



THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

**Department of Environmental
Conservation**

DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites Program

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File: 2323.38.055

March 1, 2021

Jason Goodwin, P.G.
Baker Hughes Oilfield Operations, Inc.
795 East 94th Avenue
Anchorage AK 99515

Re: Baker Oil Tools - Delores Drive ADEC Hazard ID: 25935
Data Gap Review and Site characterization Work Plan
Baker Oil Tools – Delores Drive
ADEC Work Plan Comments

Dear Mr. Goodwin

The Alaska Department of Environmental Conservation Contaminated Sites Program (ADEC), would like to thank you for submitting the September 2, 2020, Data Gap Review and Site Characterization Work Plan, for the Baker Oil Tools – Delores Drive site located in Nikiski, Alaska. This work plan was prepared by dnaENVIRONMENTAL, LLC, and received at our office on October 12, 2020. ADEC has the following comments.

ADEC's primary concern is that the site is contaminated with trichloroethylene (TCE) which is a chlorinated solvent that has a long degradation pathway for natural attenuation. This compound attenuates over decades, not years. The source area is a potential groundwater threat to an adjacent community well and water supply system, and a high school well. Residential and industrial wells are also adjacent to the site. Groundwater impacted with chlorinated solvents are not likely to meet our criteria for cleanup complete in the near term without some form of remediation.

This site will not qualify for closure without an environmental covenant at this time because the chlorinated solvents are present in the drinking water aquifer. The Baker Hughes injection well was an extensive disposal system. Excavation of impacted soils extended only to accessible soils within the first eleven feet of the ground surface. Impacts of chlorinated solvents reached the water table at approximately 40 feet below ground surface, and the impacts extended into the aquifer to impact the

former water well, which was screened at 20 feet below the water surface. This implies that a significant portion of the unsaturated zone and as yet undefined depth of the aquifer under the building, and potentially under the leach field is impacted with chlorinated solvents.

The septic tank was last pumped in 2013. Impacted water from the abandoned water well has passed through the septic system into the septic leach field, causing a potential secondary source of contamination. The septic leach field is considered as potentially impacted area until investigation proves otherwise. The risk conclusions should address septic field failure and the implications of removing and replacing the septic system. This will be a factor in site closure. Please update the text on risk and address potential septic system impacts.

ADEC recommends that an additional monitoring well(s) be installed to define contamination in the location of the former water well and the septic system leach field. These wells should also define the vertical extent of contamination within the aquifer.

The implications of contamination extending from the former sump to the former drinking water well highlights the potential for vapor intrusion into the building from this source. It is our understanding that the building is unoccupied, making this an ideal time to collect indoor air samples. ADEC requires that Baker Hughes conduct quarterly indoor air sampling for chlorinated solvents, specifically TCE.

On page 2 in the last paragraph the work plan stated that “The water samples were collected as part of the McGahan Water System investigation. They were actually collected as part of the Arness Septic Site Investigation.

Page six at the bottom of the page lists 1,1,2-TCA as a contaminate of concern. ADEC could only identify 1,1,1-TCA. Please verify and correct.

SB-17 had soil sample results which were above migration to groundwater levels for TCE. This boring is closest to the high school drinking water well. The contaminants appear to be separate from other source areas that have been identified. A source has not been identified and is considered to be a data gap. Contaminants are present in the first shallow samples collected in the boring implying a possible surface or shallow source area.

Page 8 states that “TCE was the only analyte detected at a concentration that exceeded a groundwater risk-based level with the only location of the exceedance being MW-01.” The former water well also exceeded the GW cleanup levels at a deeper level of the aquifer. Soil samples collected from the soil water interface suggest that the area of TCE impact above groundwater cleanup levels is greater than what is represented by water samples from MW-1.

ADEC disagrees with the implication drawn from the page 9 Mann-Kendall analysis for groundwater concentrations in monitoring wells MW-1 and MW-2. Chlorinated solvents do not

degrade in a short time frame. This could be a sampling or lab error or hydrologic condition, or the result of flushing from the new clean water source, which might imply that the source of this impact is the septic system, and the result of discharge from the former on-site water well that was contaminated with TCE. ADEC recommends resampling MW-1 to determine if the trend is continuing. If you want to demonstrate degradation, sample for the degradation pathways and present data that confirms that the daughter products of TCE degradation are present in relevant ratios. Please update the work plan to measure the biological degradation of TCE away from known areas of contamination and demonstrate the degradation process.

ADEC disagrees with the conceptual site model source area, and notes that releases may have occurred at more than two locations. Chlorinated solvents were found in shallow soils, (SB-11, SB-12, SB-17, and SB-18). Please review soil boring logs and data and re-evaluate source area data gaps. There may be an error in assumptions on how contaminants (TCE in particular) were released. There is the possibility of contamination from surface releases in some areas. No shallow soil samples (surficial) were collected from these borings to determine if there has been a surface release. Detections at 15 feet BGL may have originated from nearby surface releases. It is unlikely that contamination at 15' BGL is caused by capillary fringe action and condensation from the water table at 40 feet BGL as we do not observe this in other areas that are also impacted at the water table. Section 4.2 HRC Results, Page 14 - 3rd bullet: The text states that equipment yard surface soils are generally not contaminated, however ADEC notes that there has been no surface soil sampling to eliminate this exposure route. Please add surface soil sampling to this work plan, particularly in the areas surrounding SB-11, SB-12, SB-17 and SB-18.

Section 4.2 HRC Results, Page 12, 1st sentence states that indoor air pathway is incomplete. Indoor air has not been sampled. ADEC will require indoor air sampling to close this pathway. See the ADEC guidance document for indoor air sampling. Air sampling can occur as part of this work plan, or a separate work plan. The primary concern is the source of impacts to the former water well that could contribute to indoor air contamination.

Page 15, 1st bullet: "Drinking water wells are completed in the confined aquifer. This is true for many of the wells in the area" Please verify that the water supply wells for the Nikiska water system, which are the closest wells to the site, are completed below the confined aquifer. We have provided well logs and cross sections from the Nikiska well investigation. (See Attachments)

Page 16 top of page. Groundwater has not been analyzed for GRO, DRO, RRO, PAH, or SVOCs. ADEC will require that these compounds be sampled in monitoring wells as they are contaminants of concern. Eliminating from sampling based on solubility, attenuation and dilution is not acceptable. Please update the work plan to include this sampling and analysis.

Which two wells will have slug tests? When will the slug tests be conducted in relation to water sampling?

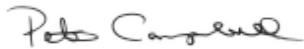
Comments on the proposed soil gas samples in the leach field. Drill one boring to the water table and set a well to measure potential groundwater impacts. If impacts are present in the groundwater, please investigate the vertical extent of groundwater contamination.

ANSI/AWWA Standard A100-97 referred to in our monitoring well guidance, requires that borings be sealed with grout, not with native materials. Cuttings will be containerized, tested and disposed of appropriately. Please update the work plan accordingly.

Water samples typically should not be filtered prior to analysis. If filtering is approved by CSP in a site-specific work plan, both filtered and non-filtered samples will need to be collected and analyzed so the effects (bias) of the filtering process on the contaminant concentrations can be evaluated. Please update the work plan accordingly.

Please submit a revised work plan to ADEC for review and approval. If you have questions about this letter, or any other aspect of this project, please contact me at (907) 262-3412, or by e-mail at peter.campbell@alaska.gov

