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AGGRESSIVE FLUID VAPOR RECOVERY ANALYSIS AT SELECT SITES MCAS CHERRY POINT NC

3/23/1999

OHM REMEDIATION SERVICES CORP.

AGGRESSIVE FLUID – VAPOR RECOVERY ANALYSIS
SELECT SITES, MARINE CORPS AIR STATION
CHERRY POINT, NORTH CAROLINA

Prepared for:

DEPARTMENT OF THE NAVY
Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street
Norfolk, Virginia 23511-2644
Contract No. N62470-97-D-5000

Prepared by:

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Senior Project Manager

for John P. Franz, P.E
Program Manager

March 23, 1999
OHM Project 777960

OHM Remediation Services Corp.
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1.0 INTRODUCTION

The purpose of this report is to present evaluations of individual remedial sites at Marine Corps Air Station (MCAS) Cherry Point, North Carolina currently being remediated under an Aggressive Fluid Vapor Recovery (AFVR) regime and determine the viability of continuing that remedial activity or not.

Aggressive Fluid –Vapor Recovery (AFVR) is a technology that is used for quick recovery of free product or liquid phase petroleum hydrocarbons (LPH). AFVR uses a vacuum to recover both fluids (groundwater/LPH) and vapor phase hydrocarbons from existing monitoring wells at a given site. The primary goal of AFVR is to rapidly remove LPH from the groundwater and capillary fringe in a short period of time. There are five sites at MCAS Cherry Point that have utilized AFVR to work on remediaton of LPH at these sites. During the last two years (1997-1998) AFVR has been employed with some success.

As a result of the expeditures of conducting AFVRs and the length of time that has transpired during the course of implementing AFVRs it has been determined that the process be evaluated. To evaluate the situation at Cherry Point a problem statement was developed and an evaluation performed to resolve the problem statement. This report presents the basis of development of the problem statement and a data evaluation and analysis to resolve the problem statement.

In the development of the analysis of the situation at Cherry Point the following Problem Statement was developed:

> At Marine Corps Air Station (MCAS) Cherry Point, North Carolina there are several sites that have employed AFVR technology during the last few years. Upon review of the data from these sites there is a sufficient quantity of data available to perform a comparison analysis of AFVR activity versus hydrogeologic conditions and relative mass of contaminant removal. Subsequently an evaluation of the AFVR technology can be made assessing the effectiveness of the technology and to weigh the analysis against different technologies that may be applicable.
>
> During the course of application of Aggressive Fluid and Vapor Recovery (AFVR) over time, an operational effectiveness evaluation has not been performed on this method of remedial activity. In order to evaluate the effectiveness and beneficial results of application of AFVR an analysis of hydrogeologic conditions over time should be performed and compared against results of removal of mass of contaminant by the AFVR.
>
> At this juncture in the evolution of the subject sites it is appropriate that this evaluation be performed. The results of the evaluation may or may not be conclusive, however, they are designed with the goal:

That further remedial activity at these sites be reduced to no further action, or minimal activity with greater remedial success at less cost or provide a recommendation directing a change in remedial technology that provides greater value.

This report is designed to resolve the Problem Statement by presenting alternatives to the current situation based upon the evaluation of the existing data for the sites. This report is organized to present each site, introduce a brief background, summarize remedial activities and analyze site data to determine a better course of remedial action. In the course of the analyses there may be some instances where a more viable course of remedial action may not exist than that being currently performed.

Section 2.0 of the report presents the background information for the sites. Section 3.0 presents the site analysis, Section 4.0 derives and presents the conclusions, where Section 5.0 provides potential recommendations as appropriate.

2.0 BACKGROUND

At MCAS Cherry Point there are several sites that currently undergo AFVR remedial activity on a periodic basis. These sites are:

- Bldg. 1640
- Bldg.296
- Bldg. 486
- Tank Farm D
- Atlantic 7012

Each of these sites throughout their remedial history have exhibited separate liquid phase hydrocarbons (LPH) floating on the groundwater table in monitoring wells. As an alternative to implementing full scale remedial systems at each of the sites AFVR has been employed to reduce the mass of LPH.

Under the North Carolina regulations, a site impacted by petroleum hydrocarbons that exhibits LPH has to implement a remedial strategy that removes the LPH to a minimum thickness of 1/8 inch on groundwater (0.01ft). For the sites evaluated under this report each site in its history has had or continues to have the existence of LPH greater than 0.01 ft thick in a monitoring well. This fact is one of the historical basis by which a determination was made to employ AFVR at the sites.

The rational for employing AFVR at these sites historically has been in accordance with North Carolina regulatory acceptance of the technology. The regulatory recognized / endorsed activity of AFVR being an economical remedial action for removal of LPH is described in the regulations. (Section 16.1, Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater March 1997, State of North Carolina, Department of Environment, Health, and Natural Resources, Division of Water Quality, Groundwater Section).

The following subsections present each site and provide a brief background description of monitoring and a summary of AFVR activity in 1997. The data for 1998 is calculated differently and the net results for all of the sites is that AFVR recovers less hydrocarbons based on the 1998 approved calculation methods. Appendix H contains the 1998 AFVR recovery data and graphs.

2.1 Building 1640

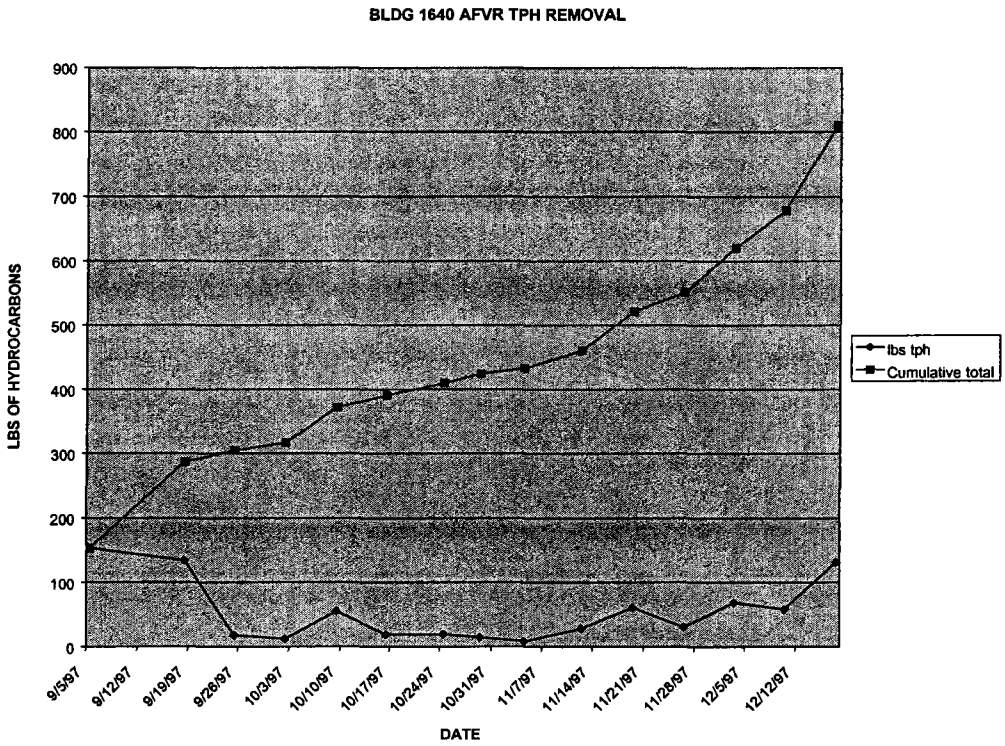
Building 1640 initially underwent AFVR activity in September 1997. There are eight monitoring wells that are gauged each time at Building 1640. AFVRs have been conducted 19 times between September 5, 1997 and April 4, 1998. Of the eight monitoring wells five were regularly used for performance of an AFVR event. The five wells were: 59GW01, 59GW02, 59GW03, 59PR25, and 59PR26. A 20th AFVR event was performed on October 10, 1998 in two monitoring wells (59GW01, 59GW02) at the site. A product only recovery system was installed in monitoring wells 59GW03 and 59PR26 on September 18, 1998. No AFVR events have been performed at Building 1640 since October 10, 1998. In the course of operations of the portable product only recovery systems limited success has been achieved in total product recovered.

During the AFVR events field monitoring data is collected and analyzed to determine the volume of mass removed during each AFVR event. From 15 AFVR events for Building 1640 the following mass removal data was calculated.

Building 1640 AFVR events performance summary:
15 Events 1997

Date	Total Pounds of Hydrocarbons Recovered
9/5/97	153.2
9/18/97	133.8
9/25/97	17.7
10/2/97	12
10/9/97	55
10/16/97	19
10/24/97	19
10/29/97	14.7
11/4/97	8.3
11/12/97	27.8
11/19/97	60.6
11/26/97	30.4
12/3/97	68.6
12/10/97	58.1
12/17/97	131.5

On average over the 15 AFVR events conducted at Building 1640 in 1997 over 50 pounds of total hydrocarbons were removed each event. During peak recovery events over 100 pounds total hydrocarbons were removed.



Summary Data for Building 1640:

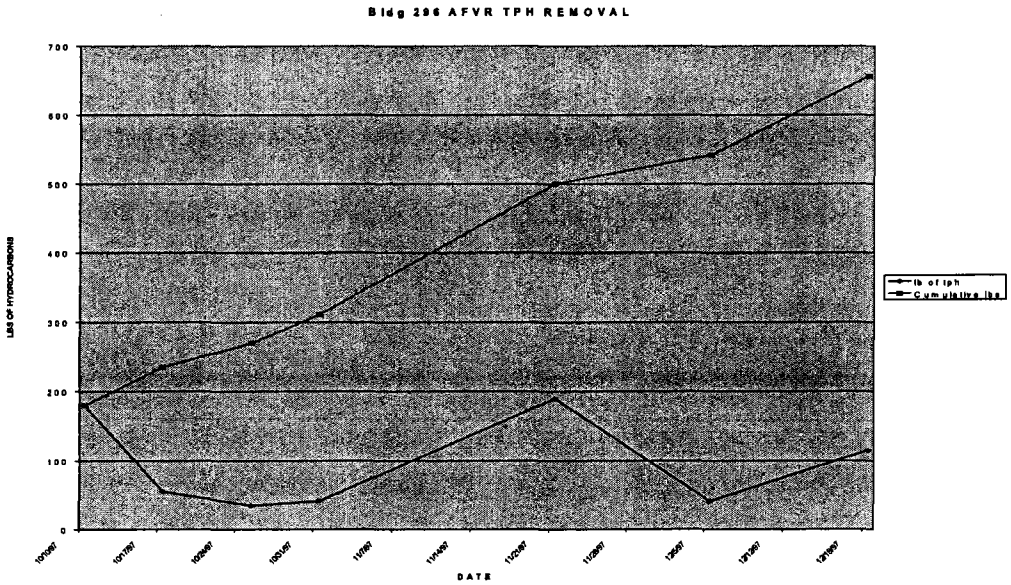
LPH type	Diesel
No. of Wells. (typ. Monitored)	8
No. of Wells with LPH	4
Range of LPH Thickness (in ft.)	3.0 – 0.50 ft
Average Depth to water (in ft. bgs)	6.5 – 11.5 ft
Range of Water Table Fluctuation (ft.)	1.5 - 2.5 ft

2.2 Building 296

Building 296 has been consistently been monitored by OHM since October 1997. Of the seven monitoring wells: 65GW04, 65GW05, 65GW06, 65GW22, 65GW23, 65GW25, and 65GW32, monitoring wells 65GW04, 65GW05 and 65GW06 have exhibited Liquid Phase Hydrocarbons on a regular basis. AFVR events were performed at Building 296 seven times during 1997. The following Table and Graph depict the AFVR events and total amount in pounds of hydrocarbons removed at Building 296.

Building 296
AFVR Performance Summary

UST 296 Date of AFVR	Total Pounds Hydrocarbons Removed
10/10/97	179.8
10/17/97	55.1
10/25/97	34.8
10/31/97	41.1
11/21/97	189.2
12/5/97	41.4
12/19/97	114.4



On average during each AFVR event at Building 296 over 90 pounds of hydrocarbons are removed.

Summary Data for Building 296:

LPH type	Diesel
No. of Wells. (typ. Monitored)	7
No. of Wells with LPH	3
Range of LPH Thickness (in ft.)	1.46 – 0.01ft
Average Depth to water (in ft. bgs)	11.52 ft
Range of Water Table Fluctuation (ft.)	2.03 ft

2.3 Building 486

At Building 486 there are a total of ten monitoring wells which are regular gauged for depth to water and depth to product. The ten monitoring wells gauged: 57GW01, 57GW02, 57GW03, 57GW08, 57GW11, 57GW12, 57 GW13, 57GW14, OHM 1 and OHM 2. Of the ten monitoring wells gauged at Building 486 wells 57GW03 (one time) and 57GW14 have exhibited the presence of LPH. The thickness of LPH in 57GW14 has been relatively consistent averaging in thickness from 0.10 feet to 0.33 feet. AFVR events at Building 486 have been performed four times: September 4, 1997, September 17, 1997, September 24, 1997 and October 1, 1997.

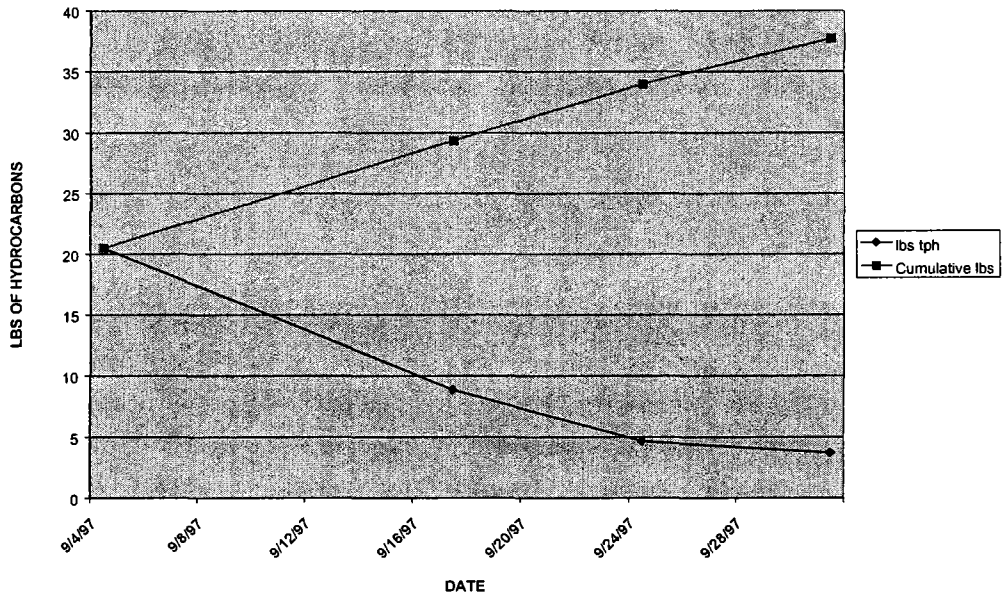
Summary Data for Building 486:

LPH type	Heating Oil
No. of Wells. (typ. Monitored)	10
No. of Wells with LPH	2
Range of LPH Thickness (in ft.)	0.33 – 0.01ft
Average Depth to water (in ft. bgs)	14.9 – 18.8 ft
Range of Water Table Fluctuation (ft.)	2.5 – 3.0 ft

The following table and graph depict the results of these AFVR events.

Building 486
AFVR Performance Summary

Date AFVR Event	Total Pounds of Hydrocarbons Removed
9/4/97	20.49
9/17/97	8.85
9/24/97	4.65
10/1/97	3.7

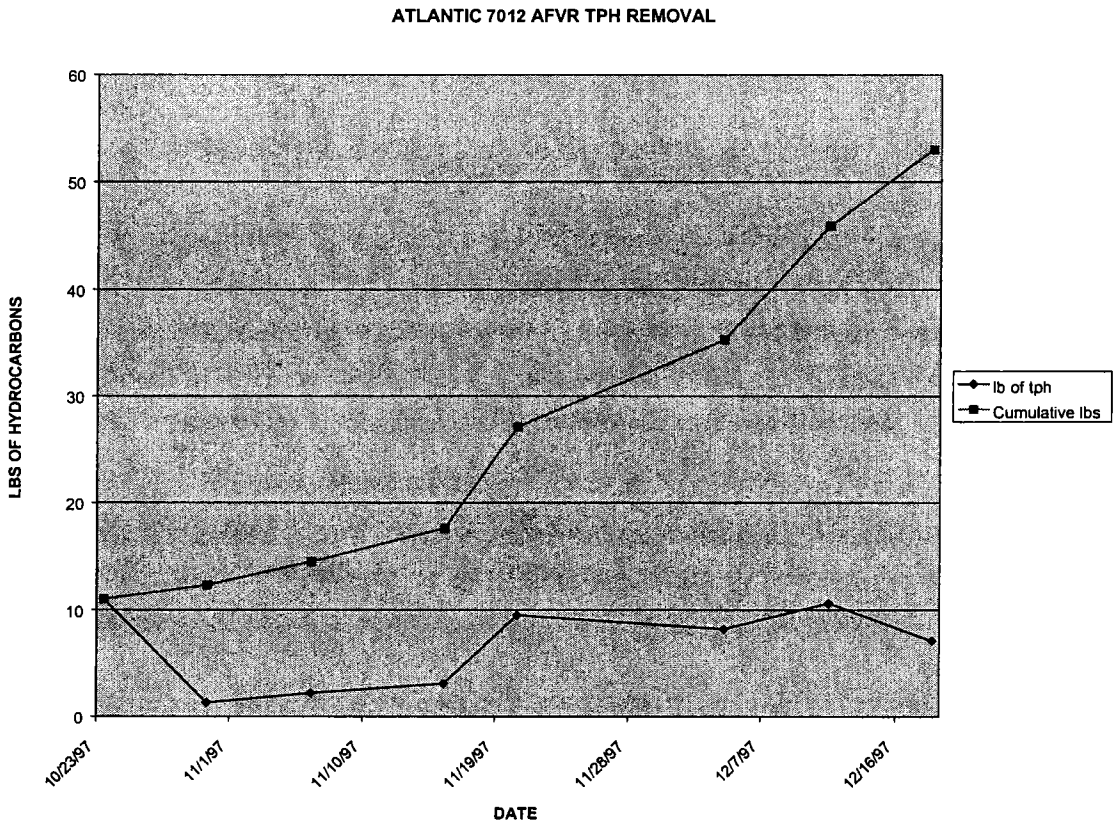


2.4 Atlantic 7012

At Atlantic 7012 there are seven monitoring wells that are periodically monitored by OHM since October 1997. Of the seven monitoring wells two wells have exhibited the presence of LPH. The wells at Atlantic 7012 that are monitored are: 25GW01, 25GW02, 25GW03, 25GW04, 25GW08, 25GW10 and 25GW13. Of these wells LPH has appeared in 25GW04 and 25GW13. It should be noted that the frequency of the appearance of LPH in monitoring well 25GW04 has not been consistent, i.e. LPH has only been recorded in this well between July and August 1998. In monitoring well 25GW13, LPH has been present on a frequent basis since monitoring began in October 1997. AFVR events conducted at Atlantic 7012 have been conducted on monitoring well 25GW13.

Atlantic 7012
AFVR Performance Summary

Date AFVR Event	Total Pounds of Hydrocarbons Removed
10/23/97	11
10/30/97	1.3
11/6/97	2.2
11/15/97	3.1
11/20/97	9.5
12/4/97	8.2
12/11/97	10.6
12/18/97	7.1



The average hydrocarbon removal rate by AFVR per event at Atlantic 7012 is just over 6 pounds.

Summary Data for Atlantic 7012:

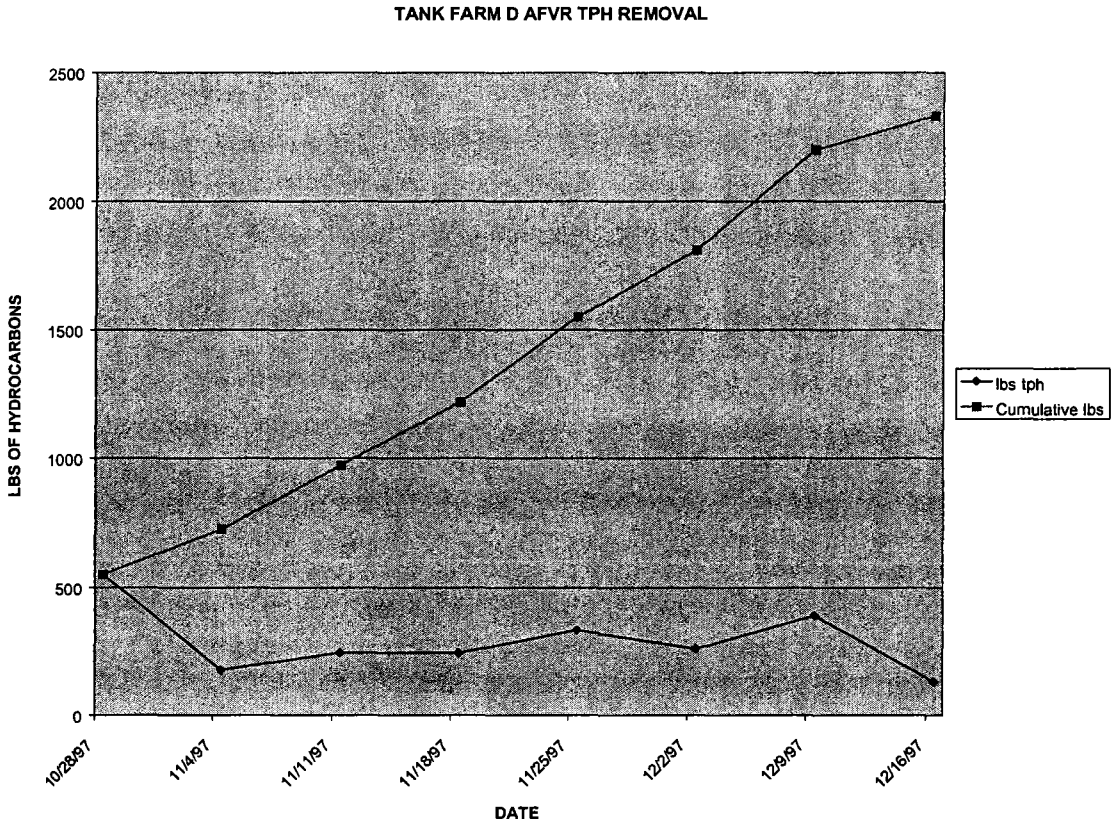
LPH type	Fuel Oil #2
No. of Wells. (typ. Monitored)	7
No. of Wells with LPH	2
Range of LPH Thickness (in ft.)	1.61 – 0.02ft
Average Depth to water (in ft. bgs)	4.0 – 9.7 ft
Range of Water Table Fluctuation (ft.)	4.01 ft

2.5 Tank Farm D

There are 10 monitoring wells that are periodically monitored at Tank Farm D. Since October 1997 LPH has consistently appeared at varying thicknesses in three of the wells: 9GW01, 9GW14, and 9GW24. At Tank Farm D in 1997 eight AFVR events were conducted. The following table and graph depict the results of the 1997 AFVR events.

Tank Farm D
AFVR Performance Summary

Date AFVR Event	Total Pounds of Hydrocarbons Removed
10/28/97	548.8
11/4/97	177.7
11/11/97	245.5
11/18/97	244.3
11/25/97	333.8
12/2/97	261
12/9/97	389.9
12/16/97	130.6



Based on the seven AFVR events conducted at Tank Farm D the average pounds of hydrocarbons removed per event is 291.

Summary Data for Tank Farm D

LPH type	Diesel
No. of Wells. (typ. Monitored)	10
No. of Wells with LPH	3
Range of LPH Thickness (in ft.)	0.66 – 0.01ft
Average Depth to water (in ft. bgs)	14.4 – 20.3 ft
Range of Water Table Fluctuation (ft.)	5.9 (average) ft

2.6 Product Only Recovery Systems

At two of the AFVR sites (Atlantic 7012 and Building 1640) portable LPH only recovery systems are being used. At Atlantic 7012 a portable LPH recovery system is deployed in wells 25GW13 and 25GW04. At Building 1640 a portable LPH only recovery system is deployed in wells, OHM 2 and 59GW03. The operation and maintenance of these systems is performed on a regular basis.

At Atlantic 7012 the system deployed is a solar powered system. According to records kept for the fourth quarter 1998 the system deployed at Atlantic recovered a total of 5 gallons of LPH. At Building 1640 an electrical system is deployed in the wells and for the fourth quarter 1998 a total of 18.25 gallons of product have been recovered.

3.0 SITE ANALYSIS

In this section we describe the application of AFVR as it relates to the natural cycle of groundwater fluctuation, the criteria used in evaluation of a site and potential alternative remedial options. Within this section a description of each of the different remedial technologies is provided. An initial description of AFVR is presented along with other technologies that were evaluated against AFVR for potential application at the referenced sites.

