could not be sampled because flooding prevented access to the wells. The remaining wells CCW-2a, CCW-2b, CCW-4a, and CCW-4b were sampled on March 28, 1994.

A peristaltic pump was used to purge the wells before sampling. Temperature, pH, and specific conductance were measured after each well volume had been removed, and a sample was collected after the three field parameters had stabilized. A minimum of three well volumes were removed from each well before samples were collected. Samples were collected with disposable bailers and placed in laboratory supplied bottles. All samples were placed in coolers and sent to the laboratory on the same day they were collected. Samples collected for metals analysis were filtered through a 10 micron filter.

3.2 Tidal Influence

The tidal memo, issued on September 23, 1994, summarizes the assessment of tidal influence over the site between June 14 and August 19, 1994. Water levels were measured in monitoring wells CCW-1b, CCW-2b, CCW-3a, CCW-3b, CCW-4b, and MW-4 for a period of three to six days per well. Water levels were recorded using an electronic data logger and 10 psi pressure transducer. The water levels are plotted on Figures 2 through 7 using the maximum vertical scale possible for each plot so that fluctuations can be easily discerned.

The results of the monitoring are summarized in Table 3. Twenty-four-hour periodic variation was seen in all of the CCW wells with amplitudes ranging from 0.03 to 0.3 feet. The likely cause of the variation in CCW-1b, CCW-2b, CCW-3a, and CCW-3b is barometric. Tidal influence is not suspected because the groundwater variation occurs daily rather than twice daily as with tides. In some cases, maximum and minimum groundwater levels and tidal levels occur at similar times. This is probably not indicative of tidal influence because the variation in water levels often occurs before the tidal change. In CCW-3a and CCW-3b the inconsistent amplitudes of the variations are also not characteristic of tidal influence.

In CCW-4b, the large amplitude and rapid changes in water levels are not attributable to natural influences. We know of no measurement error that could account for the apparent fluctuation; however, we cannot rule out the possibility. The source of the influence is not known.

No periodic change was seen in MW-4. The slow rise and fall of groundwater levels in MW-4 is likely due to a natural recharge event.

3.3 Long Term Water Levels

The Water Level memorandum, dated July 10, 1995, summarizes data collected on the CleanCare, Burlington, and Sol-Pro facilities to assess groundwater flow directions across the three contiguous sites. Water levels were measured monthly at the CleanCare facility between May 1994 and April 1995 for a total of 12 rounds. Table 4 presents water level data collected.

Four time increments were chosen as representative snapshots of water levels during the four quarters of the water year: May 13, 1994; August 16, 1994; November 15, 1994; and February 2, 1995. The November 15, 1994 event was selected because it was in the middle of the fall groundwater recharge event. This recharge event is indicated by the sharp increase in water levels during this time as shown on Figures 8, 9, and 10. The other events were selected to be three, six, and nine months from the November event.

Figures 11 through 14 present water level contour maps of the area during the four representative events. The wells included in the maps are screened in the fill aquifer. Although well logs for the Burlington wells were not reviewed, cross sections shown in Figures 13 and 14 of the RFA were used to infer screened intervals. All Burlington wells were used in the study except for CTMW-7, CTMW-9, and CTMW-12 which were excluded because of their completion depth.

The CleanCare CCW series wells were installed in pairs in the fill aquifer with two-foot screens completed between four and seven feet apart vertically. In order to use these wells in conjunction with the Burlington wells (which have screens at least five feet in length) an average water level was calculated for each of the CCW well pairs. No screen information was available for the Sol-Pro wells so they were assumed to be in a comparable interval.

The water levels were adjusted if free product was noted. The product thickness was multiplied by an assumed specific gravity of 0.8 and added to the water level.

Figures 11 through 14 indicate the following:

- A consistent groundwater mound exists beneath the Burlington facility.
- A consistent groundwater divide extends south of the mound to the area near MW-3.
- The steepest gradient off of the mound is to the southeast. If hydraulic conductivities are consistent across the area, flow may be concentrated in that direction. High conductivities may also cause flow to occur in that direction.
- Groundwater flow is towards the east across the CleanCare property.

4.0 VERTICAL HYDRAULIC GRADIENTS

Vertical hydraulic gradients for the CCW series wells were calculated using data collected during the long term water level monitoring study (Table 5). Water level elevations in the deeper "b" wells were subtracted from the water level elevations in the shallow "a" wells and then divided by the vertical distance between the centers of the shallow and deep screens. A positive gradient implies a potential for downward groundwater flow.

The vertical hydraulic gradients in the CCW-1 and CCW-2 well pairs are generally negative and close to zero. Therefore in the regions near these well pairs there is a small upward component to flow but groundwater flow is dominantly horizontal.

Vertical hydraulic gradients in the CCW-3 and CCW-4 well pairs tend to be positive and large compared to CCW-1 and CCW-2. This implies a large downward component to flow. This is consistent with the groundwater mounding seen near these wells.

5.0 MONITORING PLAN

Phase 2 of the RFI work plan dated July 9, 1993, outlines additional well installation and monitoring for further characterization of the fill aquifer. The objectives of this work are to:

- Provide more detailed information on groundwater flow direction and gradient.
- Install monitoring network for future data collection that will determine if the site as a whole is contributing to groundwater contamination.
- Collect sufficient groundwater quality data to determine how contaminant concentrations are affected by seasonal variations and site activities.
- Provide data that will be compared against proposed action levels.
- Provide data that will be used to identify constituents for additional action levels for Tasks IIC and Phase III.
- Establish monitoring parameters for future events

5.1 Monitoring Well Installation

Before installing any new wells we will gather any available information on concentrations of EPA Toxic Compound List (TCL) compounds in Burlington monitoring wells CTMW-5, CTMW-13, CTMW-17, and CTMW-18. Depending on the results of this investigation additional wells may be proposed.

The first well, temporarily designated CCW-5, will be installed along the eastern fence line east of CCW-2. The purpose of this well is to assess the eastern downgradient extent of contamination seen in CCW-2. The proposed location of CCW-5 and the proposed locations of wells listed below are shown on Figure 1

If no information is available on CTMW-17 and we are not allowed access to sample CTMW-17, an additional well may be proposed on the western fence line between CCW-3 and CCW-4 and directly upgradient from CCW-2. The new well is temporarily designated CCW-6. The purpose of CCW-6 is to assess if the contamination seen in CCW-2a and b is derived from sources onsite or upgradient of the site.

If no information is available on monitoring well CTMW-13 and we are not allowed access to sample CTMW-13, an additional well may be proposed in the vicinity of CCW-3 (CCW-7). The purpose of this well is to evaluate the source of contamination in CCW-3a and b and to more accurately determine water level elevations and flow directions in that area.

Investigations will be made into an old well on the western property line west of CCW-1 to evaluate whether it might be useful for determining the source of contamination detected in CCW-1. Monitoring data from CTMW-5 will be reviewed if available. If the well is not suitable for monitoring and data from CTMW-5 is not available, a new well may be proposed nearby.

New wells will be installed using two inch diameter, five foot long screens at a depth of approximately five to ten feet. Single well completions will be used because vertical gradients within the fill aquifer have been sufficiently documented with the existing four well-pairs. Otherwise the installations will be as proposed in Task IIA of the RFI work plan dated July 9, 1993.

5.2 Soil Sampling

Continuous soil samples will be collected during well installation and logged by a geologist in accordance with the Order and Procedure 103 of the July 9, 1993 RFI work plan.

5.3 Well Tests

All wells will be tested using a short term aquifer test or slug test. Pump tests will be used for all wells unless the well yield is less than 0.1 gpm in which case a slug test will be performed.

5.4 Groundwater Sampling

One initial round of groundwater sampling will be conducted to select the appropriate well for Appendix IX sampling. When the analytical results from Phase I, the first quarter of Task IIB, and the Appendix IX sampling are evaluated, CleanCare will submit to EPA a list of proposed wells and analytes for the remaining first year of groundwater monitoring. Quarterly monitoring will continue based on TCL list constituents until a new list is approved.

The first quarter Task IIB samples will be analyzed for the following constituents:

- Volatile organic compounds using EPA Method 8260
- Semi-volatile compounds using EPA Method 8270
- Pesticides and PCBs using EPA Method 8080
- TCL metals using EPA methods 6010 and 7000

5.5 Water Level Measurements

CleanCare Inc has an agreement with EPA that CleanCare has met its obligation to monitor water levels for 12 months. However, it is recommended that at least four quarterly rounds of water level measurements be conducted in conjunction with Burlington and Sol-Pro.

Table 1, Volatile Organic Compounds Detected In Groundwater, Method 8240
CleanCare Corporation, Tacoma, WA

Sample	Methylene Chloride	Carbon Disulfide	1,1-Dichloroethane	Vinyl Acetate	4-Methyl-2-Pentanone	Chlorobenzene	Styrene	Acetone	2-Butanone	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	1,1-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	Benzene	Toluene	Ethylbenzene	Total Xylenes
CCW-1a	2.0 U	1.0 U	1.0 U	5.3	5.0 U	1.0 U	1.0 U	7.7 M	5.0 U	4.8	51	120	1.0 U	25	50	3.0	7.6	1.2	5.4
CCW-1b	2.0 U	1.0 U	1.2	5.0 U	5.0 U	1.0 U	1.0 U	9.0	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	5.7	1.0 U	1.0 U	2.0 U
CCW-2a	3.2	1.0 U	1.0	11	7.2 M	14	1.0 U	40	23	250 K	590 K	640 K	3.6	57	92	420 K	350 K	440 K	970
CCW-2a Dilution	10 U	5.0 U	5.0 U	25 U	25 U	16	5.0 U	58	25 U	270	660	750	5.0 U	67	130	610	510	500	1200
CCW-2b	10 U	5.0 U	22	25 U	25 U	1000 K	5.0 U	25 U	25 U	10	6.0	8.6	5.0 U	5.0 U	10 U	370	370	10	110
CCW-2b Dilution	20 U	10 U	18	50 U	50 U	850	10 U	50 U	50 U	10 U	10 U	10 U	10 U	10 U	20 U	290	300	10 U	82
CCW-3a	2.0 U	1.0 U	1.0 U	5.0 U	5.0 U	1.0 U	3.5 M	70	22	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	2.0 U	15	35	24	21
CCW-3b	2.1	7.0	8.3	86	5.0 U	1.0 U	2.4 M	43	18	41	75	310 K	1.0 U	26	100	44	55	7.1	56
CCW-3b Dilution	6.0 U	9.4	8.1	86	15 U	3.0 U	3.0 U	32	15 U	50	84	330	3.0 U	27	110	48	60	7.7	60
CCW-4a	2.0 U	1.0 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	8.3	14	21	35
CCW-4b	2.0 U	1.0 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	3.7	1.8	1.0 U	3.9
Action Levels	5									0.7	5	TBD	6	TBD	2	5	10000	4000	70000

TBD=To be determined" (REI Work Plan, 1993)
Only VOCs detected in at least one sample are listed.

Concentrations in micrograms per liter
Analyses by Analytical Resources Inc.
U=Not detected at indicated PQL
K = Sample requires dilution
M = Estimated value, low spectral mass

**Table 2, Metals Detected In Groundwater
CleanCare Corporation, Tacoma, WA**

Sample	Cadmium	Arsenic	Chromium	Copper	Lead	Zinc
CCW-1a	0.002 U	0.05 U	0.005 U	0.002 U	0.001 B	0.004 U
CCW-1b	0.002 U	0.05 U	0.005 U	0.002 U	0.002 B	0.004 U
CCW-2a	0.004 U	0.1 U	0.01 U	0.004 U	0.002	0.008 U
CCW-2b	0.002 U	1.11	0.005 U	0.002 U	0.002	0.007
CCW-3a	0.002 U	0.05 U	0.010	0.020	0.140	1.48
CCW-3b	0.002 U	0.05 U	0.005 U	0.002 U	0.003 B	0.005
CCW-4a	0.002 U	0.05 U	0.005 U	0.010	0.109	0.084
CCW-4b	0.002 U	0.05 U	0.005 U	0.002 U	0.001	0.004
Action Level		TBD	0.1		0.05	

Concentrations are in milligrams per liter

Analyses by Analytical Resources Inc.

U=Not detected at indicated PQL

B=Analyte found in blank

TBD=To be determined

Sample Date March 4 1994 for CCW-1a and 1b and CCW-3a and 3b; other wells sampled March 28 1994.

Table 3, Amplitude, Periodicity, and Likely Cause of Groundwater Elevation Fluctuations

Well	Amplitude	Period	Likely Cause	Comments
CCW-1b	0.03	~24 hours	Barometric	Not tidal (period and phase shift not indicative of tidal influence)
CCW-2b	0.07	~24 hours	Barometric	Not tidal (period and phase shift not indicative of tidal influence)
CCW-3a	0.07	~24 hours	Barometric	Not tidal (period, phase shift and amplitude not indicative of tidal influence)
CCW-3b	0.08	~24 hours	Barometric	Not tidal (period, phase shift, and amplitudes not indicative of tidal influence)
CCW-4b	0.3	~24 hours	Human or technological influence	Regular water level drop at 05:15 daily, otherwise not periodic.
MW-4	NA	NA	NA	Recharge Event

Table 4, Water Level Elevations

Well	May 94	June 94	July 94	Aug 94	Sept 94	Oct 94	Nov 94	Dec 94	Jan 95	Feb 95	Mar 95	Apr 95
Burlington												
CTMW-1	9.04	8.75	8.03	6.85	6.12	6.17	8.52	13.69	10.69	10.29	10.72	
CTMW-5	8.90	8.74	8.34	7.73	7.42	4.31	8.43	10.05	10.80	10.37	11.18	
CTMW-6	12.47	14.00	9.06	8.52	8.00	8.12	9.30	10.09	10.58	10.15	11.22	
CTMW-7	2.27	2.22	1.73	1.66	1.71	1.82	2.43	3.66	3.61	3.09	3.52	
CTMW-8	8.94	9.00	8.07	7.38	7.15	7.05	8.70	9.75	10.31	9.99	10.20	
CTMW-9	2.37	2.16	1.68	1.52	1.65	1.74	2.49	3.14	3.32	3.11	3.65	
CTMW-10	9.68	9.40	6.47	5.20	5.46	5.62	6.57	12.77	6.92	6.68	10.17	
CTMW-11	9.81	9.26	8.75	7.89	7.46	7.27	7.52	8.80	10.17	9.69	10.28	
CTMW-12	2.23	2.19	1.79	1.75	1.74	1.90	2.52	3.02	3.18	3.05	3.52	
CTMW-13	9.34	9.23	8.63	8.12	7.78	7.79	9.40	10.25	10.80	10.68	10.51	
CTMW-14	5.01	5.29	4.70	4.40	4.50	4.34	5.99	3.51	6.97	6.24	8.07	
CTMW-15	8.76	9.18	7.86	6.98	6.59	6.44	9.39	10.44	10.49	10.16	10.41	
CTMW-16	9.83	9.43	9.19	8.55	8.21	7.95	7.82	8.42	9.66	9.47	10.00	
CTMW-17	10.03	9.73	8.86	8.48	8.00	8.13	10.08	11.42	11.94	11.80	12.04	
CTMW-18	10.17	9.96	9.36	8.82	8.47	8.43	10.34	11.45	11.99	11.62	11.97	
CleanCare												
CCW-1a	8.42	8.02	7.68	7.21	6.94		7.68	8.93	9.87	9.40	10.26	9.30
CCW-1b	8.42	8.04	7.74	7.21	6.97	6.86	7.69	8.96	9.87	9.87	10.27	9.32
CCW-2a	8.75		8.17	7.78	7.66	7.58			9.36	10.18	9.39	
CCW-2b	8.94		8.87	7.80	7.43				10.18	10.04	10.12	
CCW-3a	9.14	8.89	8.65	8.33	8.11	7.91	8.75	9.21	9.84	9.80		
CCW-3b	8.86	8.58	8.28	7.87	7.56	7.55	8.35	8.88	9.60	9.68		
CCW-4a	9.99	9.86	9.35	8.84	8.45	8.39	10.52		11.94	11.72	11.91	11.67
CCW-4b	9.22	8.76	8.36	7.85	7.51	7.42	8.68		10.89	10.48	11.07	10.30
MW-1 (Unico)		8.87	8.06	7.49	7.15		8.67	10.05	10.33	10.15	10.40	
MW-2 (Unico)	8.99	8.90	8.23	7.65	7.32	7.23	8.64	10.12	10.68	10.44	10.07	10.75
MW-4	9.29	8.99	8.37	7.75	7.48		8.80	10.75	11.32	10.95	11.55	
Sol-Pro												
MW-1	8.70	8.48	7.93	7.45	7.21	7.18	8.30	9.77	10.25	9.99	10.53	
MW-2	8.72	8.57	8.16	6.44	7.35	7.29	8.95	10.64	10.64	9.85	10.06	
MW-3	9.14	9.24	8.49	7.42	7.31	6.52	8.95	10.88	10.86	10.60	10.90	