Sincerely,

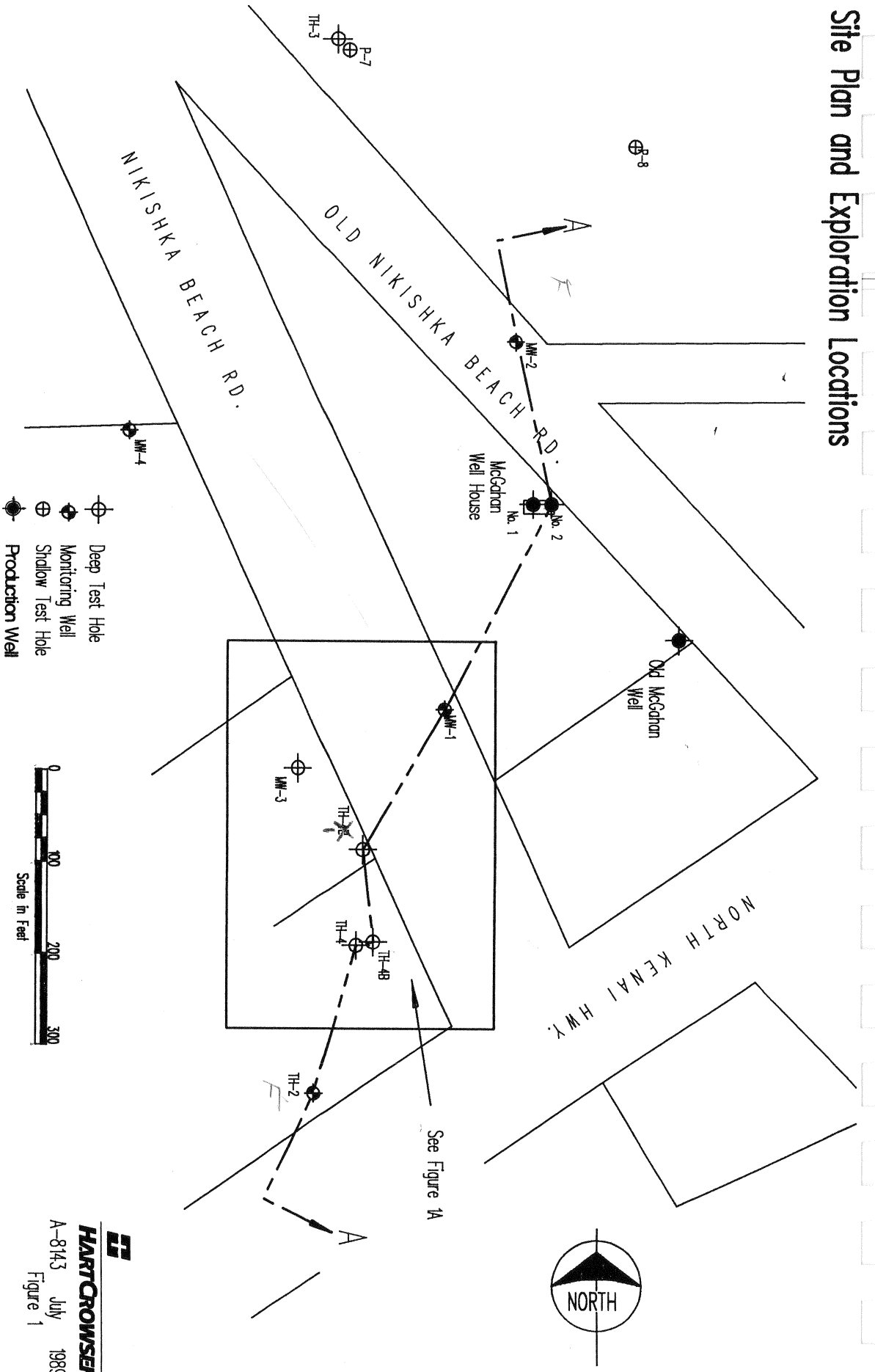


Peter Campbell
Environmental Program Specialist

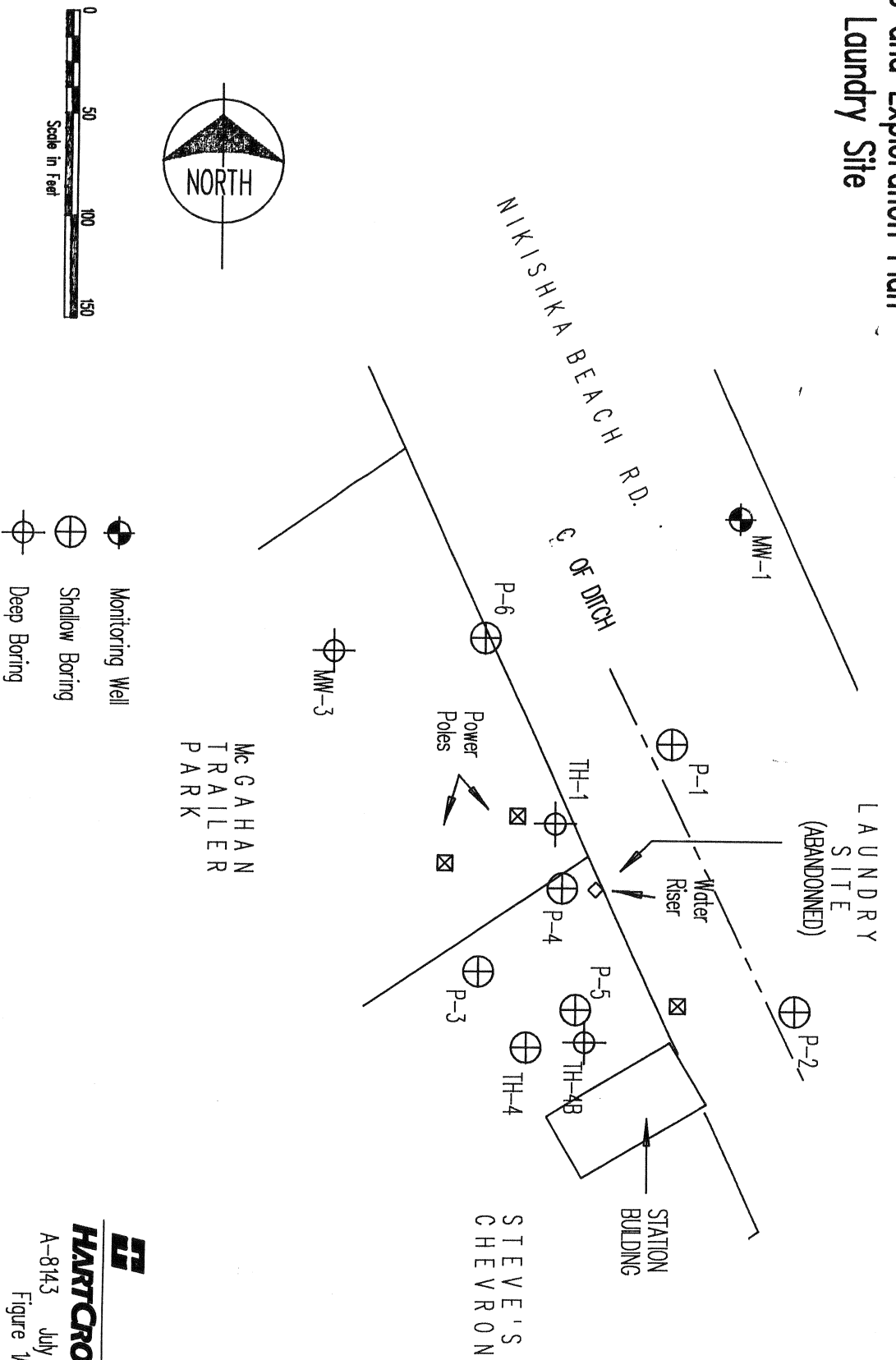
Cc: by e-mail Dan Frank, dnaENVIRONMENTAL, LLC.