Each of the sites hydrographs and liquid level data is described as interpreted from the hydrographs prepared. The descriptions provide as based on the data, relative low groundwater period time of year and the relative amount of groundwater fluctuation.

A remedial technology scoring matrix was prepared for each of the AFVR sites. This is also presented in this section. Appendix A contains the actual scoring matrices.

From original site data and previous investigations for each of the subject sites the estimated extent of LPH plume was taken and a calculation performed to determine an estimate for the mass of LPH present. These calculations and basis are presented in this section.

3.1 Description of AFVR and Hydrogeologic Aquifer Fluctuations as it Relates to Petroleum Hydrocarbon Contamination.

Typical application of AFVR is dependent on the appearance of product, due to the natural affects of hydrogeologic cycling of the groundwater table. (Groundwater Table, fluctuation). Typically, product (LNAPL -Light Non-Aqueous Phase Liquid) appears on top of the groundwater during low Groundwater table events, and disappears under rising or high water table events. Other major contributing variables are site specific and they include, lithology, stratigraphy and the associated distribution across a site. Perched water tables present local phenomena that potentially provide the appearance that the process is reversed, e.g. during high groundwater events, product appears, and during low groundwater events the product disappears due to lead-lag relationships with recharge and discharge events due to precipitation.
Other variables include:

- gradient;
- transmisstivity of the formation
- conductivity of formations;
- formation material;
- buried utility conduits;
- former trench locations;
- above ground structures;
- storm water run off characteristics of the site;
- erosion and sediment control devices;
- surface permeability to precipitation events, and;
- lag time aquifer response as a result of precipitation.

Adjacent rivers streams and lakes will also contribute to the groundwater level depending on whether the transmissistiviy/conductivity (connectivity) of the aquifer system is undergoing recharging or discharging conditions.

In most normal circumstances, the geohydrologic system cycle is semi annual where as during the course of a year there are two groundwater high periods and two corresponding groundwater low periods. This semi annual cycle is primarily driven by seasonal fluctuations in the amount of precipitation in the Mid Atlantic Coastal Plain, the typical rainy seasons are during the spring and during the fall, where as the corresponding dry periods are in winter and summer. The yearly fluctuations in conjunction with local affects are causes at specific sites that control groundwater fluctuations.

3.2 Evaluation Considerations

In order to fully evaluate the site characteristics that determine if AFVR is a proper application we looked at hydrogeologic data pertaining to each of the sites. The evaluation focused on hydrogeologic cycle and the appearance or not of product in the reported affected monitoring wells. The evaluation considered groundwater fluctuation, appearance of product and when, local lithologic and stratigraphic conditions as well as gradient. Those sites that depicted trends were more readily characterized as to when the application of AFVR would be more likely. A frequency of application can then be derived and thus determine further if AFVR is the best remedial alternative in these instances. In addition if trends were depicted then other remedial alternatives were screened that could be applied periodically

3.3 Potential Alternatives

In addition the evaluation looked at alternatives to AFVR and portable recovery pumps that provide cost effective remedial technology over a long period of time considering factors of ease of application, remedial effectiveness, and not necessarily labor or capital intensive in nature e.g. Bioventing, Windmill Venting, or Soil Vapor Extraction.

The remedial technologies evaluated in conjunction with the hydrogeologic evaluation were:

- Soil Vapor Extraction
- Natural Attentuation/Degradation
- Bioventing
- Windmill venting (WVS)
- Risk Assessment to NFA IAW NC site Characterization Criteria
- Product only recovery pumps
- Biosparging

The following paragraphs describe each of these technologies.

3.3.1 Soil Vapor Extraction

Soil Vapor Extraction (SVE) is a remediation technique used to reduce hydrocarbons found in the vadose zone. The underlying process in SVE is to capture the volatilized hydrocarbons in the vapor phase with a capture (vacuum) well. Once the contaminated vapor is captured, the air can be treated and released to the atmosphere.

With any remediation technique, there are certain parameters that make the technique well suited for the process. SVE is best suited for highly volatilized contaminates in the vadose zone. The soil must be relatively porous, i.e. sand, to allow the vapors to move freely through the soil at higher flowrates.

Application of SVE generally targets the removal of VOCs which are entrapped in the unsaturated zone as nonaqueous phase organic liquids (NAPLs), dissolved in the pore water, and/or sorbed to the soil particles. Reviews of SVE technologies [Hutzler et al. , 1989; U.S. EPA, 1991; Pedersen and Curtis, 1991; Johnson et al. , 1995] indicate success of SVE is strongly correlated with contaminant volatility and the ability to generate advective gas fluxes through the contaminated soil. Pedersen and Curtis [1991] present a nomograph relating the SVE likelihood of success to the contaminant volatility, soil permeability, and age of the spill.

SVE has been effectively applied for the removal or mass reduction of a wide variety of halogenated and nonhalogenated volatile and semivolatile organic compounds. It is not considered effective for organic compounds of low volatility, inorganic compounds, polychlorinated biphenyls (PCB), dioxins, organic pesticides, cyanides and corrosives [U.S. EPA, 1991]. SVE is generally most effective in uniform soils with good conductivity, low moisture content, and low organic carbon content [Fine and Yaron, 1993]. Soils with low air permeability are more difficult to remediate, and exhibit reduced removal efficiency [U.S.\ EPA, 1991].

3.3.2 Natural Attentuation/Degradation

Natural subsurface processes such as dilution, volatilization, biodegradation, adsorption, and chemical reactions with subsurface materials are allowed to reduce contaminant concentrations to acceptable levels.

For natural attenuation, natural subsurface processes such as dilution, volatilization, biodegradation, adsorption, and chemical reactions with subsurface materials are allowed to reduce contaminant concentrations to acceptable levels. Natural attenuation is not a "technology" per se, and there is significant debate among technical experts about its use at hazardous waste sites. Consideration of this option requires modeling and evaluation of contaminant degradation rates and pathways. The primary objective of site modeling is to demonstrate that natural processes of contaminant degradation will reduce contaminant concentrations below regulatory standards before potential exposure pathways are completed. In addition, sampling and sample analysis must be conducted throughout the process to confirm that degradation is proceeding at rates consistent with meeting cleanup objectives.

Applicability:
Target contaminants for natural attenuation are nonhalogenated VOCs, SVOCs, and fuel hydrocarbons. Halogenated VOCs and SVOCs and pesticides may be less responsive to natural attenuation.

Limitations:
Factors that may limit the applicability and effectiveness of the process include:
Data must be collected to determine model input parameters.
Although commercial services for evaluating natural attenuation are widely available, the quality of these services varies widely among the many potential suppliers. Highly skilled modelers are required.
Intermediate degradation products may be more mobile and more toxic than the original contaminant.

Natural attenuation should be used only where there are no impacts on potential receptors. Contaminants may migrate before they are degraded. The site may have to be fenced and may not be available for re-use until contaminant levels are reduced. If source material exists, it may have to be removed. Some inorganics can be immobilized, such as mercury, but they will not be degraded.

3.3.3 Bioventing

Bioventing is a process that makes use of bioremediation and soil vapor extraction. Airflows are sustained at a level that maintains oxygen in the subsurface soil. Microorganisms in the soil can then biodegrade volatile as well as nonvolatile contaminants under the proper environmental conditions. Bioventing can be done in situ or on excavated soils.

Volatile emmissions to the atmosphere are reduced as substantial quantities of volatile compounds are biodegraded in the soil rather than stripped to the surface. Costs for activated carbon trapping of the volatiles, typically a substantial cost in operations such as these, are thus reduced.

Bioventing can be used to remediate soils contaminated with light and middle weight petroleum hydrocarbons such as gasoline and diesel fuel. It is an in situ technique; that is, one that allows the soil to be treated in place, without excavation. This allows its use in cases where contaminants have migrated under buildings, buried utilities, or roads, making excavation or other forms of bioremediation difficult or impossible. Once the system is installed maintainace costs are low. For these reasons it is often less costly than other techniques. Year-around treatment is possible even in cold climates by using heated air in the subsurface.

Bioventing is best suited for more permeable soils such as sands and gravels. The process is not as efficient in soils such as clays. It would not be well suited for soils contaminated

with compounds that biodegrade slowly, such as some highly chlorinated compounds. The site soil should have a pH of 6-8 for optimum bioremediation.

In situ remediation of sandy soils contaminated with gasoline and jet fuel is well documented in the literature. There have been few reports of its use for diesel-contaminated soils and in less permeable soils such as those high in clay content. OHM has demonstrated bench-scale remediation of a diesel-contaminated clay soil. Full-scale in situ remediation of this soil is presently in progress.

3.3.4 Windmill Venting

Windmill venting is a process by which subsurface horizontal piping or vertical vapor extraction type wells are constructed and manifolded together to a common end point. Individual windmill vent points can be constructed in lieu of manifolding horizontal vent piping or vertical extraction points. On the end point of the pipe a venturi type windmill is placed on the end of the pipe and is exposed to natural wind at the site. The turning of the windmill vent on the end of the pipe creates a very low vacuum pressure differential on the inside of the extraction pipe thus facilitating air/vapor evacuation of the piping interior. This very low vacuum induced on the piping commonly only affects the interior air space of the piping to a limited degree.

Historical testing of systems of this type have been limited in success of agressively remediating contaminated soils. The windmill typically does not provide enough of a vacuum that can provide vacuum influence beyond the interior of the pipe and thus extract from the soils.

Application of windmill venting can be considered passive and is diffusion limited, e.g. diffusion of any soil vapor contaminant concentrations into the piping is purely by natural affects and not accomplished by any low pressure zone or vacuum set up by the windmill on the end of the pipe.

3.3.5 Risk Assessment

Is the means by which a site is evaluated based on its characteristics. In the process of performance of a risk assessment site data is obtained and entered into probabilistic analysis for the contaminant of concern, media carrying the contamination and potential routes of exposure and potential exposures. A risk assessment then defines the potential toxicological effects and assigns a numerical based risk number based on the specific rules of the specific model used.

Under current North Carolina Regulations all environmental site assessments are subject in part to a risk assessment. Depending on the date of discovery of discharge and subsequent reporting performed or not North Carolina has strict responsibilities for the responsible party. In particular a site needs to be classified upon the discovery of the discharge, the discharge is required to be stopped, investigated and go through the regulatory defined assessment process. For sites with existing discharges noted before January 2, 1998 (the sites in this report apply) each site should have been classified under

A, B, C, D, or E type class depended on specific parameters for each site. Each site should have had a Comprehensive Site Assessment (CSA) performed and depended on the results should lead (or have lead) to a Corrective Action Plan (CAP). Upon CAP approval implementation should then transpire, or have been ongoing.

3.3.6 Free Product Recovery Portable system (electric - - solar electric)

The free product recovery portable system is that which accomplishes removal of the separate phase liquid petroleum hydrocarbon (LPH) floating on the surface of the groundwater within a monitoring well or a specifically designed recovery well.

Several systems are available on the market which employ electrical systems powered by electrical service and some are solar powered. The recovery unit is placed down a well with the particular pump intake adjusted near or at the LPH/water interface. Sensors internal to the unit determine the presence of LPH or not and further signal the unit for energization or not. The LPH is then pumped out of the well into a surface vessel for temporary storage of the recovered LPH. Periodically the storage vessel is emptied and the LPH is recycled or disposed of.

The applicability of LPH only recovery at a particular site is primarily determined by the presence of LPH or not. In many instances existing monitoring wells contain a thickness of LPH that can be readily removed by this type of system. In this typical application the LPH pump immediately evacuates the well of the existing LPH within the well.

Limitations of direct LPH recovery is that after depletion of the LPH in the immediate vicinity of the well, the flow of LPH to the well becomes increasingly diffusion limited. Without a secondary driving force applied (e.g. induced gradient via a groundwater extraction pump creating a cone of depression), the capture and removal of the LPH becomes increasingly limited with the primary controlling factors being the natural gradient and permeability of the matrix material adjacent to the well. Often LPH only recovery systems are applied at a terminal point within a manmade recovery trench. The construction of the trench has effectively created a larger more permeable reservoir immediately adjacent to the recovery well, thus mitigating to a point the controlling diffusion factors of the native matrix. These trenches are often installed on the downgradient toe of an LPH plume to further facilitate a cut-off capture zone and to use the natural affects of gradient in recovery of the LPH.

Application of LPH only recovery systems typically work well on large volumes of LPH within the subsurface and the particular site having specific lithological conditions condusive to LPH flow towards a well. In instances where the LPH thickness becomes limited it becomes increasingly difficulty to recovery the last remaining fraction of LPH present. In those instances application of a technology that more agressively attacks mass removal from the vadose zone typically has greater success in assisting the removal of the last fraction of LPH by means of volatilization and bioremediation as opposed to direct LPH removal.

3.3.7 Biosparging

Biosparging is a remedial process where air is injected into the subsurface below the groundwater interface. This aeration process of the saturated zone below the LPH / groundwater interface is conducted under low flow operational conditions. This method of air injection is a much more controlled and less aggressive injection method than air sparging. Biosparging is the introduction of air for the means of providing additional oxygen in the saturated zone to promote bioremediation and not necessarily volatilization.

The biosparged air is injected into the saturated zone of the soil system. Mass transfer from the gas phase to the aqueous phase results in oxygenation of the groundwater. Furthermore, the injected air escapes to the unsaturated zone, and because mass transfer in the saturated soil is slow to consume oxygen completely, sparging also results in aeration of the unsaturated zone. This sparging activity results in a stimulation of the remediation of the saturated zone and the unsaturated soil. Native hydrocarbon consuming bacteria in the presence of the increased oxygen levels are then more readily able to metabolize the hydrocarbons. The addition of other nutrients (fertilizer) can be injected below the water table to further enhance or augment the growth of the micro organisms. The low injection rates of air reduce the need for vapor treatment or extraction.

Biosparging works on all petroleum types and is considered cost competitive.

3.4 Technology Comparison Scoring Matrices

Appendix A contains matrices for each of the sites scoring of the treatment technologies. In the scoring evaluation the following criteria were used: applicability, permissibility, present value cost, and time to remediate. The scoring is weighted and calculated by a rating score. In most cases for the sites that currently undergo AFVR the following technologies scored high: soil vapor extraction, bioventing, direct product recovery or continuing AFVRs. There are minor scoring differences among the selected technologies.

3.5 Hydrogeologic Data Evaluation

In evaluation of the hydrogeologic groundwater fluctuations for each of the sites, site data collected periodically was entered into a database and graphed. The liquid level data for each site, depth to water and depth to liquid petroleum hydrocarbons, if applicable was recorded and graphed versus time. These graphs represent the hydrographs for each of the sites and can be deciphered to represent the seasonal fluctuations in the groundwater table elevations on a relative scale. Correspondingly the measurement for the depth to liquid petroleum hydrocarbons was also graphed on the same scale. The relationships between the level of the groundwater and the presence or lack of presence of LPH in specific monitoring wells can be seen in the graphs. This information is then correlated with the seasonal fluctuations in the groundwater levels and approximations as to when the greatest thickness of LPH may appear in a specific monitoring well can be made. This information is invaluable in that during seasonal low groundwater elevation periods

the greater the thickness of LPH present in a particular monitoring well. With the seasonal fluctuations in groundwater elevation occurring on a relativity consistent frequency, e.g. lower groundwater table in early spring and late fall, relative scheduling for focused recovery efforts can be made to coincide so to maximize recovery.

The following paragraphs describe the individual findings from the hydrograph analylsis for each of the sites.

3.5.1 Building 1640 Hydrograph Data

Eight monitoring wells have been regularly gauged for depth to water (DTW) and depth to product (liquid petroleum hydrocarbons) (DTP) by OHM since October 1997. Of the eight regularly monitored wells four and sometimes five of the wells indicted the presence of LPH. The liquid level data was tabulated and compiled to form baseline hydrographs for each of the monitoring wells Appendix B.

From the hydrographs graphical trends can be readily noted. From evaluation of the DTW graph line the variability in the DTW in most of the wells at Building 1640 vary from 6.5 feet below grade to 11.5 feet below grade dependent upon when the gauging event was performed. In addition the magnitude of the fluctuation of the groundwater table can be determined, at Building 1640 the fluctuation ranges from approximately 1.5 to 2.5 feet.

The hydrograph data depicts the low groundwater level times of the year typically range from June through August, and November through January at Building 1640. This seasonal low groundwater level correlates fairly well with the seasonal fluctuations in precipitation. The wells that contain varying thicknesses of LPH exhibit the greatest thickness of LPH during the Fall low groundwater period, and a relatively thicker LPH measurement in the spring groundwater table low. During the groundwater table elevation high periods, the thickness of the LPH diminishes.

The hydrographs and liquid level data tables for Building 1640 are included in Appendix B.

3.5.2 Building 296 Hydrograph Data

Liquid level monitoring is conducted on a regular basis on seven monitoring wells at Building 296. Of the seven monitoring wells three have been reported to contain LPH on a frequent basis. The three monitoring wells containing LPH on a regular basis are: 65GW04, 65GW05, and 65GW06. Depth to ground water measurements in all the wells monitored range between 9.0 and 15.0 feet below grade. The average yearly fluctuation observed in the ground water table as observed at these wells is 2.03 feet. The seasonal low groundwater level periods run May through July and November through January.

Corresponding with the low groundwater level periods the LPH in monitoring wells 65GW04, 65GW05 and 65GW06 is measured as being thicker during the groundwater table low periods. The liquid level data and hydrographs for the monitoring wells at Building 296 can be found in Appendix C.

3.5.3 Building 486 Hydrograph Data

Gauging of the ten monitoring wells at Building 486 has occurred periodically since October 1997. During the monitoring events since October 1997 LPH has been noted in two monitoring wells, 57GW03 and 57GW14. In monitoring well 57GW03 LPH has been noted only one time during the monthly monitoring events. The LPH measured in monitoring well 57GW14 has ranged in thickness between 0.10 feet and 0.33 feet.

The gauging of the monitoring wells indicates that the groundwater table level varies on average between 14.9 feet below grade and 18.8 feet below grade. The fluctuation of the groundwater table at the site ranges between 2.5 and 3.0 feet. Over the course of the monitoring for these wells one groundwater elevation low period can be discerned as occurring during November through January. The typical second groundwater low period during the year cannot be determined from the data, as an entire year of monitoring on a regular periodic basis for this site has not been accomplished.

The LPH present in monitoring well 57GW14 is apparently measured as being thicker during the groundwater table elevation low period during the months of November through January. The liquid level data and hydrographs for Building 486 can be found in Appendix D.

3.5.4 Atlantic 7012 Hydrograph Data

Since October 1997 OHM has performed liquid level gauging on seven monitoring wells. In two of the seven regularly gauged monitoring wells (25GW13, 25GW04) LPH has been present on a consistent basis. In September 1998 product only recovery systems were deployed in these two monitoring wells.

The liquid level data for the monitoring wells at Atlantic 7012 in hydrograph form depict that a groundwater elevation low period occurs during the months of October through December. There is not enough data to discern whether or not the site has a biannual groundwater elevation cycle.

Evaluation of the graphed data for the elevation and relative thickness of the LPH measured in monitoring wells 25GW13, and 25GW04 is inconclusive as to whether the appearance or relative thickness increase in LPH occurs concurrently with the groundwater elevation low periods. There appears to be other influences in the subsurface matrix that are impacting the measured thickness of LPH during the groundwater low elevation period. It is highly likely that subsurface influences such as an impermeable or partially less permeable discontinuous lithological lense is impacting

the groundwater fluctuation. The typical response exhibited when petroleum hydrocarbons are contained within the subsurface matrix is not readily evident in the hydrographs for this site.

The average groundwater table elevation fluctuation is 4.01 feet among the monitoring wells at Atlantic 7012. Depth to groundwater ranges between 4.0 and 9.7 feet below grade dependent upon the time of year that the well is gauged.

The hydrographs and liquid level data for Atlantic 7012 are contained in Appendix E.

3.5.5 Tank Farm D Hydrograph Data

Groundwater elevation data has been collected at Tank Farm D by OHM on a regular basis since October 1997. During the weekly monitoring a total of ten wells were regularly gauged for depth to water and depth to product. Groundwater elevation during the period from October 1997 to February 1999 typically has averaged between approximately 20.3 feet and 14.4 feet below ground level. The groundwater fluctuation averages 5.9 feet based on the data for the site.

Groundwater elevation typically is at its lower elevation during the period of October through January and a second low period during the period April through May.

Measurement data for the product thickness indicates that on average the product thickness varies between 0.01 feet and 0.66 feet among the wells indicating product thickness. The wells typically with LPH are: 9GW01, 9GW14 and 9GW24.

The hydrographs for the wells monitored at Tank Farm D are contained in Appendix F.

3.6 Mass of Liquid Petroleum Hydrocarbons (LPH) Estimates

For each of the sites the original LPH plume was evaluated in terms of extent and an approximate calculation of the mass of LPH present was calculated. The following presents the summary of the calculations for each of the sites.

For each site the extent of the LPH plume was taken from the original site map. The areal extent of the plume and the current apparent LPH thickness was used in formulating the calculation to derive the LPH mass. Subsequently the calculation used is simple in nature and is conservative as used to calculate the approximate recoverable LPH at a given site. In most instances the following calculation was used. Appendix G contains the calculations for each of the sites.

EXAMPLE CALCULATION FOR LPH MASS ESTIMATE:

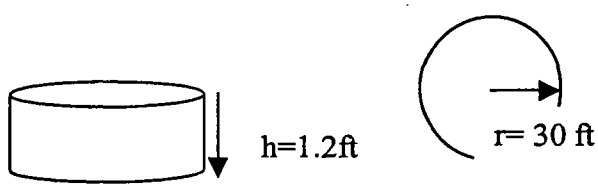
Based on the original site map definition delineating the perimeter of extent of free product (liquid phase hydrocarbons (LPH)) the following is derived.

An approximate radius of extent of LPH. (r) in feet from an approximate center point in the LPH plume (30 feet). The configuration of the plume is roughly round.

From site data and physical measurements the LPH plume is approximated at being 1.2 feet in thickness (h).

An assumption of the free pore space of the subsurface matrix (porosity) is 20%. (0.20)

To then calculate the volume of the LPH at the site:
V=volume
h = LPH thickness in feet
$\pi = 3.14$
r = radius of LPH plume



where:
$V=2\pi r^2 h$
$\therefore V= (2)(3.14)(30)^2(1.2)$

$=6{,}782\ ft^3$

$6{,}782\ ft^3$ = total mass without correction for porosity. $(6{,}782\ ft^3)x(0.20)$ [for porosity]
= $1{,}356.40ft^3$ mass of LPH (Contaminant)
= $1{,}356.40ft^3$ convert to gallons of LPH, $1ft^3$=7.4 gallons
= $(7.4)(1{,}356.40ft^3)$
= 10,037 gallons.
= ~10,000 gallons.

In summary the following table was prepared for all of the sites which depicts the mass of hydrocarbons that may potentially be recovered at the particular site.

LPH MASS ESTIMATE SUMMARY TABLE

SITE	LPH MASS IN LBS
Bldg 1640	27,711
Bldg 296	19,226
Bldg 486	875
Atlantic 7012	26,845
Tank Farm D	7,933

4.0 CONCLUSIONS

In Section 3.0 each of the technologies considered were presented along with each site's individual characteristics. Section 2.0 provided a brief background for the sites that undergo AFVRs and summary information pertaining to the performance of those AFVR events. As a result of the analysis of the AFVRs performed and other information presented in this report the following conclusions can be made.

1. Each site exhibits its own unique characteristics of hydrogeologic cycle as expressed in the baseline hydrographs constructed from the data.

2. The baseline hydrographs for each site depicts specifically in individual wells the low groundwater table elevation periods for the periods which the wells were monitored.

3. Corresponding to the groundwater elevation lows the thickness of the LPH in the wells where LPH has been found typically is of a greater thickness as measured during that period.

4. AFVR activities at each of the sites have been performed on an irregular basis. Typically, the AFVR event is scheduled after a site monitoring event where product thickness measured in a monitoring well was greater than 1.0 foot thick.

5. Consistent tracking of the sites hydrogeologically will allow for better management of conducting AFVR events.

6. AFVR events can be conducted on a more predictive basis, thus yielding more optimum recovery results.

7. The mass of contamination in LPH at some of the sites appears to be under greater influence from other physical constraints (e.g. permeability, porosity) such that a different remedial option other than AFVR may yield better remedial results. In some instances a more aggressive system will yield better results and in others a more passive approach should be considered.

8. The mass of LPH at each site as estimated is variable and indicates relatively which sites have a greater mass of LPH that is potentially recoverable.

9. Based on the mass estimates for each of the sites prioritization can be made for which sites should receive focused attention for active hydrocarbon removal efforts.

10. From Section 2.0 and the background analysis of the performance of the AFVR events the averages for the mass of hydrocarbons removed during an AFVR event are highly variable from site to site.