Elevations reported in feet above MSL

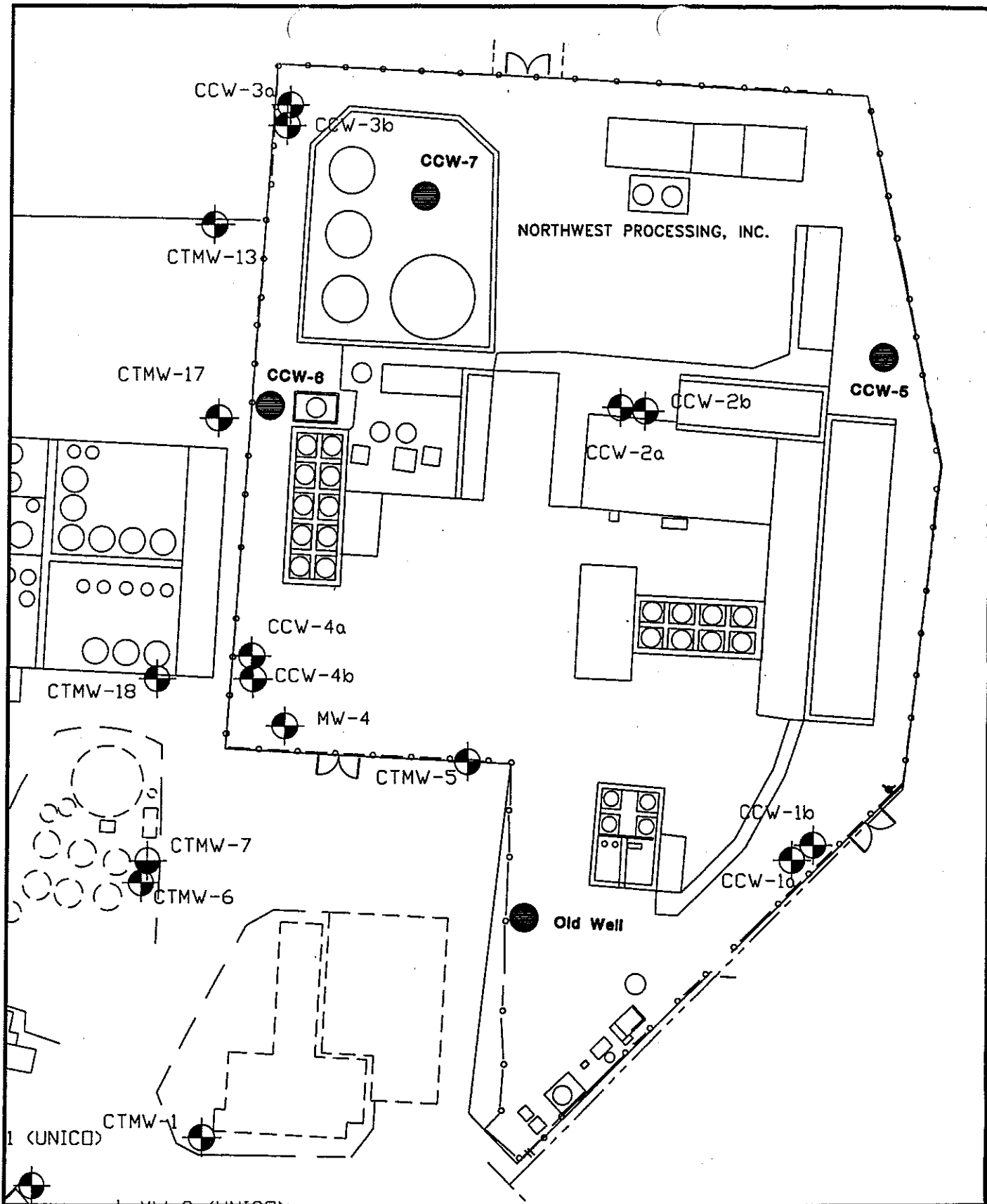
CleanWLs.mdb

7/14/95

Table 5, Vertical Hydraulic Gradient Calculations

	CCW-1	CCW-2	CCW-3	CCW-4
May 94	0.000	-0.027	0.080	0.128
June 94	-0.004	NA	0.089	0.183
July 94	-0.012	-0.100	0.106	0.165
August 94	0.000	-0.003	0.131	0.165
September 94	-0.006	0.033	0.157	0.157
October 94	NA	NA	0.103	0.162
November 94	-0.002	NA	0.114	0.307
December 94	-0.006	NA	0.094	NA
January 95	0.000	-0.117	0.069	0.175
February 95	NA	0.020	0.034	0.207
March 95	-0.002	-0.104	NA	0.140
April 95	-0.004	0.000	NA	0.228
Mean	-0.004	-0.037	0.098	0.183

*NM - One or both water level values not available.
Positive values indicate a downward gradient*



MW-1
 9.99

Well Location, Well Identifier, and
Groundwater Level Elevation (Feet MSL)

Proposed Well Locations



0 60 120
Scale in Feet

FIGURE 1
Site Plan

Cleanore Corporation



CGS22, 02/04/2008, 10/78

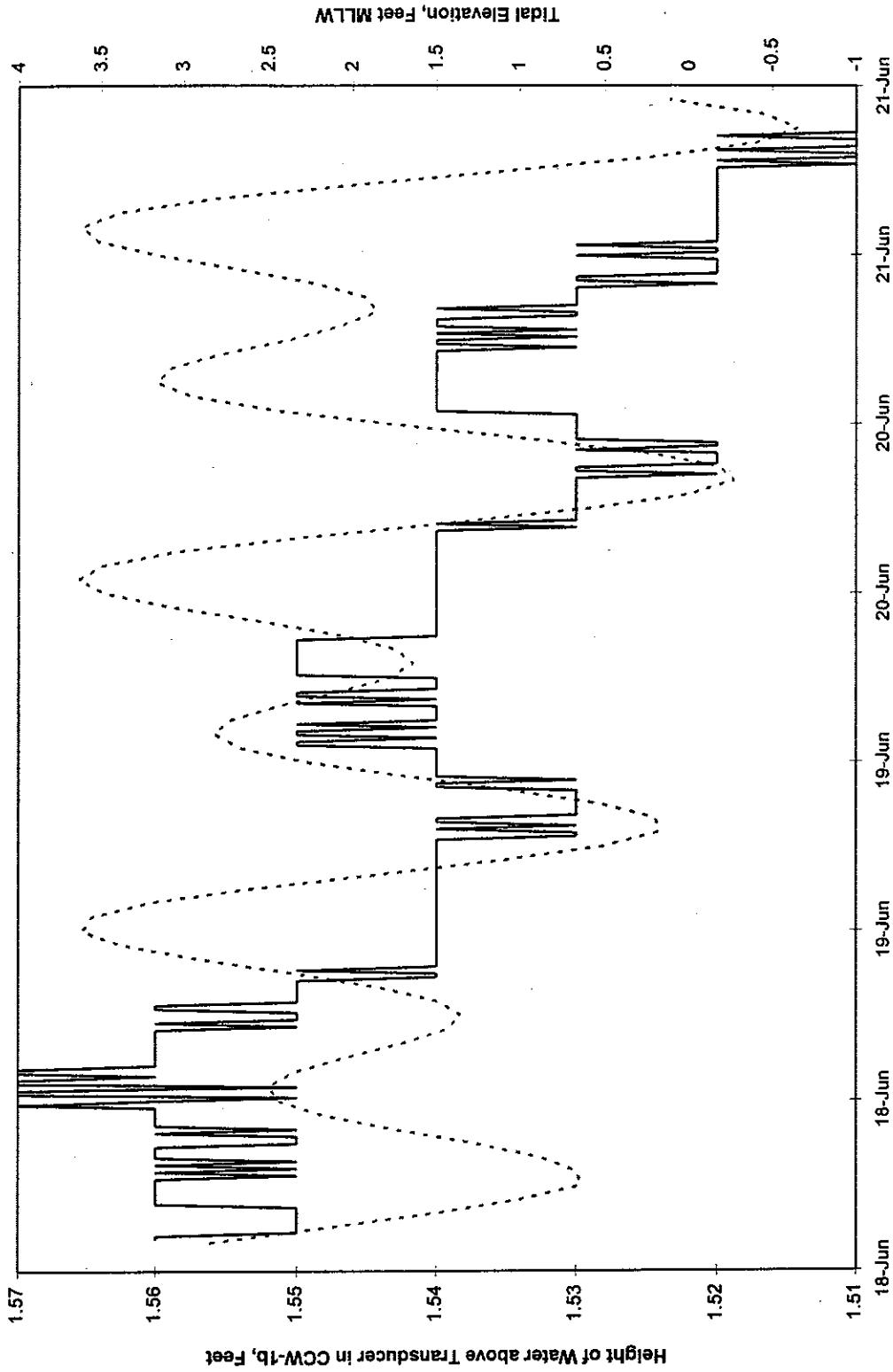


Figure 2, Height of Water Above Transducer in CCW-1b Versus Tidal Elevation
 CleanCare Inc
 10/10/95 TIDLSTDY.XLS

LEGEND

- CCW-1b
- Tidal Data

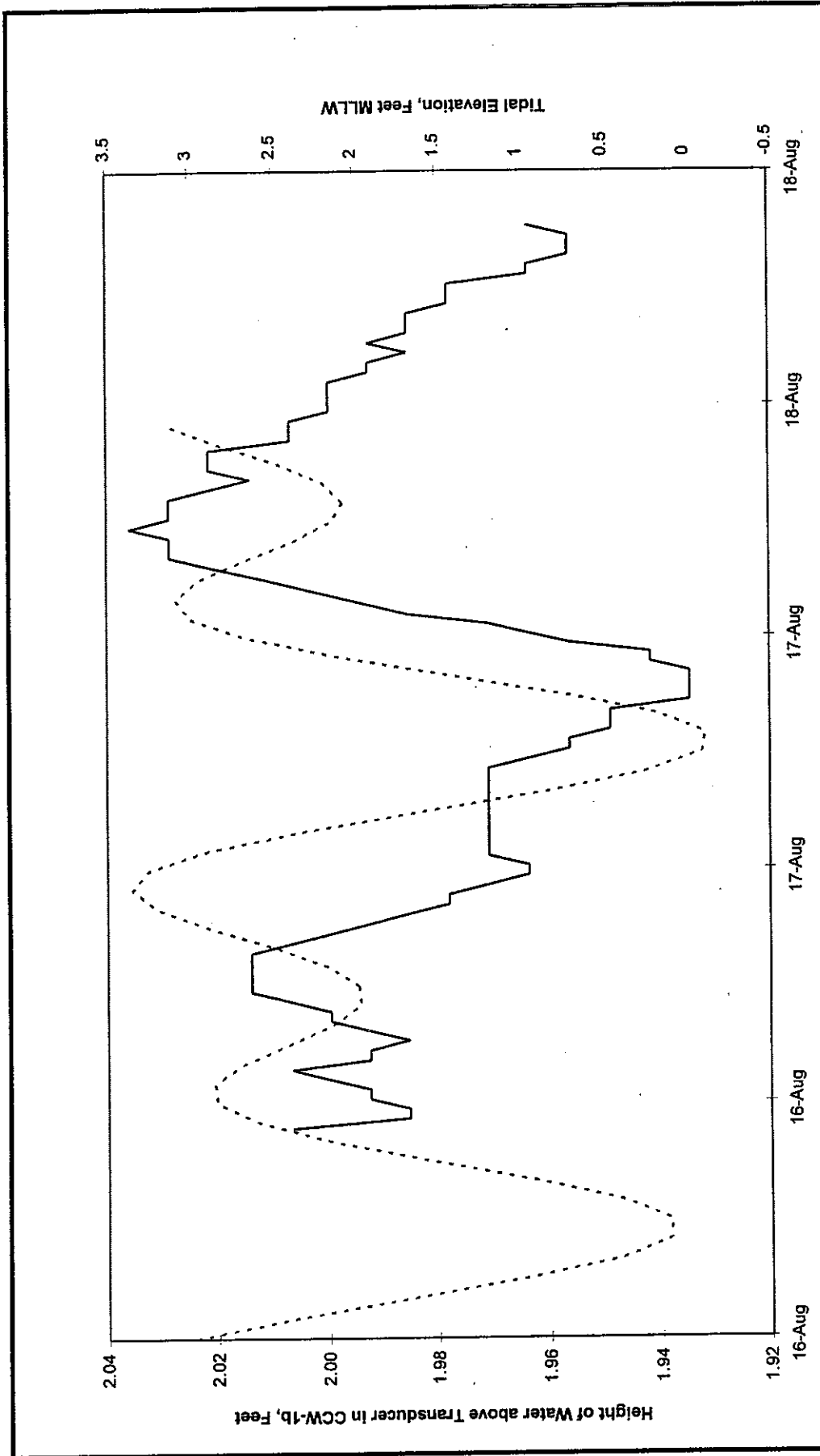


Figure 3, Height of Water Above Transducer in CCW-2b Versus Tidal Elevation
 CleanCare Inc
 10/7095 TIDLSTDY.XLS

LEGEND

- CCW-2b
- Tidal Data

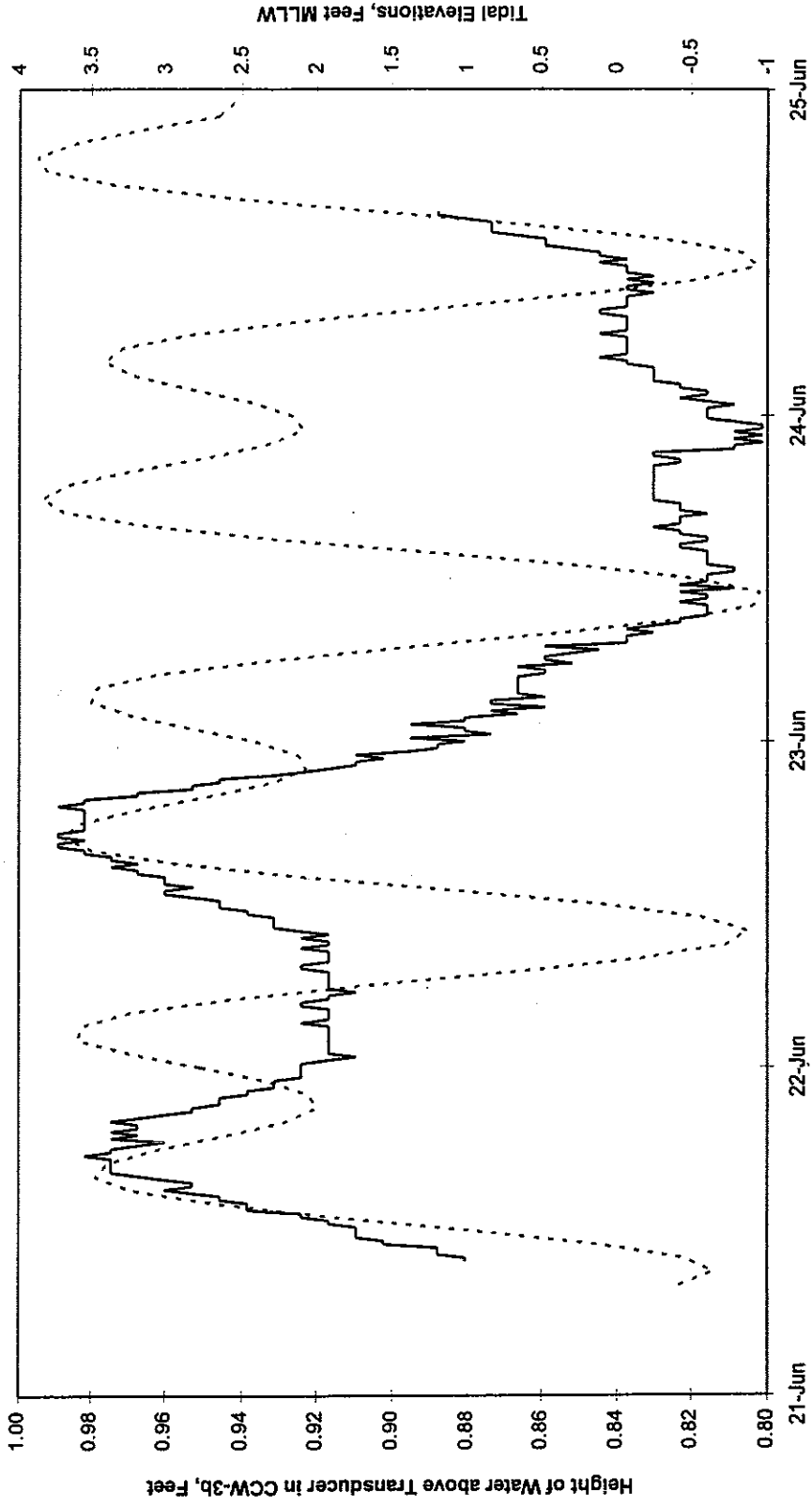


Figure 4, Height of Water Above Transducer in CCW-3b
 Versus Tidal Elevation
 CleanCare Inc
 10/10/95 TIDLSTDY.XLS