Attachments: Site Plan and Drilling Locations – Nikiska Bay
Boring Logs

Site Plan and Exploration Locations



Site and Exploration Plan Old Laundry Site



WATER TABLE ELEVATION ON 3/20/89 * * Non-pumping Cycle

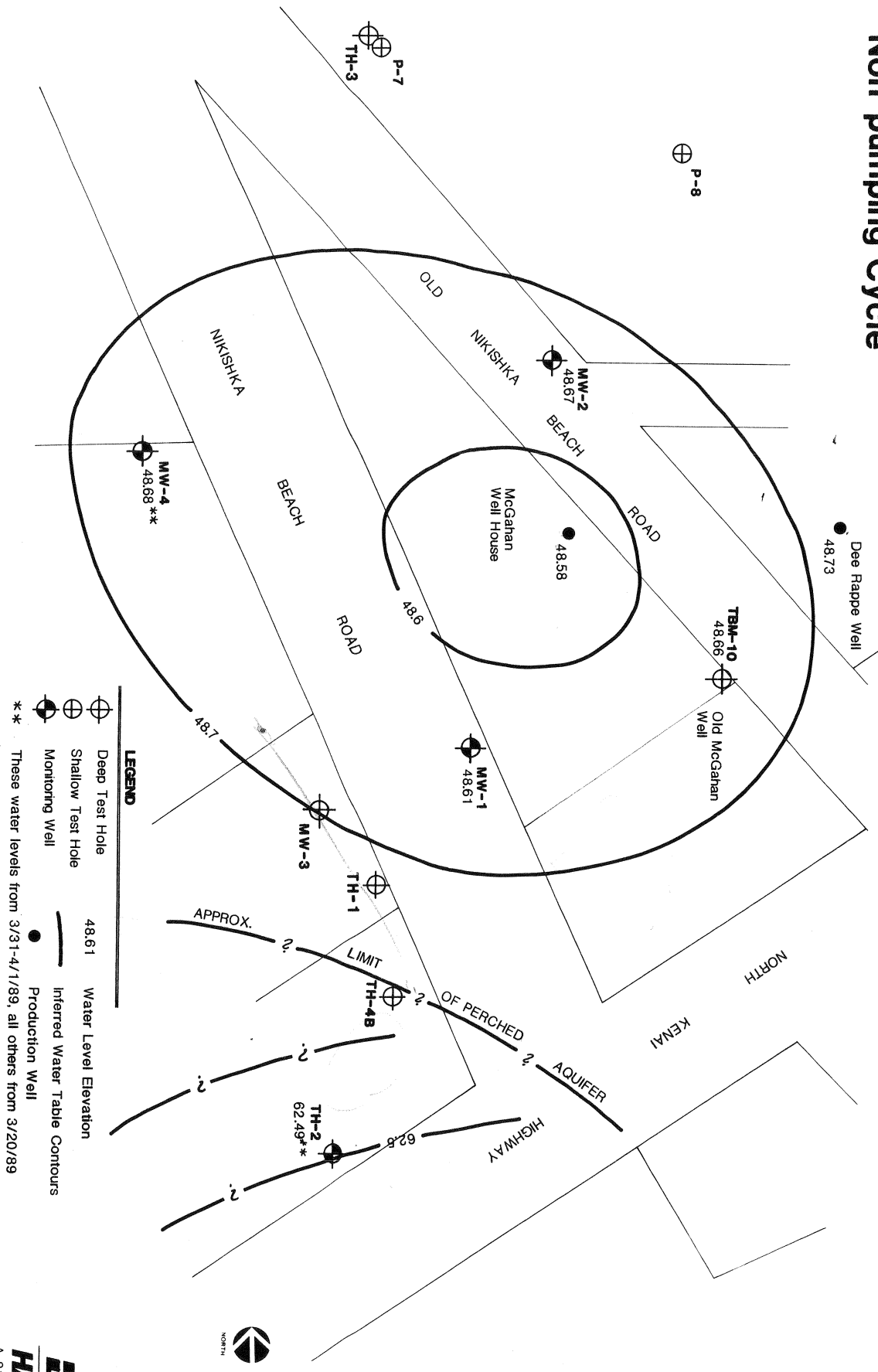


Figure 2

HEADSPACE PCE CONTOURS (5 foot depth)

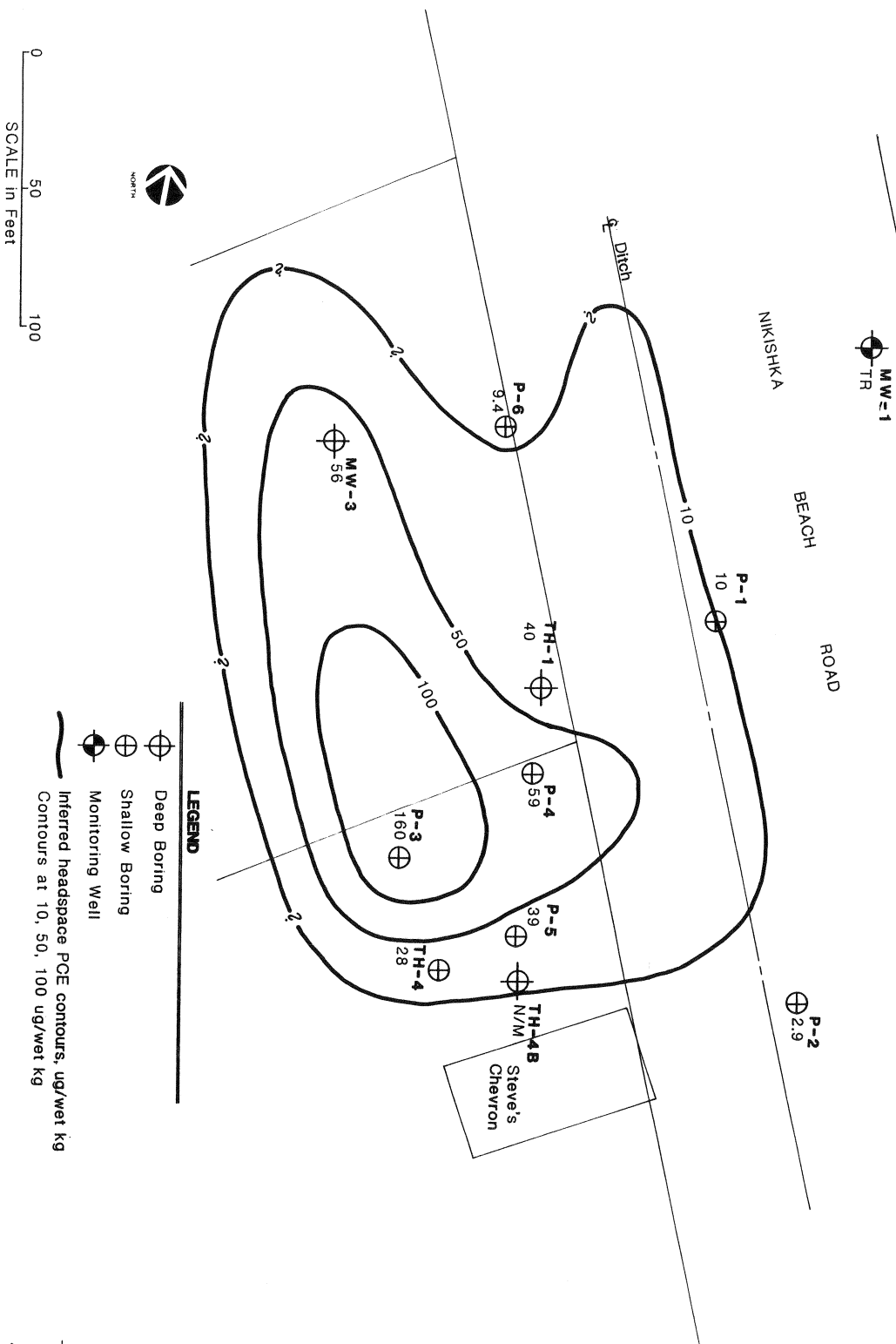
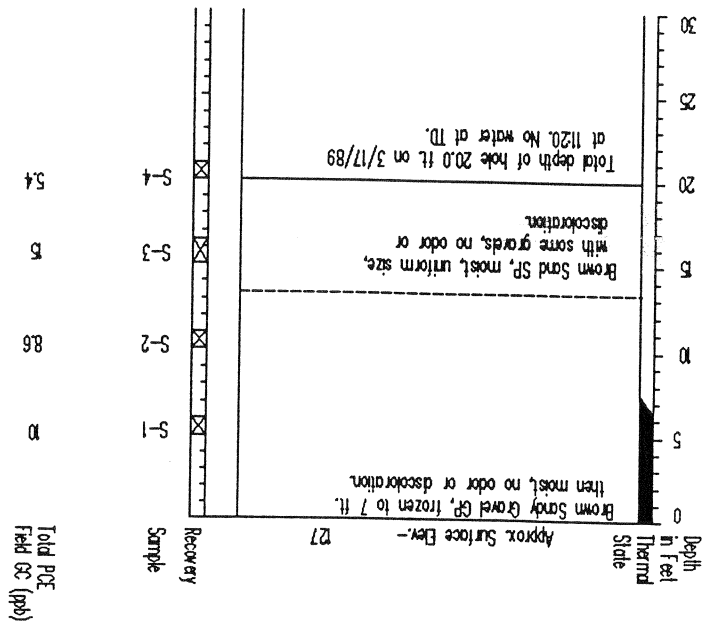
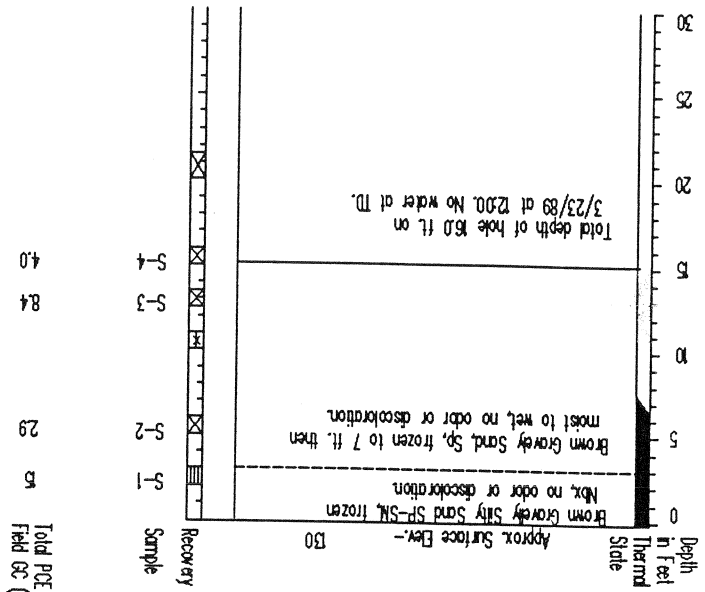