Table 4-1 summarizes: CAP recommendations, LPH mass estimated in Section 3.0, relative ranking of the site by the LPH mass estimate, average pounds of hydrocarbons removed during an AFVR event (from Section 2.0), and the relative ranking of each site as based on the AFVR performance average per event.

Table 4-1
Summary of CAP Recommendations vs. LPH mass, vs. Mass Estimate Ranking, Average Hydrocarbons (in lbs.) removed during AFVR event, vs. AFVR Mass Removed per Event Ranking.

Site	CAP Recommendation (Law, 1995)	LPH Mass Estimate in lbs.	Site Rank by LPH mass estimate	Site Rank by average lbs. removed during an AFVR event	Average lbs. hydrocarbons removed during AFVR event
Bldg. 1640	Active LPH removal, Install 2 recovery wells, LPH discriminating recovery system, pneumatic operation	27,711	1	3	53.98
Bldg. 296	Active LPH removal, Install 4 recovery wells, LPH discriminating recovery system, pneumatic operation	19,226	3	2	93.68
Bldg. 486	Passive removal of LPH (bailing periodically), remediate soil by excavation, allow for natural attenuation and degradation	875	5	4	9.42
Atlantic 7012	Active LPH removal, Install 3 recovery wells, LPH discriminating recovery system, pneumatic system.	26,845	2	5	6.62
Tank Farm D	Active LPH removal, Install recovery wells with LPH discriminating pumps, vadose zone remediation via biovent wells groundwater via biosparge wells.	7,933	4	1	291.45

Evaluation of Table 4-1 yields further conclusions that the ranking of the sites by mass estimate of LPH does not necessarily correlate with the performance of a successful AFVR event. The sites with the higher estimated mass of LPH do not necessarily yield the best removal rate per AFVR event. Careful site specific consideration should be taken into account in comparisons made between the sites. For example table 4-1 depicts for Building 1640 that a potential recoverable mass of LPH is 27,711 pounds and each AFVR event removes on average 54 pounds. By removing LPH via AFVRs at this site it then would take approximately 513 AFVR events to remove the estimated mass, this remedial approach then can be considered unrealistic. In this example the conclusion then can be drawn that other mitigating factors such as porosity, permeability, soil matrix type and others play a significant role as to how well an AFVR works at this site and other means of remediation should be looked into.

The opposite can be said for the situation at Tank Farm D. The potentially recoverable LPH mass at Tank Farm D is estimated at 7,933 pounds and the average AFVR event removes 291 pounds of total hydrocarbons. At this removal rate, AFVR shows better potential, by being able to remove the mass estimated in 27 AFVR events. Other problems exist at Tank Farm D that indicate that AFVR might not be the best approach. The single most problematic variable at this site is the slow rate by which the monitoring well recovers free product. Therefore the conclusion that AFVR is appropriate at Tank Farm D needs consideration to a limited degree. Again other limiting variables are taking place.

Table 4-2 presents each site, the current state of remedial activity, a brief summary of the contamination, what the desired status for the site is and a general conclusion.

From the conclusions and the data presented in the preceding sections a recommendation section has been prepared as Section 5.0. Section 5.0 provides a more detailed description of recommendations for each site.

Table 4-2

Site	Current state	Contamination	Desired state	Conclusion
1640	Periodic AFVRs scheduled after appearance of LPH on an irregular basis	LPH typical to one monitoring well, It is likely that a fair to high concentration of adsorbed phase hydrocarbons exist in the vadose zone	Eliminate LPH concentrate on elimination of adsorbed phase in soil to achieve soil TPH clean up levels	Historical AFVRs removal only partial, LPH reappears consistently, likely candidate for continued AFVRs or more permanent LPH recovery system.
296	Periodic AFVRs scheduled after appearance of LPH on an irregular basis	LPH is typical to two sometimes three of seven monitoring wells. The thickness of the LPH is 1.0 foot on a regular basis. Recharge of the LPH occurs steadily after an AFVR event.	Eliminate LPH on the groundwater table. Remediation can then concentrate on adsorbed phase.	Historical application of AFVR eliminates the immediate presence of LPH. It is likely that the volume of LPH is more significant than originally thought. This site is a likely candidate for a more permanent LPH recovery system.
486	One well out of ten slowly recharges after an AFVR event. Enough accumulation of LPH occurs after nine months to	LPH typical to only one well and is limited in amount that recharges, which takes up to nine months to	Completely eliminate the reappearance of the LPH.	Perform AFVR once yearly; monitor liquid levels at site monthly. Re-evaluate yearly. If LPH fails to

Site	Current state	Contamination	Desired state	Conclusion
	justify an AFVR event.	accumulate to a thickness greater than 0.01 feet.		appear in year after latest AFVR, this site has potential for elimination completely from AFVR activity, and determine other course of action depends on other contamination at site if in existence.
Atlantic 7012	Periodic AFVRs have been performed on two of seven wells at the site. Currently systems deployed in two wells for LPH recovery	LPH frequently appears in 25GW13, and less occasionally in 25GW04. System installed in 25GW13, and 25GW04.	Remove LPH from the two monitoring wells that continue to exhibit.	LPH typically rebound after AFVR events in monitoring well 25GW13. Ideal candidate site for removal of LPH, and monitor monthly. Evaluate LPH removal system and total mass removed.
Tank Farm D	Last AFVR event April 1998. Of ten wells monitored two have limited thickness of LPH greater than 0.01 feet. One monitoring well 9GW24 has LPH thickness greater than 0.5 feet since October.	LPH Contamination is limited to two monitoring wells. LPH thickness is typically 0.50 feet thick or less.	Eliminate the LPH thickness to less than 0.01 feet. Evaluate site against ultimate project goals.	Limited AFVR at this site is working due to limited LPH in existence. LPH recovery is slow and appears to level off in monitoring well around 0.50 feet thick.

5.0 RECOMMENDATIONS

In this section for each site we present recommended action(s) to further enhance the remedial activity at a specific site. Each recommendation is subject to basis of design considerations that have not yet been performed. The basis of design considerations that can be considered elemental in developing final remedial systems for the site are: cost/value engineering, life cycle cost analysis, and pilot testing for performance unit sizing. The three elements for the design basis can be performed easily prior to initiating the design and subsequent construction.

The following paragraphs provide summary recommendations for each of the sites that have historically used AFVR activity as the remedial approach to their respective LPH contamination problem.

Building 1640

The contaminant type at Building 1640 is diesel with a relatively large mass of LPH at the site. AFVR activity at the site has been conducted with limited success, and has achieved on average recovery of only 54 pounds of hydrocarbons per event. Building 1640 is an ideal candidate for application of a LPH only recovery system, that can be enhanced further with the application of a biosparge system or an air sparge / soil vapor extraction system. Ideally, before the system is designed a small pilot scale/test be performed that can be scaled up for full implementation. The system can be constructed in phases to address the mass of contaminant and the phase the contaminant is in. Initially the LPH needs to be addressed, followed by the adsorbed phase in the soils and the final phase being the groundwater dissolved fraction.

The diesel contamination at the site currently is in relative equilibrium. The application of AFVRs at the site only upsets the equilibrium on a very short-term basis allowing for limited recovery. The amount of mass that is present is such that continuing AFVRs here would in the long run be more costly than the installation of a more direct aggressive LPH recovery system.

Building 296

The contaminant type at Building 296 is diesel. There is sufficient mass at 296 to warrant a permanent installation to remove the LPH. The ideal system application at Building 296 would be to install a small permanent LPH only recovery system augmented by a biosparge system. Prior to system installation a small pilot test should be performed to provide for the basis of final design and system construction parameters. The system that should be installed should be phased in and evaluated as construction is completed and initial start up operations commence. Ideally, once removal of the LPH is complete a low flow biosparge system could be implemented using the existing wells or new wells to accomplish removal of the remaining adsorbed and dissolved phase by

bioremediation. Another option that should be considered at Building 296 in lieu of biosparging would be the application of an air sparge/ soil vapor extraction system after implementation of the LPH only recovery system. A value engineering evaluation and cost analysis should be performed between the technologies and considerations need to be made for life cycle costing of capital equipment and longer-term operations and maintenance.

Building 486

The contaminant type at Building 486 is heating oil. The estimated mass of LPH at 486 is relatively small. This site should have AFVR events conducted on a yearly basis and only after a monitoring event determines that a sufficient quantity of LPH is present. Monthly monitoring of the wells at this site would suffice to determine the quantity of LPH. Overall this site is a prime candidate for natural attenuation, and natural bioremediation, which ultimately in several years can potentially be petitioned for closure.

Atlantic 7012

The fuel oil #2 mass at Atlantic 7012 is of an estimated sufficient mass that a direct LPH recovery system should be considered. After a system is operated for a period of time (6 – months) careful consideration should be made as to the effectiveness of the LPH removal system. In the initial design considerations should be made for dual purpose recovery wells that could readily be converted to biosparge wells. The fuel oil#2 over time is going to lose the majority of its volatile fraction and the LPH recovery over time is going to decline. The site does not have a significant gradient such that the LPH is mobile, subsequently the mass (estimate of 26,845 lbs.) is such that as much LPH as possible needs to be removed. AFVR activity has had negligible impact, as the remaining LPH is removed the remaining fractions of hydrocarbons are going to become increasingly difficult to remediate. Therefore after a time consideration of direct LPH removal the consideration to changing the focus from physical recovery to bioremedial activity is made.

Tank Farm D

The contamination at Tank Farm D is of diesel origin. The AFVR activity conducted at this site has produced fairly good AFVR recovery rates. The mass estimated for recoverable LPH at Tank Farm D is 7,933 where on average AFVR removes 291 pounds. The LPH recovery is becoming increasingly slower thus indicting diffusion limited recovery and overall LPH mass reduction.

It is recommended that Tank Farm D be considered for a biosparge system where the current equilibrium setting up in the subsurface (diffusion limited LPH recovery) can be upset such that bioremediation activity induced by the biosparge system become the primary focus for remediation at this site. It is suggested that the initial system design be based from a pilot test and designed as such that it can be dual purpose, and potentially be a air sparge/ soil vapor extraction system with minimal changes.

APPENDIX A

TECHNOLOGY COMPARISON SCORING MATRICES

SITE NAME >>>>>>> **BUILDING 1640**
Contaminant >>>>>>>>>>>>> Diesel

Treatment Options	Applicability 0-5	Permissibility 0-3	Present Value Cost	Time 1-3	Score 0-120	Retain Y / N
Vadose Zone						
Soil Vapor Extraction (active)	5	3	3	2	75	Y
SVE - Windmill	2	3	2	2	24	N
SVE - open	2	3	2	1	18	N
Excavation	2	2	4	3	28	N
Biovent	4	3	3	2	60	Y
Natural Attenuation	3	2	3	1	24	N
Risk Assessment	2	2	3	2	20	N
Biosparge	3	3	4	2	54	Y
LNAPL Recovery	4	3	3	1	48	Y
AFVR	4	3	3	2	60	Y

Permissibility
0= Not Permissible
1= Probably not Permissible
2= Probably Permissible
3= No permitting Problems

Treatment Time
1= Treatment Time longer than Desired
2= Acceptable Treatment time
3= Rapid Treatment

Present Value Cost (Soils)
1= Greater thant $1000/ Cu Yd
2= $300 - $1,000 / Cu Yd
3= $200 - $300 / Cu Yd
4= $100 - $200/ Cu Yd
5= less thant $100/ Cu Yd

Rating Score: A x P x (C+T)
A = Applicability (0-5)
P = Permissibility (0-3)
C = Cost (1-5)
T = Treatment Time (1-3)
Rating Score ranges from 0 - 120

Applicability Matrix

Contaminant and Site Characteristics	**Available Widely Used**	**Available Not Widely Used**	**Not Available**
Proven Technology for Contaminant & Site Conditions	5	4	0
Probably Applicable for Contaminant & Site Conditions	4	3	0
Applicability for Contaminant and /or Site Questionable	3	2	0
Probably Inapplicable for Contaminant & Site conditions	2	1	0
Not Applicable for Contaminant & Site conditions or Not Implimentable	0	0	0

SITE NAME >>>>>>> **BUILDING 296**
Contaminant >>>>>>>>>>>>> Diesel

Treatment Options	Applicability 0-5	Permissibility 0-3	Present Value Cost	Time 1-3	Score 0-120	Retain Y / N
Vadose Zone						
Soil Vapor Extraction (active)	5	3	3	2	75	Y
SVE - Windmill	2	3	2	1	18	N
SVE - open	2	3	2	1	18	N
Excavation	2	2	4	3	28	N
Biovent	4	3	3	2	60	Y
Natural Attenuation	3	2	3	1	24	N
Risk Assessment	2	2	3	2	20	N
Biosparge	3	3	4	2	54	Y
LNAPL Recovery	4	3	3	1	48	Y
AFVR	4	3	3	2	60	Y

Permissibility
0= Not Permissible
1= Probably not Permissible
2= Probably Permissible
3= No permitting Problems

Treatment Time
1= Treatment Time longer than Desired
2= Acceptable Treatment time
3= Rapid Treatment

Present Value Cost (Soils)
1= Greater thant $1000/ Cu Yd
2= $300 - $1,000 / Cu Yd
3= $200 - $300 / Cu Yd
4= $100 - $200/ Cu Yd
5= less thant $100/ Cu Yd

Rating Score: A x P x (C+T)
A = Applicability (0-5)
P = Permissibility (0-3)
C = Cost (1-5)
T = Treatment Time (1-3)
Rating Score ranges from 0 - 120

Applicability Matrix

Contaminant and Site Characteristics	Available Widely Used	Available Not Widely Used	Not Available
Proven Technology for Contaminant & Site Conditions	5	4	0
Probably Applicable for Contaminant & Site Conditions	4	3	0
Applicability for Contaminant and /or Site Questionable	3	2	0
Probably Inapplicable for Contaminant & Site conditions	2	1	0
Not Applicable for Contaminant & Site conditions or Not Implimentable	0	0	0

SITE NAME >>>>>>> **BUILDING 486**
Contaminant >>>>>>>>>>>>> Heating Oil

Treatment Options	Applicability 0-5	Permissibility 0-3	Present Value Cost	Time 1-3	Score 0-120	Retain Y / N
Vadose Zone						
Soil Vapor Extraction (active)	5	3	3	2	75	Y
SVE - Windmill	2	3	2	1	18	N
SVE - open	2	3	2	1	18	N
Excavation	2	2	4	3	28	N
Biovent	4	3	3	2	60	Y
Natural Attenuation	3	2	3	1	24	N
Risk Assessment	2	2	3	1	16	N
Biosparge	2	3	4	2	36	Y
LNAPL Recovery	4	3	3	2	60	Y
AFVR	4	3	3	2	60	Y

Permissibility
0= Not Permissible
1= Probably not Permissible
2= Probably Permissible
3= No permitting Problems

Treatment Time
1= Treatment Time longer than Desired
2= Acceptable Treatment time
3= Rapid Treatment

Present Value Cost (Soils)
1= Greater thant $1000/ Cu Yd
2= $300 - $1,000 / Cu Yd
3= $200 - $300 / Cu Yd
4= $100 - $200/ Cu Yd
5= less thant $100/ Cu Yd

Rating Score: A x P x (C+T)
A = Applicability (0-5)
P = Permissibility (0-3)
C = Cost (1-5)
T = Treatment Time (1-3)
Rating Score ranges from 0 - 120

Applicability Matrix

Contaminant and Site Characteristics	**Available Widely Used**	**Available Not Widely Used**	**Not Available**
Proven Technology for Contaminant & Site Conditions	5	4	0
Probably Applicable for Contaminant & Site Conditions	4	3	0
Applicability for Contaminant and /or Site Questionable	3	2	0
Probably Inapplicable for Contaminant & Site conditions	2	1	0
Not Applicable for Contaminant & Site conditions or Not Implimentable	0	0	0

SITE NAME >>>>>>> **ATLANTIC 7012**
Contaminant >>>>>>>>>>>>> Fuel Oil #2

Treatment Options	Applicability 0-5	Permissibility 0-3	Present Value Cost	Time 1-3	Score 0-120	Retain Y / N
Vadose Zone						
Soil Vapor Extraction (active)	5	3	2	2	60	Y
SVE - Windmill	2	3	1	1	12	N
SVE - open	2	3	1	1	12	N
Excavation	2	2	3	3	24	N
Biovent	4	3	3	2	60	Y
Natural Attenuation	3	2	1	1	12	N
Risk Assessment	2	2	1	2	12	N
Biosparge	2	3	4	2	36	Y
LNAPL Recovery	4	3	3	2	60	Y
AFVR	4	3	3	2	60	Y

Permissibility
0= Not Permissible
1= Probably not Permissible
2= Probably Permissible
3= No permitting Problems

Treatment Time
1= Treatment Time longer than Desired
2= Acceptable Treatment time
3= Rapid Treatment

Present Value Cost (Soils)
1= Greater thant $1000/ Cu Yd
2= $300 - $1,000 / Cu Yd
3= $200 - $300 / Cu Yd
4= $100 - $200/ Cu Yd
5= less thant $100/ Cu Yd

Rating Score: A x P x (C+T)
A = Applicability (0-5)
P = Permissibility (0-3)
C = Cost (1-5)
T = Treatment Time (1-3)
Rating Score ranges from 0 - 120

Applicability Matrix

Contaminant and Site Characteristics	**Available Widely Used**	**Available Not Widely Used**	**Not Available**
Proven Technology for Contaminant & Site Conditions	5	4	0
Probably Applicable for Contaminant & Site Conditions	4	3	0
Applicability for Contaminant and /or Site Questionable	3	2	0
Probably Inapplicable for Contaminant & Site conditions	2	1	0
Not Applicable for Contaminant & Site conditions or Not Implimentable	0	0	0

SITE NAME >>>>>>> **TANK FARM D**
Contaminant >>>>>>>>>>>>> Diesel

Treatment Options	Applicability 0-5	Permissibility 0-3	Present Value Cost	Time 1-3	Score 0-120	Retain Y / N
Vadose Zone						
Soil Vapor Extraction (active)	5	3	2	2	60	Y
SVE - Windmill	2	3	1	1	12	N
SVE - open	2	3	1	1	12	N
Excavation	2	2	3	3	24	N
Biovent	5	3	2	2	60	Y
Natural Attenuation	3	2	2	1	18	N
Risk Assessment	2	2	2	2	16	N
Biosparge	3	3	4	2	54	Y
LNAPL Recovery	4	3	3	1	48	Y
AFVR	4	3	2	1	36	Y

Permissibility
0= Not Permissible
1= Probably not Permissible
2= Probably Permissible
3= No permitting Problems

Treatment Time
1= Treatment Time longer than Desired
2= Acceptable Treatment time
3= Rapid Treatment

Present Value Cost (Soils)
1= Greater thant $1000/ Cu Yd
2= $300 - $1,000 / Cu Yd
3= $200 - $300 / Cu Yd
4= $100 - $200/ Cu Yd
5= less thant $100/ Cu Yd

Rating Score: A x P x (C+T)
A = Applicability (0-5)
P = Permissibility (0-3)
C = Cost (1-5)
T = Treatment Time (1-3)
Rating Score ranges from 0 - 120

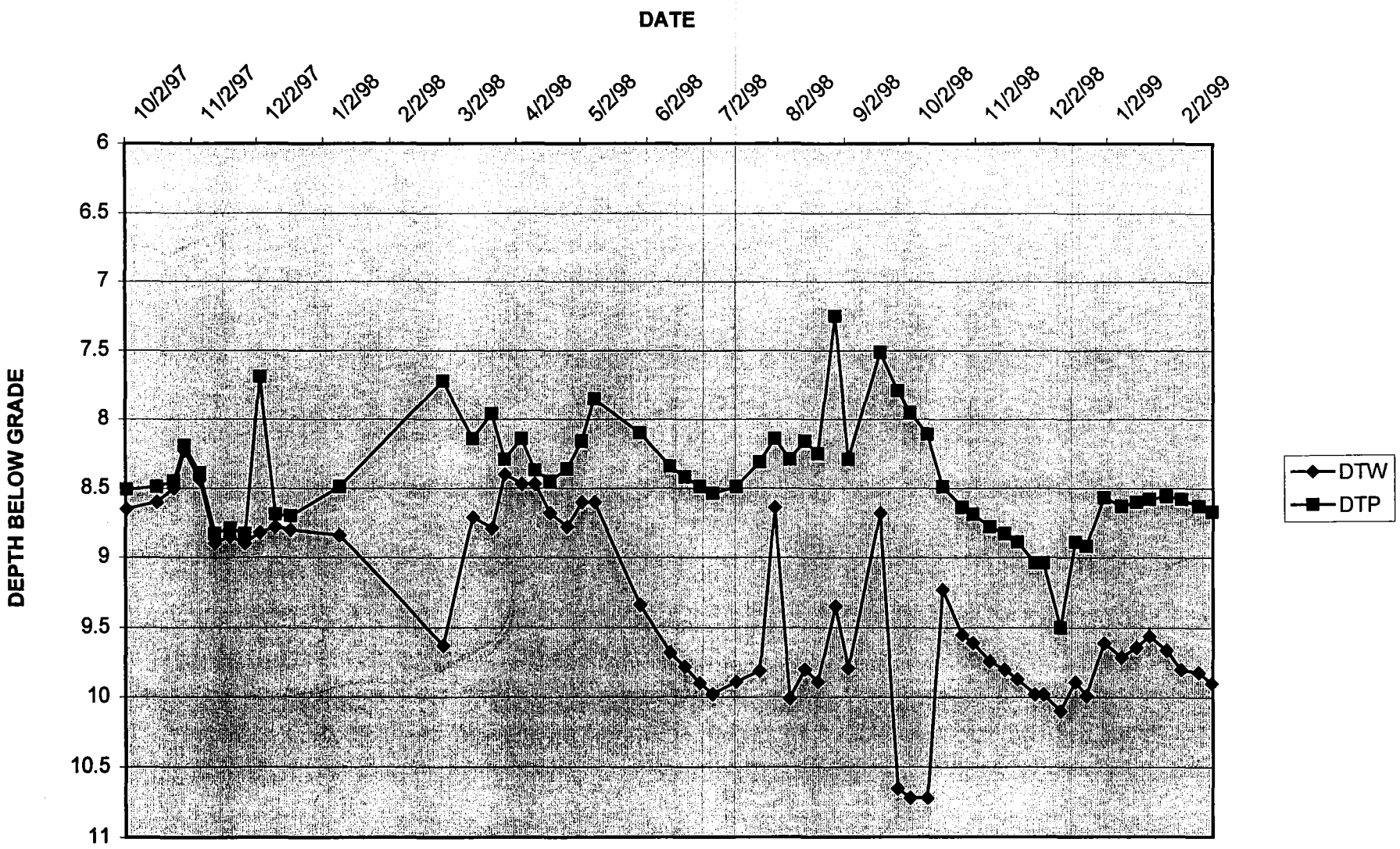
Applicability Matrix

Contaminant and Site Characteristics	**Available Widely Used**	**Available Not Widely Used**	**Not Available**
Proven Technology for Contaminant & Site Conditions	5	4	0
Probably Applicable for Contaminant & Site Conditions	4	3	0
Applicability for Contaminant and /or Site Questionable	3	2	0
Probably Inapplicable for Contaminant & Site conditions	2	1	0
Not Applicable for Contaminant & Site conditions or Not Implimentable	0	0	0