Legend

- CCW-3b
- Tidal Data

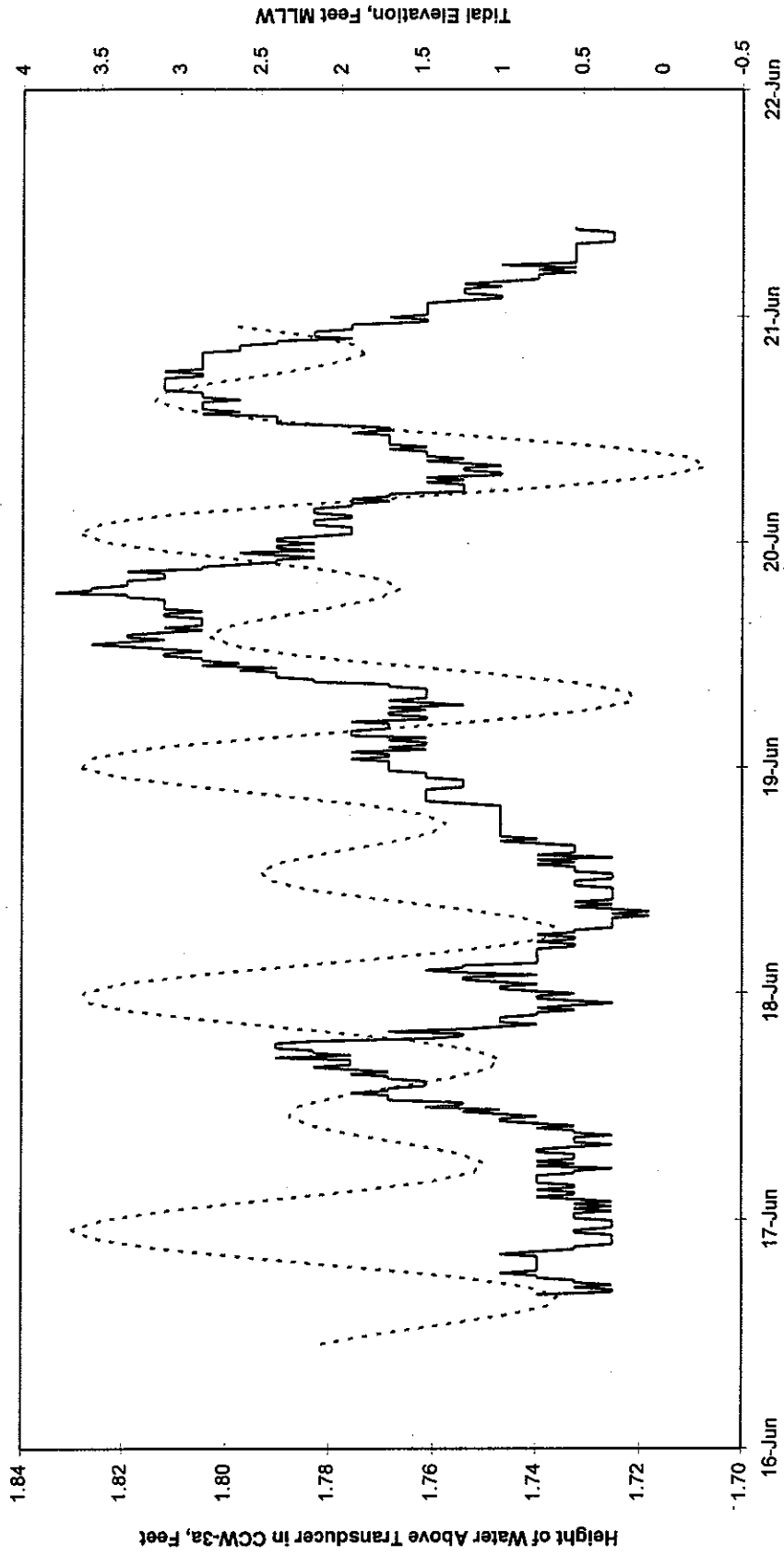
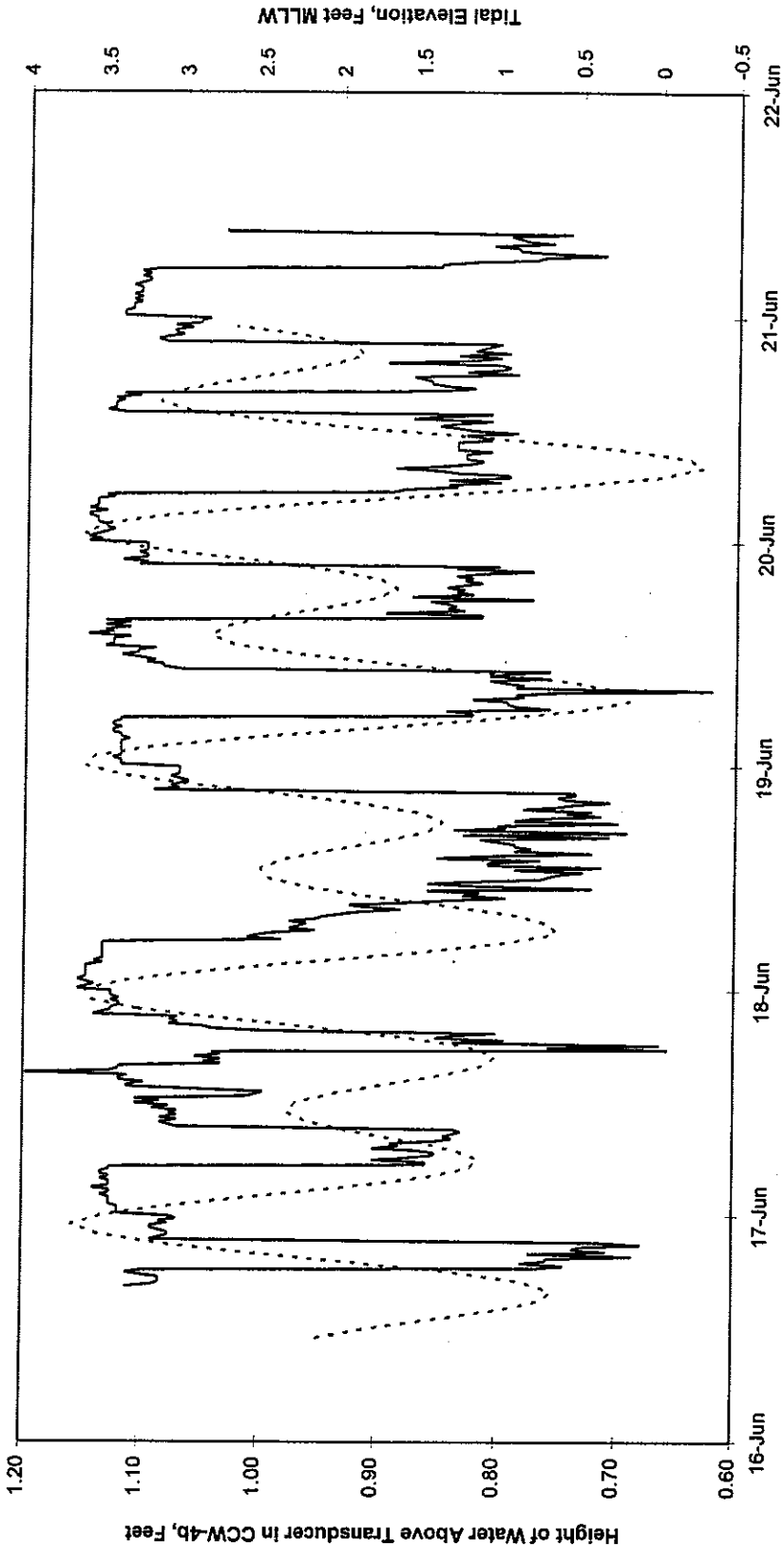


Figure 5, Height of Water Above Transducer in CCW-3a
 Versus Tidal Elevation
 CleanCare Inc
 10/10/95 TIDLSTDY.XLS

LEGEND

- CCW-3a
- Tidal Data



LEGEND

- CCW-4b
- Tidal Data

Figure 6. Height of Water Above Transducer in CCW-4b
 Versus Tidal Elevation
 CleanCare Inc
 10/10/95 TIDLSTDY.XLS