Figure 4

Boring Log P-1

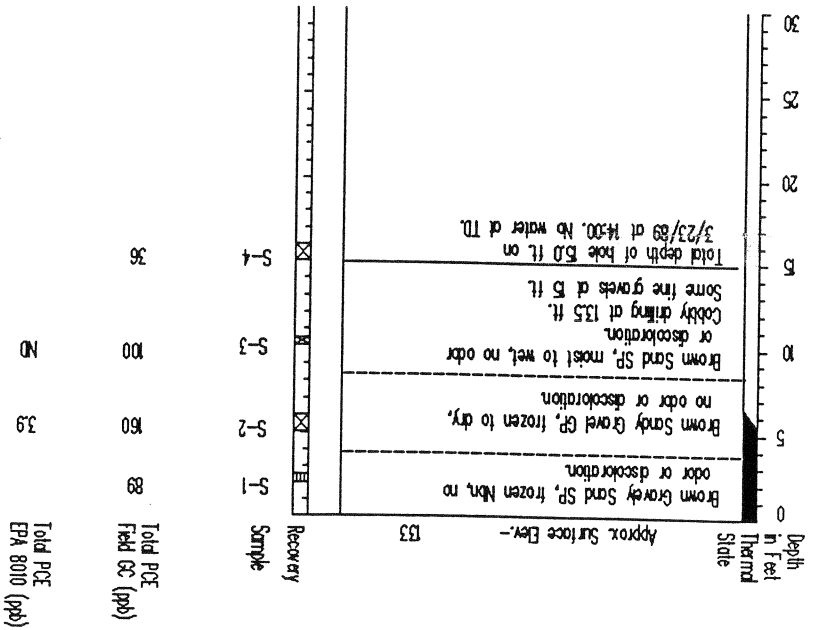


Boring Log P-2

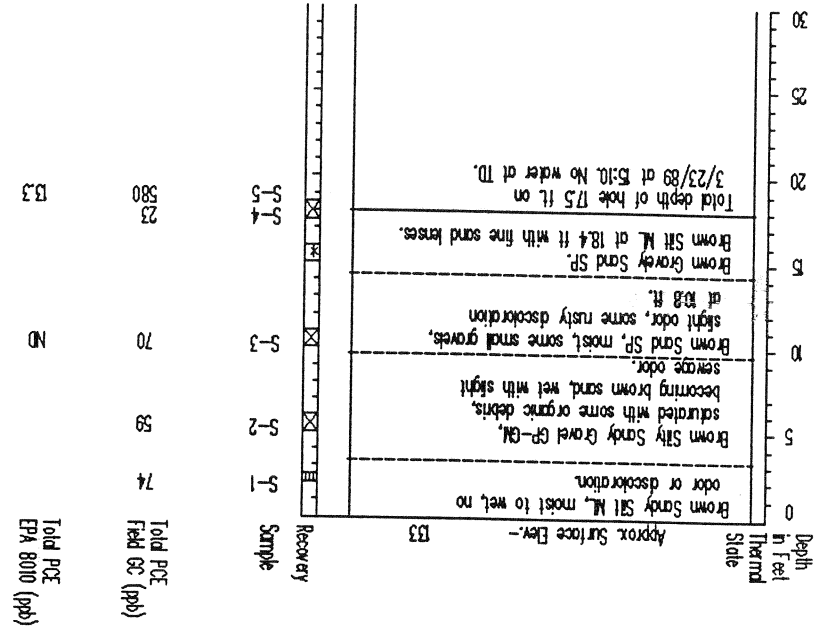


NOTES:
 1 Soil descriptions are interpretive and could change may be gradual.
 2 Water level is for date indicated and may vary with time of year. (ATD - At Time of Drilling)

Boring Log P-3

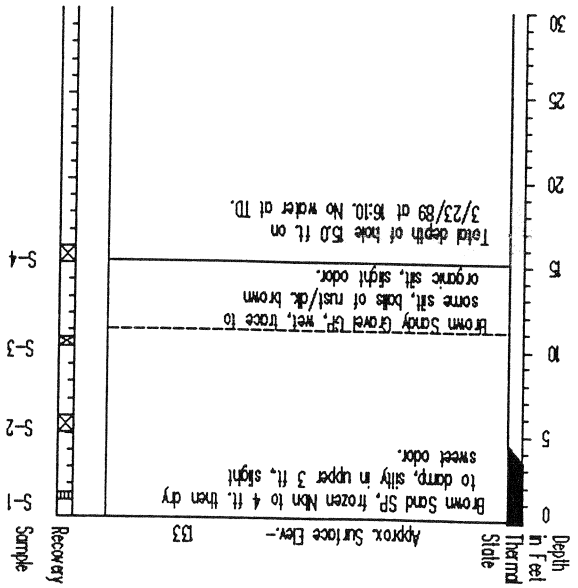


Boring Log P-4



- NOTES:
- 1 Soil descriptions are interpretive and actual changes may be made.
 - 2 Water level is far date indicated and may vary with time of year. (ATD) - At time of Drilling

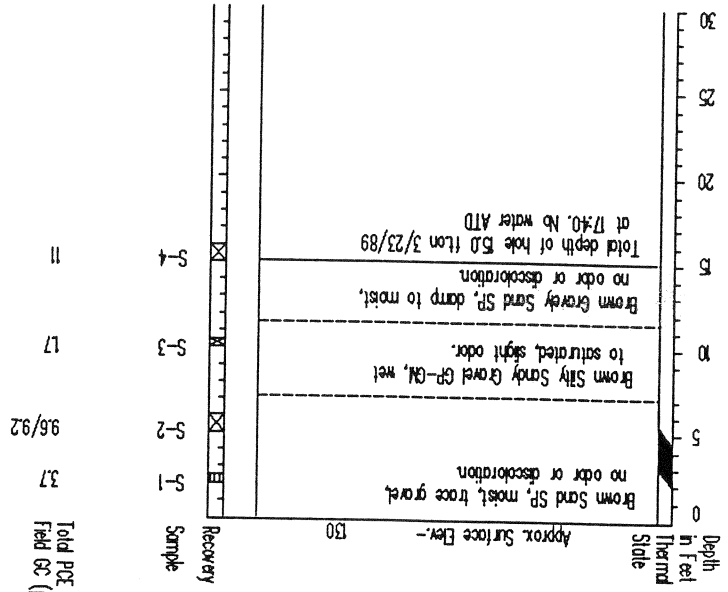
Boring Log P-5



Total PCB Field GC (ppb) 130

Total PCB EPA 8010 (ppb) ND

Boring Log P-6



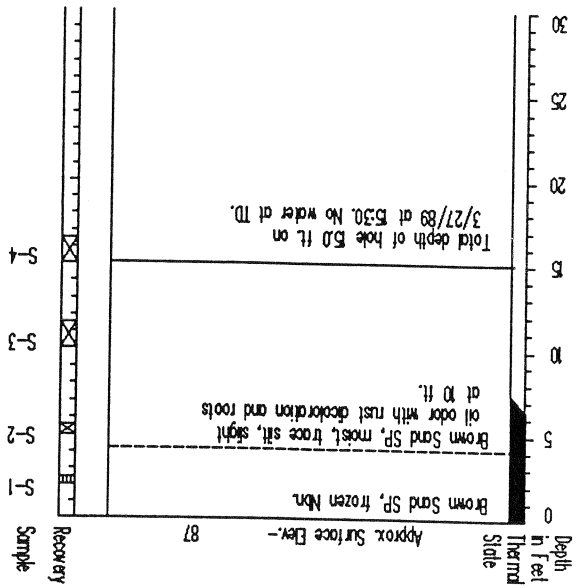
Total PCB Field GC (ppb) 96/92

Total PCB EPA 8010 (ppb) 3.7

NOTES:

- Soil descriptions are interpretive and actual changes may be gradual.
- Water level is for date indicated and may vary with time of year. (ATD - At Time of Drilling)

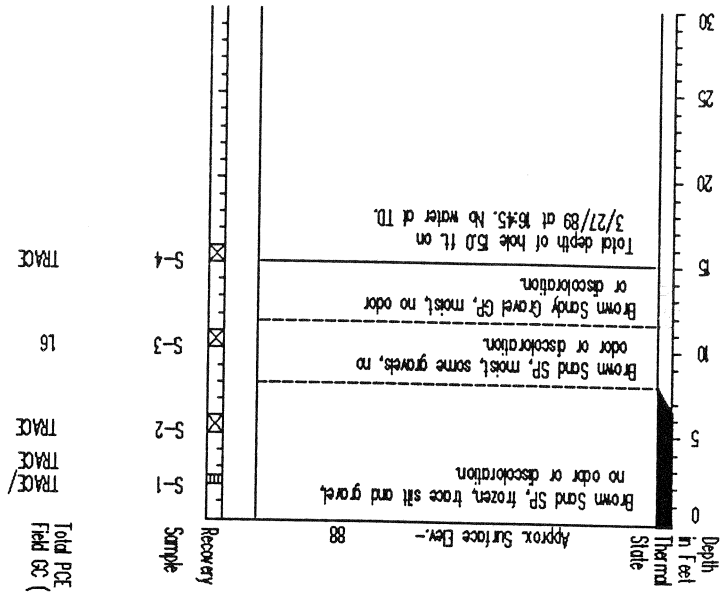
Boring Log P-7



Total PCE
Field GC (ppb) NO

Total PCE
EPA 8010 (ppb) NO

Boring Log P-8



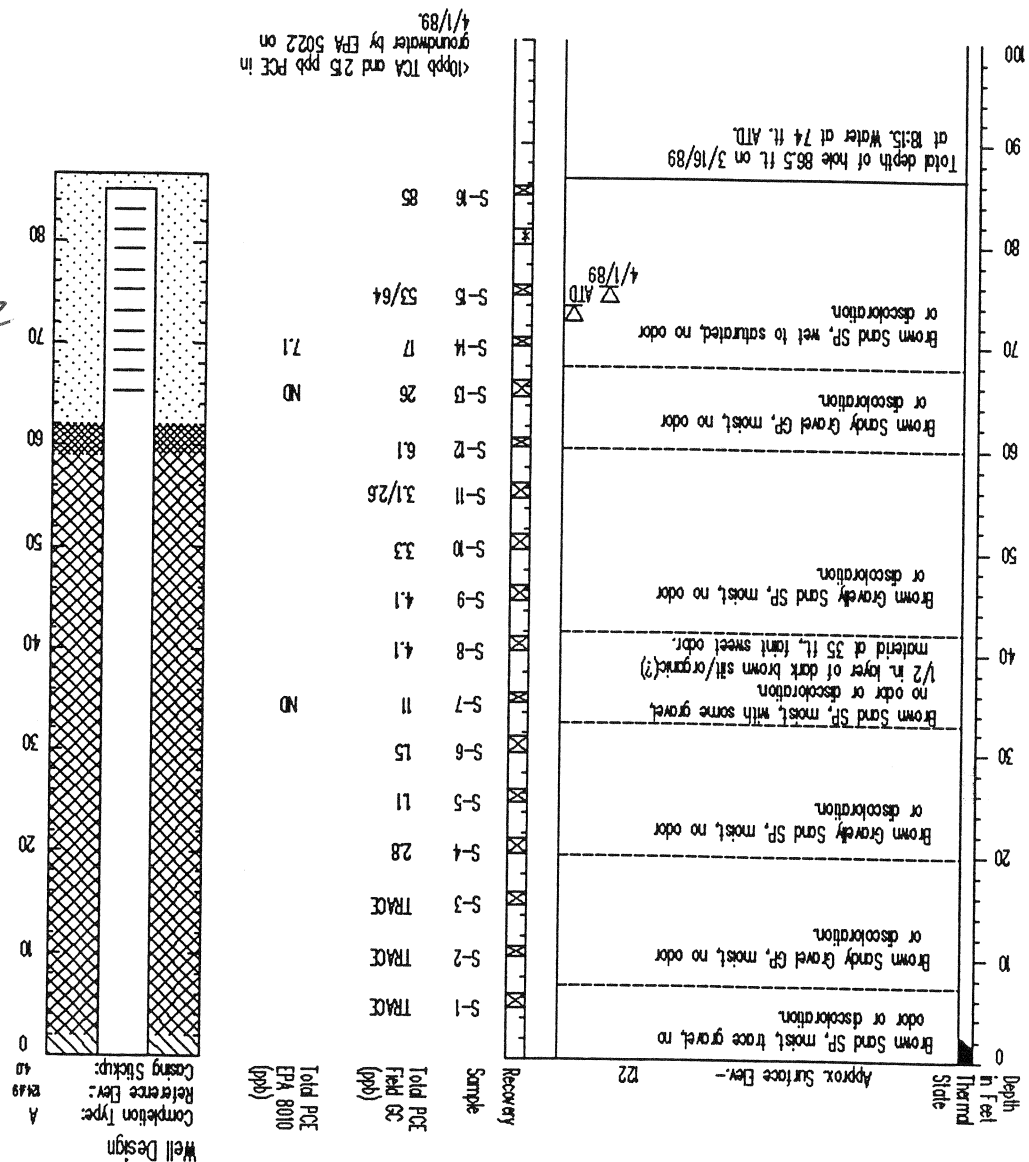
Total PCE
Field GC (ppb) NO

Total PCE
EPA 8010 (ppb) NO

NOTES:

- 1 Soil descriptions are representative and actual changes may be gradual.
- 2 Water level is for date indicated and may vary with time of year. (ATD - At Time of Drilling)

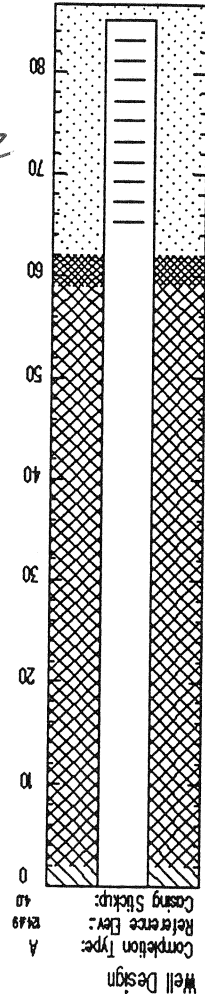
Boring Log and Construction Data for Well MW-1