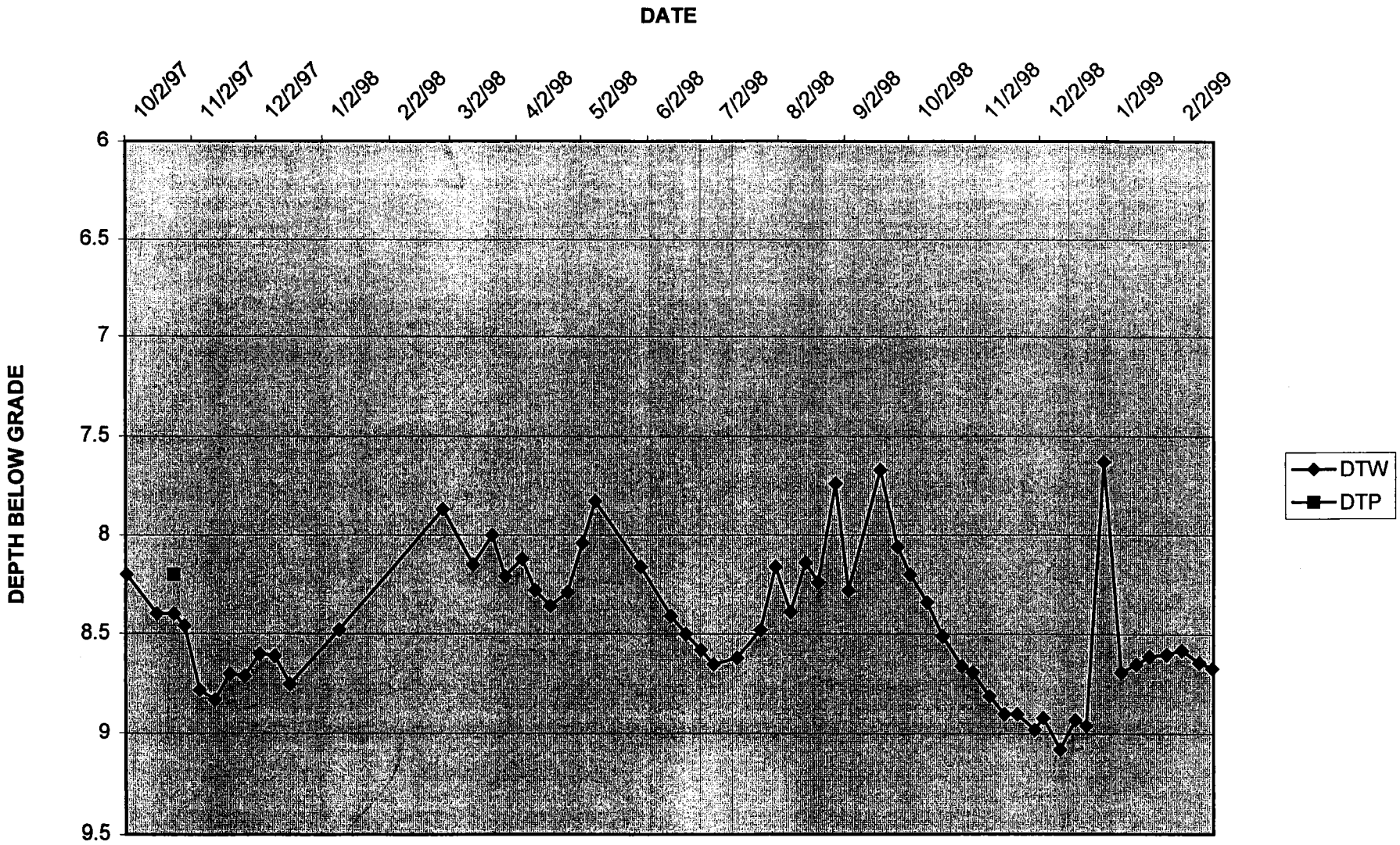
APPENDIX B

BUILDING 1640 HYDROGRAPH DATA

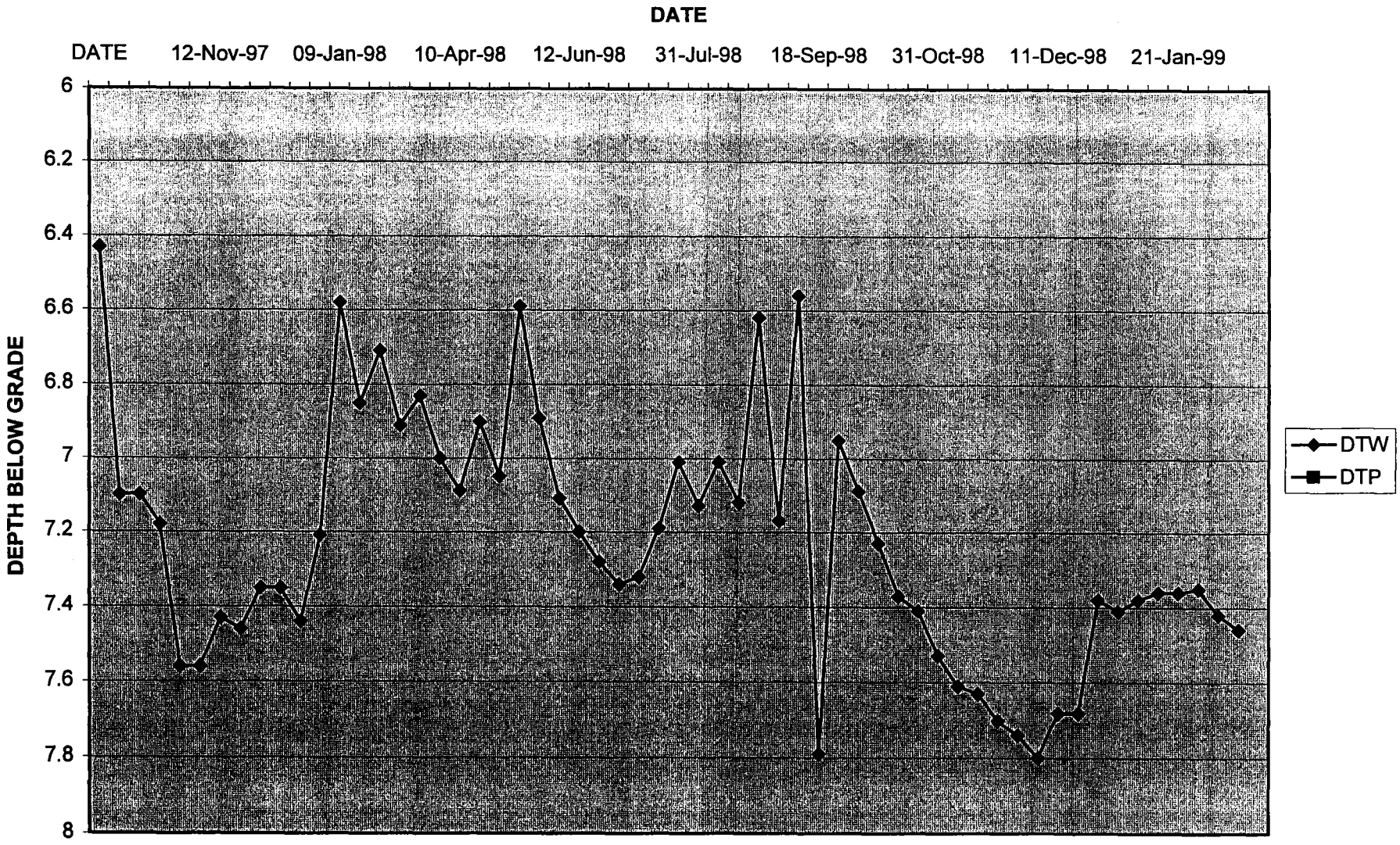
HYDROGRAPH 59GW02/ BUILDING 1640

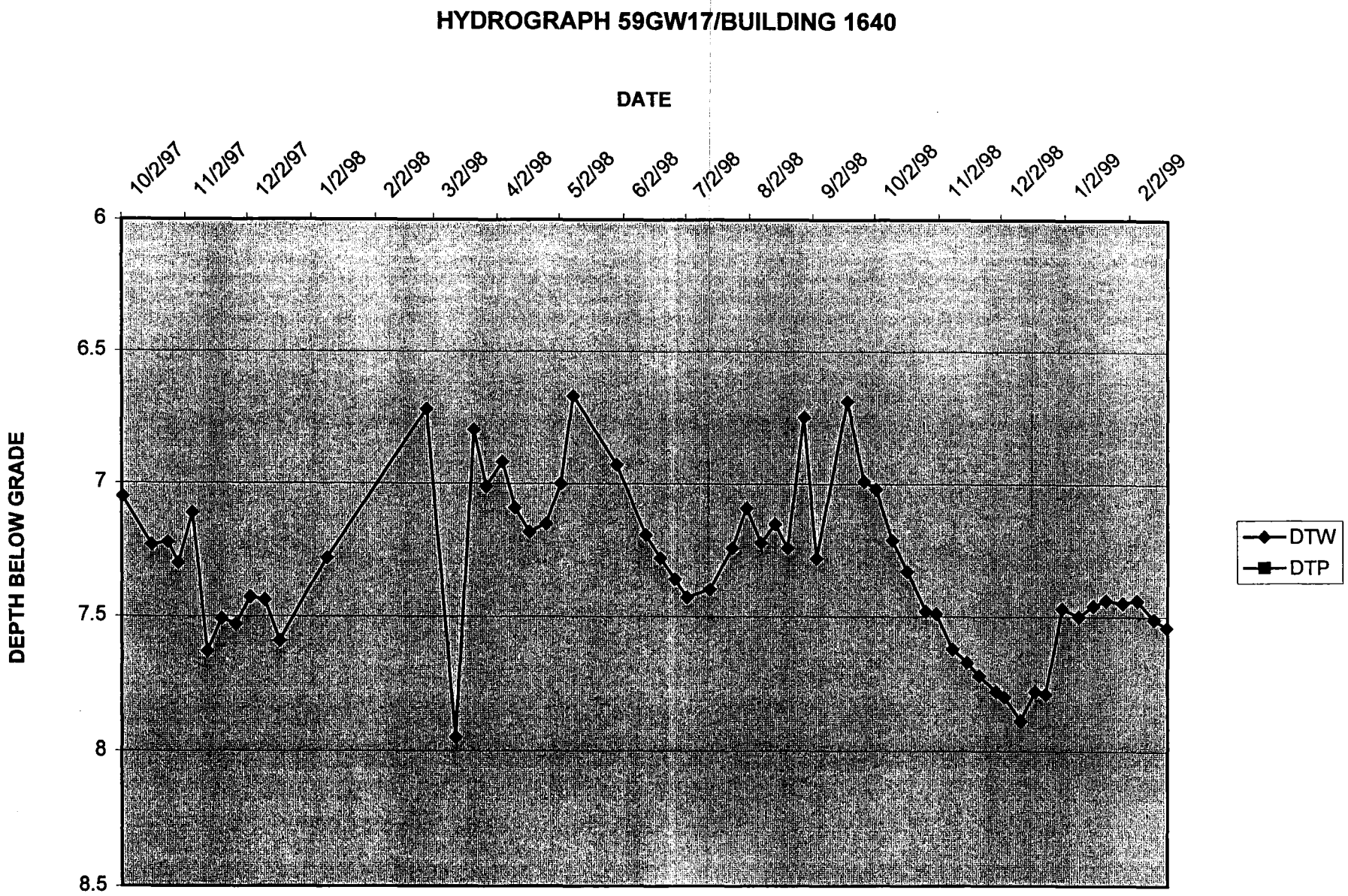


HYDROGRAPH 59GW06/ BUILDING 1640

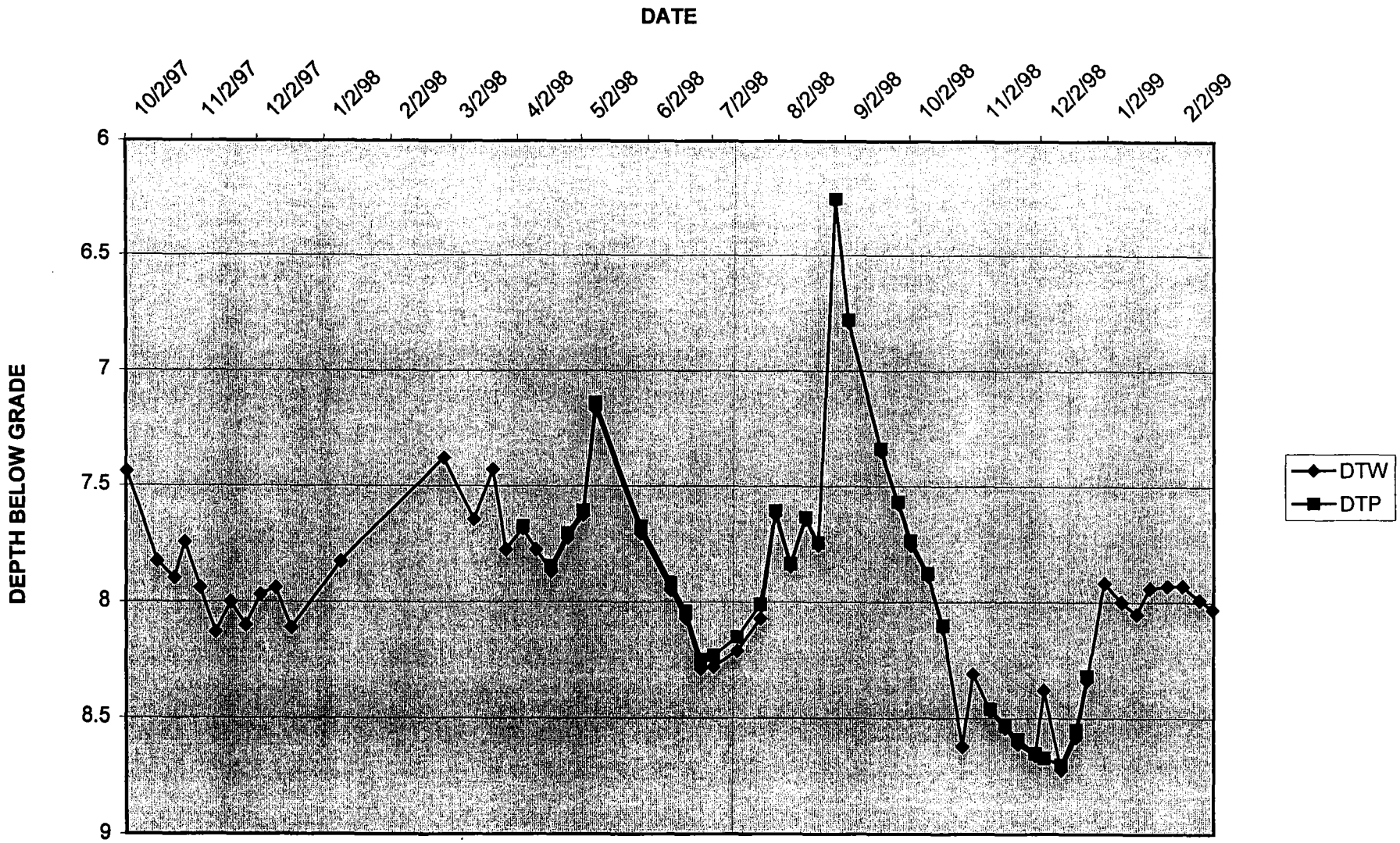


HYDROGRAPH 59GW11/ BUILDING 1640

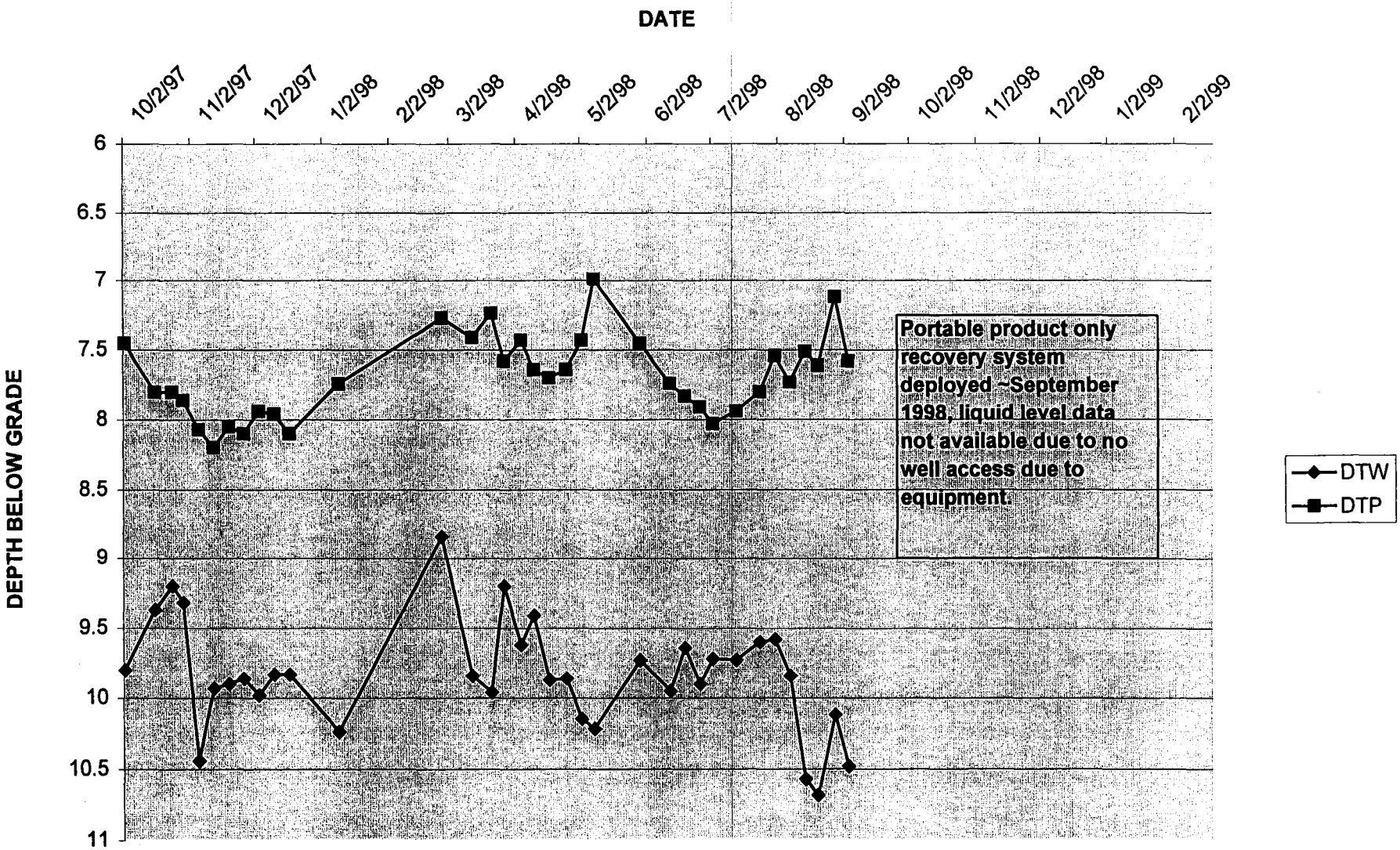



HYDROGRAPH 59GW17/BUILDING 1640
DATE
10/2/97
11/2/97
12/2/97
1/2/98
2/2/98
3/2/98
4/2/98
5/2/98
6/2/98
7/2/98
8/2/98
9/2/98
10/2/98
11/2/98
12/2/98
1/2/99
2/2/99
DEPTH BELOW GRADE
6
6.5
7
7.5
8
8.5
DTW
DTP

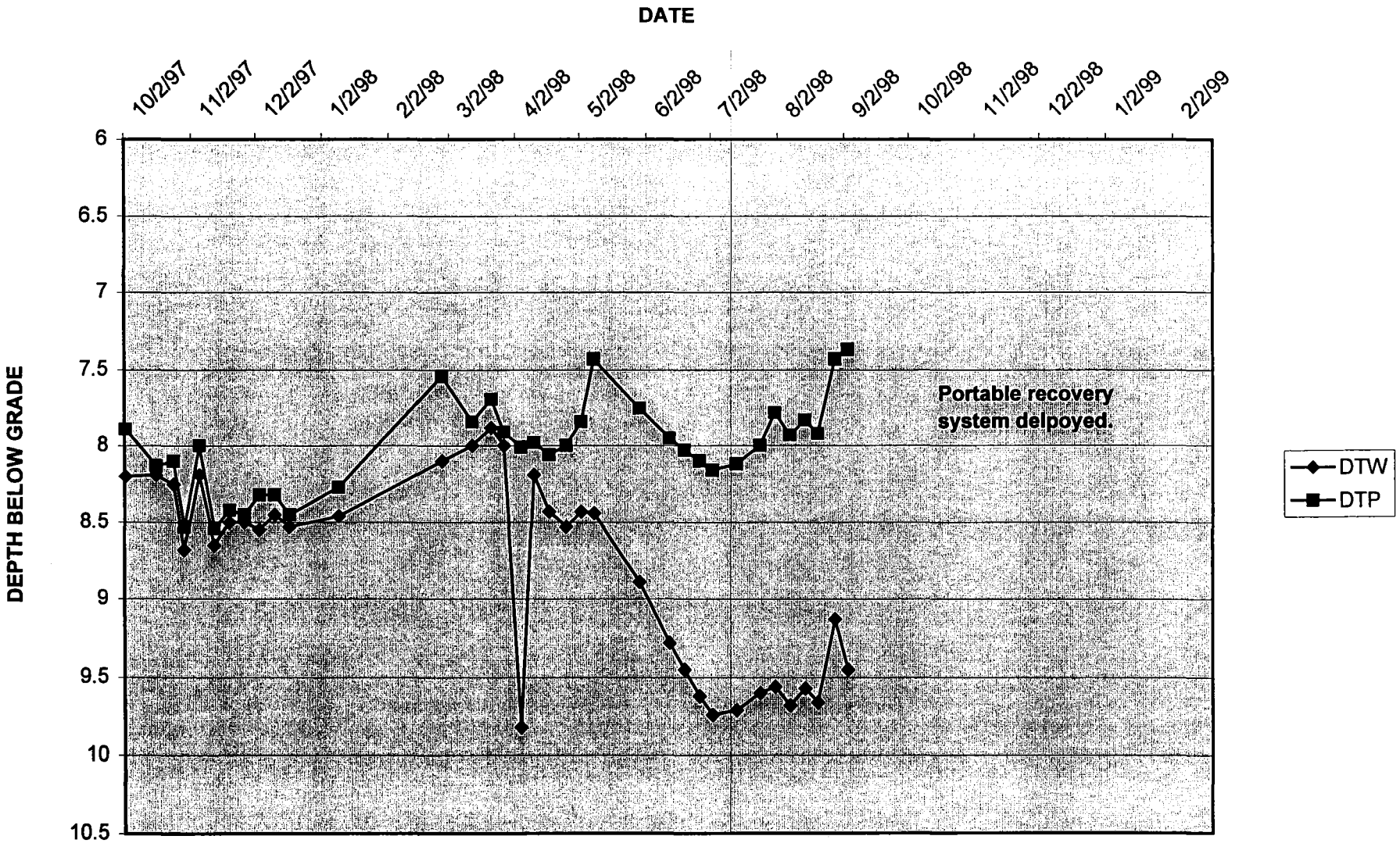
HYDROGRAPH OHM 1/ BUILDING 1640

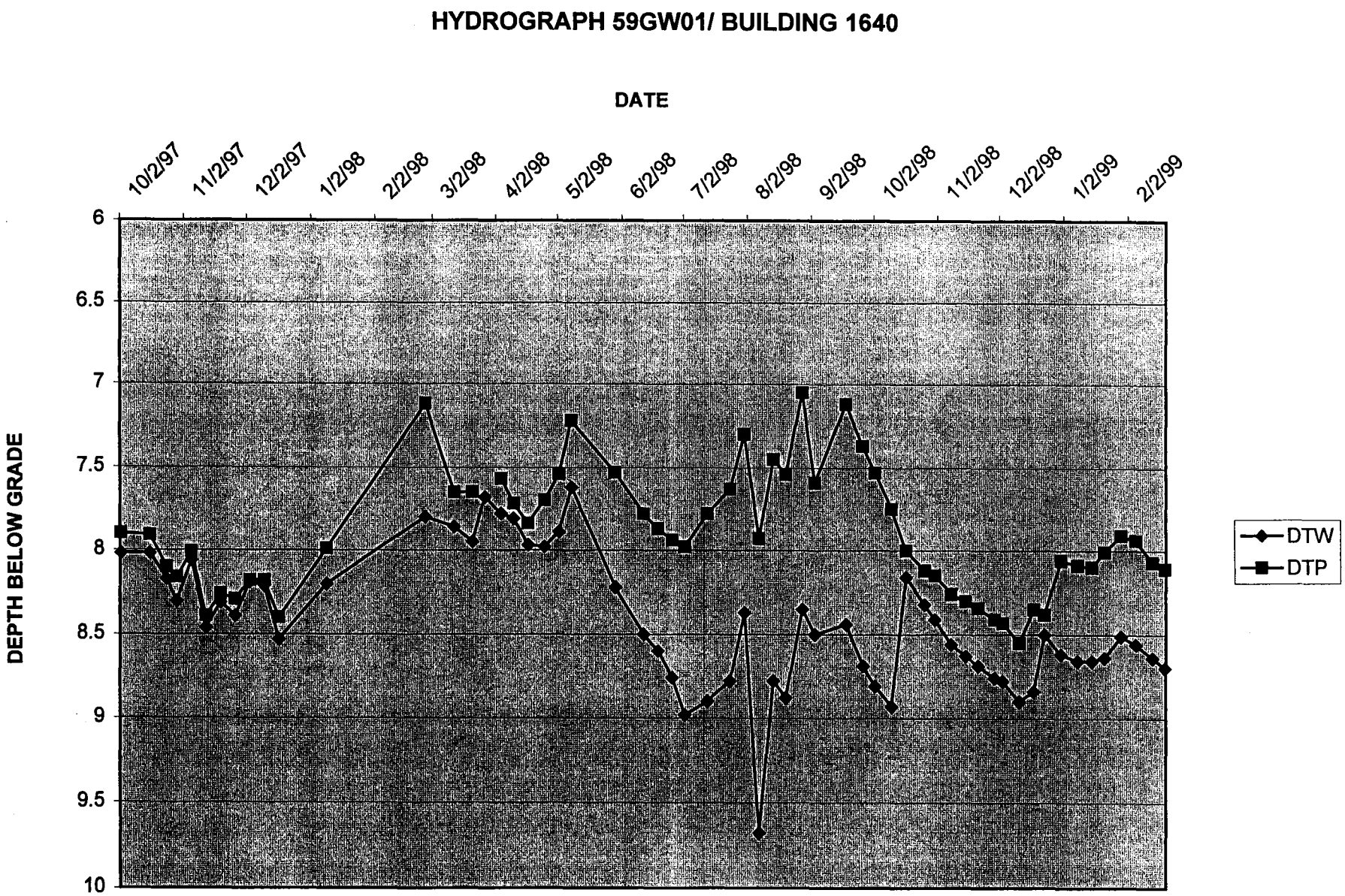


HYDROGRAPH OHM 2 / BUILDING 1640



HYDROGRAPH 59GW03/ BUILDING 1640




HYDROGRAPH 59GW01/ BUILDING 1640
DATE
10/2/97
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1/2/98
2/2/98
3/2/98
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5/2/98
6/2/98
7/2/98
8/2/98
9/2/98
10/2/98
11/2/98
12/2/98
1/2/99
2/2/99
DEPTH BELOW GRADE
6
6.5
7
7.5
8
8.5
9
9.5
10
DTW
DTP