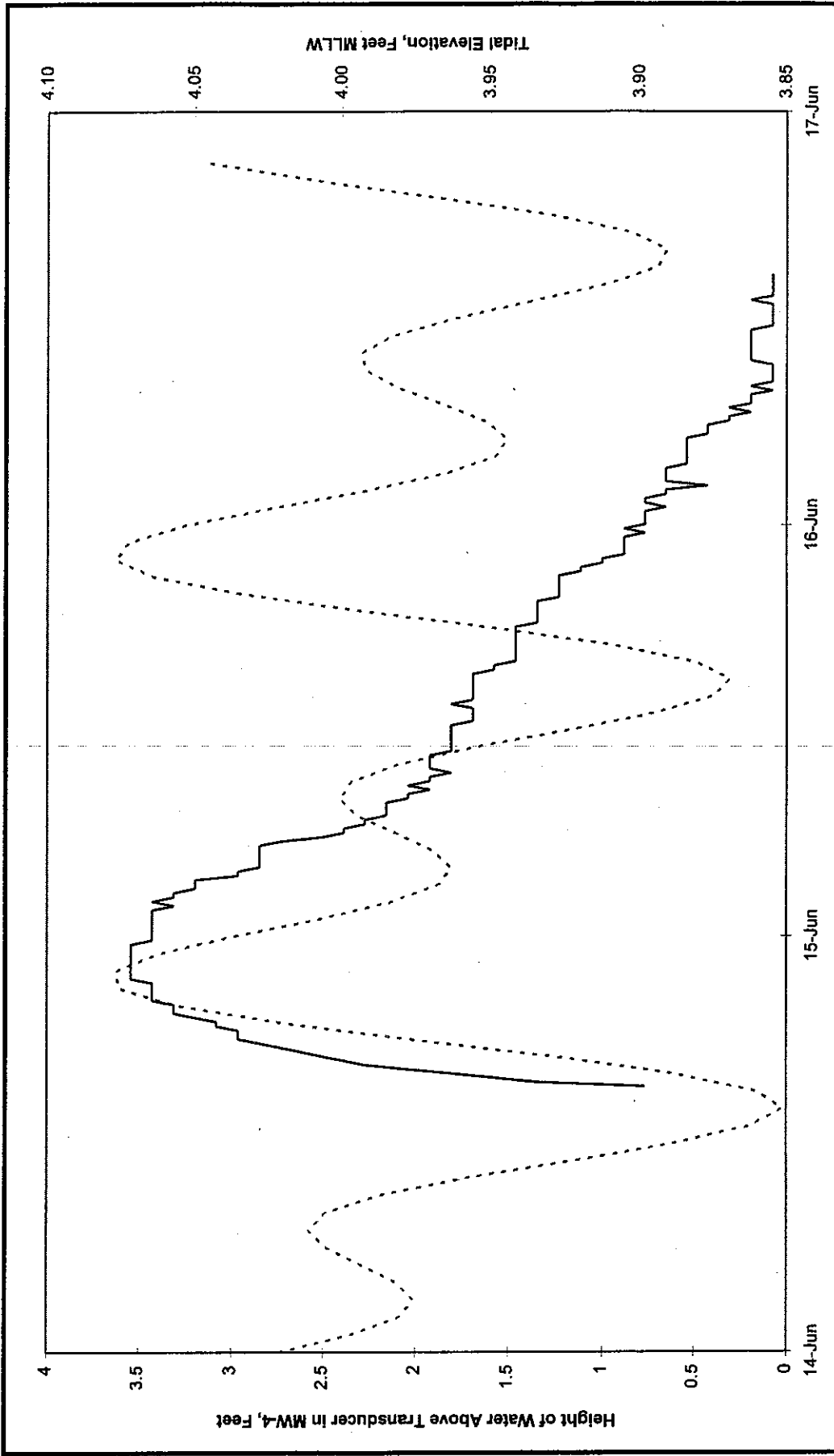


Figure 7, Height of Water Above Transducer in CCW-4

Versus Tidal Elevation

CleanCare Inc

10/10/95 TIDLSTDY.XLS

LEGEND

- Tidal Data
- _____ MW-4

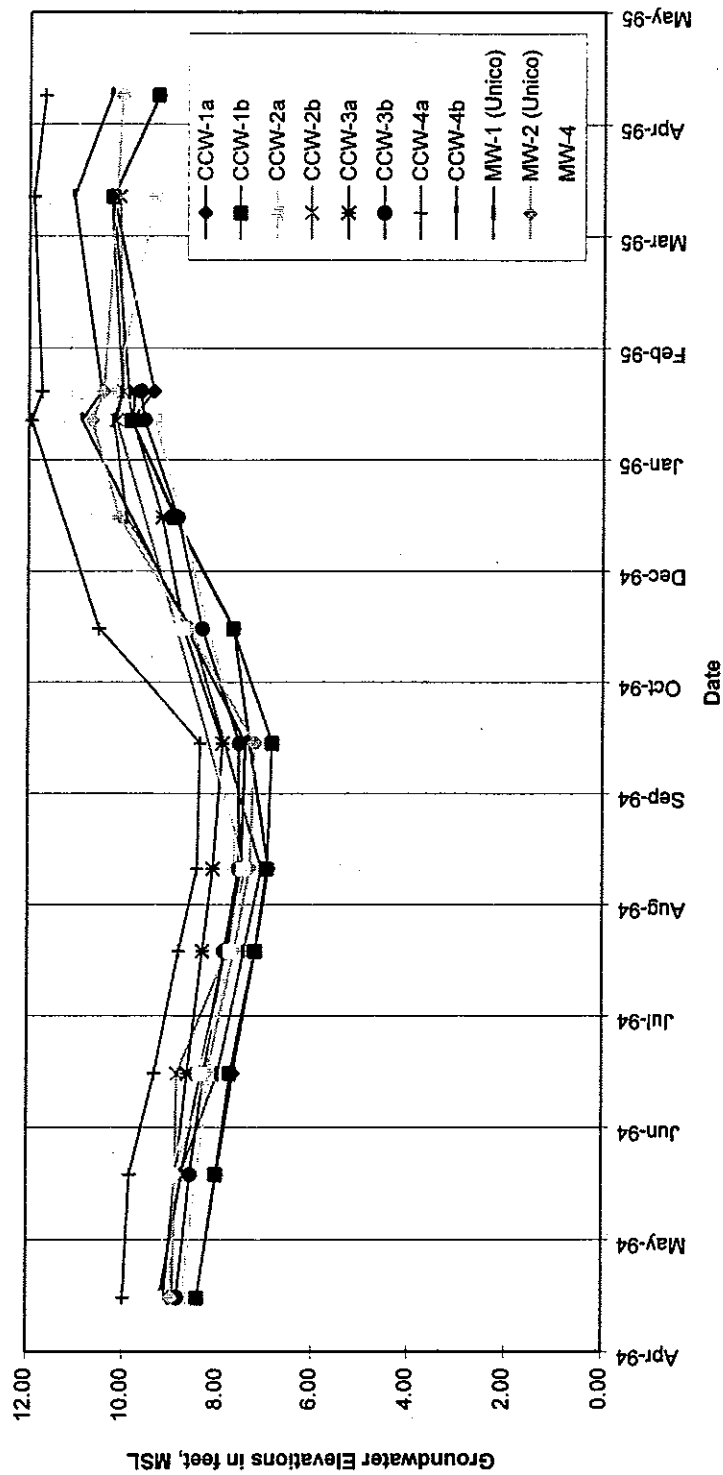


Figure 8, CleanCare Groundwater Elevations
CleanCare Inc

WL_STUDY.XLS 10/12/95

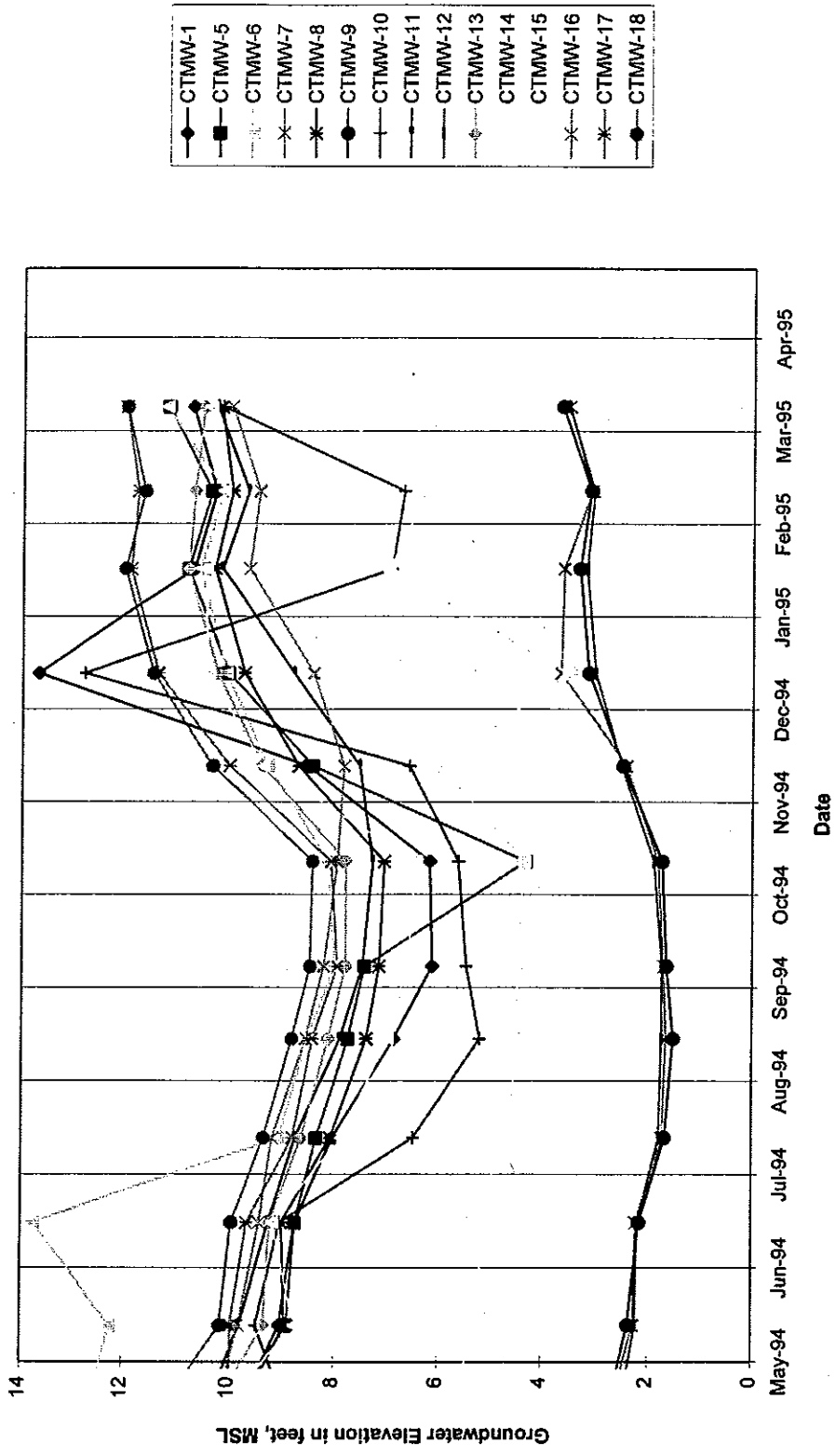


Figure 9, Burlington Groundwater Level Elevations
CleanCare Inc

WL_STUDY.XLS 10/12/95

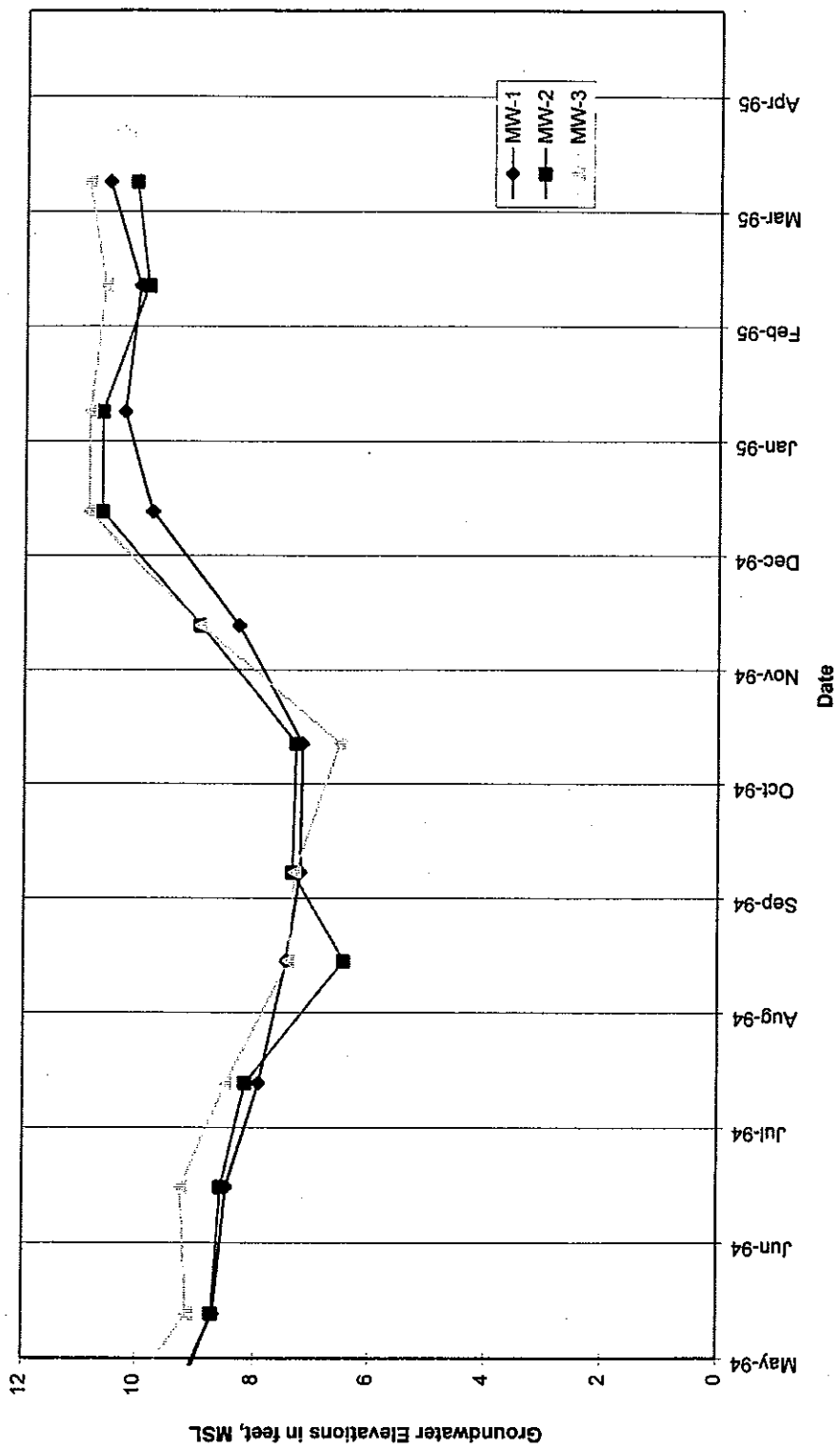


Figure 10, Sol-Pro Groundwater Level Elevations
CleanCare Inc

WL_STUDY.XLS 10/12/95

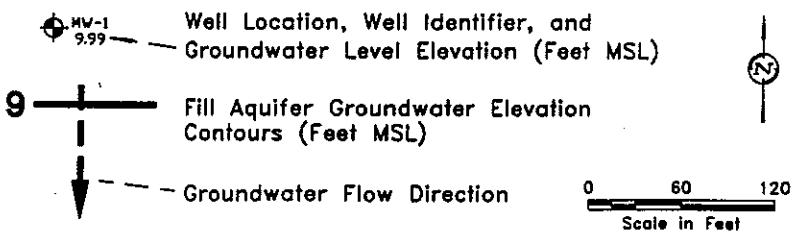
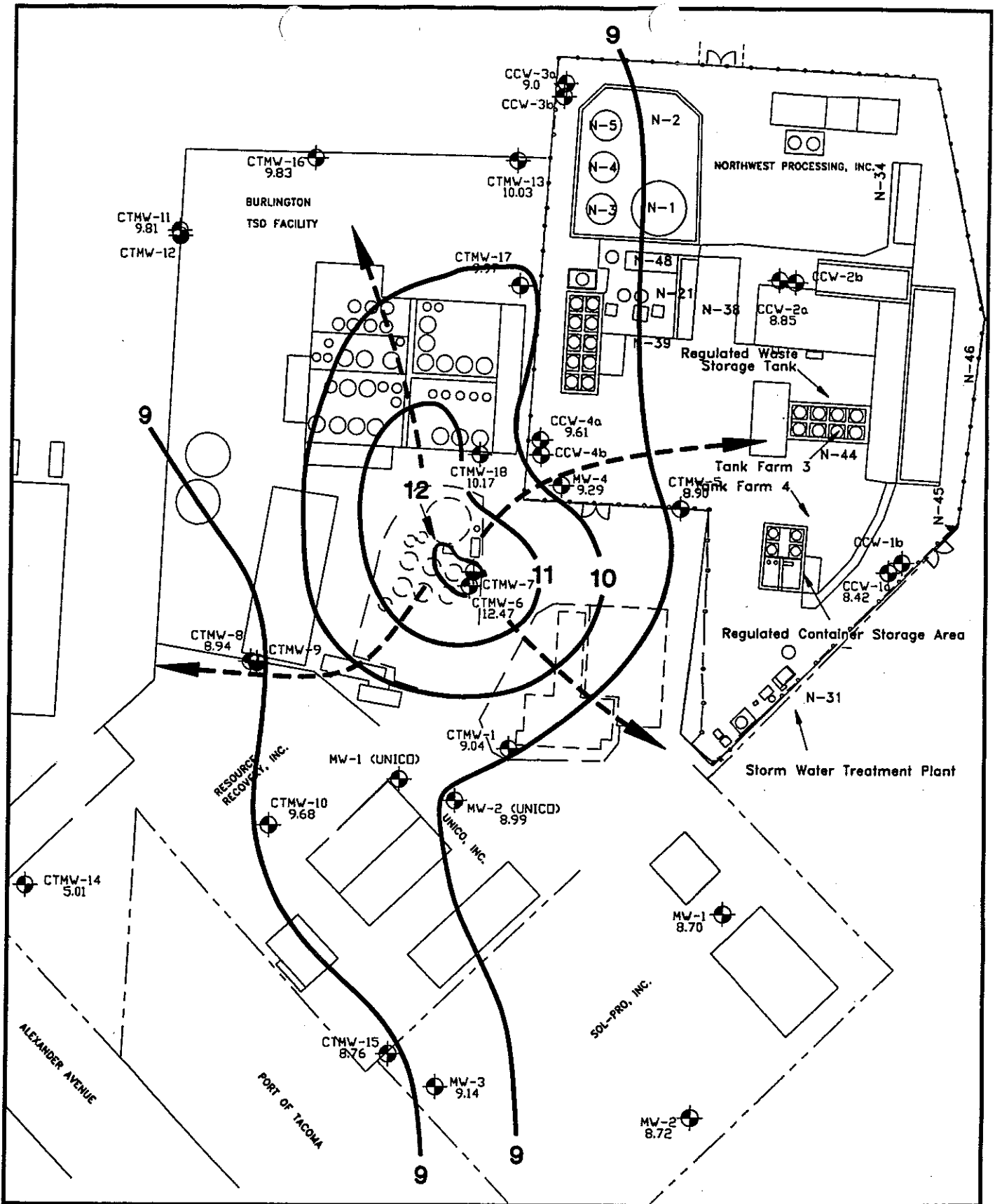


FIGURE 11
Groundwater Elevations
May 13, 1994

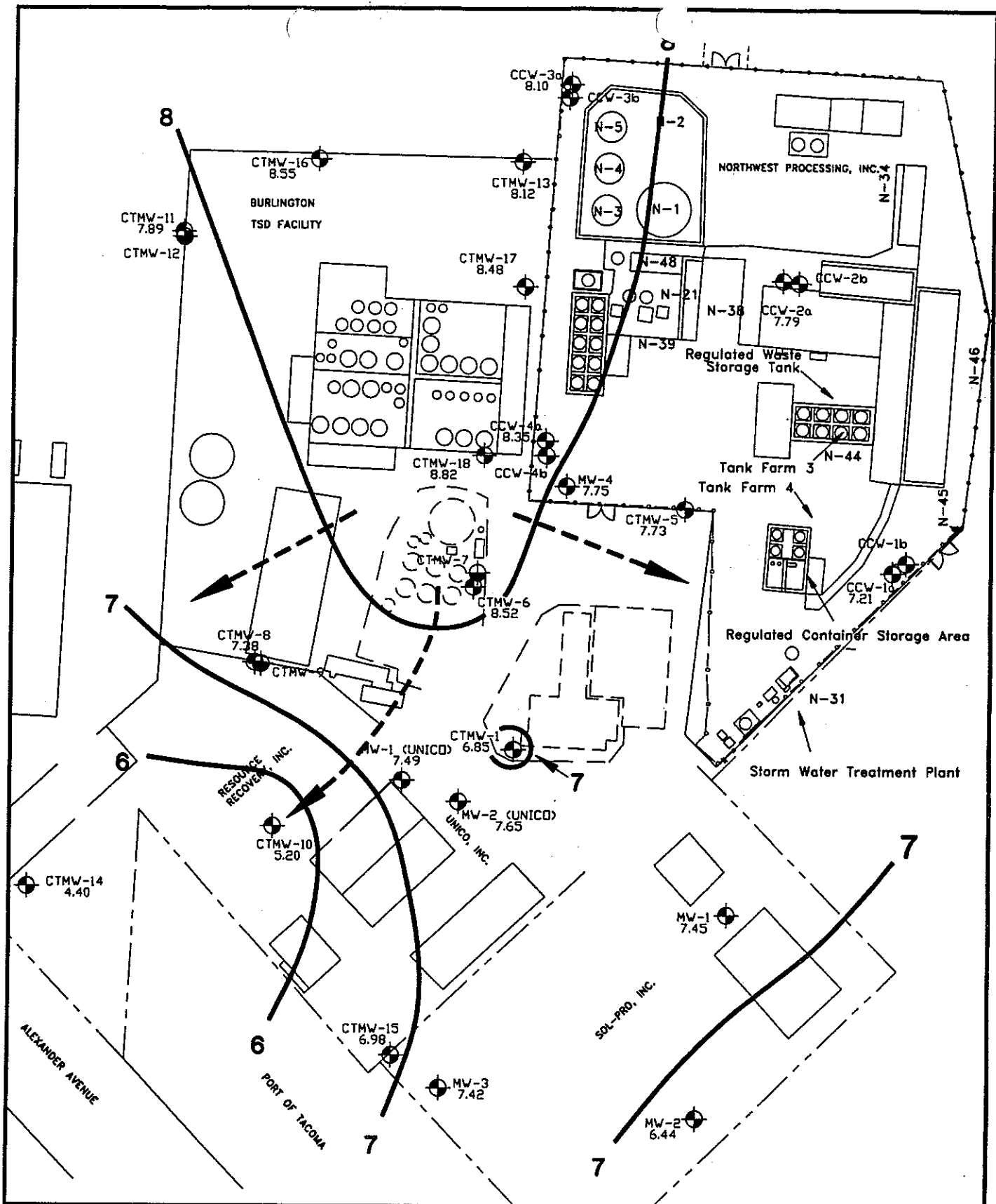
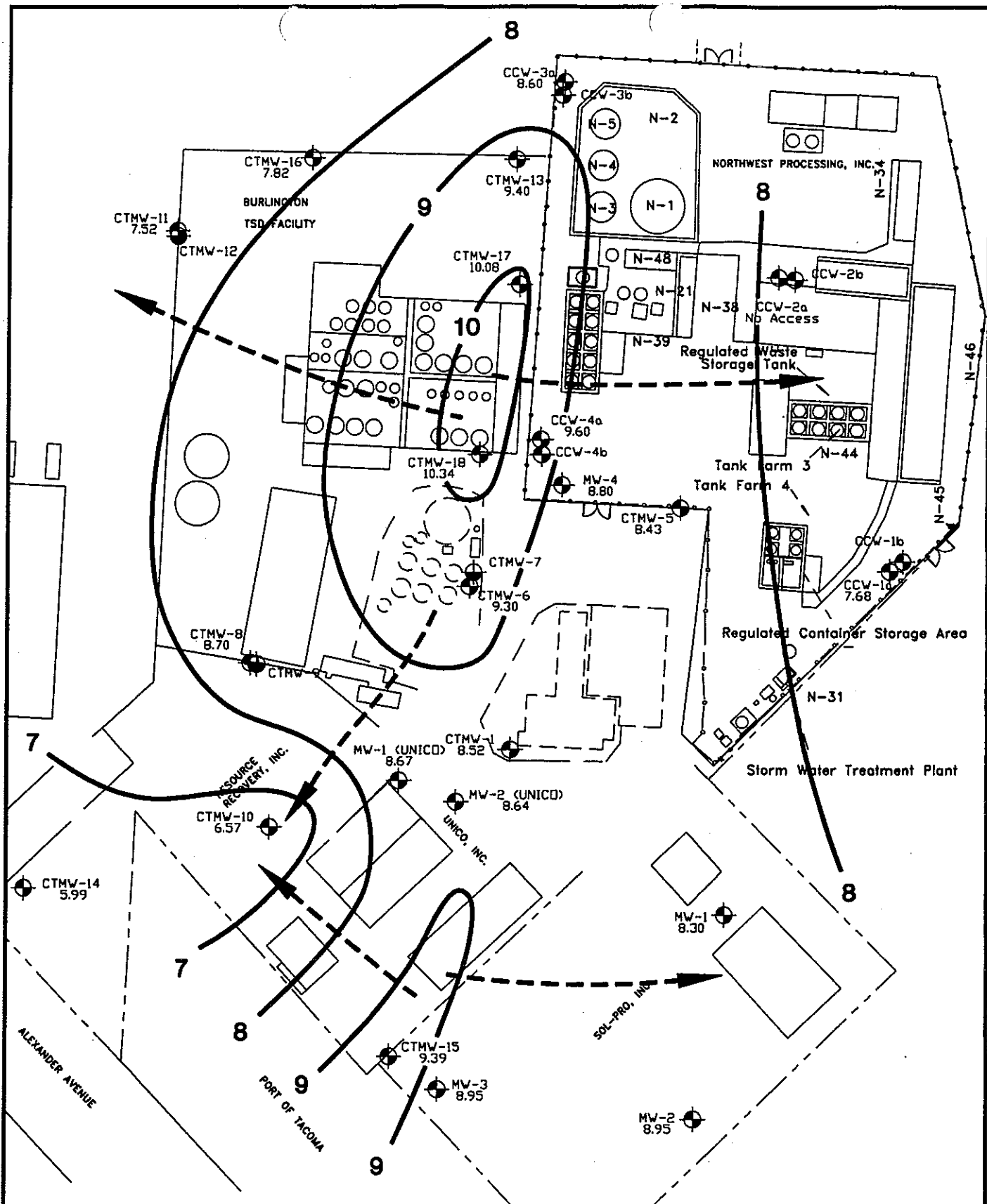




FIGURE 12
Groundwater Elevations
August 16, 1994

Well Location, Well Identifier, and Groundwater Level Elevation (Feet MSL)
 Fill Aquifer Groundwater Elevation Contours (Feet MSL)
 Groundwater Flow Direction

0 60 120
 Scale in Feet




 Well Location, Well Identifier, and Groundwater Level Elevation (Feet MSL)


 Fill Aquifer Groundwater Elevation Contours (Feet MSL)


 Groundwater Flow Direction

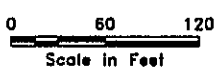


FIGURE 13
Groundwater Elevations
November 15, 1994

Cleanare Corporation



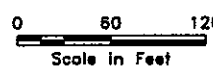
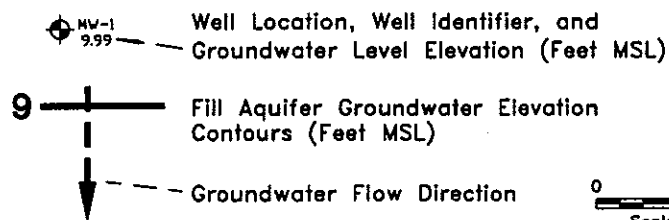
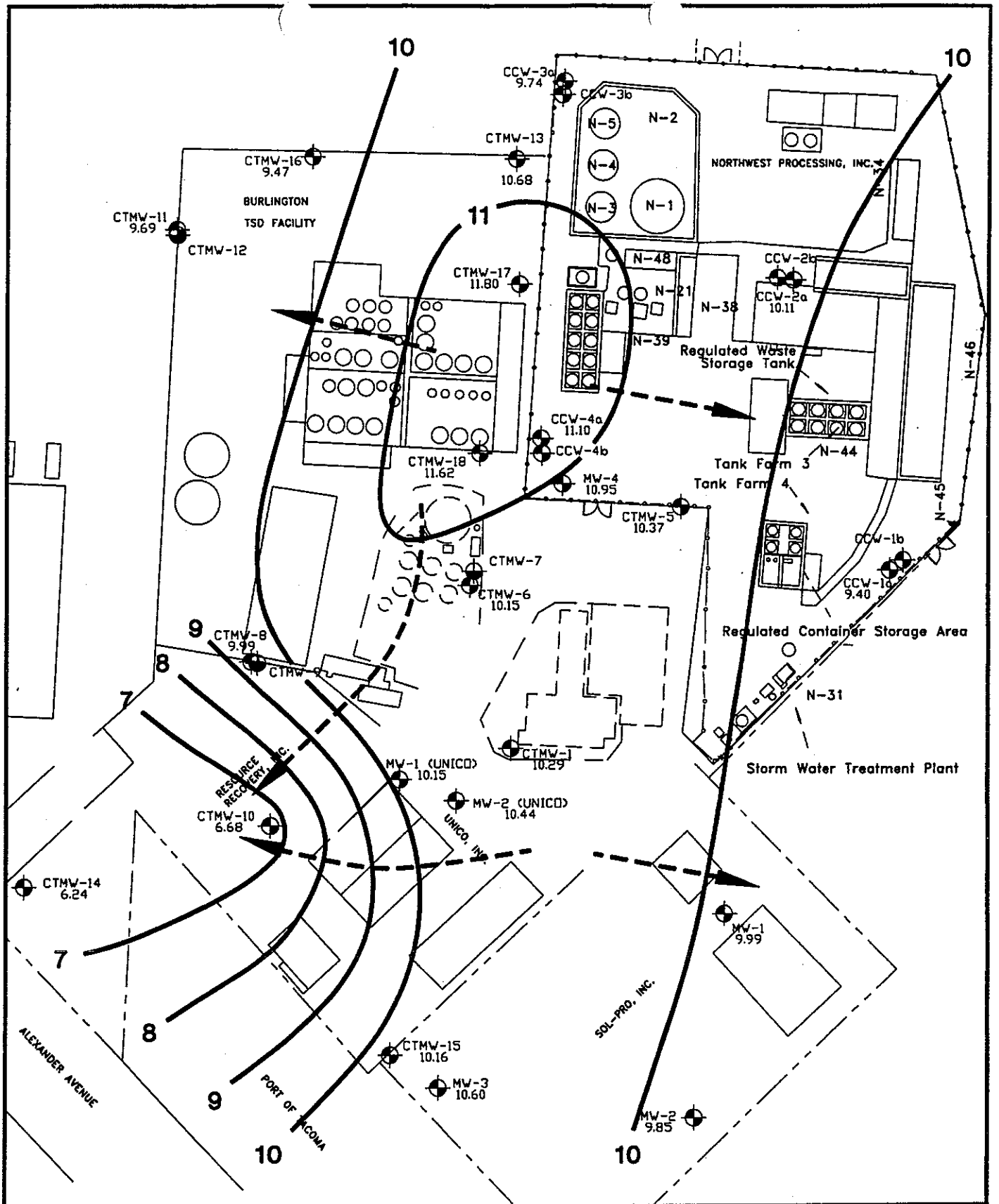