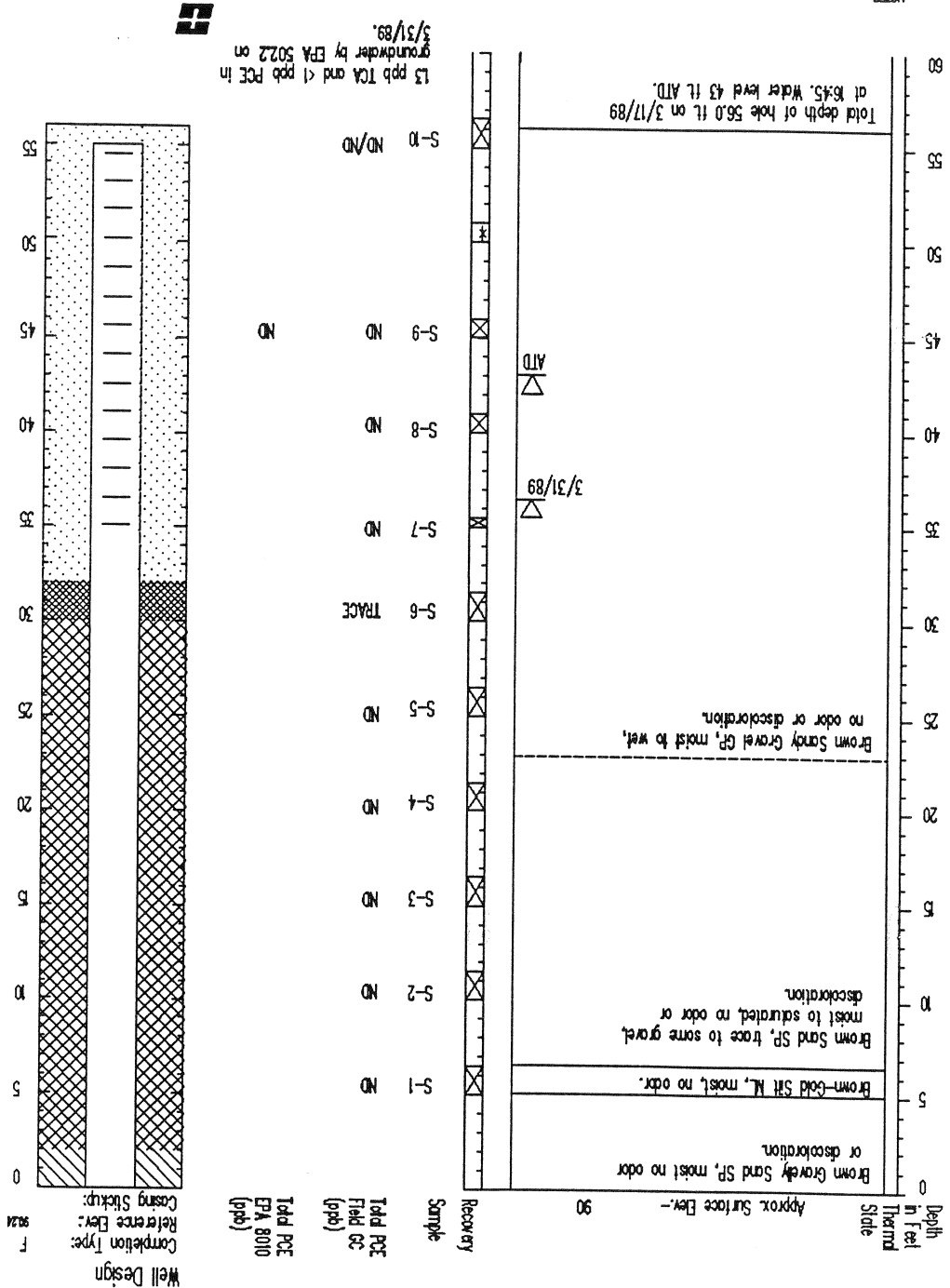
HARTCROWSER
A-8143 July 1989
Figure A-6

- NOTES:
- Soil descriptions are interpretive and actual changes may be gradual.
 - Water level is for date indicated and may vary with time of year. (ATD - At Time of Drilling)

20' SS Screen



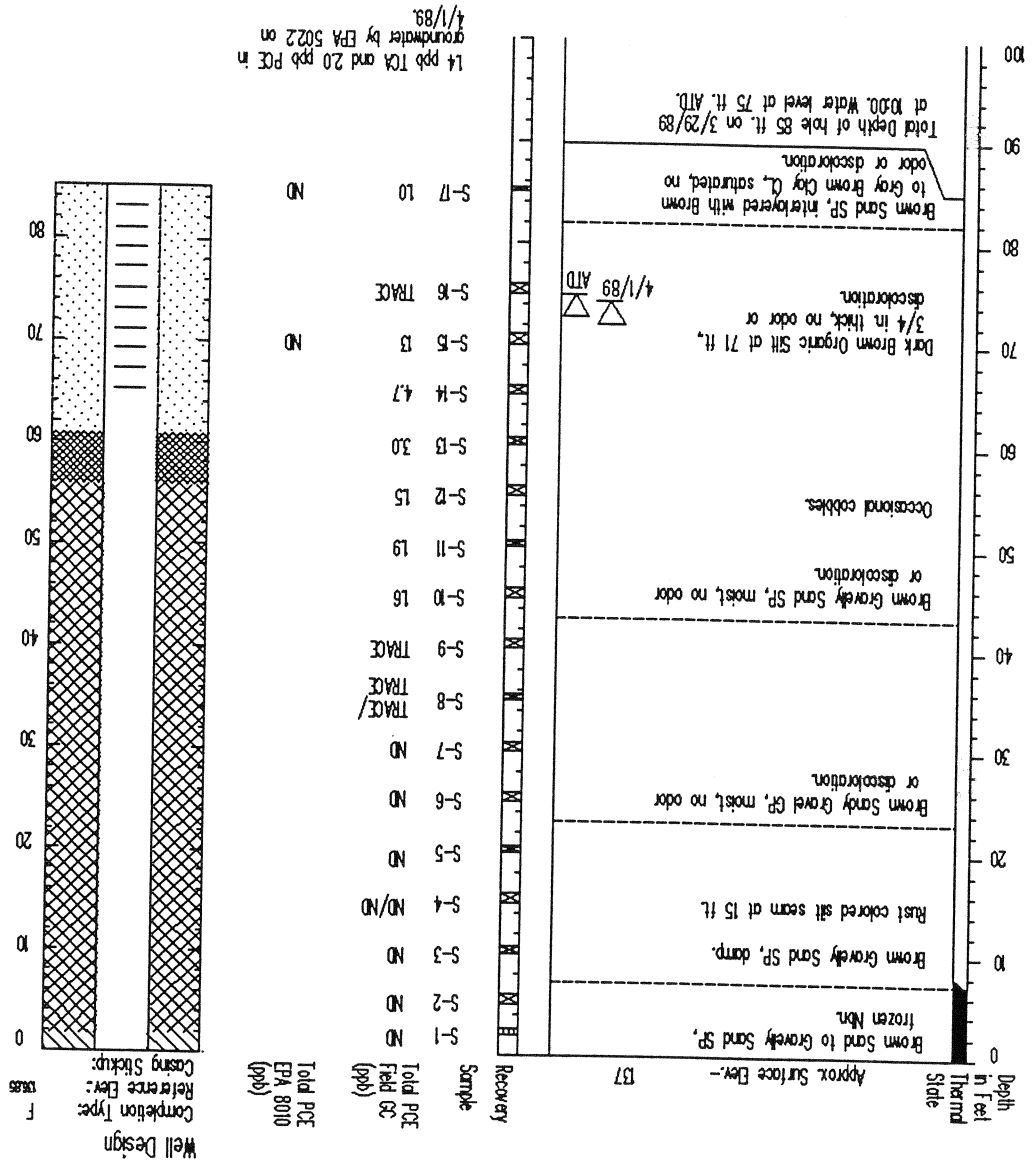
Boring Log and Construction Data for Well MW-2



13 ppb TCA and <1 ppb PCE in groundwater by EPA 5022 on 3/31/89.

HARTCROWSER
 A-8143 July 1989
 Figure A7

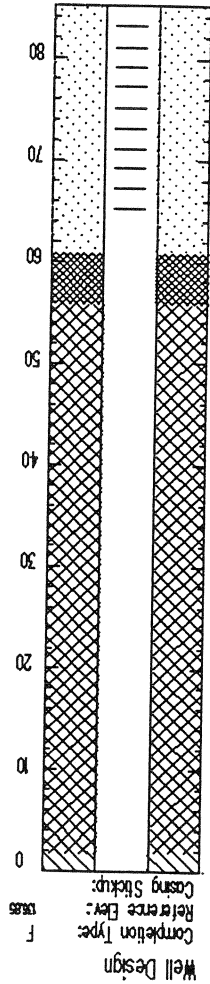
Boring Log and Construction Data for Well TH-2