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 02-Oct-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.20			
59GW11	6.43			
59GW17	7.05			
OHM1	7.44			
OHM2	9.80	7.45	2.35	
59GW01	8.02	7.90	0.12	
59GW02	8.65	8.51	0.14	
59GW03	8.20	7.89	0.31	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 16-Oct-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.40			
59GW11	7.10			
59GW17	7.23			
OHM1	7.83			
OHM2	9.37	7.80	1.57	
59GW01	8.02	7.91	0.11	
59GW02	8.60	8.49	0.11	
59GW03	8.19	8.13	0.06	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 24-Oct-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.40	8.20	0.20	
59GW11	7.10			
59GW17	7.22			
OHM1	7.90			
OHM2	9.20	7.80	1.40	
59GW01	8.17	8.10	0.07	
59GW02	8.50	8.45	0.05	
59GW03	8.25	8.10	0.15	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 29-Oct-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.46			
59GW11	7.18			
59GW17	7.30			
OHM1	7.75			
OHM2	9.32	7.86	1.46	
59GW01	8.30	8.16	0.14	
59GW02	8.23	8.19	0.04	
59GW03	8.68	8.53	0.15	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 5-Nov-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.78			
59GW11	7.56			
59GW17	7.11			
OHM1	7.94			SHEEN
OHM2	10.44	8.07	2.37	
59GW01	8.06	8.01	0.05	
59GW02	8.44	8.39	0.05	
59GW03	8.19	8.00	0.19	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 12-Nov-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.83			
59GW11	7.56			
59GW17	7.63			
OHM1	8.13			
OHM2	9.93	8.20	1.73	
59GW01	8.46	8.39	0.07	
59GW02	8.90	8.83	0.07	
59GW03	8.65	8.54	0.11	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 19-Nov-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.70			
59GW11	7.43			
59GW17	7.51			
OHM1	8.00			SHEEN
OHM2	9.90	8.05	1.85	
59GW01	8.31	8.26	0.05	
59GW02	8.85	8.79	0.06	
59GW03	8.50	8.42	0.08	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 26-Nov-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.71			
59GW11	7.46			
59GW17	7.53			
OHM1	8.10			SHEEN
OHM2	9.86	8.10	1.76	
59GW01	8.39	8.29	0.10	
59GW02	8.90	8.83	0.07	
59GW03	8.50	8.45	0.05	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 3-Dec-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.6			
59GW11	7.35			
59GW17	7.43			
OHM1	7.97			SHEEN
OHM2	9.98	7.94	2.04	
59GW01	8.19	8.18	0.01	
59GW02	8.82	7.69	1.13	
59GW03	8.55	8.32	0.23	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 10-Dec-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.61			
59GW11	7.35			
59GW17	7.44			
OHM1	7.94			SHEEN
OHM2	9.83	7.96	1.87	
59GW01	8.21	8.18	0.03	
59GW02	8.78	8.69	0.09	
59GW03	8.45	8.32	0.13	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 17-Dec-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.75			
59GW11	7.44			
59GW17	7.59			
OHM1	8.11			
OHM2	9.83	8.1	1.73	
59GW01	8.53	8.4	0.13	
59GW02	8.80	8.70	0.1	
59GW03	8.53	8.45	0.08	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 9-Jan-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.48			
59GW11	7.21			
59GW17	7.28			
OHM1	7.83			
OHM2	10.24	7.74	2.50	
59GW01	8.20	7.99	0.21	
59GW02	8.84	8.49	0.35	
59GW03	8.46	8.27	0.19	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 26-Feb-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	7.87			
59GW11	6.58			
59GW17	6.72			
OHM1	7.38			
OHM2	8.84	7.27	1.57	
59GW01	7.8	7.12	0.68	
59GW02	9.63	7.72	1.91	
59GW03	8.1	7.54	0.56	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 12-Mar-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.15			
59GW11	6.85			
59GW17	7.95			
OHM1	7.65			
OHM2	9.84	7.41	2.43	
59GW01	7.86	7.65	0.21	
59GW02	8.71	8.14	0.57	
59GW03	8.00	7.84	0.16	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 21-Mar-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.00			
59GW11	6.71			
59GW17	6.8			
OHM1	7.43			SHEEN
OHM2	9.96	7.24	2.72	
59GW01	7.95	7.65	0.30	
59GW02	8.79	7.96	0.83	
59GW03	7.88	7.69	0.19	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 27-Mar-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.21			
59GW11	6.91			
59GW17	7.01			
OHM1	7.78			SHEEN
OHM2	9.2	7.58	1.62	
59GW01	7.68			SHEEN
59GW02	8.4	8.29	0.11	
59GW03	8.00	7.91	0.09	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 4-Apr-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.12			
59GW11	6.83			
59GW17	6.92			
OHM1	7.69	7.68	0.01	
OHM2	9.62	7.43	2.19	
59GW01	7.78	7.57	0.21	
59GW02	8.47	8.14	0.33	
59GW03	8.01	9.82	-1.81	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 10-Apr-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.28			
59GW11	7.00			
59GW17	7.09			
OHM1	7.78			SHEEN
OHM2	9.41	7.64	1.77	
59GW01	7.81	7.72	0.09	
59GW02	8.47	8.37	0.10	
59GW03	8.19	7.98	0.21	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 17-Apr-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.36			
59GW11	7.09			
59GW17	7.18			
OHM1	7.87	7.85	0.02	
OHM2	9.78	7.70	2.08	
59GW01	7.97	7.84	0.13	
59GW02	8.68	8.45	0.23	
59GW03	8.43	8.06	0.37	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 2-May-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.04			
59GW11	6.90			
59GW17	7.00			
OHM1	7.63	7.61	0.02	
OHM2	10.15	7.43	2.72	
59GW01	7.89	7.54	0.35	
59GW02	8.60	8.16	0.44	
59GW03	8.43	7.84	0.59	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 25-Apr-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.29			
59GW11	7.05			
59GW17	7.15			
OHM1	7.73	7.71	0.02	
OHM2	9.86	7.64	2.22	
59GW01	7.98	7.70	0.28	
59GW02	8.78	8.36	0.42	
59GW03	8.53	8.00	0.53	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 8-May-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	7.83			
59GW11	6.59			
59GW17	6.67			
OHM1	7.17	7.14	0.03	
OHM2	10.22	6.99	3.23	
59GW01	7.62	7.22	0.4	
59GW02	8.60	7.85	0.75	
59GW03	8.44	7.43	1.01	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 29-May-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.16			
59GW11	6.89			
59GW17	6.93			
OHM1	7.71	7.68	0.03	
OHM2	9.73	7.45	2.28	
59GW01	8.22	7.53	0.69	
59GW02	9.34	8.10	1.24	
59GW03	8.89	7.75	1.14	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 12-Jun-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.41			
59GW11	7.11			
59GW17	7.19			
OHM1	7.95	7.92	0.03	
OHM2	9.95	7.74	2.21	
59GW01	8.50	7.78	0.72	
59GW02	9.68	8.34	1.34	
59GW03	9.28	7.95	1.33	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 19-Jun-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.50			
59GW11	7.20			
59GW17	7.28			
OHM1	8.07	8.04	0.03	
OHM2	9.64	7.83	1.81	
59GW01	8.60	7.87	0.73	
59GW02	9.78	8.42	1.36	
59GW03	9.45	8.03	1.42	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 26-Jun-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.58			
59GW11	7.28			
59GW17	7.36			
OHM1	8.29	8.25	0.04	
OHM2	9.90	7.91	1.99	
59GW01	8.76	7.94	0.82	
59GW02	9.90	8.49	1.41	
59GW03	9.62	8.10	1.52	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 2-Jul-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.65			
59GW11	7.34			
59GW17	7.43			
OHM1	8.28	8.23	0.05	
OHM2	9.72	8.03	1.69	
59GW01	8.98	7.98	1.00	
59GW02	9.98	8.54	1.44	
59GW03	9.74	8.16	1.58	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 13-Jul-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.62			
59GW11	7.32			
59GW17	7.40			
OHM1	8.21	8.15	0.06	
OHM2	9.73	7.94	1.79	
59GW01	8.90	7.78	1.12	
59GW02	9.89	8.49	1.40	
59GW03	9.71	8.12	1.59	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 24-Jul-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.48			
59GW11	7.19			
59GW17	7.24			
OHM1	8.07	8.01	0.06	
OHM2	9.60	7.80	1.80	
59GW01	8.78	7.63	1.15	
59GW02	9.81	8.31	1.50	
59GW03	9.60	8.00	1.60	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 31-Jul-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.16			
59GW11	7.01			
59GW17	7.09			
OHM1	7.63	7.61	0.02	
OHM2	9.58	7.54	2.04	
59GW01	8.37	7.3	1.07	
59GW02	8.64	8.14	0.50	
59GW03	9.56	7.78	1.78	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 7-Aug-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.39			
59GW11	7.13			
59GW17	7.22			
OHM1	7.85	7.84	0.01	
OHM2	9.84	7.73	2.11	
59GW01	9.68	7.93	1.75	
59GW02	10.01	8.29	1.72	
59GW03	9.68	7.93	1.75	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 14-Aug-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.14			
59GW11	7.01			
59GW17	7.15			
OHM1	7.65	7.64	0.01	
OHM2	10.57	7.51	3.06	
59GW01	8.78	7.45	1.33	
59GW02	9.80	8.16	1.64	
59GW03	9.57	7.83	1.74	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 20-Aug-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.24			
59GW11	7.12			
59GW17	7.24			
OHM1	7.76	7.75	0.01	
OHM2	10.68	7.61	3.07	
59GW01	8.88	7.54	1.34	
59GW02	9.89	8.25	1.64	
59GW03	9.66	7.92	1.74	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 28-Aug-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	7.74			
59GW11	6.62			
59GW17	6.75			
OHM1	6.26	6.25	0.01	
OHM2	10.12	7.12	3.00	
59GW01	8.35	7.05	1.30	
59GW02	9.35	7.25	2.10	
59GW03	9.13	7.43	1.70	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 3-Sep-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.28			
59GW11	7.17			
59GW17	7.28			
OHM1	6.79	6.78	0.01	
OHM2	10.48	7.58	2.90	
59GW01	8.50	7.59	0.91	
59GW02	9.79	8.29	1.50	
59GW03	9.45	7.37	2.08	

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 18-Sep-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	7.67			
59GW11	6.56			
59GW17	6.69			
OHM1	7.35	7.34	0.01	
OHM2				COVERY SYSTEM
59GW01	8.44	7.12	1.32	
59GW02	8.68	7.51	1.17	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 26-Sep-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.06			
59GW11	7.79			
59GW17	6.99			
OHM1	7.58	7.57	0.01	
OHM2				COVERY SYSTEM
59GW01	8.69	7.37	1.32	
59GW02	10.65	7.79	2.86	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 2-Oct-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.20			
59GW11	6.95			
59GW17	7.02			
OHM1	7.76	7.74	0.02	
OHM2				COVERY SYSTEM
59GW01	8.81	7.53	1.28	
59GW02	10.72	7.95	2.77	COVERY SYSTEM
59GW03				

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 10-Oct-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.34			
59GW11	7.09			
59GW17	7.21			
OHM1	7.89	7.88	0.01	
OHM2				COVERY SYSTEM
59GW01	8.93	7.75	1.18	
59GW02	10.72	8.11	2.61	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 17-Oct-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.51			
59GW11	7.23			
59GW17	7.33			
OHM1	8.11	8.10	0.01	
OHM2				COVERY SYSTEM
59GW01	8.16	8.00	0.16	
59GW02	9.23	8.49	0.74	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 26-Oct-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.66			
59GW11	7.37			
59GW17	7.48			
OHM1	8.62			
OHM2				COVERY SYSTEM
59GW01	8.32	8.12	0.20	
59GW02	9.55	8.64	0.91	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 31-Oct-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.69			
59GW11	7.41			
59GW17	7.49			
OHM1	8.31			
OHM2				COVERY SYSTEM
59GW01	8.41	8.15	0.26	
59GW02	9.61	8.69	0.92	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 8-Nov-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.81			
59GW11	7.53			
59GW17	7.62			
OHM1	8.47	8.46	0.01	
OHM2				COVERY SYSTEM
59GW01	8.56	8.26	0.30	
59GW02	9.74	8.78	0.96	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 15-Nov-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.90			
59GW11	7.61			
59GW17	7.67			
OHM1	8.54	8.53	0.01	
OHM2				COVERY SYSTEM
59GW01	8.63	8.30	0.33	
59GW02	9.80	8.83	0.97	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 21-Nov-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.90			
59GW11	7.63			
59GW17	7.72			
OHM1	8.61	8.59	0.02	
OHM2				COVERY SYSTEM
59GW01	8.69	8.34	0.35	
59GW02	9.87	8.89	0.98	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 29-Nov-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.98			
59GW11	7.70			
59GW17	7.78			
OHM1	8.66	8.65	0.01	
OHM2				COVERY SYSTEM
59GW01	8.76	8.41	0.35	
59GW02	9.98	9.04	0.94	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 03-Dec-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.92			
59GW11	7.74			
59GW17	7.80			
OHM1	8.68	8.67	0.01	
OHM2				COVERY SYSTEM
59GW01	8.78	8.43	0.35	
59GW02	9.98	9.04	0.94	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 11-Dec-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	9.08			
59GW11	7.80			
59GW17	7.89			
OHM1	8.72	8.70	0.02	
OHM2				COVERY SYSTEM
59GW01	8.90	8.55	0.35	
59GW02	10.10	9.50	0.60	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 18-Dec-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.93			
59GW11	7.68			
59GW17	7.78			
OHM1	8.58	8.55	0.03	
OHM2				COVERY SYSTEM
59GW01	8.84	8.35	0.49	
59GW02	9.89	8.89	1.00	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 23-Dec-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.96			
59GW11	7.68			
59GW17	7.79			
OHM1	8.34	8.32	0.02	
OHM2				COVERY SYSTEM
59GW01	8.50	8.38	0.12	
59GW02	9.99	8.92	1.07	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 31-Dec-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	7.63			
59GW11	7.38			
59GW17	7.47			
OHM1	7.92			
OHM2				COVERY SYSTEM
59GW01	8.62	8.06	0.56	
59GW02	9.61	8.57	1.04	COVERY SYSTEM
59GW03				

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 08-Jan-99

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.69			
59GW11	7.41			
59GW17	7.50			
OHM1	8.00			
OHM2				COVERY STSTEM
59GW01	8.66	8.09	0.57	
59GW02	9.71	8.63	1.08	
59GW03				COVERY STSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 15-Jan-99

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.65			
59GW11	7.38			
59GW17	7.46			
OHM1	8.05			
OHM2				COVERY SYSTEM
59GW01	8.66	8.10	0.56	
59GW02	9.64	8.60	1.04	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 21-Jan-99

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.61			
59GW11	7.36			
59GW17	7.44			
OHM1	7.94			
OHM2				COVERY SYSTEM
59GW01	8.64	8.01	0.63	
59GW02	9.56	8.58	0.98	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 29-Jan-99

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.60			
59GW11	7.36			
59GW17	7.45			
OHM1	7.93			
OHM2				COVERY SYSTEM
59GW01	8.51	7.91	0.60	
59GW02	9.66	8.56	1.10	
59GW03				COVERY SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 05-Feb-99

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.58			
59GW11	7.35			
59GW17	7.44			
OHM1	7.93			
OHM2				:OVERING SYSTEM
59GW01	8.56	7.94	0.62	
59GW02	9.80	8.58	1.22	
59GW03				:OVERING SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 13-Feb-99

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.64			
59GW11	7.42			
59GW17	7.51			
OHM1	7.99			
OHM2				OVERING SYSTEM
59GW01	8.64	8.07	0.57	
59GW02	9.82	8.63	1.19	
59GW03				OVERING SYSTEM

Liquid Level Data

Site Name: **Bldg. 1640**
Date: 19-Feb-99

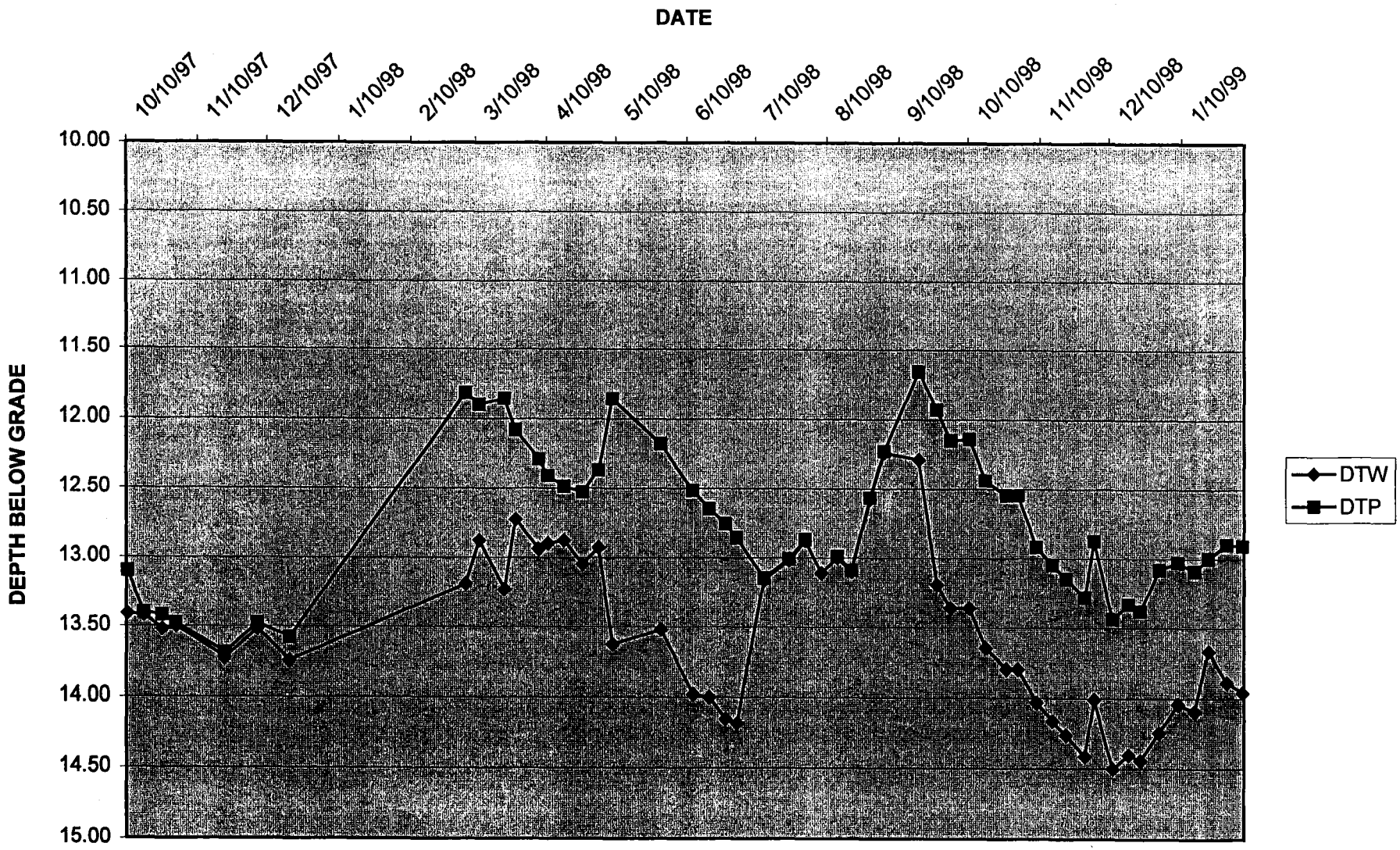
MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
59GW06	8.67			
59GW11	7.46			
59GW17	7.54			
OHM1	8.03			
OHM2				OVERING SYSTEM
59GW01	8.70	8.11	0.59	
59GW02	9.90	8.67	1.23	
59GW03				OVERING SYSTEM