FIGURE 14
Groundwater Elevations
February 2, 1995

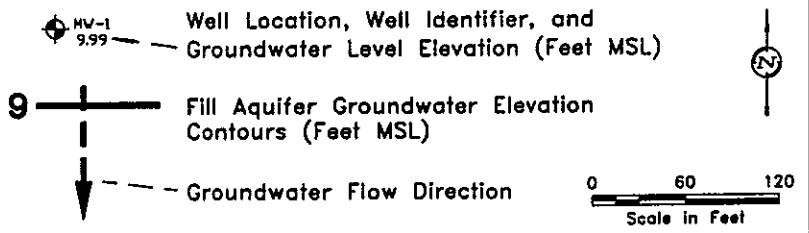
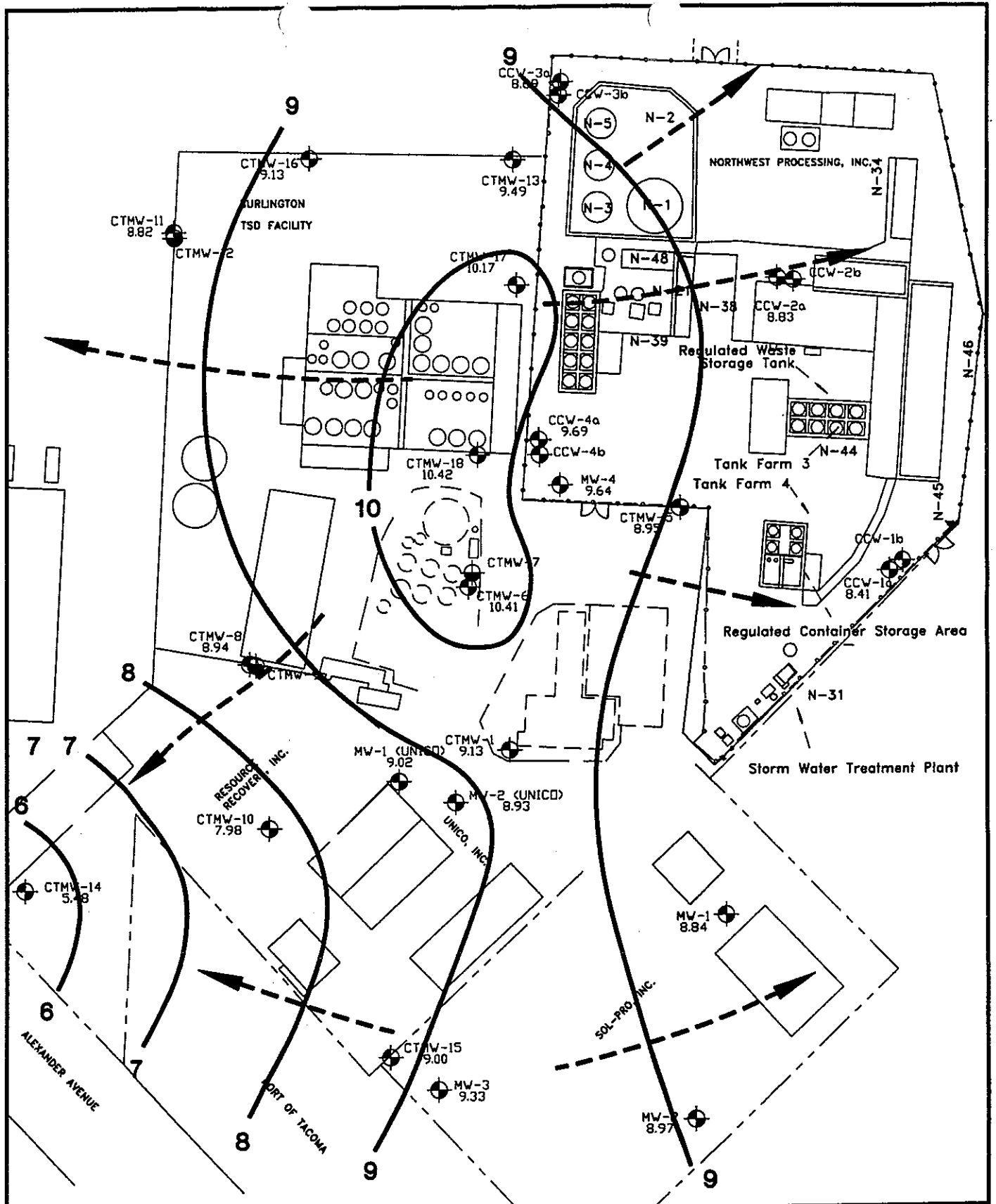
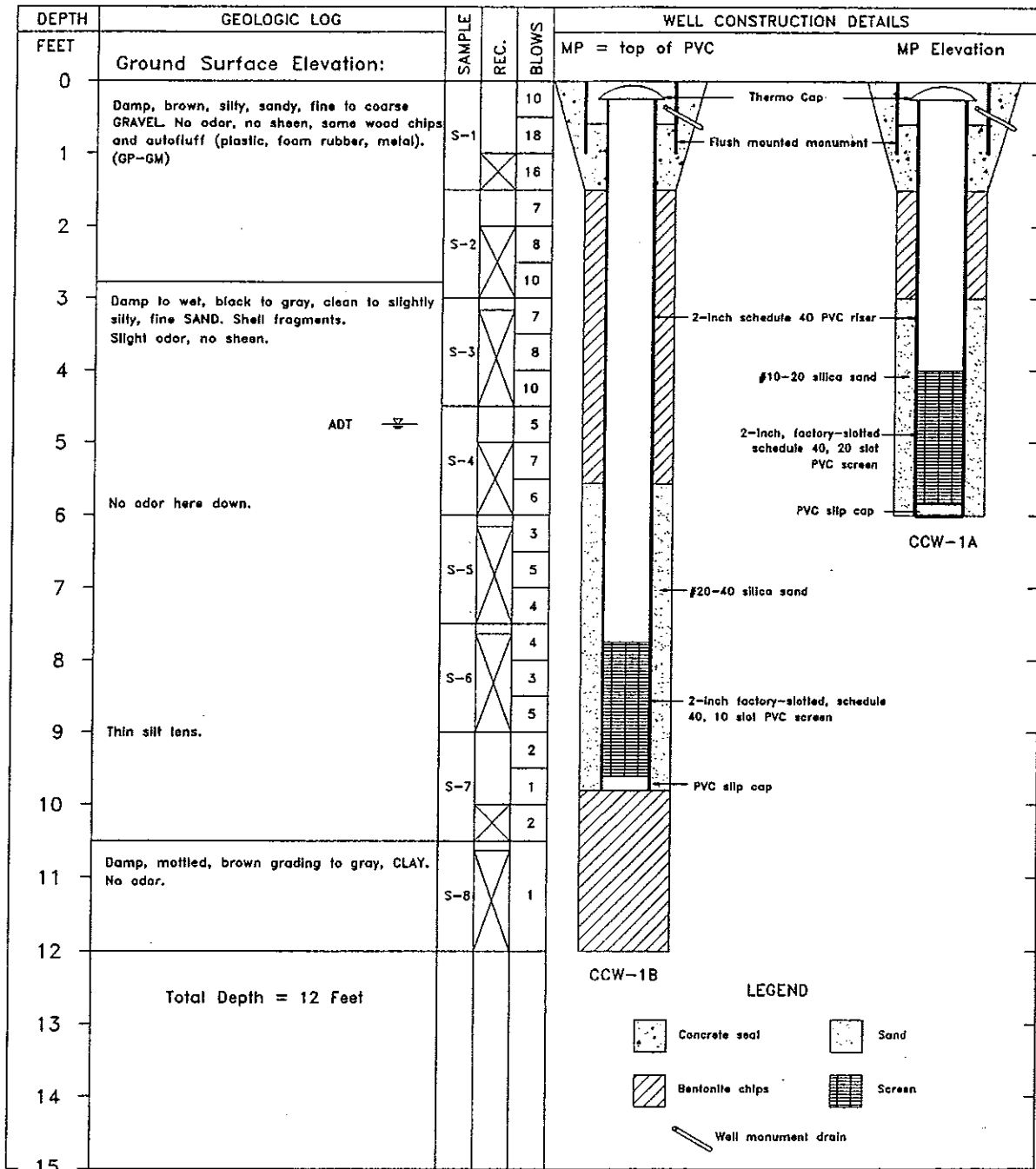


FIGURE 15
Average Groundwater Elevations
May, 1994 to April, 1995

Appendix 1

GEOLOGIC LOG AND WELL AS-BUILT, MONITORING WELLS CCW-1A AND CCW-1B



NOTE: Descriptions of odors and sheens are included on this log where noted in the field.
No references to odors or sheens generally indicates the absence of odors or sheens.

FIGURE ##, GEOLOGIC LOG AND WELL AS-BUILTS
MONITORING WELLS CCW-1A & CCW-1B

PACIFIC GROUNDWATER GROUP
JE9205.03

PROJECT NAME: Clean Care
WELL IDENTIFICATION NUMBERS: CCW-1A, CCW-1B
DRILLING METHOD: Hollow Stem Auger
DRILLER: Charles Richard
FIRM: Holt Drilling
CONSULTING FIRM: Pacific Groundwater Group
REPRESENTATIVE: Chad Bring

LOCATION: NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec.
DATUM: NGVD
WATER LEVEL ELEVATION:
INSTALLED: February 1-2, 1994
DEVELOPED: February 14, 1993
START CARD NO.: 06851

GEOLOGIC LOG AND WELL AS-BUILTS, MONITORINGS WELL CCW-2A AND CCW-2B

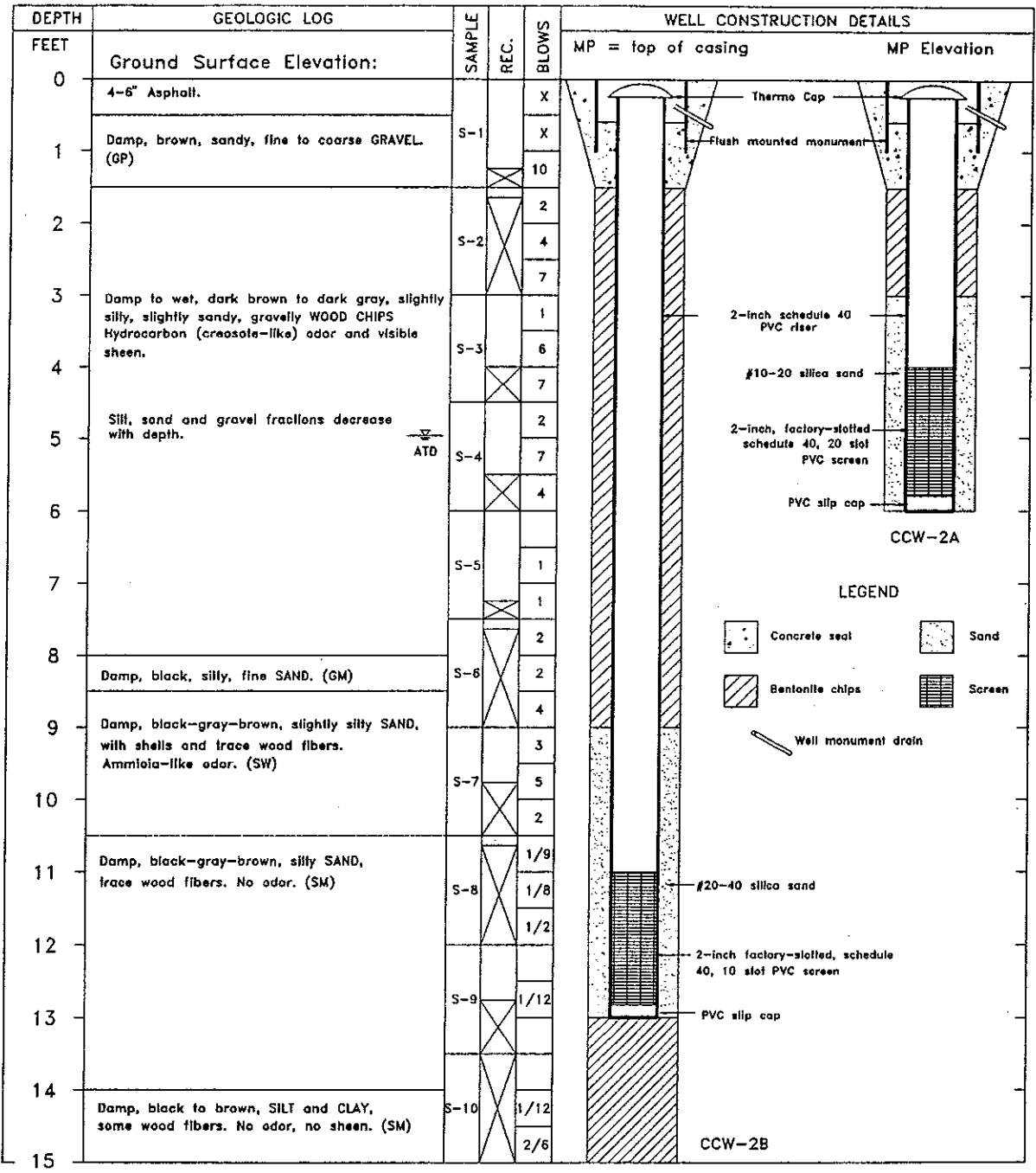


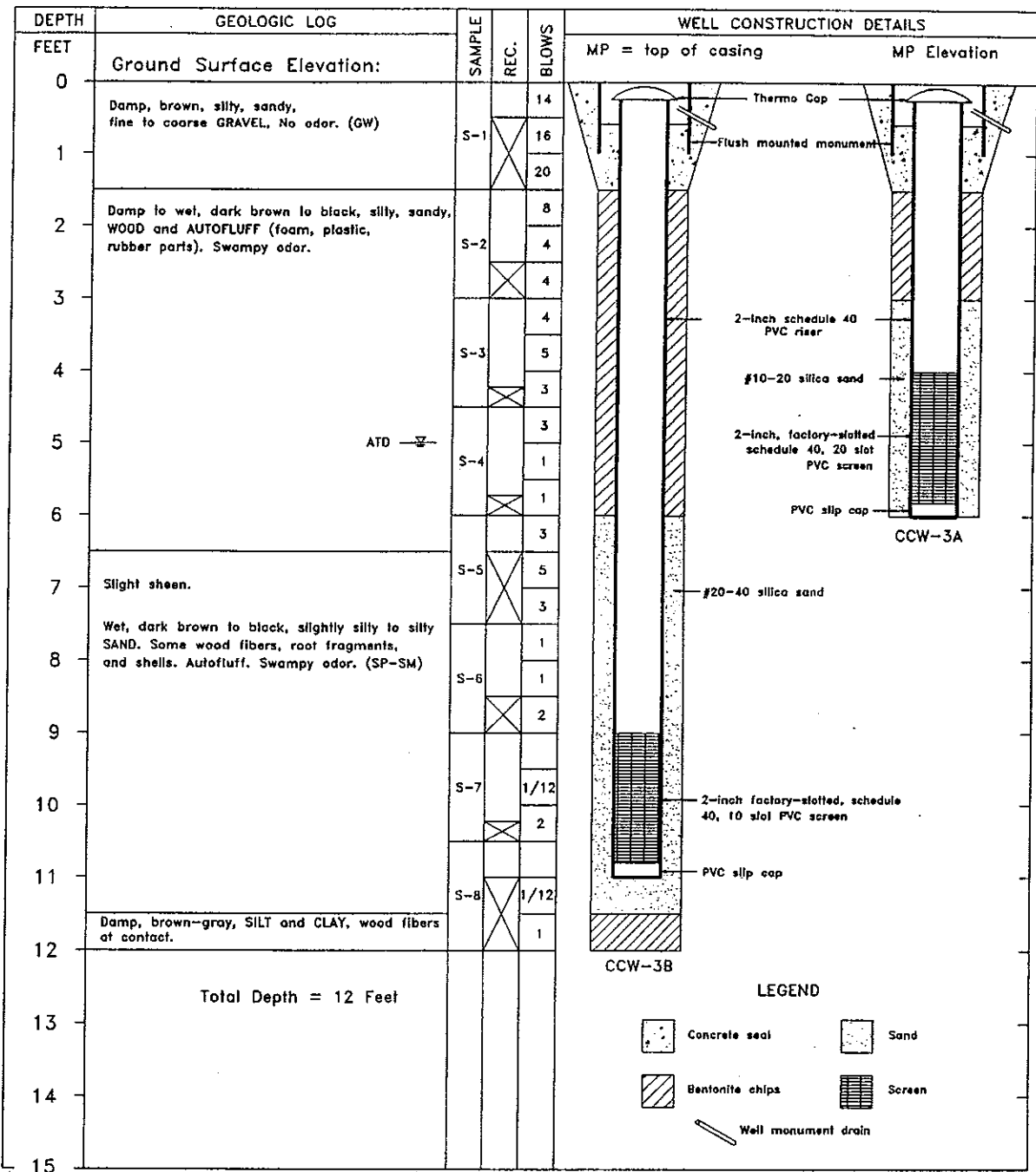
FIGURE ##, GEOLOGIC LOG AND WELL AS-BUILTS
MONITORING WELLS CCW-2A & CCW-2B

PACIFIC GROUNDWATER GROUP
JE9205.03

PROJECT NAME: Clean Care
WELL IDENTIFICATION NUMBERS: CCW-2A, CCW-2B
DRILLING METHOD: Hollow Stem Auger
DRILLER: Charles Richard
FIRM: Holt Drilling
CONSULTING FIRM: Pacific Groundwater Group
REPRESENTATIVE: Chad Bring

LOCATION: NW 1/4 SW 1/4 Sec.
DATUM: NGVD
WATER LEVEL ELEVATION:
INSTALLED: February 1-2, 1994
DEVELOPED: February 14, 1993
START CARD NO.: 06851

GEOLOGIC LOG AND WELL AS-BUILTS, MONITORING WELLS CCW-3A AND CCW-3B



NOTE: Descriptions of odors and sheens are included on this log where noted in the field. No references to odors or sheens generally indicates the absence of odors or sheens.

FIGURE ##, GEOLOGIC LOG AND WELL AS-BUILTS
MONITORING WELLS CCW-3A & CCW-3B

 **PACIFIC GROUNDWATER GROUP**
JE9205.03

PROJECT NAME: Clean Care
WELL IDENTIFICATION NUMBERS: CCW-3A, CCW-3B
DRILLING METHOD: Hollow Stem Auger
DRILLER: Charles Richard
FIRM: Holt Drilling
CONSULTING FIRM: Pacific Groundwater Group
REPRESENTATIVE: Chad Bring

LOCATION: NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec.
DATUM: NGVD
WATER LEVEL ELEVATION:
INSTALLED: February 1-2, 1994
DEVELOPED: February 14, 1994
START CARD NO.: 06851



CleanCare
CORPORATION

Original

July 14, 1995

Dr. David B. Bartus
Chemical Engineer
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, WA 98101

Subject: CleanCare Corporation
Quarterly Report
2nd Quarter, 1995

Dear Dave:

This letter present CleanCare's Quarterly Report as required by the RCRA Corrective Action Order, Number 1090-07-26-3008, for the period ending June 30, 1995.

Activities Completed this Period

Monthly water level readings were collected in April in a coordinated effort with the surrounding TSD Alley sites. This completes twelve months of water level readings. Sealed wells were allowed to adjust to static pressure prior to measurement.

CleanCare has installed the new foundation pad. Re-analysis of the test pit samples was completed and summarized in a technical memorandum to Russell Bulman, CleanCare, from Charles T. Ellingson, Pacific Groundwater Group. Samples were analyzed for selected metals and Total Petroleum Hydrocarbon (TPH).