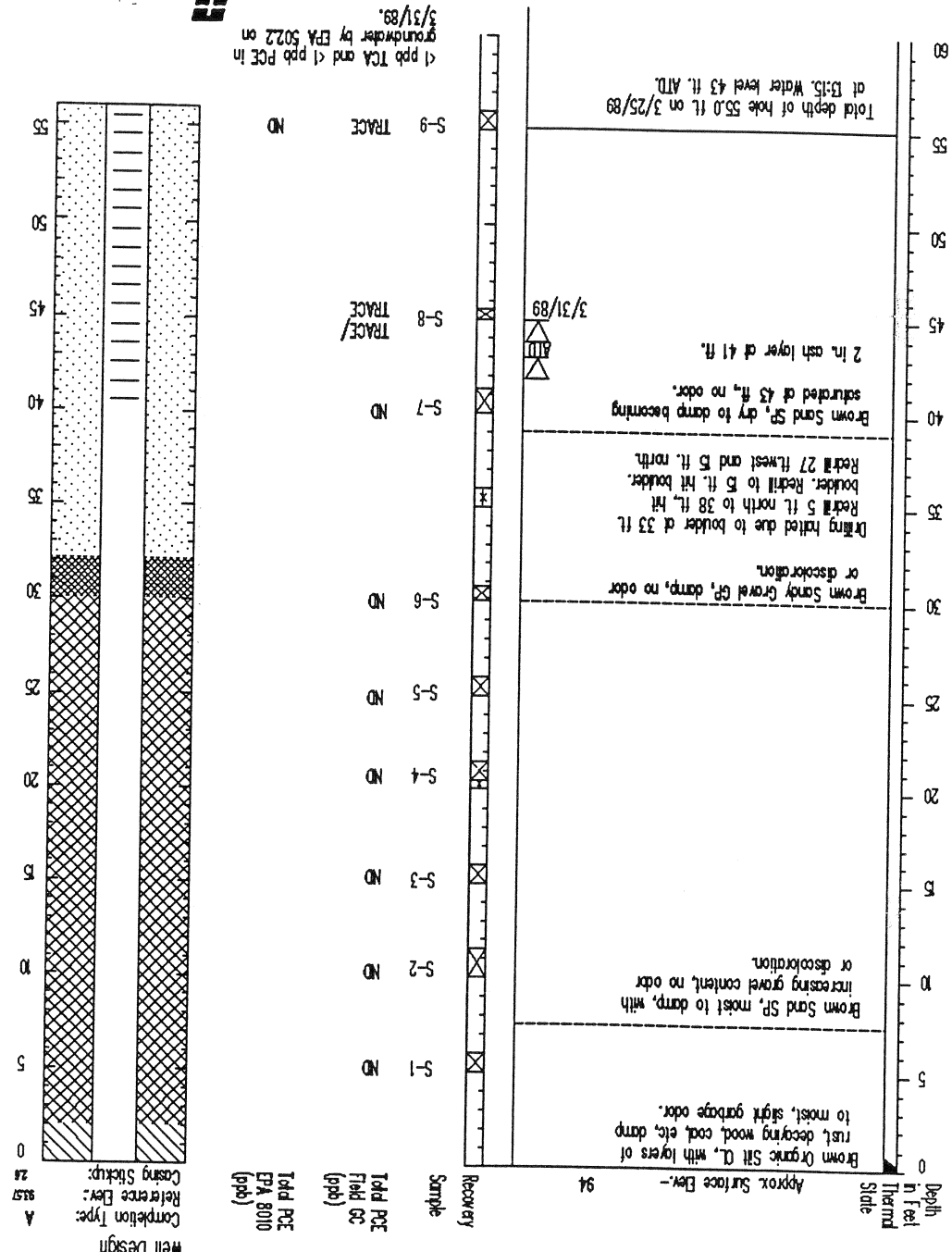
A-8143 July 1989
Figure A-8

NOTES:
1. Soil descriptions are interpretive and actual changes may be gradual.
2. Water level is for date indicated and may vary with time of year. (ATD) - At time of Drilling

14 ppb TCA and 20 ppb PCE in groundwater by EPA 502.2 on 4/1/89.



Boring Log and Construction Data for Well MW-4

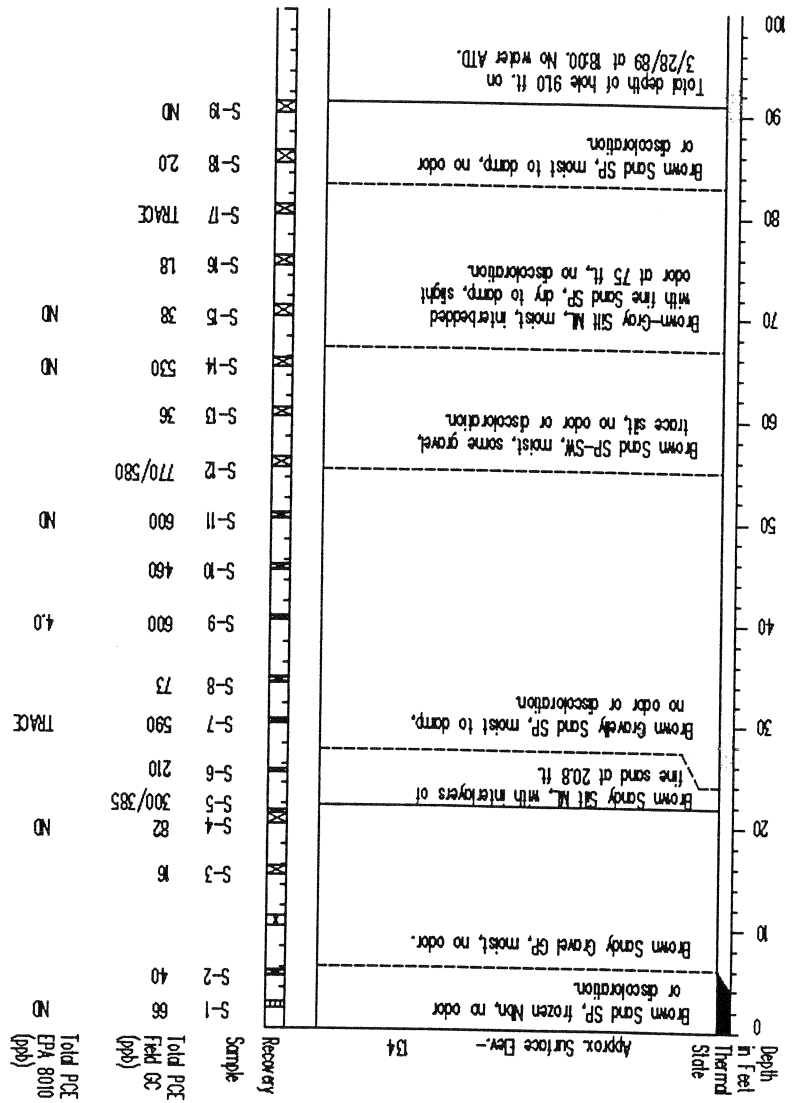


HARTCROWSER
 A-8143 July 1989
 Figure A-9

< 1 ppb TCA and < 1 ppb PCE in groundwater by EPA 502.2 on 5/31/89.

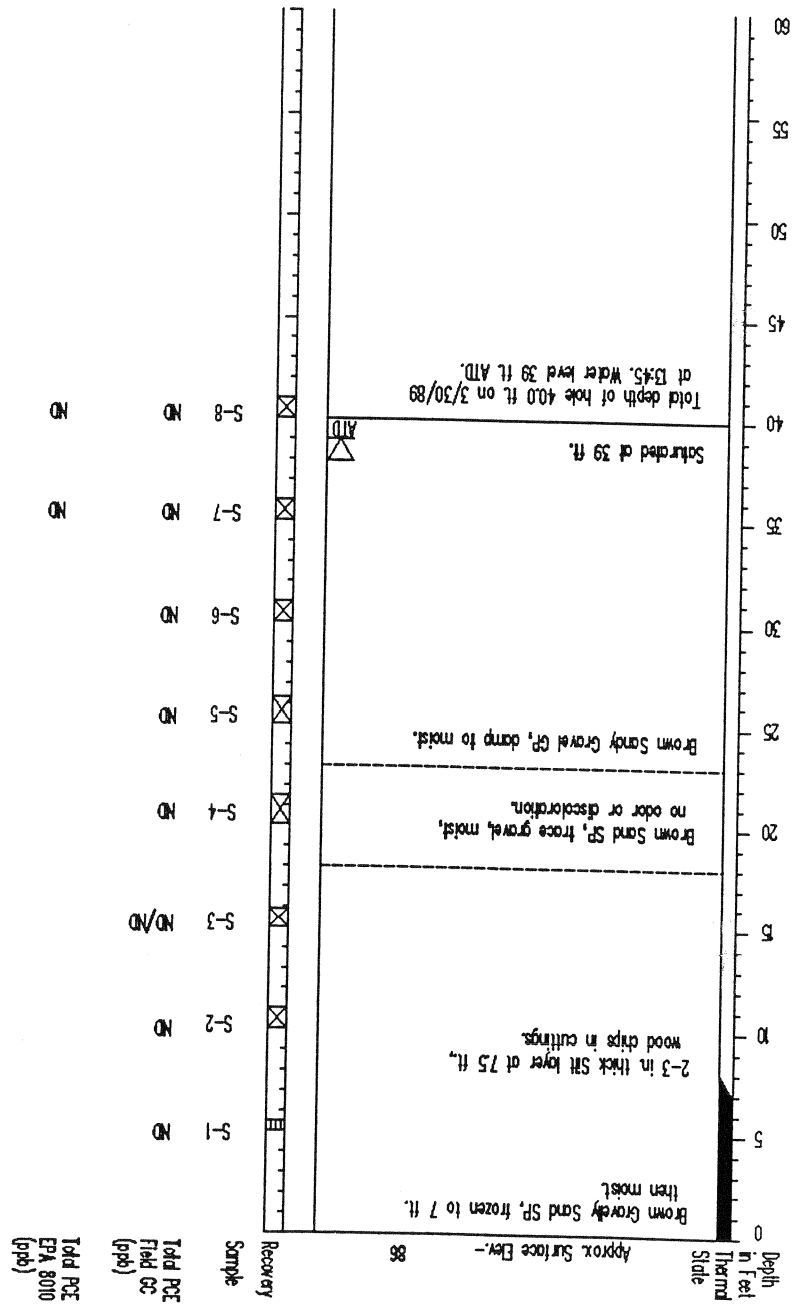
NOTES:
 1. Soil descriptions are representative and actual changes may be gradual.
 2. Water level is for date indicated and may vary with time of year. (AITD - At Time of Drilling)