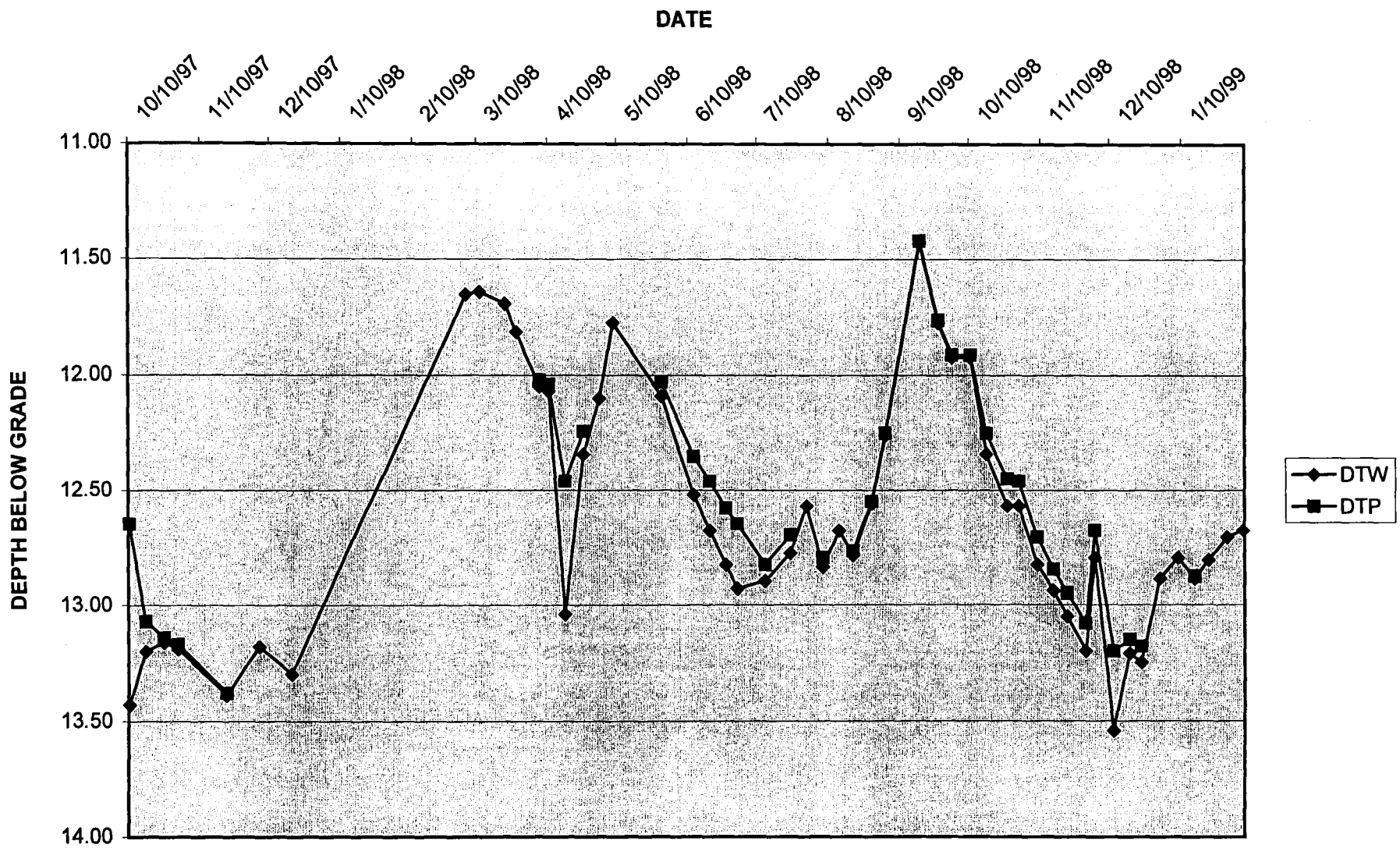
APPENDIX C

BUILDING 296 HYDROGRAPH DATA

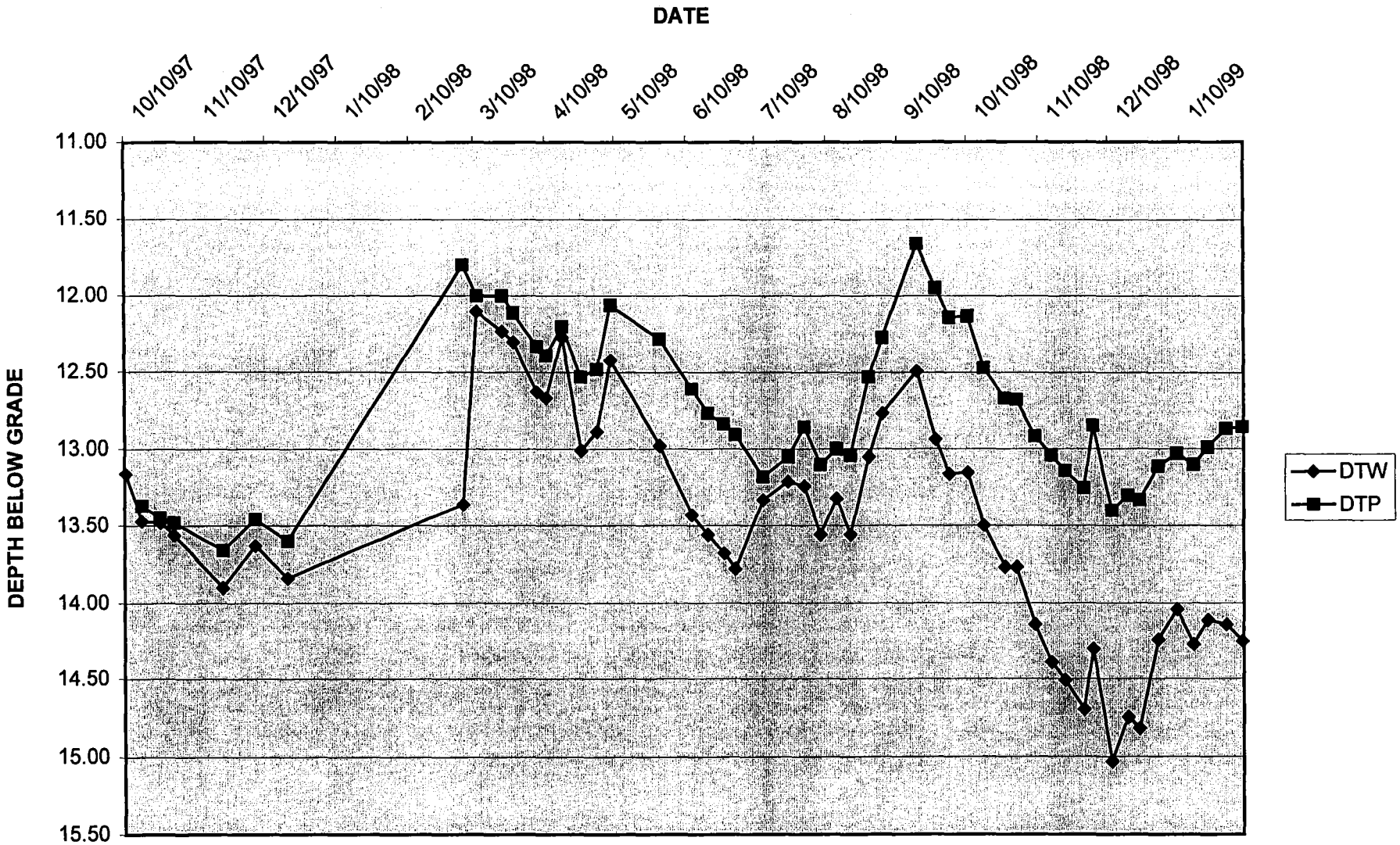
HYDROGRAPH 65GW04/BUILDING 296

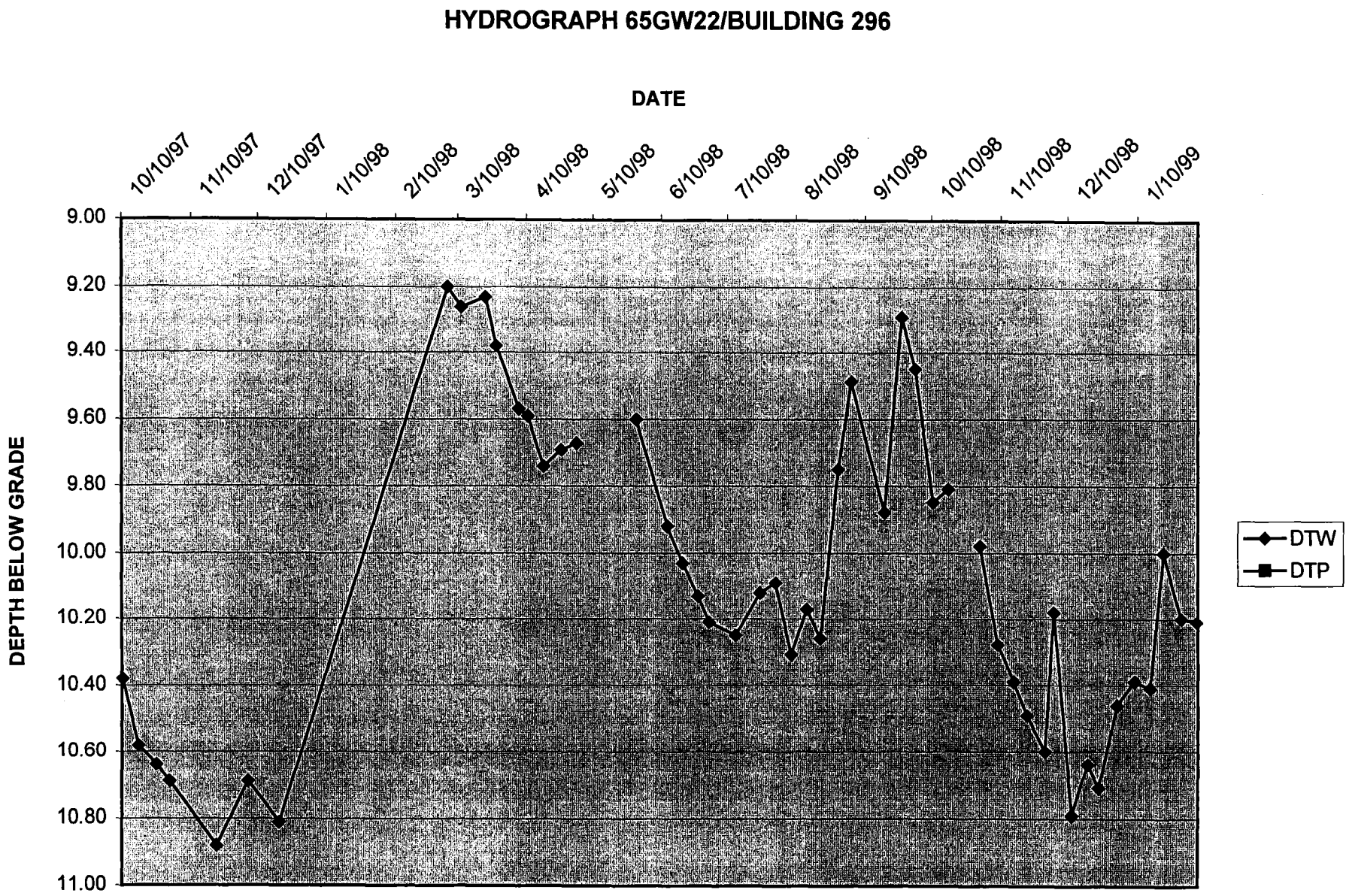


HYDROGRAPH 65GW05/BUILDING 296

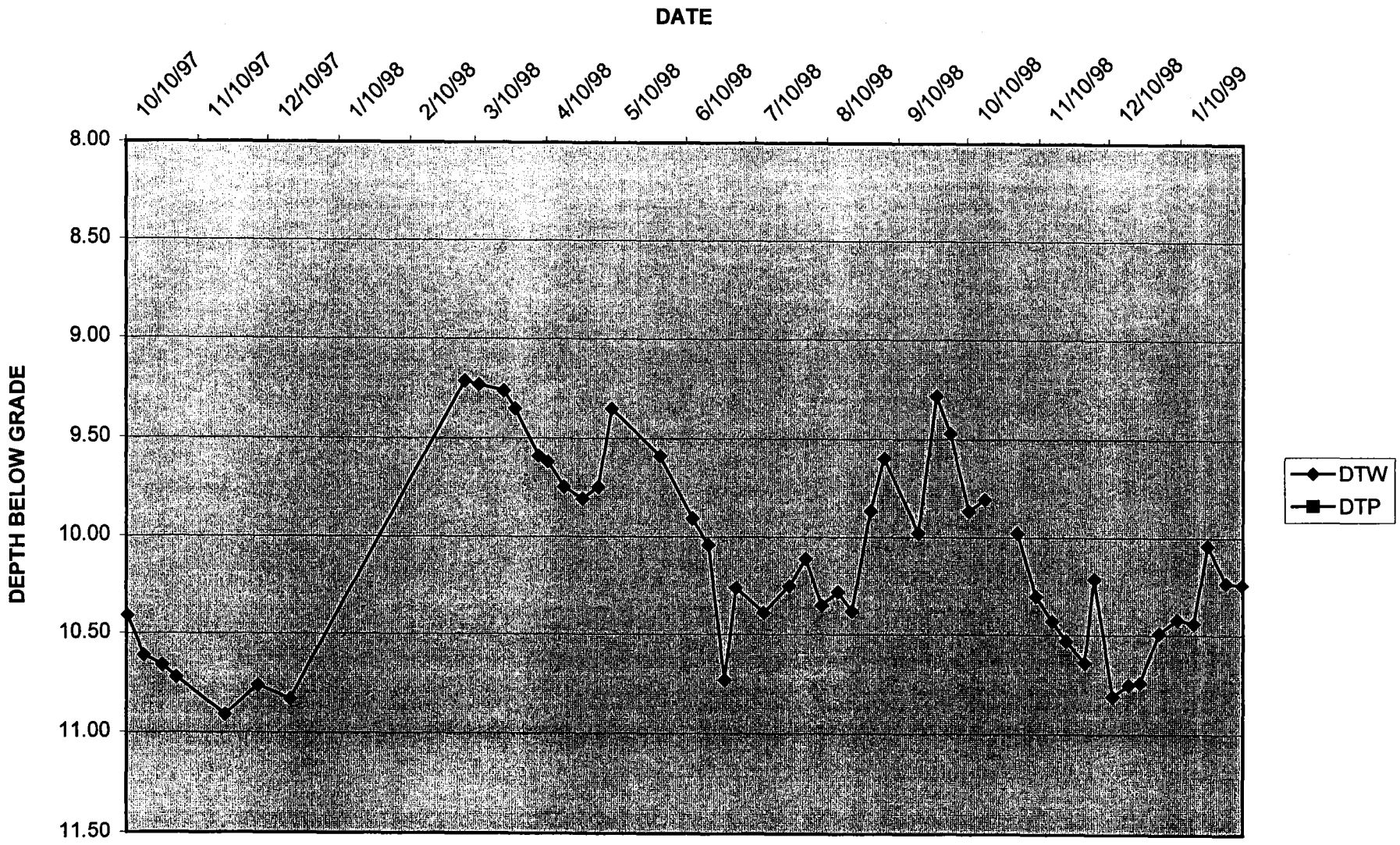


HYDROGRAPH 65GW06/BUILDING 296

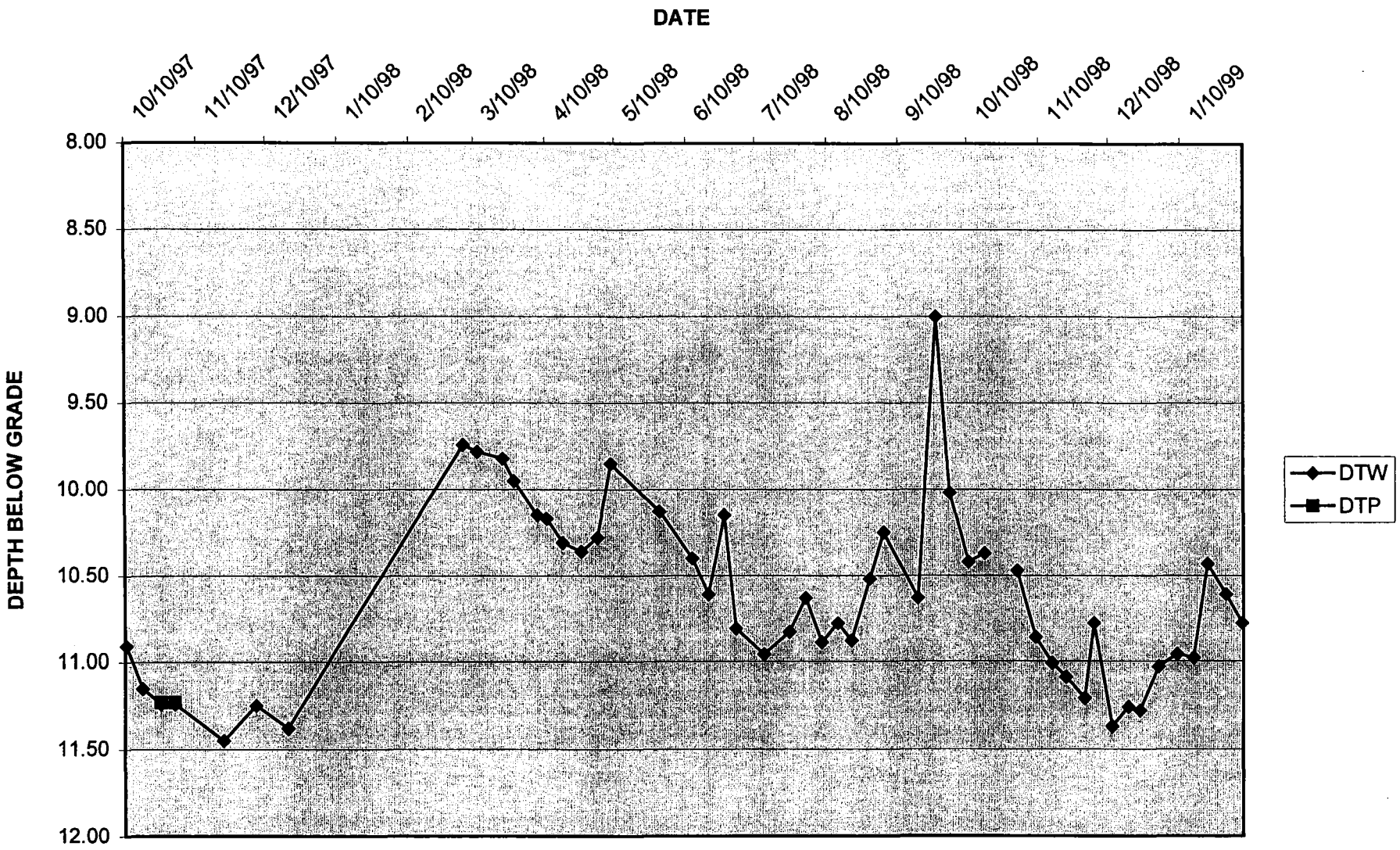



HYDROGRAPH 65GW22/BUILDING 296
DATE
10/10/97
11/10/97
12/10/97
1/10/98
2/10/98
3/10/98
4/10/98
5/10/98
6/10/98
7/10/98
8/10/98
9/10/98
10/10/98
11/10/98
12/10/98
1/10/99
DEPTH BELOW GRADE
9.00
9.20
9.40
9.60
9.80
10.00
10.20
10.40
10.60
10.80
11.00
DTW
DTP