A draft groundwater flow assessment was prepared and summarized in a technical memorandum to Russell Bulman, CleanCare, from Charles T. Ellingson, Pacific Groundwater Group. Data was obtained from the Burlington and Sol-Pro facilities. The assessment indicates a mound beneath the Burlington facility with a flow to the east across CleanCare property. Further interpretive work on the vertical and horizontal flow vectors is ongoing.

7/14/95

Letter to D. Bartus/US E. A

Page 2

Summary of Significant Findings

Test pit analysis indicates elevated levels of lead and arsenic in one test pit. The slag-looking material has chemical characteristics of slag. Groundwater flow was determined to be east across CleanCare property. A groundwater mound exists beneath the Burlington facility.

Work to be Conducted Next Quarter and Beyond

1. Produce a reasonably accurate area map based on file provided by Burlington in conjunction with CleanCare's basemap.
2. Completion of groundwater flow analysis based on water level observations in the newly installed wells and from other facilities. This will be prepared during the third and fourth quarters of 1995. Included in the analysis will be:
 - Tidal effects study
 - Recommendation of additional well placement for quarterly groundwater monitoring if needed.
 - Confirmation of analytical parameters.
3. Determination of Action Levels as necessary based on discussion with EPA for those constituents observed that do not have action levels.
4. Stormwater system analysis. A confirmation of the stormwater collection system will be conducted this quarter. Stormwater evaluation will be completed.
5. Completion of Tank Farm 1 SWMU reconnaissance soil sampling (Task 1C). The workplan calls for soil sampling and hand auguring in the area of Tank Farm 1. Other SWMU reconnaissance sampling was completed during the initial investigation. Sampling at this location was delayed due to a stormwater storage tank release.

Attachments

The following information is attached to this quarterly report:

- April, May, and June 1995 water level measurements
- Re-analysis of test pit samples
- Groundwater flow direction assessment

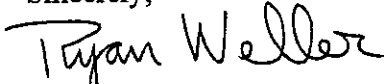
7/14/95

Letter to D. Bartus/US . A

Page 3

Please update your records to indicate myself as official contact for CleanCare Corporation. If you have questions or require further information, please contact me at (206) 627-3925.

Sincerely,




Ryan Weller

Regulatory Affairs Manager

enclosure

cc: Gerald Lenssen, Washington State Department of Ecology
Tacoma Public Library
Citizens for a Healthy Bay
John Stiller, Burlington Environmental
John Spencer, Sol Pro

TEST PIT LOG TP-4

Sample Number	PID Headspace Reading	Depth (feet)	SOIL DESCRIPTIONS
		0.0	
TP4-1	176	0.5	Damp, red-brown, slightly silty, slightly sandy GRAVEL; some gray layers
		1.0	
TP4-2	5.5	1.5	Damp, brown, slightly silty, very gravelly, fine to medium SAND; some cobbles. More gravel in bottom 6 inches
		2.0	
TP4-3	0.0	2.5	Damp, dark brown, gravelly, fine SAND with plant fibers; some cobbles
		3.0	
TP4-4	0.0	3.5	
		4.0	Damp to moist, black, SILT, SAND, & REFUSE; abundant plant debris; mixed with auto fluff in lower foot
		4.5	
 TP4-5	0.0	5.0	
		5.5	
TP4-6		6.0	Wet, black, slightly silty, fine SAND with shells; some refuse
		6.5	
TP4-7	0.0	7.0	
		7.5	Bottom of pit at 7.0 feet 3/17/95
		8.0	
		8.5	
		9.0	

PROJECT NAME: Clean Care New Pad
 DRILLING METHOD: Excavator
 OPERATOR:
 FIRM:
 DATE: 03/17/95

CONSULTING FIRM: Pacific Groundwater Group
 REPRESENTATIVE: Nancy Riocio



Soil Descriptions and Stratum lines are interpretive
 and actual changes may be gradual

QUALITY ASSURANCE/QUALITY CONTROL REVIEW

March 1995 Sampling of Soils Below New Pad at CleanCare Corporation

Review of the Quality Assurance/Quality Control (QA/QC) data was performed as part of this report to assess the validity of analytical results. Sound Analytical Services, Inc. was the analytical laboratory for this data set. Thirteen soil samples were submitted to the lab. The samples were collected on March 17, 1995.

In summary, the analytical results were found to be acceptable with respect to the QA/QC objectives. The analytical results were generally found to meet the Department of Ecology (DOE) guidelines for Total Petroleum Hydrocarbons Analytical Methods (1992), Contract Laboratory Program (CLP) (Environmental Protection Agency (EPA), 1985) limits or guidelines, Functional Guidelines for Evaluating Inorganic Analyses (EPA, 1988), and EPA Method specifications or project-acceptable requirements.

The following summarizes the findings of the QA/QC review:

1. **METHODOLOGY: *Acceptable***

Samples were analyzed using acceptable EPA and standard methods as listed on each page of the analytical results. The methods used correspond to those requested on Chain-of-Custody (COC) forms.

2. **HOLDING TIMES: *Acceptable***

The holding times were met for all analyses.

3. **SURROGATE SPIKES: *Acceptable***

Surrogates spikes are known concentrations of compounds not normally found in samples which are added to samples in order to check for analytical interferences in every sample.

Surrogates were added to all samples for all analyses except for metals, EPA Method 6010; and TPH, Method 418.1. These methods do not recommend that surrogates be added. The surrogates for TP COMP5 was diluted-out during WTPH-HCID analysis. The surrogates for TP COMP1 were also diluted-out during WTPH-G analysis. The surrogate percent recovery ranges for all methods were within the acceptable ranges.

4. **MATRIX SPIKES/MATRIX SPIKE DUPLICATE (MS/MSD): *Acceptable***

Matrix Spikes/Matrix Spike Duplicates (MS/MSD) are known concentrations of analytes added to one sample in 20 to check for matrix interferences in recovering the analyte from

the sample matrix; the duplicate is then run to check analytical duplication. Laboratory control sample (spiked deionized water) is also used for lab internal precision control.

MS/MSD were run for all analytical methods except for method WTPH-HCID which was not requested. MS for WTPH-418.1 was diluted-out during analysis. MS/MSD recovery and Relative Percent Difference (RPD) values for WTPH-418.1 and recovery values for WTPH-G were outside advisory QC limits due to high contaminant levels. No qualifier is being used as recommended by guidelines. MS recovery for lead was 200% which is outside the advisory QC limits and was re-analyzed with similar results. A "J" qualifier indicating an estimated value, is being used as recommended by guidelines. Other MS/MSD results indicate acceptable recovery of analytes and acceptable RPDs.

5. **METHOD BLANKS: *Acceptable***

Method Blanks were run by the laboratory to check for possible laboratory contamination. Blanks were analyzed for all analytes in all analytical batches at a rate of at least one in 20. No laboratory contamination was detected.

6. **METHOD DETECTION LIMITS: *Acceptable***

Practical Quantitation Limits (PQLs) were found to be lower or equivalent to those required by the analytical methods for all analyses except for metals. PQLs for metals varied as they are sample dependent and may vary as the sample matrix varies.

7. **FIELD DUPLICATES: *Not Applicable***

No field duplicates were collected.

8. **FIELD BLANKS: *Not Applicable***

No field blanks were collected.

9. **TENTATIVELY IDENTIFIED COMPOUNDS: *Not Applicable***

The QAP and chain of custody (COC) did not request the analysis of tentatively identified compounds nor do they make provisions for the evaluation of them; therefore; this report does not include a discussion of those results.

10. **CHAIN OF CUSTODY/SAMPLE CONTAINERS AND PRESERVATION: *Acceptable***

Appropriate containers and methods of preservation were used in sample collection. The samples were stored and transported according to the requirements outlined in the QAP. Chain of custody was maintained at all times.

Sound Analytical



Services, Inc.

ANALYTICAL &
ENVIRONMENTAL
CHEMISTS

Facsimile Cover Sheet

To: Ali

Company: PGG

Fax: 206/329-6968

From: AS Riddell

Phone: (206) 922-2310

Fax: (206) 922-5047

Date: 7/11/95

Pages including
this cover page: 2

Comments:

SOUND ANALYTICAL SERVICES, INC.

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 • TELEPHONE 206-922-2310 • FAX 206-922-5047

DATA QUALIFIERS AND ABBREVIATIONS

- J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.
- B1: This analyte was also detected in the associated method blank. The reported sample results have been adjusted for moisture, final extract volume, and/or dilutions performed during extract preparation. The analyte concentration was evaluated prior to sample preparation adjustments, and was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).
- B2: This analyte was also detected in the associated method blank. However, the analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).
- E: The concentration of this analyte exceeded the instrument calibration range.
- D: The reported result for this analyte is calculated based on a secondary dilution factor.
- X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.
- X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.
- X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.
- X4: RPD for duplicates outside advisory QC limits. Sample was re-analyzed with similar results.
- X4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit.
- X5: Matrix spike was diluted out during analysis.
- X6: Recovery of matrix spike outside advisory QC limits. Sample was re-analyzed with similar results.
- X7: Recovery of matrix spike outside advisory QC limits. Matrix interference is indicated by blank spike recovery data.
- X7a: Recovery and/or RPD values for MS/MSD outside advisory QC limits due to high contaminant levels.
- X8: Surrogate was diluted out during analysis.
- X9: Surrogate recovery outside advisory QC limits due to matrix composition.
- N: See analytical narrative.
- ND: Not Detected
- PQL: Practical Quantitation Limit
- MCL: Maximum Contaminant Level

QA/QC CHECKLIST

Job Number: JE 9205 Clean Care
 Data Set: Sound analytical Services 47217

Sample date: 3/17/95
 Sample type: Soil

METHODOLOGY	Metals (As, Pb)	WTPH - HClD	WTPH - 418.1	WTPH - G	WTPH - D
Method	EPA 6010	4	4	5	6
Date Sampled	3/12/95	3/17/95	3/17/95	3/17/95	3/17/95
Date Analyzed	3/21/95	Ext.: 3/20/95 analy: 3/20-31/95	Ext.: 3/30/95 analy: 4/13/95	Prep.: 3/30/95 analy: 3/31/95	Prep.: 3/30/95 analy: 3/31/95
Holding Time	OK	OK	OK	OK	OK
SURROGATE SPIKES	—	—	is not recom.	—	—
Surrogate	—	2 compounds	—	1 compound	1 compound
Recoveries	—	all OK except	—	X8	OK
- unacceptable	—	TPcomp 5, X8	—	TPcomp 1,	—
MS/MSD	on TPT-1	Not requested	on batch QC	on TP comp 1	on blank spike
Surrogate	—	—	—	—	—
Recoveries	AS: OK	—	X5, X7a	X7a	OK
- unacceptable	Pb = 7125% and sample result > IDL therefore use J estimates use also X6	—	—	—	—
METHOD BLANKS	—	—	—	—	—
Parameters found	None	None	None	None	None
Qualifiers	—	—	—	—	—
MDLs	Varies, is OK according to	OK	OK	OK	OK
Met	SW-846, limits are	—	—	—	—
- high	sample dependent	—	—	—	—
- low	AS: 53 ug/L Pb: 12 ug/L	—	—	—	—
DUPLICATES	—	—	—	—	—
FIELD	—	—	—	—	—
- RPDs	—	—	—	—	—
LAB	on TPT-1	on TP comp 2	on batch QC	on TP comp 1	on ??
- RPDs	OK	OK	40%, X4	OK	—
TRIP BLANKS	—	—	—	—	—
Parameters found	—	—	—	—	—
Qualifiers	—	—	—	—	—
COC	Yes	Yes	Yes	Yes	Yes
Containers	OK	OK	OK	OK	OK
Preservation	OK	OK	OK	OK	OK
Completeness	OK	OK	OK	OK	OK

Note: For list of qualifiers, ie -X7a, refer to the lab data qualifiers, abbreviations sheet.



Questions for Sound Analytical Services...

Lab Job # 47217

(1) - Surrogate recoveries for TP comp S
method WTPH-HCID are NRs, what does
X8 mean?

(2) - No MS/MSD for WTPH-HCID? ^{It is not recommended, it is quantified method.}

(3) - WTPH-418.1 duplicate RPD 40% ^{What does}
X4 mean?

(4) - MS/MSD WTPH-418.1 are NRs ^{are} flagged X5 (X7a)
What does it mean?

(5) - Same as (5)? for WTPH-G

(6) - WTPH-G surrogate recovery flagged X8?

(7) - Dup. for WTPH-D, what sample did you use? on report
have sample ID 37338? → Batch sample.

Called Andrew J. Riddell (AJ) 7/11/95:

- for questions 1 and 3-6 he'll fax their Qualifier sheet.

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

47217


TRANSMITTAL MEMORANDUM

DATE: April 4, 1995
TO: Clean Care
PROJECT: JE9205
LABORATORY NUMBER: 47217

Enclosed are the original and one copy of the Tier II data deliverables package for Laboratory Work Order Number 47217. Thirty - five samples were received for analysis at Sound Analytical Services, Inc., on March 20, 1995.

Should there be any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,



Andrew J. Riddell
Project Manager

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Clean Care

Date: April 4, 1995

Report On: Analysis of Soil

Lab No.: 47217

IDENTIFICATION:

Samples received on 03-20-95

Project: JE9205

ANALYSIS:

Lab Sample No. 47217-1

Client ID: TP1-1

ICP Metals Per EPA Method 6010

Date Analyzed: 3-21-95

Units: mg/kg

<u>Parameter</u>	<u>Result</u>	<u>PQL</u>
Arsenic	79	11.
Lead	150	5.4

Lab Sample No. 47217-4

Client ID: TP1-4

ICP Metals Per EPA Method 6010

Date Analyzed: 3-21-95

Units: mg/kg

<u>Parameter</u>	<u>Result</u>	<u>PQL</u>
Arsenic	5,400	14
Lead	4,800	7.2

PQL - Practical Quantitation Limit

SOUND ANALYTICAL SERVICES, INC.

Clean Care
Project: JE9205
Lab No. 47217
April 4, 1995

Lab Sample No. 47217-5

Client ID: TP1-5

ICP Metals Per EPA Method 6010
Date Analyzed: 3-21-95
Units: mg/kg

<u>Parameter</u>	<u>Result</u>	<u>PQL</u>
Arsenic	1,200	16
Lead	2,100	8.0

Lab Sample No. 47217-8

Client ID: TP2-1

ICP Metals Per EPA Method 6010
Date Analyzed: 3-21-95
Units: mg/kg

<u>Parameter</u>	<u>Result</u>	<u>PQL</u>
Arsenic	9.6	9.4
Lead	44	4.7

PQL - Practical Quantitation Limit

SOUND ANALYTICAL SERVICES, INC.

Clean Care
Project: JE9205
Lab No. 47217
April 4, 1995

Lab Sample No. 47217-15

Client ID: TP3-1

ICP Metals Per EPA Method 6010
Date Analyzed: 3-21-95
Units: mg/kg

<u>Parameter</u>	<u>Result</u>	<u>PQL</u>
Arsenic	11	9.9
Lead	53	4.9

Lab Sample No. 47217-22

Client ID: TP4-1

ICP Metals Per EPA Method 6010
Date Analyzed: 3-21-95
Units: mg/kg

<u>Parameter</u>	<u>Result</u>	<u>PQL</u>
Arsenic	ND	9.4
Lead	19	4.7

ND - Not Detected
PQL - Practical Quantitation Limit

SOUND ANALYTICAL SERVICES, INC.

Clean Care
Project: JE9205
Lab No. 47217
April 4, 1995

Lab Sample No. 47217-29

Client ID: TP Comp 1

WTPH-HCID
Date Extracted: 3-20-95
Date Analyzed: 3-21-95
Units: mg/kg

<u>Parameters</u>	<u>Result</u>	<u>Flag</u>
Gasoline (C7 - C12)	> 20	
Diesel (> C12 - C24)	> 50	
Heavy Oil (C24+)	> 100	

SURROGATE RECOVERY, %

1-chlorooctane	90
o-terphenyl	78

WTPH-418.1 Modified
Date Extracted: 3-30-95
Date Analyzed: 4-3-95
Units: mg/kg

<u>Parameter</u>	<u>Result</u>
Heavy petroleum oils	810

SOUND ANALYTICAL SERVICES, INC.

Clean Care
Project: JE9205
Lab No. 47217
April 4, 1995

Lab Sample No. 47217-30

Client ID: TP Comp 2

WTPH-HCID
Date Extracted: 3-20-95
Date Analyzed: 3-21-95
Units: mg/kg

<u>Parameters</u>	<u>Result</u>	<u>Flag</u>
Gasoline (C7 - C12)	< 20	
Diesel (> C12 - C24)	> 50	
Heavy Oil (C24+)	> 100	

SURROGATE RECOVERY, %

1-chlorooctane	77
o-terphenyl	66

SOUND ANALYTICAL SERVICES, INC.

Clean Care
Project: JE9205
Lab No. 47217
April 4, 1995

Lab Sample No. 47217-31

Client ID: TP Comp 3

WTPH-HCID
Date Extracted: 3-20-95
Date Analyzed: 3-20-95
Units: mg/kg

<u>Parameters</u>	<u>Result</u>	<u>Flag</u>
Gasoline (C7 - C12)	< 60	
Diesel (> C12 - C24)	> 150	
Heavy Oil (C24+)	> 300	

SURROGATE RECOVERY, %

1-chlorooctane	87
o-terphenyl	86

WTPH-418.1 Modified
Date Extracted: 3-30-95
Date Analyzed: 4-3-95
Units: mg/kg

<u>Parameter</u>	<u>Result</u>
Heavy petroleum oils	2,800

SOUND ANALYTICAL SERVICES, INC.

Clean Care
Project: JE9205
Lab No. 47217
April 4, 1995

Lab Sample No. 47217-32

Client ID: TP Comp 4

WTPH-HCID
Date Extracted: 3-20-95
Date Analyzed: 3-20-95
Units: mg/kg

<u>Parameters</u>	<u>Result</u>	<u>Flag</u>
Gasoline (C7-C12)	< 60	
Diesel (> C12-C24)	> 150	
Heavy Oil (C24+)	> 300	

SURROGATE RECOVERY, %

1-chlorooctane	99
o-terphenyl	98

SOUND ANALYTICAL SERVICES, INC.

Clean Care
Project: JE9205
Lab No. 47217
April 4, 1995

Lab Sample No. 47217-33

Client ID: TP Comp 5

WTPH-HCID
Date Extracted: 3-20-95
Date Analyzed: 3-20-95
Units: mg/kg

<u>Parameters</u>	<u>Result</u>	<u>Flag</u>
Gasoline (C7 - C12)	< 60	
Diesel (> C12 - C24)	> 150	
Heavy Oil (C24+)	> 300	

SURROGATE RECOVERY, %

1-chlorooctane	NR	X8
o-terphenyl	NR	X8

WTPH-418.1 Modified
Date Extracted: 3-30-95
Date Analyzed: 4-3-95
Units: mg/kg

<u>Parameter</u>	<u>Result</u>
Heavy petroleum oils	7,800

NR - Not Reported

3

SOUND ANALYTICAL SERVICES, INC.