Boring Log TH-1



- NOTES:
- Soil descriptions are interpretive and actual changes may be made.
 - Water level is for date indicated and may vary with time of year. (ATT - At Time of Drilling)

Boring Log TH-3



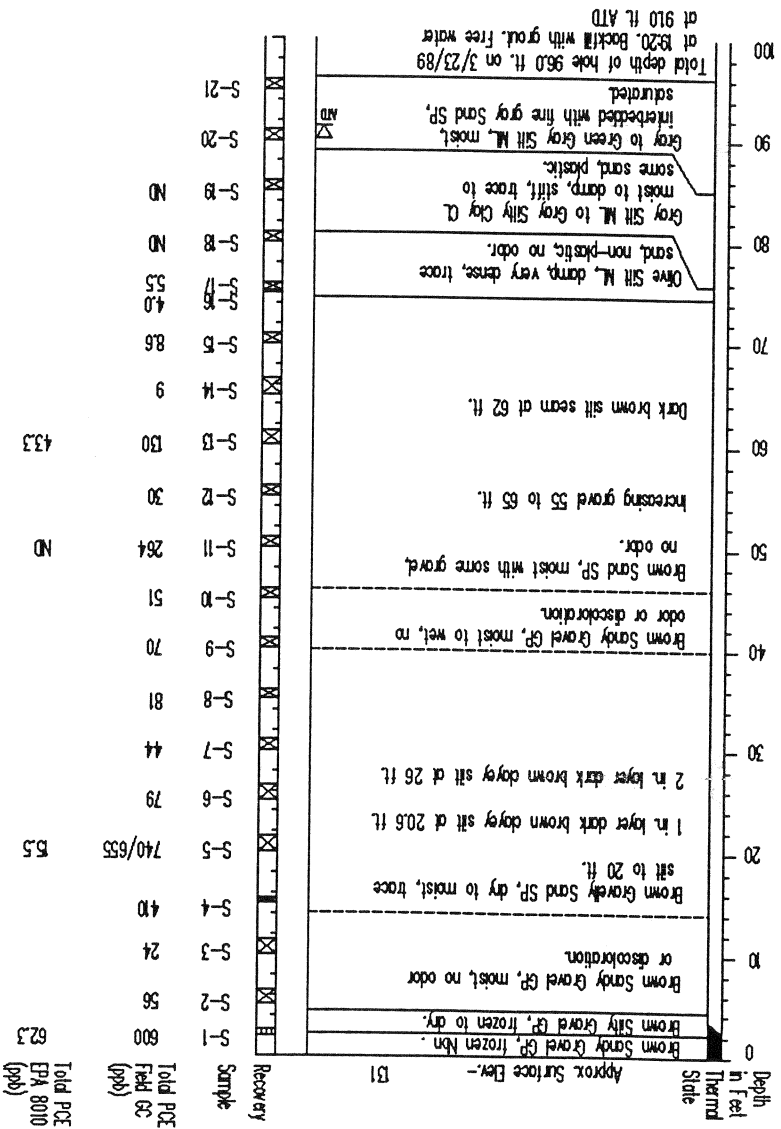
- NOTES:
- Soil descriptions are interpretive and actual changes may be made.
 - Water level is for date indicated and may vary with time of year. (ATD - At Time of Drilling)

HARTBROWSER
 A-8143 July 1989
 Figure A-II

Total PCE
 EPA 8010
 (ppb)

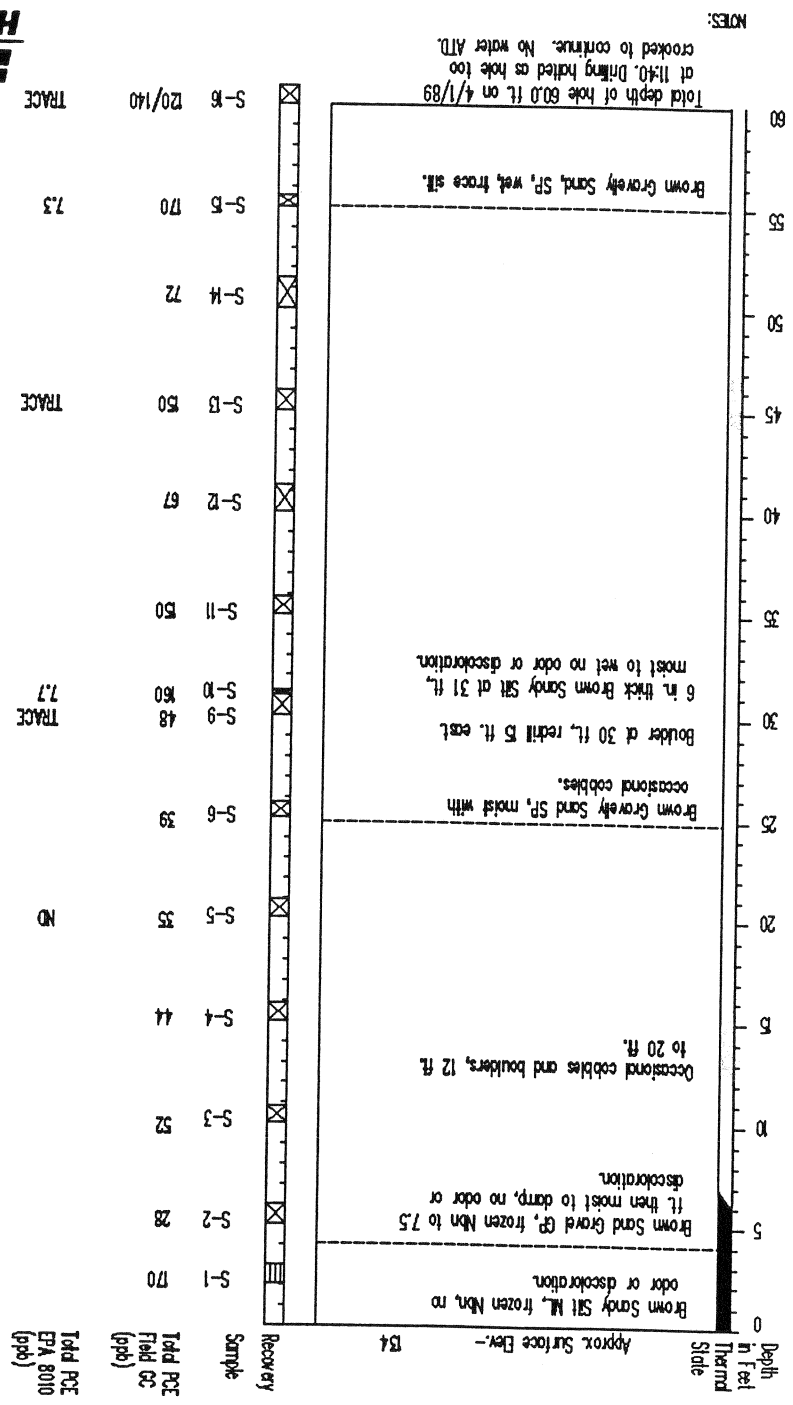
Total PCE
 Field GC
 (ppb)

Boring Log MW-3



NOTES:
 1 Soil descriptions are interpretive and actual changes may be gradual.
 2 Water level is for date indicated and may vary with time of year. (ATD - At Time of Drilling)

Boring Log TH-4



NOTES:
 1. Soil descriptions are interpretive and actual changes may be gradual.
 2. Water level is for date indicated and may vary with time of year. (ATD - At Time of Drilling)
 Total depth of hole 60.0 ft on 4/1/89 at 11:40. Drilling halted as hole too crooked to continue. No water ATD.

HARTCROWSER
 A-8143 July 1989
 Figure A-13