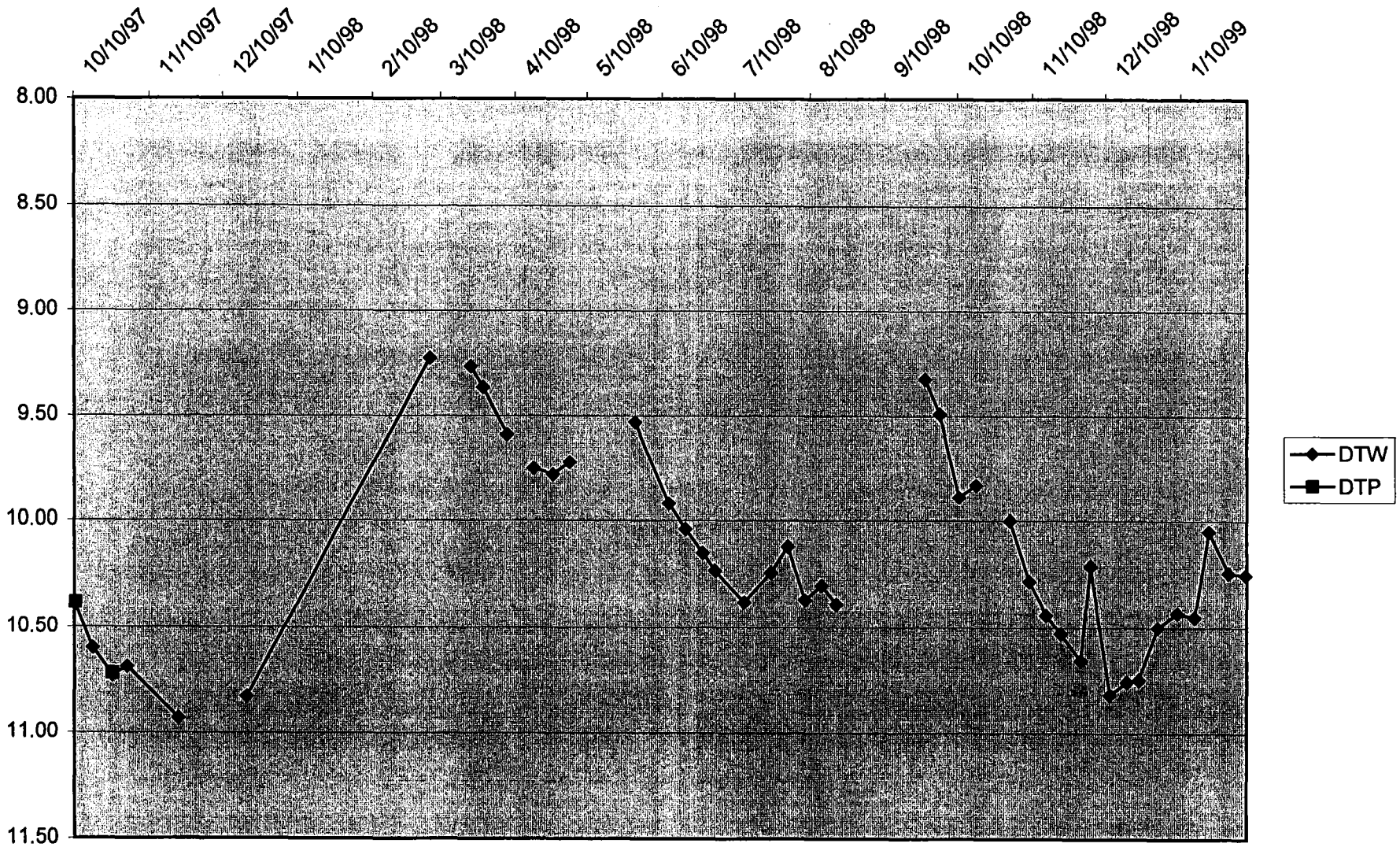
HYDROGRAPH 65GW23/BUILDING 296



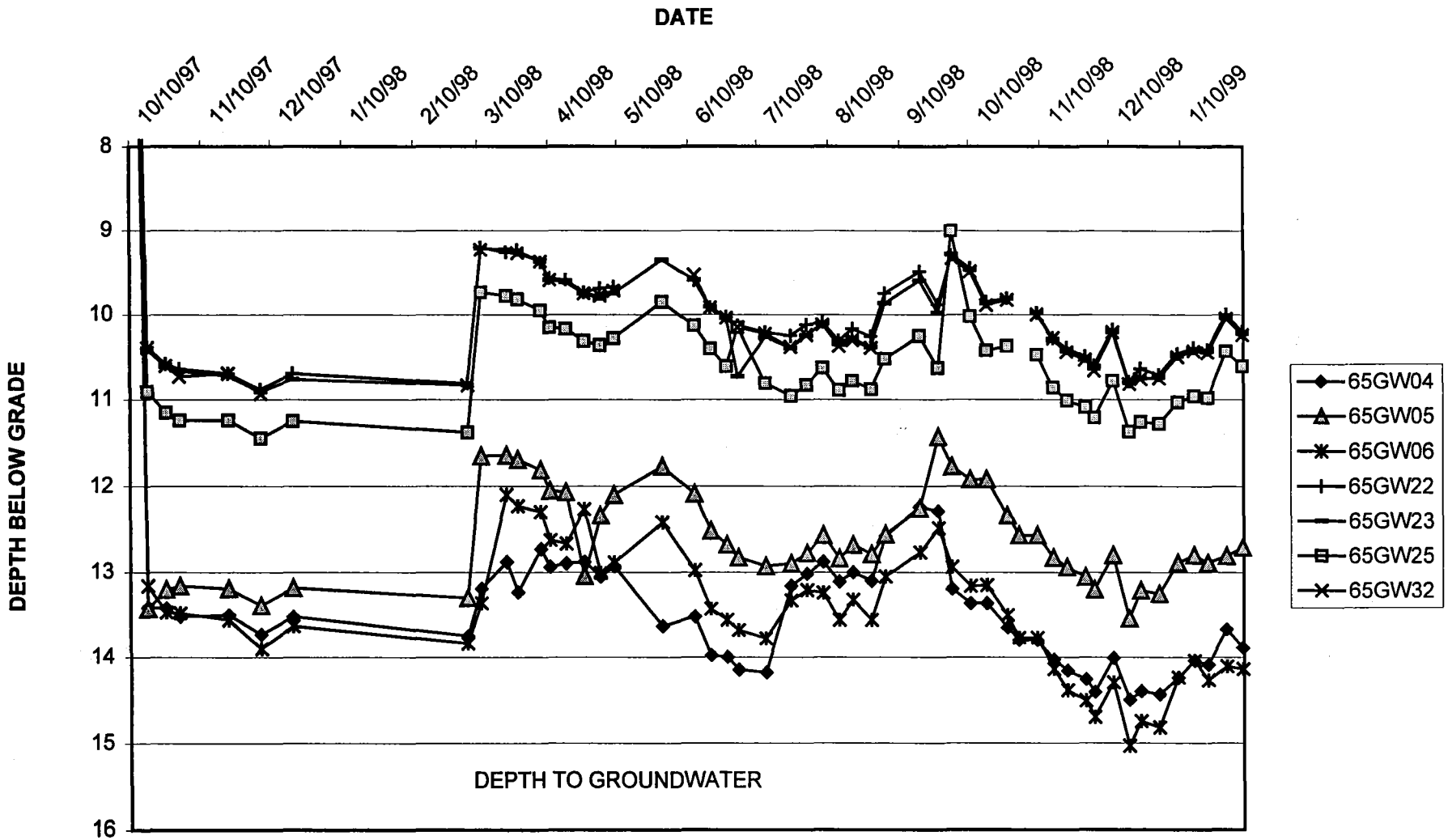
HYDROGRAPH 65GW25/BUILDING 296



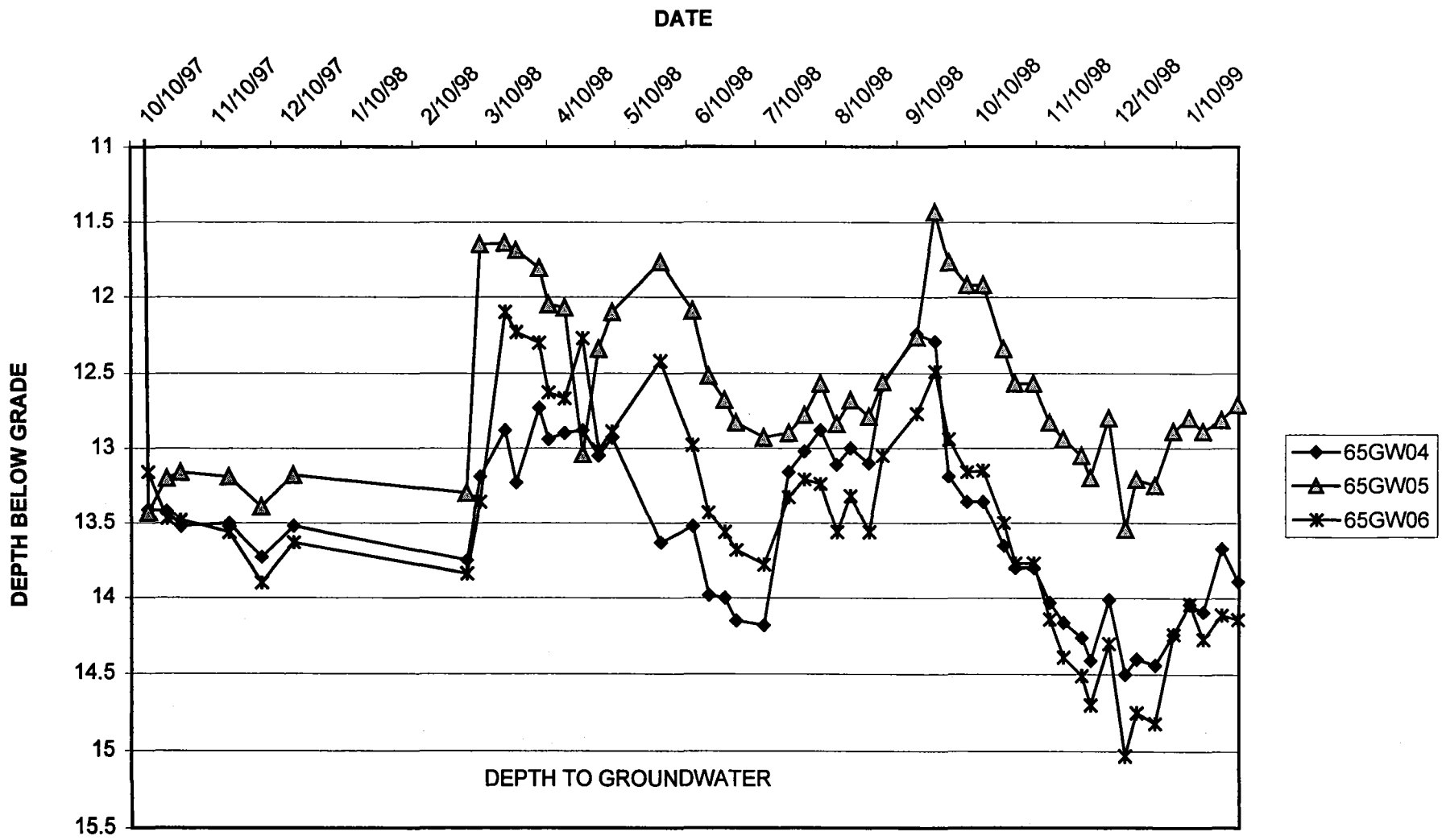
HYDROGRAPH 65GW32/BUILDING 296

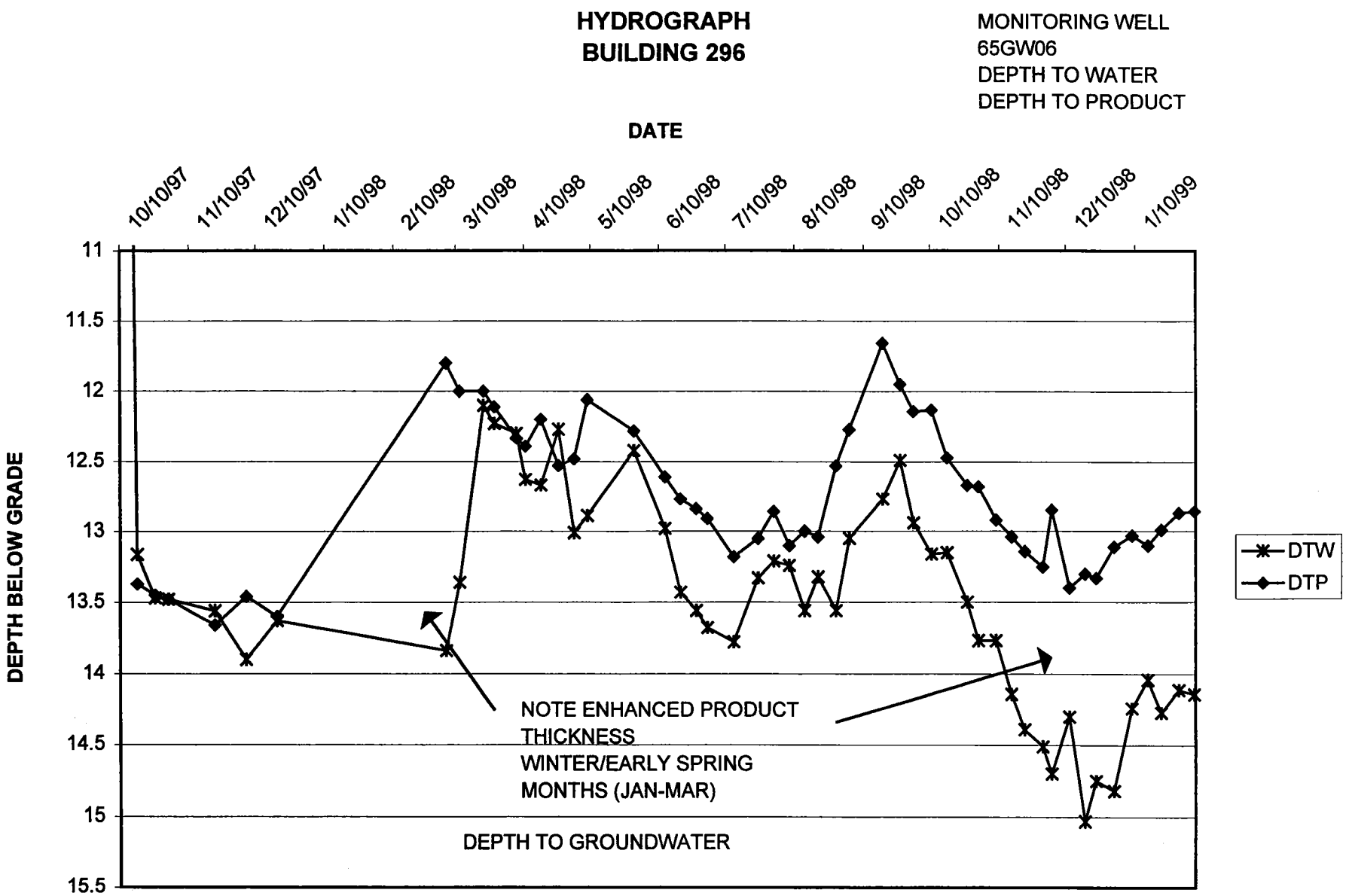


HYDROGRAPH
BUILDING 296



HYDROGRAPH
BUILDING 296




HYDROGRAPH
BUILDING 296
MONITORING WELL
65GW06
DEPTH TO WATER
DEPTH TO PRODUCT
DATE
10/10/97
11/10/97
12/10/97
1/10/98
2/10/98
3/10/98
4/10/98
5/10/98
6/10/98
7/10/98
8/10/98
9/10/98
10/10/98
11/10/98
12/10/98
1/10/99
DEPTH BELOW GRADE
11
11.5
12
12.5
13
13.5
14
14.5
15
15.5
DTW
DTP
NOTE ENHANCED PRODUCT
THICKNESS
WINTER/EARLY SPRING
MONTHS (JAN-MAR)
DEPTH TO GROUNDWATER

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 05-Feb-99 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.96	12.91	1.05	
65GW05	12.68			
65GW06	14.25	12.86	1.39	
65GW22	10.21			
65GW23	10.24			
65GW25	10.78			
65GW32	10.25			

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Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 29-Jan-99 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.89	12.90	0.99	
65GW05	12.71			
65GW06	14.14	12.87	1.27	
65GW22	10.20			
65GW23	10.23			
65GW25	10.61			
65GW32	10.24			

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Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 21-Jan-99 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.67	13.00	0.67	
65GW05	12.81			
65GW06	14.11	12.99	1.12	
65GW22	10.00			
65GW23	10.04			
65GW25	10.43			
65GW32	10.05			

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Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 15-Jan-99 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	14.09	13.09	1.00	
65GW05	12.89	12.88	0.01	
65GW06	14.27	13.10	1.17	
65GW22	10.41			
65GW23	10.44			
65GW25	10.98			
65GW32	10.45			

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Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 08-Jan-99 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	14.04	13.03	1.01	
65GW05	12.80		SHEEN	
65GW06	14.04	13.03	1.01	
65GW22	10.39			
65GW23	10.42			
65GW25	10.96			
65GW32	10.43			

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Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 31-Dec-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	14.24	13.08	1.16	
65GW05	12.89			
65GW06	14.24	13.11	1.13	
65GW22	10.46			
65GW23	10.49			
65GW25	11.03			
65GW32	10.50			

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Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 23-Dec-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	14.44	13.38	1.06	
65GW05	13.25	13.18	0.07	
65GW06	14.82	13.33	1.49	
65GW22	10.71			
65GW23	10.74			
65GW25	11.28			
65GW32	10.75			

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Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 18-Dec-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	14.40	13.33	1.07	
65GW05	13.21	13.15	0.06	
65GW06	14.75	13.30	1.45	
65GW22	10.64			
65GW23	10.75			
65GW25	11.26			
65GW32	10.76			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 11-Dec-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	14.50	13.44	1.06	
65GW05	13.54	13.20	0.34	
65GW06	15.03	13.40	1.63	
65GW22	10.79			
65GW23	10.81			
65GW25	11.37			
65GW32	10.82			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 03-Dec-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	14.01	12.88	1.13	
65GW05	12.80	12.68	0.12	
65GW06	14.30	12.85	1.45	
65GW22	10.18			
65GW23	10.21			
65GW25	10.78			
65GW32	10.21			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 29-Nov-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	14.41	13.28	1.13	
65GW05	13.20	13.08	0.12	
65GW06	14.70	13.25	1.45	
65GW22	10.60			
65GW23	10.64			
65GW25	11.21			
65GW32	10.66			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 21-Nov-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	14.26	13.15	1.11	
65GW05	13.05	12.95	0.10	
65GW06	14.51	13.14	1.37	
65GW22	10.49			
65GW23	10.53			
65GW25	11.09			
65GW32	10.53			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 15-Nov-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	14.16	13.05	1.11	
65GW05	12.94	12.85	0.09	
65GW06	14.39	13.04	1.35	
65GW22	10.39			
65GW23	10.43			
65GW25	11.01			
65GW32	10.44			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 08-Nov-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	14.03	12.92	1.11	
65GW05	12.83	12.71	0.12	
65GW06	14.14	12.92	1.22	
65GW22	10.28			
65GW23	10.30			
65GW25	10.86			
65GW32	10.28			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 31-Oct-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.80	12.55	1.25	
65GW05	12.57	12.46	0.11	
65GW06	13.77	12.68	1.09	
65GW22	9.98			
65GW23	9.98			
65GW25	10.47			
65GW32	10.00			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 26-Oct-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.80	12.55	1.25	
65GW05	12.57	12.45	0.12	
65GW06	13.77	12.67	1.10	
65GW22				NO DATA
65GW23				NO DATA
65GW25				NO DATA
65GW32				NO DATA

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 17-Oct-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.65	12.44	1.21	
65GW05	12.34	12.25	0.09	
65GW06	13.50	12.47	1.03	
65GW22	9.81			
65GW23	9.81			
65GW25	10.37			
65GW32	9.83			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 10-Oct-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.36	12.14	1.22	
65GW05	11.92	11.91	0.01	
65GW06	13.15	12.13	1.02	
65GW22	9.85			
65GW23	9.87			
65GW25	10.42			
65GW32	9.89			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 02-Oct-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.36	12.15	1.21	
65GW05	11.92	11.91	0.01	
65GW06	13.16	12.14	1.02	
65GW22	9.45			
65GW23	9.47			
65GW25	10.02			
65GW32	9.49			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 26-Sep-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.19	11.93	1.26	
65GW05	11.77	11.76	0.01	
65GW06	12.94	11.95	0.99	
65GW22	9.29			
65GW23	9.28			
65GW25	9.00			
65GW32	9.33			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 18-Sep-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	12.29	11.66	0.63	
65GW05	11.43	11.42	0.01	
65GW06	12.49	11.66	0.83	
65GW22	9.88			
65GW23	9.98			
65GW25	10.63			
65GW32				UNDER WATER

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 03-Sep-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	12.24	12.23	0.01	
65GW05	12.26	12.25	0.01	
65GW06	12.77	12.27	0.50	
65GW22	9.49			
65GW23	9.60			
65GW25	10.25			
65GW32				UNDER WATER

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 28-Aug-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	12.58	12.57	0.01	
65GW05	12.56	12.55	0.01	
65GW06	13.05	12.53	0.52	
65GW22	9.75			
65GW23	9.87			
65GW25	10.52			
65GW32				UNDER WATER

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 20-Aug-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.10	13.09	0.01	
65GW05	12.79	12.77	0.02	
65GW06	13.56	13.04	0.52	
65GW22	10.26			
65GW23	10.38			
65GW25	10.88			
65GW32	10.39			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 14-Aug-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.00	12.99	0.01	
65GW05	12.68			
65GW06	13.32	13.00	0.32	
65GW22	10.17			
65GW23	10.28			
65GW25	10.78			
65GW32	10.30			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 07-Aug-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.11			
65GW05	12.84	12.80	0.04	
65GW06	13.56	13.10	0.46	
65GW22	10.31			
65GW23	10.35			
65GW25	10.89			
65GW32	10.37			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 31-Jul-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	12.88	12.87	0.01	
65GW05	12.57			SHEEN
65GW06	13.24	12.86	0.38	
65GW22	10.09			
65GW23	10.11			
65GW25	10.63			
65GW32	10.12			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 24-Jul-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.02	13.01	0.01	
65GW05	12.78	12.70	0.08	
65GW06	13.21	13.05	0.16	
65GW22	10.12			
65GW23	10.25			
65GW25	10.83			
65GW32	10.24			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 13-Jul-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.16	13.15	0.01	
65GW05	12.90	12.83	0.07	
65GW06	13.33	13.18	0.15	
65GW22	10.25			
65GW23	10.39			
65GW25	10.96			
65GW32	10.38			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 01-Jul-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	14.18	12.86	1.32	
65GW05	12.93	12.65	0.28	
65GW06	13.78	12.91	0.87	
65GW22	10.21			
65GW23	10.26			
65GW25	10.81			
65GW32	10.23			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 26-Jun-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	14.15	12.76	1.39	
65GW05	12.83	12.58	0.25	
65GW06	13.68	12.84	0.84	
65GW22	10.13			
65GW23	10.73			
65GW25	10.15			
65GW32	10.15			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 19-Jun-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	14.00	12.65	1.35	
65GW05	12.68	12.46	0.22	
65GW06	13.56	12.77	0.79	
65GW22	10.03			
65GW23	10.04			
65GW25	10.61			
65GW32	10.04			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 12-Jun-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.98	12.52	1.46	
65GW05	12.52	12.35	0.17	
65GW06	13.43	12.61	0.82	
65GW22	9.92			
65GW23	9.91			
65GW25	10.40			
65GW32	9.92			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 29-May-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.52	12.18	1.34	
65GW05	12.09	12.03	0.06	
65GW06	12.98	12.28	0.70	
65GW22	9.60			
65GW23	9.59			
65GW25	10.13			
65GW32	9.53			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 08-May-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.63	11.86	1.77	
65GW05	11.77			
65GW06	12.42	12.06	0.36	
65GW22				NO DATA WELL UNDER WATER
65GW23	9.35			
65GW25	9.85			
65GW32				NO DATA WELL UNDER WATER

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 02-May-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	12.93	12.37	0.56	
65GW05	12.10			
65GW06	12.89	12.48	0.41	
65GW22	9.67			
65GW23	9.75			
65GW25	10.28			
65GW32	9.72			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 25-Apr-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.05	12.53	0.52	
65GW05	12.34	12.24	0.10	
65GW06	13.01	12.53	0.48	
65GW22	9.69			
65GW23	9.81			
65GW25	10.36			
65GW32	9.78			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 17-Apr-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	12.88	12.49	0.39	
65GW05	13.04	12.46	0.58	
65GW06	12.27	12.20	0.07	
65GW22	9.74			
65GW23	9.75			
65GW25	10.31			
65GW32	9.75			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 10-Apr-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	12.90	12.41	0.49	
65GW05	12.07	12.04	0.03	
65GW06	12.67	12.39	0.28	
65GW22	9.59			
65GW23	9.62			
65GW25	10.17			
65GW32				NO DATA, WELL UNDER WATER

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Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 06-Apr-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	12.94	12.29	0.65	
65GW05	12.05	12.02	0.03	
65GW06	12.63	12.33	0.30	
65GW22	9.57			
65GW23	9.59			
65GW25	10.15			
65GW32	9.59			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 27-Mar-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	12.73	12.08	0.65	
65GW05	11.81			
65GW06	12.30	12.11	0.19	
65GW22	9.38			
65GW23	9.35			
65GW25	9.95			
65GW32	9.37			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 22-Mar-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.23	11.86	1.37	
65GW05	11.69			
65GW06	12.23	12.00	0.23	
65GW22	9.23			
65GW23	9.26			
65GW25	9.82			
65GW32	9.27			

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Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 11-Mar-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	12.88	11.90	0.98	
65GW05	11.64			
65GW06	12.10	12.00	0.10	
65GW22	9.26			
65GW23	9.23			
65GW25	9.78			
65GW32				NODATA/ WELL UNDERWATER

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 05-Mar-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.19	11.82	1.37	
65GW05	11.65			
65GW06	13.36	11.80	1.56	
65GW22	9.20			
65GW23	9.21			
65GW25	9.74			
65GW32	9.23			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 19-Dec-97 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.75	13.58	0.17	
65GW05	13.30			
65GW06	13.84	13.60	0.24	
65GW22	10.81			
65GW23	10.83			
65GW25	11.38			
65GW32	10.83			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 05-Dec-97 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.52	13.48	0.04	
65GW05	13.18			SHEEN
65GW06	13.63	13.46	0.17	
65GW22	10.69			
65GW23	10.76			
65GW25	11.25			
65GW32				NO DATA

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 21-Nov-97 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.73	13.69	0.04	
65GW05	13.39	13.38	0.01	
65GW06	13.90	13.66	0.24	
65GW22	10.88			
65GW23	10.91			
65GW25	11.45			
65GW32	10.93			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 31-Oct-97 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.50	13.48	0.02	
65GW05	13.19	13.17	0.02	
65GW06	13.56	13.48	0.08	
65GW22	10.69			
65GW23	10.72			
65GW25	11.24	11.23	0.01	
65GW32	10.69			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 25-Oct-97 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.53	13.42	0.11	
65GW05	13.16	13.14	0.02	
65GW06	13.48	13.45	0.03	
65GW22	10.64			
65GW23	10.66			
65GW25	11.24	11.23	0.01	
65GW32	10.73	10.72	0.01	

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 17-Oct-97 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.42	13.40	0.02	
65GW05	13.20	13.07	0.13	
65GW06	13.47	13.37	0.10	
65GW22	10.58			
65GW23	10.61			
65GW25	11.15			
65GW32	10.60			

ysis\hydrographs\[BLDG296.xls]05FEB99

Liquid Level Data

Site Name: **BLDG 296** **MCAS Cherry Point**

Date: 10-Oct-97 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
65GW04	13.41	13.10	0.31	
65GW05	13.43	12.65	0.78	
65GW06	13.16			SKIMMER IN WELL
65GW22	10.38			
65GW23	10.41			
65GW25	10.91			
65GW32	10.39	10.38	0.01	

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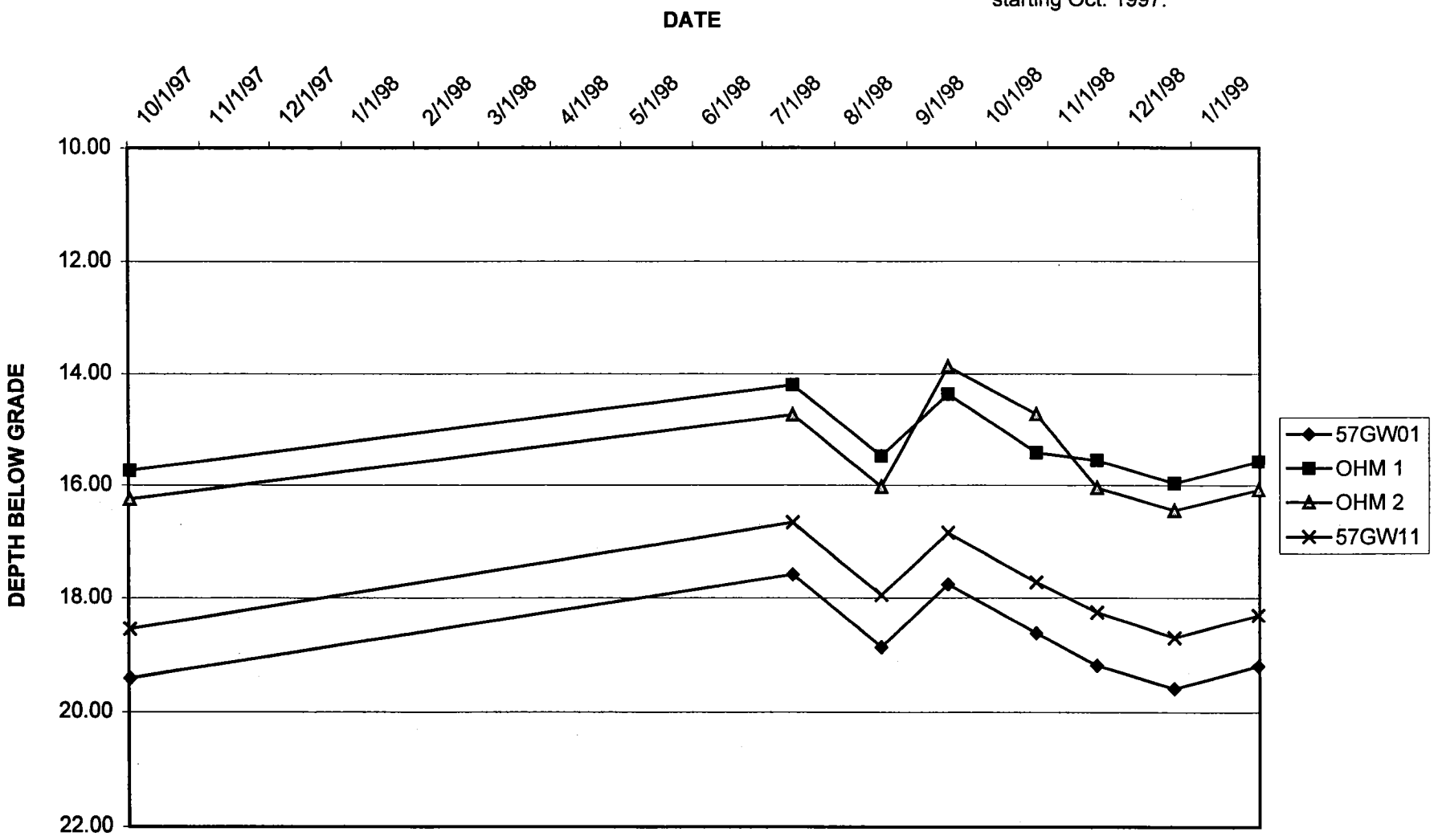
APPENDIX D

BUILDING 486 HYDROGRAPH DATA

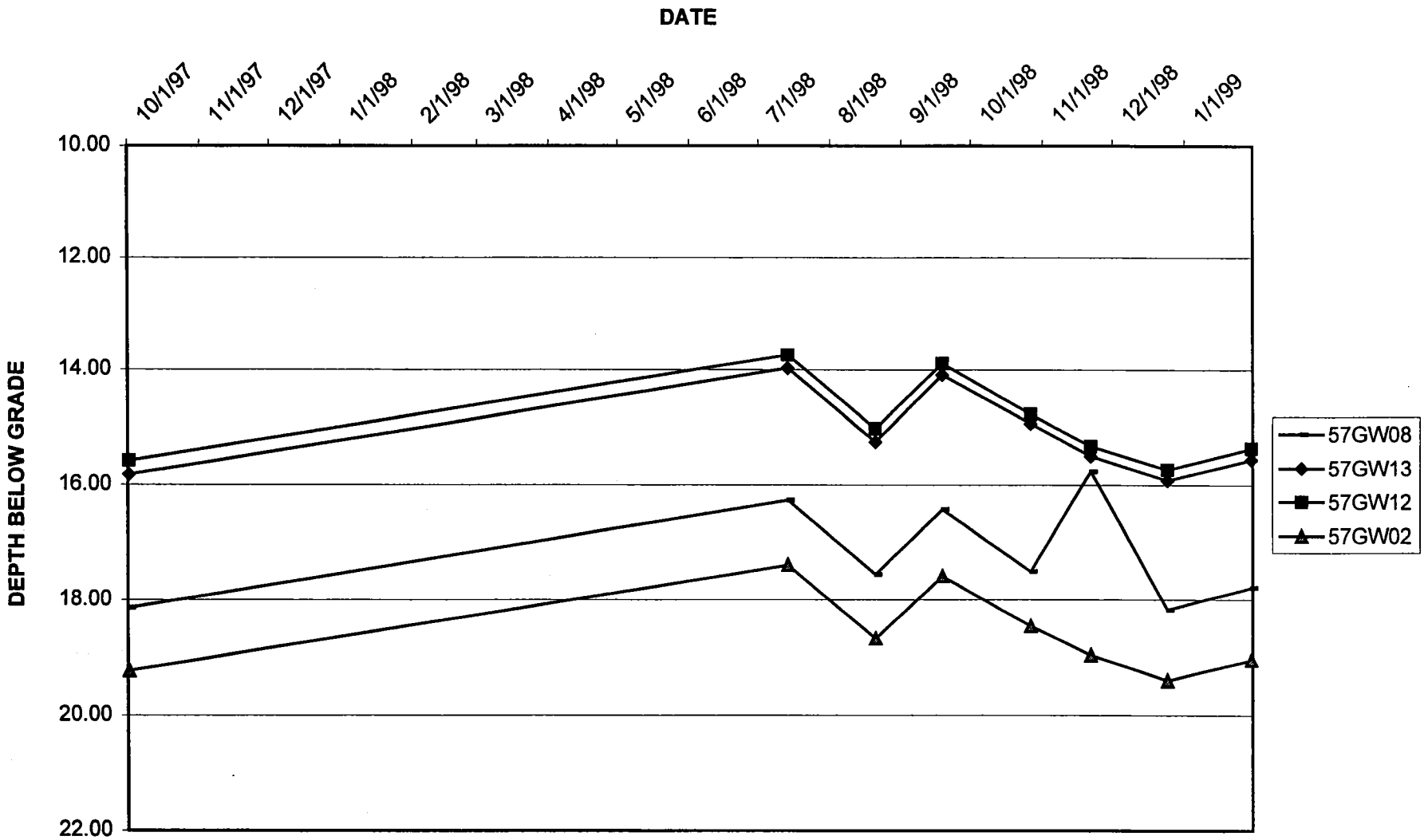
HYDROGRAPH
SITE 486

Graph depicts groundwater elevation for (4) monitoring wells from data collected starting Oct. 1997.