Clean Care
Project: JE9205
Lab No. 47217
April 4, 1995

Lab Sample No. 47217-34

Client ID: TP Comp 6

WTPH-HCID
Date Extracted: 3-20-95
Date Analyzed: 3-21-95
Units: mg/kg

<u>Parameters</u>	<u>Result</u>	<u>Flag</u>
Gasoline (C7 - C12)	< 20	
Diesel (> C12 - C24)	> 50	
Heavy Oil (C24+)	> 100	

SURROGATE RECOVERY, %

1-chlorooctane	93
o-terphenyl	82

SOUND ANALYTICAL SERVICES, INC.

Clean Care
Project: JE9205
Lab No. 47217
April 4, 1995

Lab Sample No. 47217-35

Client ID: TP Comp 7

WTPH-HCID
Date Extracted: 3-20-95
Date Analyzed: 3-21-95
Units: mg/kg

<u>Parameters</u>	<u>Result</u>	<u>Flag</u>
Gasoline (C7-C12)	< 20	
Diesel (> C12-C24)	> 50	
Heavy Oil (C24+)	> 100	

SURROGATE RECOVERY, %

1-chlorooctane	94
o-terphenyl	83

WTPH-418.1 Modified
Date Extracted: 3-30-95
Date Analyzed: 4-3-95
Units: mg/kg

<u>Parameter</u>	<u>Result</u>
Heavy petroleum oils	< 100

SOUND ANALYTICAL SERVICES, INC.

Client Name	Clean Care
Client ID:	TP COMP 1
Lab ID:	47217-29
Date Received:	3/20/95
Date Prepared:	3/30/95
Date Analyzed:	3/31/95
% Solids	94.72

Gasoline by WTPH-G

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	-	X8	50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Gasoline (Toluene-nC12)	1100	100	X2

SOUND ANALYTICAL SERVICES, INC.

Client Name	Clean Care
Client ID:	TP COMP 1 - dup
Lab ID:	47217R29
Date Received:	3/20/95
Date Prepared:	3/30/95
Date Analyzed:	3/31/95
% Solids	94.72

Gasoline by WTPH-G

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	-	X8	50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Gasoline (Toluene-nC12)	990	100	X2

SOUND ANALYTICAL SERVICES, INC.

Client Name	Clean Care
Client ID:	TP COMP 1
Lab ID:	47217-29
Date Received:	3/20/95
Date Prepared:	3/30/95
Date Analyzed:	3/31/95
% Solids	94.72

Diesel by WTPH-D

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
o-Terphenyl	83		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Diesel (>nC12-nC24)	280	26	X2

SOUND ANALYTICAL SERVICES, INC.

Client Name	Clean Care
Client ID:	TP COMP 3
Lab ID:	47217-31
Date Received:	3/20/95
Date Prepared:	3/30/95
Date Analyzed:	3/31/95
% Solids	85.36

Diesel by WTPH-D

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
o-Terphenyl	76		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Diesel (>nC12-nC24)	1200	280	X2

SOUND ANALYTICAL SERVICES, INC.

Client Name	Clean Care
Client ID:	TP COMP 5
Lab ID:	47217-33
Date Received:	3/20/95
Date Prepared:	3/30/95
Date Analyzed:	3/31/95
% Solids	73.72

Diesel by WTPH-D

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
o-Terphenyl	60		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Diesel (>nC12-nC24)	3400	330	X2

SOUND ANALYTICAL SERVICES, INC.

Client Name	Clean Care
Client ID:	TP COMP 7
Lab ID:	47217-35
Date Received:	3/20/95
Date Prepared:	3/30/95
Date Analyzed:	3/31/95
% Solids	77.13

Diesel by WTPH-D

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
o-Terphenyl	76		50	150

Sample results are on a dry weight basis.

Analyte	Result (mg/kg)	PQL	Flags
Diesel (>nC12-nC24)	ND	32	

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

Total Metals

Client: Clean Care
Lab No: 47217qcl
Units: mg/kg
Date Analyzed: 3-21-95

METHOD BLANK

Parameter	Result	PQL
Arsenic	ND	10
Lead	ND	5.0

ND = Not Detected

PQL = Practical Quantitation Limit

DUPLICATE

Dup No. 46217-1

Parameter	Sample	Duplicate	RPD
Arsenic	79	82	3.7
Lead	150	200	28

RPD = Relative Percent Difference

MATRIX SPIKE

MS No. 46217-1

Parameter	Sample Result	Spiked Sample Result	Spike Added	%R	Flag
Arsenic	79	440	410	88	
Lead	150	350	100	200	X6

%R = Percent Recovery

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SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

WTPH-HCID

Client: Clean Care
Lab No: 47217qc2
Units: mg/kg

Date Extracted: 3-20-95
Date Analyzed: 3-20-95

METHOD BLANK

Blank No. 031R0201.D

Parameter	Result	Flags
Gasoline (C ₇ -C ₁₂)	< 20	
Diesel (>C ₁₂ -C ₂₄)	< 50	
Heavy Petroleum Oil (C ₂₄ +)	< 100	
<u>SURROGATE RECOVERY, %</u>		
1-chlorooctane	82	
o-terphenyl	75	

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

WTPH-HCID

Client: Clean Care
Lab No: 47217qc2
Units: mg/kg

Date Extracted: 3-20-95
Date Analyzed: 3-20-95

DUPLICATE

Dup No. 47217-30

Parameter	Sample (S)	Duplicate (D)	RPD	Flags
Gasoline (C ₇ -C ₁₂)	< 20	< 20	NC	
Diesel (>C ₁₂ -C ₂₄)	> 50	> 50	NC	
Heavy Petroleum Oil (C ₂₄ +)	> 100	> 100	NC	
<u>SURROGATE RECOVERY, %</u>				
1-chlorooctane	77	78		
o-terphenyl	66	69		

NC = Not Calculated

RPD = Relative Percent Difference

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

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QUALITY CONTROL REPORT

WTPH-418.1 Modified

Client: Clean Care
Lab No: 47217qc3
Units: mg/kg

Date Extracted: 3-30-95
Date Analyzed: 4-3-95

METHOD BLANK

Parameter	Result
Heavy Petroleum Oils	< 100

DUPLICATE

Dup No. 47247-16 Batch QC

Parameter	Sample Result	Duplicate Result	RPD	Flag
Heavy Petroleum Oils	27,000	18,000	40	X4

RPD = Relative Percent Difference

MATRIX SPIKE / MATRIX SPIKE DUPLICATE

MS/MSD No. 47247-16 Batch QC

Parameter	Sample Result	MS Amount	MS Result	MS %R	MSD Amount	MSD Result	MSD %R	RPD	Flag
Heavy Oil	27,000	615	11,300	NR	610	26,500	NR	NR	X5, X7a

%R = Percent Recovery

MS = Matrix Spike

MSD = Matrix Spike Duplicate

RPD = Relative Percent Difference

NR = Not Reported

SOUND ANALYTICAL SERVICES, INC.

Lab ID: Method Blank - GB286
Date Received: -
Date Prepared: 3/30/95
Date Analyzed: 3/30/95
% Solids

Gasoline by WTPH-G

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
Trifluorotoluene	85		50	150

Sample results are on an as received basis.

Analyte	Result (mg/kg)	PQL	Flags
Gasoline (Toluene-nC12)	ND	1	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike Report

Lab ID: GB286
Date Prepared: 3/30/95
Date Analyzed: 3/30/95
QC Batch ID: GB286

Gasoline by WTPH-G

Parameter Name	Blank Result (mg/kg)	Spike Amount (mg/kg)	BS Result (mg/kg)	BS % Rec.	Flag
Gasoline (Toluene-nC12)	0	12	12	100	

SOUND ANALYTICAL SERVICES, INC.

Duplicate Report

Client Sample ID:	TP COMP 1
Lab ID:	47217-29
Date Prepared:	3/30/95
Date Analyzed:	3/31/95
QC Batch ID:	GB286

Gasoline by WTPH-G

Parameter Name	Sample Result (mg/kg)	Duplicate Result (mg/kg)	RPD %	Flag
Gasoline (Toluene-nC12)	1100	990	11.0	

SOUND ANALYTICAL SERVICES, INC.

Matrix Spike/Matrix Spike Duplicate Report

Client Sample ID: TP COMP 1
Lab ID: 47217-29
Date Prepared: 3/30/95
Date Analyzed: 3/31/95
QC Batch ID: GB286

Gasoline by WTPH-G

Compound Name	Sample Result (mg/kg)	Spike Amount (mg/kg)	MS Result (mg/kg)	MS % Rec.	MSD Result (mg/kg)	MSD % Rec.	RPD	Flag
Gasoline (Toluene-nC12)	1100	1200	970	0	1300	13	200.0	X7a

SOUND ANALYTICAL SERVICES, INC.

Lab ID: Method Blank - DI245
Date Received:
Date Prepared: 3/30/95
Date Analyzed: 3/31/95
% Solids

Diesel by WTPH-D

Surrogate	% Recovery	Flags	Recovery Limits	
			Low	High
o-Terphenyl	86		50	150

Sample results are on an as received basis.

Analyte	Result (mg/kg)	PQL	Flags
Diesel (>nC12-nC24)	ND	25	

SOUND ANALYTICAL SERVICES, INC.

Blank Spike Report

Lab ID:	DI245
Date Prepared:	3/30/95
Date Analyzed:	3/31/95
QC Batch ID:	DI245

Diesel by WTPH-D

Parameter Name	Blank Result (mg/kg)	Spike Amount (mg/kg)	BS Result (mg/kg)	BS % Rec.	Flag
Diesel (>nC12-nC24)	0	250	250	100	

SOUND ANALYTICAL SERVICES, INC.

Duplicate Report

Client Sample ID: 37338
Lab ID: 47375-02
Date Prepared: 3/30/95
Date Analyzed: 3/31/95
QC Batch ID: DI245

Diesel by WTPH-D

Parameter Name	Sample Result (mg/kg)	Duplicate Result (mg/kg)	RPD %	Flag
Diesel (>nC12-nC24)	340	480	34.0	X4



UST PARAMETERS
CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: Clean Care / P&G

PROJECT NAME: JE9205

CONTACT: Pony Ellingson
(pae.h = Bio Prod water)

PHONE NO: (206) 529 0191

ANALYSIS REQUESTED: _____ Specify State _____

LAB #	SAMPLE I.D.	DATE	TIME MATRIX	# of Containers	HClD	TPH-G	TPH-D	TPH 418.1	BTEX	TPH-G / BTEX	TPH 8015M	Total Lead	TCLP Lead	PCB's	PAH's	Phenols	Halogenated Volatiles EPA 601/8010	Aromatic Volatiles EPA 602/6020	Volatile Organics EPA 624/8240 GC/MS	Semi-volatiles EPA 625/8270 GC/MS	Metals	Total Halogens	CLOSURE DELIVERABLES
	TP1-1	3-17-95	1115	5012	1	X																	
	TP1-2		1130																				
	TP1-3		1145																				
	TP1-4		1200																				
	TP1-5		1215																				
	TP1-6		1230																				
	TP1-7		1245																				
	TP2-1		1305																				
	TP2-2		1310																				
	TP2-3		1320																				
	TP2-4		1340																				
	TP2-5		1350																				
	TP2-6		1400																				
	TP2-7		1405																				

SPECIAL INSTRUCTIONS/COMMENTS:

*Hold all for
TPH HClD
Pending results of
TP Comp Series Samples
(see p 3) will box COC
at that time*

Relinquished By	Signature	Printed Name	Firm	Time / Date
	<i>[Signature]</i>	Ty R Johnson	CleanCare Corp	1134 3/20/95
Received By	<i>[Signature]</i>	Giang	SAS	1134 3/20/95
Relinquished By				
Received By				
Relinquished By				
Received By				



SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

UST PARAMETERS CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: <u>Clean Care / PGG</u>				ANALYSIS REQUESTED: _____ Specify State _____																					
PROJECT NAME: <u>JE9205</u>																									
CONTACT: <u>Bony Ellingson (PGG)</u>																									
PHONE NO: <u>(206) 329 0141</u>																									
LAB #	SAMPLE I.D.	DATE	TIME	MATRIX	# of Containers	HClD	TPH-G	TPH-D	TPH 418.1	BTEX	TPH-G / BTEX	TPH 8015M	Total Lead	TCLP Lead	PGB's	PAH's	Phenols	Halogenated Volatiles EPA 601/8010	Aromatic Volatiles EPA 602/8020	Volatile Organics EPA 624/8240 GC/MS	Semi-Volatiles EPA 625/8270 GC/MS	Metals	Total Halogens	CLOSURE DELIVERABLES	
	TP3-1	3/7/95	1440	PGG 5012	1	X																			
	TP3-2		1440																						
	TP3-3		1450																						
	TP3-4		1500																						
	TP3-5		1505																						
	TP3-6		1515																						
	TP3-7		1520																						
	TP4-1		1525																						
	TP4-2		1530																						
	TP4-3		1535																						
	TP4-4		1545																						
	TP4-5		1550																						
	TP4-6		1555																						
	TP4-7		1600																						

		SPECIAL INSTRUCTIONS/COMMENTS:											
Relinquished By	Signature	Printed Name	Firm	Time / Date									
	<i>[Signature]</i>	Tr R. Johnson	CLEARCARE CORP	134 3/20/95									
Received By	<i>[Signature]</i>	Siang Siang	SAS	134 3/20/95									
Relinquished By													
Received By													
Relinquished By													
Received By													

*Hold All for TPH -
HC 1D pending results
of "TP Comp" series
samples, (see p 3)
Will fax COC at that
time...*



SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

UST PARAMETERS CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: Clean Care / P66		ANALYSIS REQUESTED: Specify State																					
PROJECT NAME: JE9205																							
CONTACT: Pony Ellingson (Pac. & Bro. & water)																							
PHONE NO: (206) 329 0191																							
LAB #	SAMPLE I.D.	DATE	TIME MATRIX	# of Containers	HClD	TPH-g	TPH-D	TPH 418.1	BTEX	TPH-g / BTEX	TPH 8015M	Total Lead	TCLP Lead	PCB's	PAH's	Phenols	Halogenated Volatiles EPA 601/8010	Aromatic Volatiles EPA 602/8020	Volatile Organics EPA 624/8240 GC/MS	Semi-Volatiles EPA 625/8270 GC/MS	Metals	Total Halogens	CLOSURE DELIVERABLES
	TP1-1	3-17-95	1115	5016	1	X																	
	TP1-2		1130																				
	TP1-3		1145																				
	TP1-4		1200																				
	TP1-5		1215																				
	TP1-6		1230																				
	TP1-7		1245																				
	TP2-1		1305																				
	TP2-2		1310																				
	TP2-3		1320																				
	TP2-4		1340																				
	TP2-5		1350																				
	TP2-6		1400																				
	TP2-7		1405																				

SPECIAL INSTRUCTIONS/COMMENTS:		Time / Date	Firm	Printed Name	Signature
<p><i>Hold all for TPH HClD</i></p> <p><i>Pending results of TP Comp Series Samples (see p 3) will get CAC at that time</i></p>					
		Relinquished By			
		Received By			
		Relinquished By			
		Received By			
		Relinquished By			
		Received By			



SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

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UST PARAMETERS CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: <i>Clean Care / PEG</i>		ANALYSIS REQUESTED: Specify State																							
PROJECT NAME: <i>JE9205</i>																									
CONTACT: <i>Pony Ellingson (PEG)</i>																									
PHONE NO: <i>(206) 329 0191</i>																									
LAB #	SAMPLE I.D.	DATE	TIME MATRIX	# of Containers	HClD	TPH-G	TPH-D	TPH 418.1	BTEX	TPH-G / BTEX	TPH 8015M	Total Lead	TCLP Lead	PCB's	PAH's	Phenols	Halogenated Volatiles EPA 601/8010	Aromatic Volatiles EPA 602/8020	Volatiles Organics EPA 824/8240 GC/MS	Semi-volatiles EPA 625/8270 GC/MS	Metals	Total Halogens	CLOSURE DELIVERABLES		
	<i>TP Camp 1</i>	<i>8-17-95</i>	<i>1601</i>	<i>5012</i>	<i>1</i>	<i>X</i>																			
	<i>TP Camp 2</i>		<i>1602</i>		<i>1</i>	<i>X</i>																			
	<i>TP Camp 3</i>		<i>1603</i>		<i>1</i>	<i>X</i>																			
	<i>TP Camp 4</i>		<i>1604</i>		<i>1</i>	<i>X</i>																			
	<i>TP Camp 5</i>		<i>1605</i>		<i>1</i>	<i>X</i>																			
	<i>TP Camp 6</i>		<i>1606</i>		<i>1</i>	<i>X</i>																			
	<i>TP Camp 7</i>		<i>1607</i>		<i>1</i>	<i>X</i>																			
	<i>TP Camp 8</i>																								

SPECIAL INSTRUCTIONS/COMMENTS:

Bill to Clean Care
FAX preliminary results
to Pony Ellingson,
Pacific Groundwater
Group
206 329 6968

	Signature	Printed Name	Firm	Time / Date
Relinquished By				
Received By				
Relinquished By				
Received By				
Relinquished By				
Received By				



SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX: (206) 922-5047

UST PARAMETERS CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: <u>Alan Case / PEG</u>		ANALYSIS REQUESTED: _____ Specify State _____																						
PROJECT NAME: <u>JE9205</u>																								
CONTACT: <u>Rony Ellingson (PEG)</u>																								
PHONE NO: <u>(206) 329 0141</u>																								
LAB #	SAMPLE I.D.	DATE	TIME	MATRIX	# of Containers	HClD	TPH-G	TPH-D	TPH 418.1	BTEX	TPH-G / BTEX	TPH 8015M	Total Lead	TCLP Lead	PCB's	PAH's	Phenols	Halogenated Volatiles EPA 601/8010	Aromatic Volatiles EPA 602/8020	Volatile Organics EPA 624/8240 GC/MS	Semi-Volatiles EPA 625/8270 GC/MS	Metals	Total Halogens	CLOSURE DELIVERABLES
	TP3-1	3-17-95	1430	SOIL	1	X																X		
	TP3-2		1440																					
	TP3-3		1450																					
	TP3-4		1500																					
	TP3-5		1505																					
	TP3-6		1515																					
	TP3-7		1520																					
	TP4-1		1525																				X	
	TP4-2		1530																					
	TP4-3		1535																					
	TP4-4		1545																					
	TP4-5		1550																					
	TP4-6		1555																					
	TP4-7		1600																					

		SPECIAL INSTRUCTIONS/COMMENTS:	
Relinquished By	Signature	Printed Name	Firm
Received By			
Relinquished By			
Received By			
Relinquished By			
Received By			

*Hold All for TPH -
the ID pending results
of "TP Comp" series
samples, (see p 3)
Will fax COC at that
time...*

WAD 8512
14F
7/13/95

TECHNICAL MEMORANDUM

JE9205.04 CleanCare

To: Russell Bulman, CleanCare
From: Charles T. Ellingson, Pacific Groundwater Group
Re: Soil Sampling Below New Building Foundation Pad
Date: July 13, 1995

This technical memorandum summarizes excavation of test pits and soil sampling below the new building foundation pad at CleanCare's Port of Tacoma facility. The dimensions of pad are 82 feet by 60 feet, elongated in an east-west direction. It is located contiguous to, and immediately east of, a series of 10 tanks and immediately south of the vacuum distillation facilities on the property. The pad is a floating slab-on-grade without pilings; however, 12 roof support beams are founded on shallow spread footings.

Our scope of work consisted of:

- excavation of four backhoe test pits to depths of seven feet below ground surface (bgs)
- sampling of soils over the explored depth
- analysis of composite samples for Total Petroleum Hydrocarbons (TPH)
- analysis of discrete samples for total lead and arsenic
- consultation with CleanCare regarding implications of pad construction on possible remediation

The work was performed and this memorandum prepared in accordance with generally accepted hydrogeologic practices at this time, and in this area, for the exclusive use of CleanCare Corporation and their designated consultants for specific application to the Port of Tacoma facility. No other warranty, express or implied, is made.

Summary of Findings

- Materials encountered in the subsurface include gravel fill; green silty sand; a fill unit with auto fluff, silty sand, and a trace of gravel; slag-like sand with wood; and hydraulic fill. Figure 1 presents a site plan and Figure 2 presents two cross-sections through the test pits. The four test pit logs are also attached.
- Analysis of six samples for arsenic and lead indicates that the slag-looking material (samples TP1-4 and TP1-5) has chemical characteristics of slag. Lead concentrations in the apparent slag are above RFI action levels. Arsenic concentrations are also elevated above background but the RFI did not establish action levels for arsenic. Table 1 summarizes chemical analyses performed by Sound Analytical. Raw data and a QA/QC report are attached.

- Analysis of seven composite samples for TPH indicates that fill materials above the hydraulic fill contain petroleum hydrocarbons in concentrations above RFI action levels. The TPH is predominantly in the diesel and heavier molecular weight range.
- The soils and groundwater in the pad area may require remediation at some time. The only remedial alternative that is precluded by construction of the pad is removal of soil. Removal of soil below this pad area will probably not eliminate possible groundwater contamination because other adjacent and inaccessible areas also likely contain contaminated soils.

attachments:

Table 1 - Analytical Results from Test Pit Samples in Building Foundation Pad Area

Figure 1 - Site Plan Sketch

Figure 2 - Cross Sections

Test Pit Log TP-1

Test Pit Log TP-2

Test Pit Log TP-3

Test Pit Log TP-4

QA/QC Report

Raw Laboratory Data

**Table 1 - Analytical Results from Test Pit Samples in Building Foundation Pad Area
CleanCare Corp.**

RESULTS									
Sample	Depth in feet	WTPH-HCID			WTPH-G	WTPH-D	WTPH- 418.1	total arsenic	total lead
		gas	diesel	oil					
		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
TPcomp1	0-1	>20	>50	>100	1100	280	810	NA	NA
TPcomp2	1-2	<20	>50	>100	NA	NA	NA	NA	NA
TPcomp3	2-3	<60	>150	>300	NA	1200	2800	NA	NA
TPcomp4	3-4	<60	>150	>300	NA	NA	NA	NA	NA
TPcomp5	4-5	<60	>150	>300	NA	3400	7800	NA	NA
TPcomp6	5-6	<20	>50	>100	NA	NA	NA	NA	NA
TPcomp7	6-7	<20	>50	>100	NA	<32	<100	NA	NA
TP1-1	0-1	NA	NA	NA	NA	NA	NA	79	150J
TP3-1	0-1	NA	NA	NA	NA	NA	NA	11	53J
TP4-1	0-1	NA	NA	NA	NA	NA	NA	<9.4	19J
TP2-1	0-1	NA	NA	NA	NA	NA	NA	9.6	44J
TP1-4	3-4	NA	NA	NA	NA	NA	NA	5400	4800J
TP1-5	4-5	NA	NA	NA	NA	NA	NA	1200	2100J
STANDARDS									
RFI action level						200	200	TBD	1000
MTCA-A(i)					100	200	200	200	1000
MTCA-B	as carcinogen							1.3	na
	non-carcinogen							60	na
MTCA-C	as carcinogen							57.1	na
	non-carcinogen							240	na
MTCA-C(i)	as carcinogen							188	na
	non-carcinogen							2620	na
BACKGROUND 90% (Natural Background Soil Metals Concentrations in Washington State (Ecology, 1994))									
Puget Sound								7	24
Point Defiance Park								>50	

J = Estimated quantity; matrix spike-recovery for lead was 200%. Sample was reanalyzed with similar results.



Figure 1
Site Plan Sketch

existing
paddy?

approx locn.
B-3

area likely
to contain
slaggy sand
volume est =
35 Ft x 60 Ft x 4.5 Ft
= 9450 Ft³
= 350 yds³
(soil volume from
bottom of Stg Fill
to 6 Ft depth)

3.5	2.5
0	

TP-4

2	4
0	

TP-3

NOT TO SCALE



thickness
of slaggy
sand

1.5	5
3	

depth to top of auth fill
plus thickness of
auto fill
sand plus slaggy
(to 6 Ft depth)

1.5	4.5
3	

TP-1

2	4
2	

TP-2

W

B-7

CLEAN CARE SE9205
Figure 2 - X Sections Concrete Pad Area

DEC 95
(75)

B-3

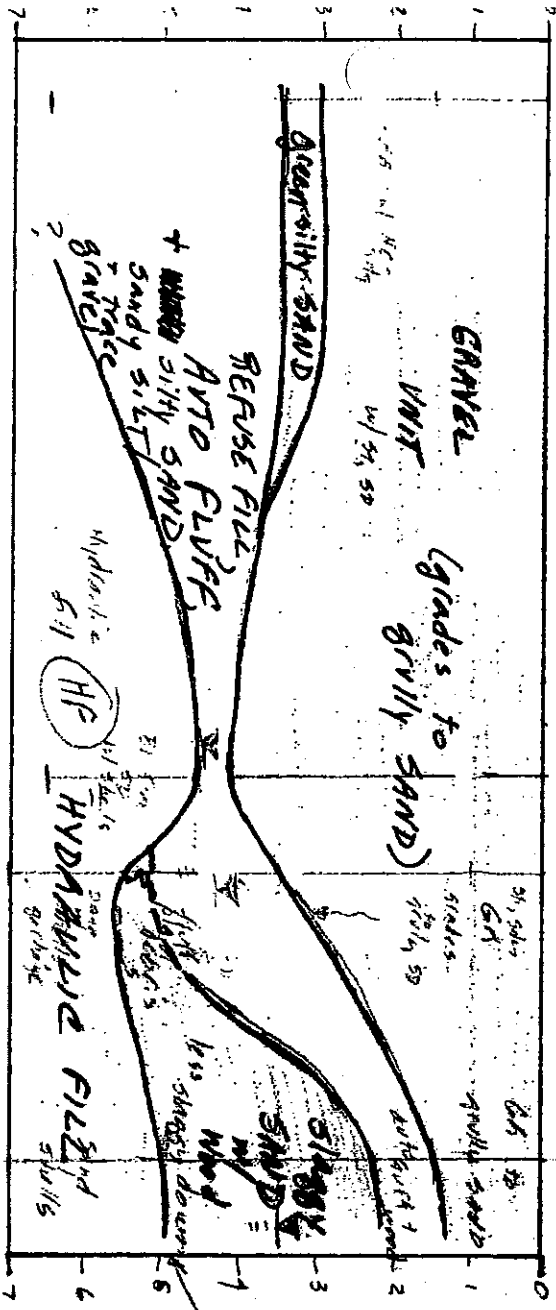
TP4

TP1

E

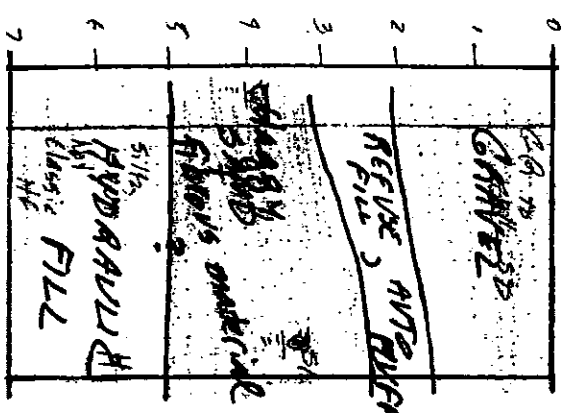
HORIZ SCALE 1" = 20'
VERTICAL SCALE 1" = 2.5'

8X VERT EXAGG.



N

B



no slag in TP3
thinner auto fluff
clean silt sand
where slag would be

TEST PIT LOG TP-1

Sample Number	PID Headspace Reading	Depth (feet)	SOIL DESCRIPTIONS
		0.0	
TP1-1	0.0	0.5	Damp, brown, slightly sandy, slightly silty GRAVEL with organics and garbage-like odor.
TP1-2	0.0	1.0	Damp, green-gray, silty, gravelly, medium SAND. Thin rust-colored zone at 1.0 feet.
TP1-3	0.4	1.5	AUTO FLUFF (hoses, wires, metallic debris) with abundant branches and fibers in a silty SAND matrix
		2.0	
TP1-4	0.0	2.5	Damp to wet, black, silty fine SAND with wood debris. SAND consists of fine particles of SLAG. SLAG particles have an oily, slightly metallic luster.
		3.0	
		3.5	
TP1-5	0.1	4.0	
		4.5	
TP1-6	1.0	5.0	Wet, black, fine to medium SAND with shells. Some orange-brown grains, some fibrous organic material.
		5.5	
		6.0	
TP1-7	0.0	6.5	
		7.0	
		7.5	Bottom of pit at 7.0 feet 3/17/95
		8.0	
		8.5	
		9.0	

PROJECT NAME: Clean Care New Pad
 DRILLING METHOD: Excavator
 OPERATOR:
 FIRM:
 DATE: 03/17/95

CONSULTING FIRM: Pacific Groundwater Group
 REPRESENTATIVE: Nancy Riccio



Soil Descriptions and Stratum lines are interpretive
 and actual changes may be gradual

TEST PIT LOG TP-2

Sample Number	PID Headspace Reading	Depth (feet)	SOIL DESCRIPTIONS
		0.0	
TP2-1	0.0	0.5	Damp, brown-gray, slightly sandy, slightly silty GRAVEL
		1.0	
TP2-2	0.0	1.5	Damp, tan, slightly silty, gravelly, fine SAND with occasional clay clumps and refuse
		2.0	
TP2-3	0.0	2.5	Damp, dark brown, slightly gravelly, very silty SAND with abundant wood refuse, some auto fluff, and occasional clay clumps
		3.0	
TP2-4	0.0	3.5	Moist, black SAND with cardboard-like and fibrous organic waste material; SAND consists of slag-like granules
		4.0	
		4.5	Less fibrous organic material; some rock fragments
TP2-5	0.0	5.0	Gradational contact
		5.5	
TP2-6	0.0	6.0	Wet, dark brown, silty SAND with wood & other debris
		6.5	
TP2-7	0.0	7.0	
		7.5	Bottom of pit at 7.0 feet 3/17/95
		8.0	
		8.5	
		9.0	



PROJECT NAME: Clean Care New Pad
 DRILLING METHOD: Excavator
 OPERATOR:
 FIRM:
 DATE: 03/17/95

CONSULTING FIRM: Pacific Groundwater Group
 REPRESENTATIVE: Nancy Riccio



Soil Descriptions and Stratum lines are interpretive
 and actual changes may be gradual

TEST PIT LOG TP-3

Sample Number	PID Headspace Reading	Depth (feet)	SOIL DESCRIPTIONS
		0.0	
TP3-1	0.0	0.5	Damp, brown-gray, slightly sandy, slightly silty GRAVEL
		1.0	
TP3-2	0.0	1.5	Damp, gray-tan, silty, sandy GRAVEL
		2.0	
		2.5	AUTO FLUFF, SILT, WOOD, & PAPER DEBRIS
TP3-3	0.3	2.5	Damp, brown, slightly silty SAND with some gravel, refuse
		3.0	----- Gradational contact -----
		3.5	
TP3-4	0.0	4.0	Moist, brown & green, silty SAND & GRAVEL with some wood debris
		4.5	
		5.0	grading to
TP3-5	0.3	5.5	
		6.0	
TP3-6	0.0	6.0	Wet, salt & pepper, slightly gravelly, silty SAND with roots & wood debris
		6.5	
TP3-7	0.0	7.0	
		7.5	Bottom of pit at 7.0 feet 3/17/95
		8.0	
		8.5	
		9.0	




PROJECT NAME: Clean Care New Pad
 DRILLING METHOD: Excavator
 OPERATOR:
 FIRM:
 DATE: 03/17/95

CONSULTING FIRM: Pacific Groundwater Group
 REPRESENTATIVE: Nancy Riecio



Soil Descriptions and Stratum lines are interpretive
 and actual changes may be gradual

TEST PIT LOG TP-4

Sample Number	PID Headspace Reading	Depth (feet)	SOIL DESCRIPTIONS
		0.0	
TP4-1	176	0.5	Damp, red-brown, slightly silty, slightly sandy GRAVEL; some gray layers
		1.0	
TP4-2	5.5	1.5	Damp, brown, slightly silty, very gravelly, fine to medium SAND; some cobbles. More gravel in bottom 6 inches
		2.0	
TP4-3	0.0	2.5	Damp, dark brown, gravelly, fine SAND with plant fibers; some cobbles
		3.0	
TP4-4	0.0	3.5	
		4.0	Damp to moist, black, SILT, SAND, & REFUSE; abundant plant debris; mixed with auto fluff in lower foot
		4.5	
 TP4-5	0.0	5.0	
		5.5	
TP4-6		6.0	
		6.5	Wet, black, slightly silty, fine SAND with shells; some refuse
TP4-7	0.0	7.0	
		7.5	Bottom of pit at 7.0 feet 3/17/95
		8.0	
		8.5	
		9.0	

PROJECT NAME: Clean Core New Pad
 DRILLING METHOD: Excavator
 OPERATOR:
 FIRM:
 DATE: 03/17/95

CONSULTING FIRM: Pacific Groundwater Group
 REPRESENTATIVE: Nancy Riccio



Soil Descriptions and Stratum lines are interpretive
 and actual changes may be gradual

QUALITY ASSURANCE/QUALITY CONTROL REVIEW

March 1995 Sampling of Soils Below New Pad at CleanCare Corporation

Review of the Quality Assurance/Quality Control (QA/QC) data was performed as part of this report to assess the validity of analytical results. Sound Analytical Services, Inc. was the analytical laboratory for this data set. Thirteen soil samples were submitted to the lab. The samples were collected on March 17, 1995.

In summary, the analytical results were found to be acceptable with respect to the QA/QC objectives. The analytical results were generally found to meet the Department of Ecology (DOE) guidelines for Total Petroleum Hydrocarbons Analytical Methods (1992), Contract Laboratory Program (CLP) (Environmental Protection Agency (EPA), 1985) limits or guidelines, Functional Guidelines for Evaluating Inorganic Analyses (EPA, 1988), and EPA Method specifications or project-acceptable requirements.

The following summarizes the findings of the QA/QC review:

1. **METHODOLOGY: *Acceptable***

Samples were analyzed using acceptable EPA and standard methods as listed on each page of the analytical results. The methods used correspond to those requested on Chain-of-Custody (COC) forms.

2. **HOLDING TIMES: *Acceptable***

The holding times were met for all analyses.

3. **SURROGATE SPIKES: *Acceptable***

Surrogate spikes are known concentrations of compounds not normally found in samples which are added to samples in order to check for analytical interferences in every sample.

Surrogates were added to all samples for all analyses except for metals, EPA Method 6010; and TPH, Method 418.1. These methods do not recommend that surrogates be added. The surrogates for TP COMP5 was diluted-out during WTPH-HCID analysis. The surrogates for TP COMP1 were also diluted-out during WTPH-G analysis. The surrogate percent recovery ranges for all methods were within the acceptable ranges.

4. **MATRIX SPIKES/MATRIX SPIKE DUPLICATE (MS/MSD): *Acceptable***

Matrix Spikes/Matrix Spike Duplicates (MS/MSD) are known concentrations of analytes added to one sample in 20 to check for matrix interferences in recovering the analyte from

the sample matrix; the duplicate is then run to check analytical duplication. Laboratory control sample (spiked deionized water) is also used for lab internal precision control.

MS/MSD were run for all analytical methods except for method WTPH-HCID which was not requested. MS for WTPH-418.1 was diluted-out during analysis. MS/MSD recovery and Relative Percent Difference (RPD) values for WTPH-418.1 and recovery values for WTPH-G were outside advisory QC limits due to high contaminant levels. No qualifier is being used as recommended by guidelines. MS recovery for lead was 200% which is outside the advisory QC limits and was re-analyzed with similar results. A "J" qualifier indicating an estimated value, is being used as recommended by guidelines. Other MS/MSD results indicate acceptable recovery of analytes and acceptable RPDs.

5. **METHOD BLANKS: *Acceptable***

Method Blanks were run by the laboratory to check for possible laboratory contamination. Blanks were analyzed for all analytes in all analytical batches at a rate of at least one in 20. No laboratory contamination was detected.

6. **METHOD DETECTION LIMITS: *Acceptable***

Practical Quantitation Limits (PQLs) were found to be lower or equivalent to those required by the analytical methods for all analyses except for metals. PQLs for metals varied as they are sample dependent and may vary as the sample matrix varies.

7. **FIELD DUPLICATES: *Not Applicable***

No field duplicates were collected.

8. **FIELD BLANKS: *Not Applicable***

No field blanks were collected.

9. **TENTATIVELY IDENTIFIED COMPOUNDS: *Not Applicable***

The QAP and chain of custody (COC) did not request the analysis of tentatively identified compounds nor do they make provisions for the evaluation of them; therefore; this report does not include a discussion of those results.

10. **CHAIN OF CUSTODY/SAMPLE CONTAINERS AND PRESERVATION: *Acceptable***

Appropriate containers and methods of preservation were used in sample collection. The samples were stored and transported according to the requirements outlined in the QAP. Chain of custody was maintained at all times.