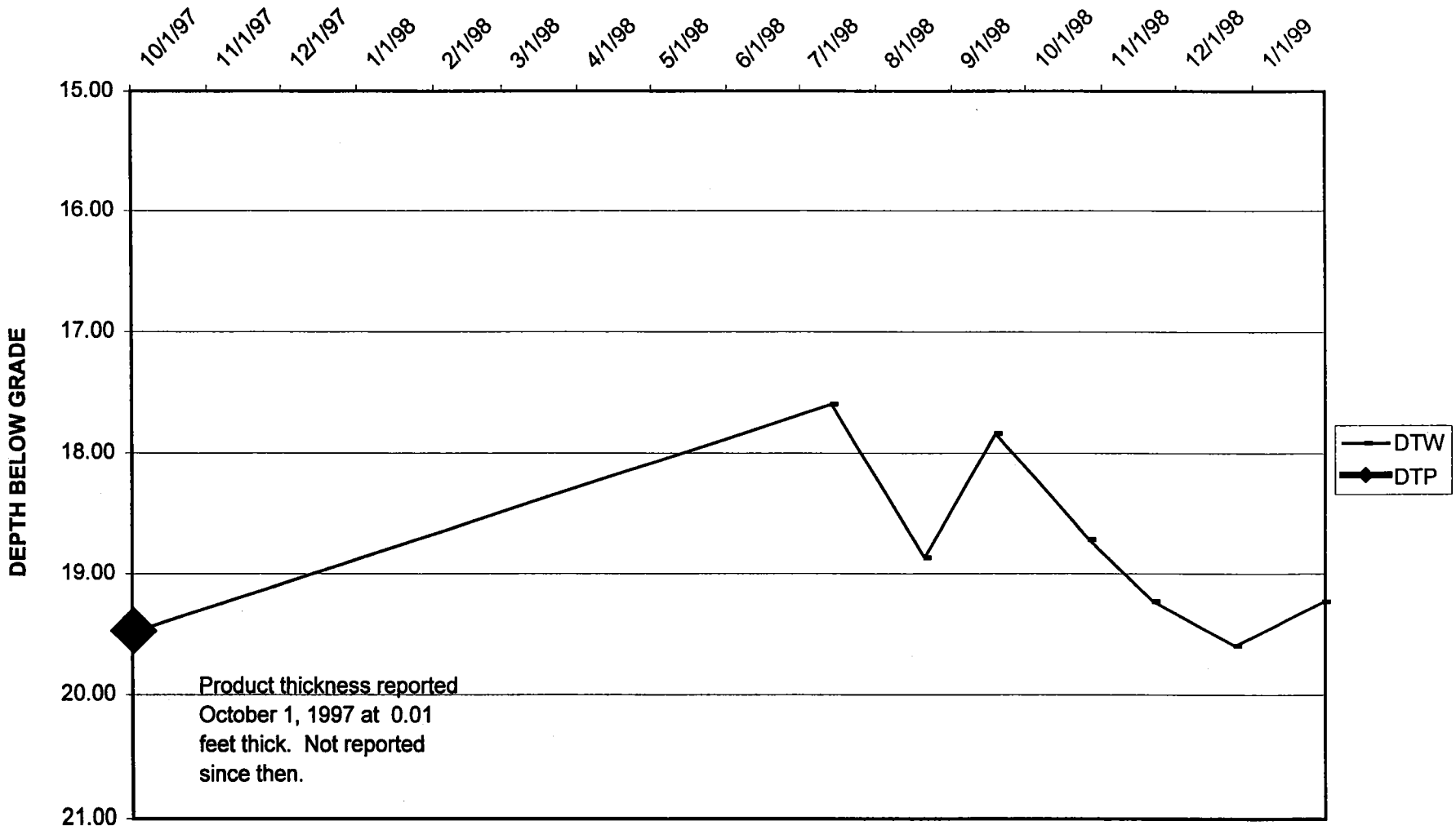
HYDROGRAPH
SITE 486

Graph depicts groundwater elevation for (4) monitoring wells from data collected starting Oct. 1997.



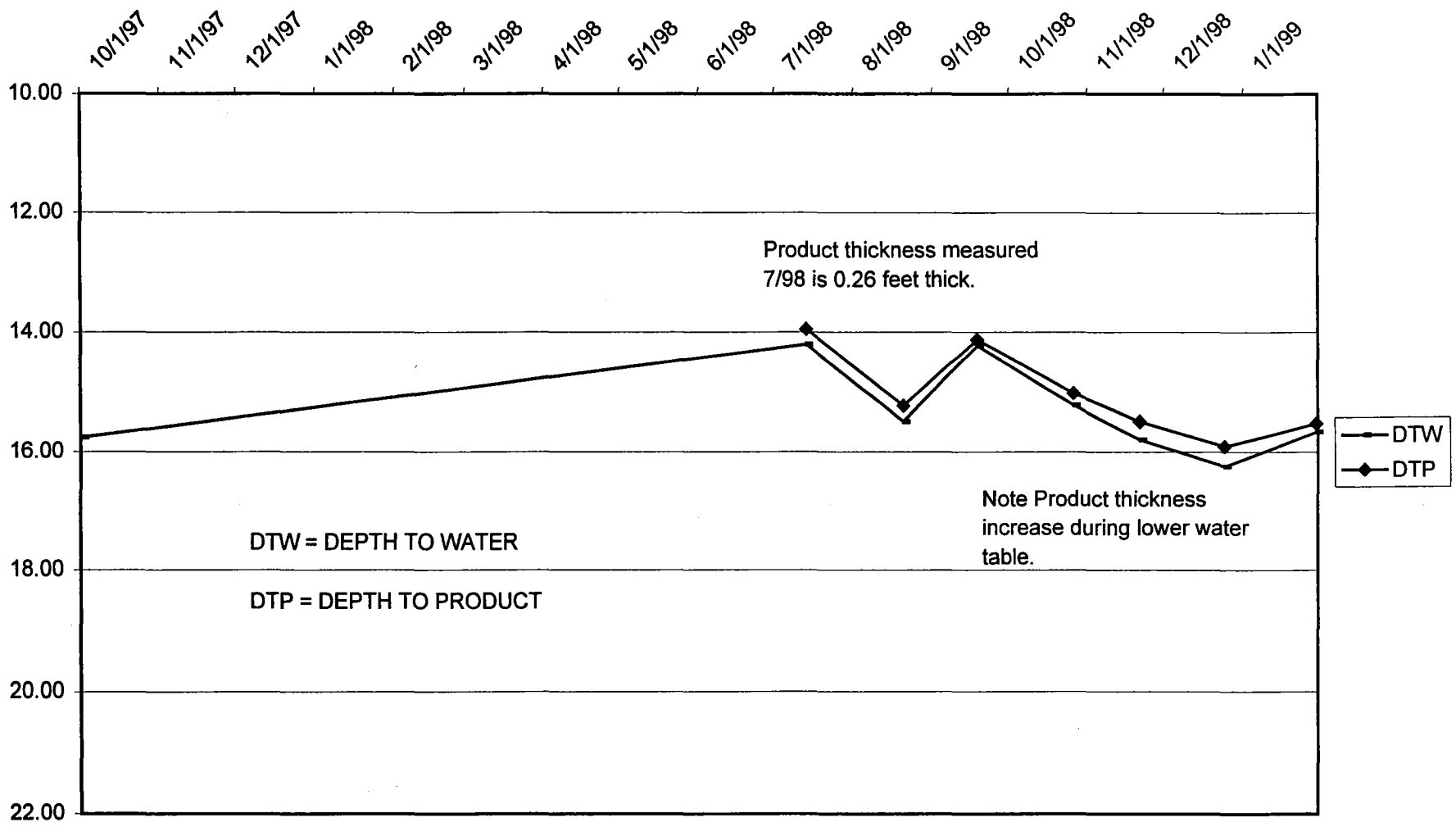
HYDROGRAPH
57GW03

This graph depict groundwater level for monitor well 57GW03 and one product thickness level 10/1/97



HYDROGRAPH

57GW14



Liquid Level Data

Site Name: Building 486 MCAS Cherry Point

Date: 1/29/99 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT
57GW01	19.20		
OHM 1	15.58		
OHM 2	16.08		
57GW11	18.31		
57GW08	17.79		
57GW13	15.55		
57GW12	15.36		
57GW03	19.23		
57GW02	19.06		
57GW14	15.67	15.53	0.14

D:\sword\cherrypt\afvranalysis\hydrographs\[BLDG486.xls]HYDROTABLE

Liquid Level Data

Site Name: Building 486 MCAS Cherry Point
Date: 24-Dec-98 Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT
57GW01	19.59		
OHM 1	15.97		
OHM 2	16.45		
57GW11	18.71		
57GW08	18.18		
57GW13	15.92		
57GW12	15.73		
57GW03	19.60		
57GW02	19.41		
57GW14	16.24	15.91	0.33

s\hydrographs\[BLDG486.xls]HYDROTABLE

Liquid Level Data

Site Name: Building 486 MCAS Cherry Point

Date:21-NOV- DTW DTP PT

LANTDIV

Well No.	DTW	DTP	PT
57GW01	19.19		
OHM 1	15.56		
OHM 2	16.05		
57GW11	18.26		
57GW08	15.76		
57GW13	15.49		
57GW12	15.32		
57GW03	19.23		
57GW02	18.98		
57GW14	15.80	15.50	0.30

s\hydrographs\[BLDG486.xls]HYDROTABLE

Liquid Level Data

Site Name: Building 486

Date: 26-Oct-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT
57GW01	18.63		
OHM 1	15.42		
OHM 2	14.73		
57GW11	17.72		
57GW08	17.51		
57GW13	14.93		
57GW12	14.77		
57GW03	18.72		
57GW02	18.47		
57GW14	15.23	15.03	0.20

s\hydrographs\[BLDG486.xls]HYDROTABLE

Liquid Level Data

Site Name: Building 486

Date: 18-Sep-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT
57GW01	17.76		
OHM 1	14.37		
OHM 2	13.87		
57GW11	16.84		
57GW08	16.43		
57GW13	14.09		
57GW12	13.89		
57GW03	17.84		
57GW02	17.59		
57GW14	14.23	14.13	0.10

s\hydrographs\[BLDG486.xls]HYDROTABLE

Liquid Level Data

Site Name: Building 486 MCAS Cherry Point
Date: 20-Aug-98 Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT
57GW01	18.87		
OHM 1	15.48		
OHM 2	16.03		
57GW11	17.95		
57GW08	17.56		
57GW13	15.25		
57GW12	15.02		
57GW03	18.87		
57GW02	18.69		
57GW14	15.50	15.24	0.26

s\hydrographs\[BLDG486.xls]HYDROTABLE

Liquid Level Data

Site Name: Building 486

Date: 13-Jul-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT
57GW01	17.58		
OHM 1	14.20		
OHM 2	14.74		
57GW11	16.66		
57GW08	16.27		
57GW13	13.97		
57GW12	13.74		
57GW03	17.60		
57GW02	17.40		
57GW14	14.21	13.95	0.26

s\hydrographs\[BLDG486.xls]HYDROTABLE

Liquid Level Data

Site Name: Building 486

Date: 01-Oct-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

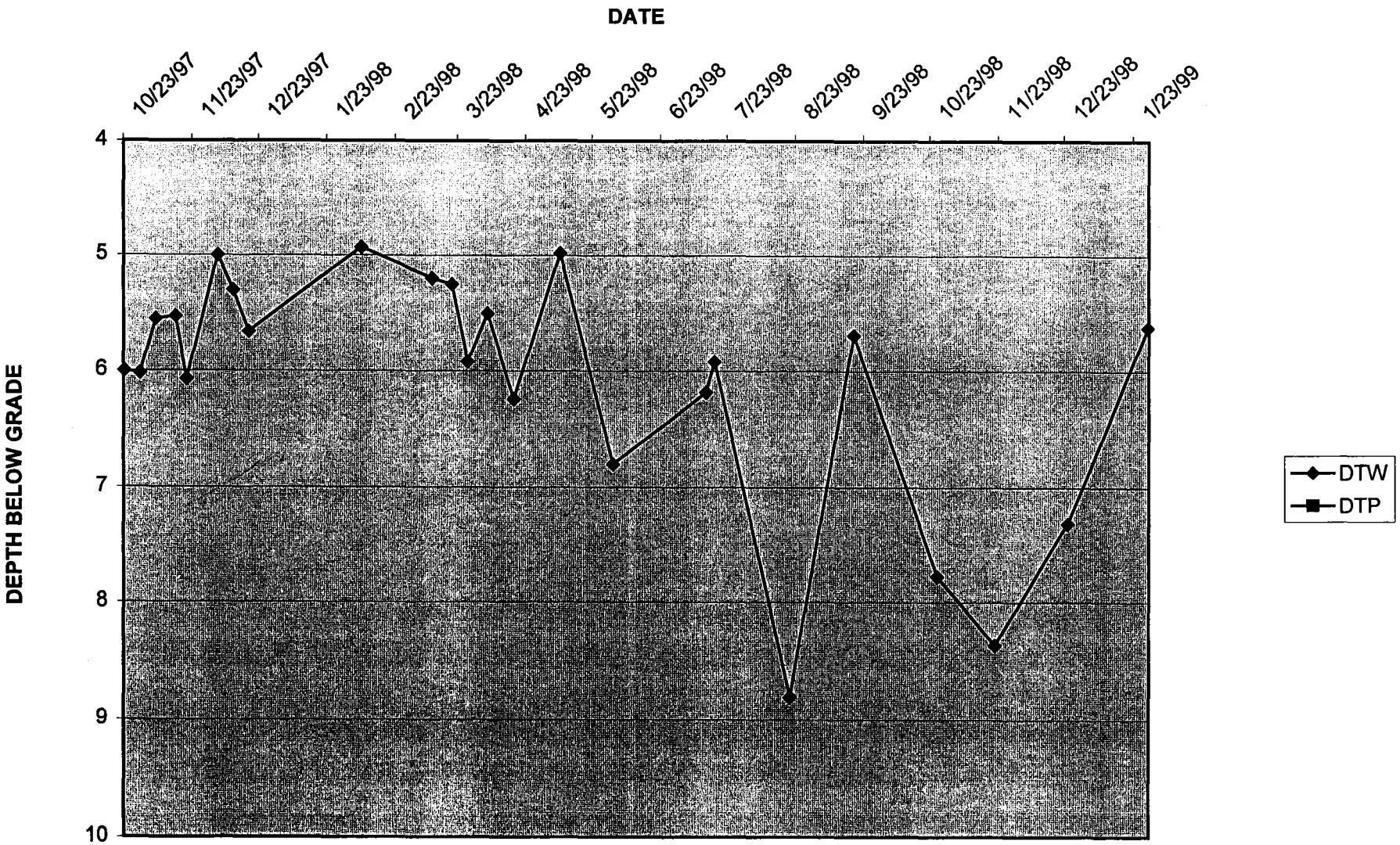
Well No.	DTW	DTP	PT
57GW01	19.41		
OHM 1	15.74		
OHM 2	16.25		
57GW11	18.55		
57GW08	18.14		
57GW13	15.82		
57GW12	15.58		
57GW03	19.48	19.47	0.01
57GW02	19.24		
57GW14	15.76		

s\hydrographs\[BLDG486.xls]HYDROTABLE

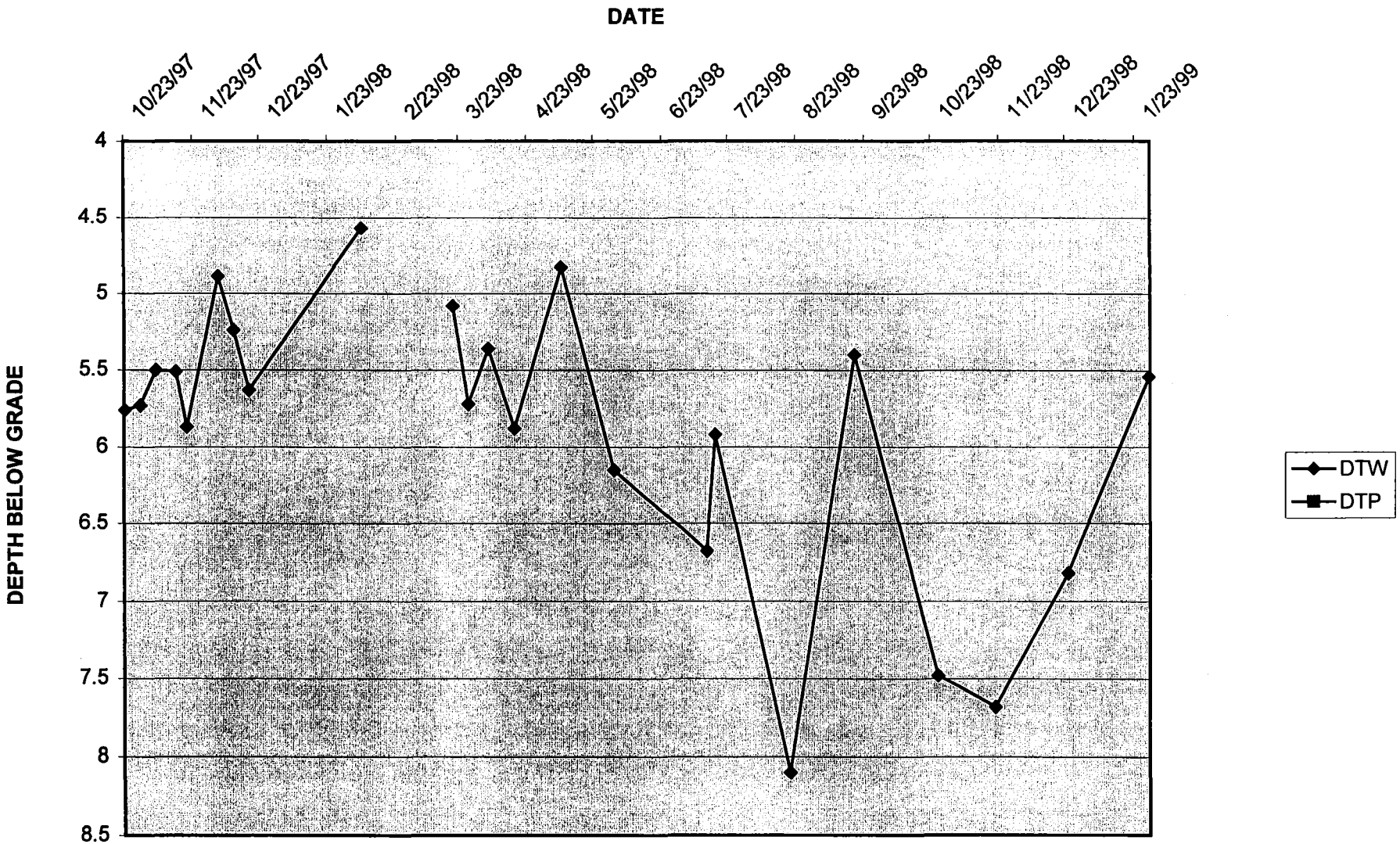
APPENDIX E

ATLANTIC 7012 HYDROGRAPH DATA

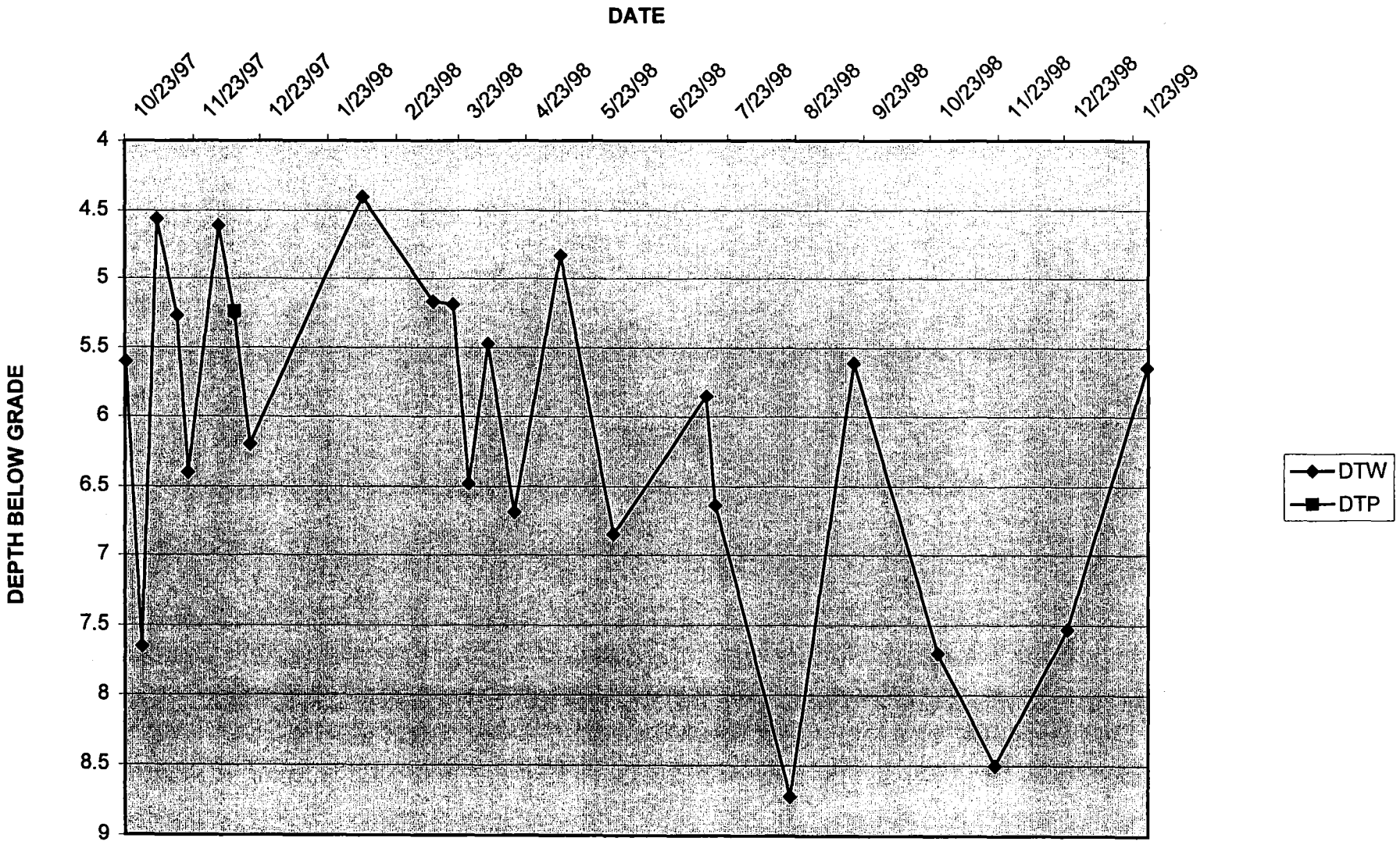
HYDROGRAPH 25GW08/ATLANTIC 7012



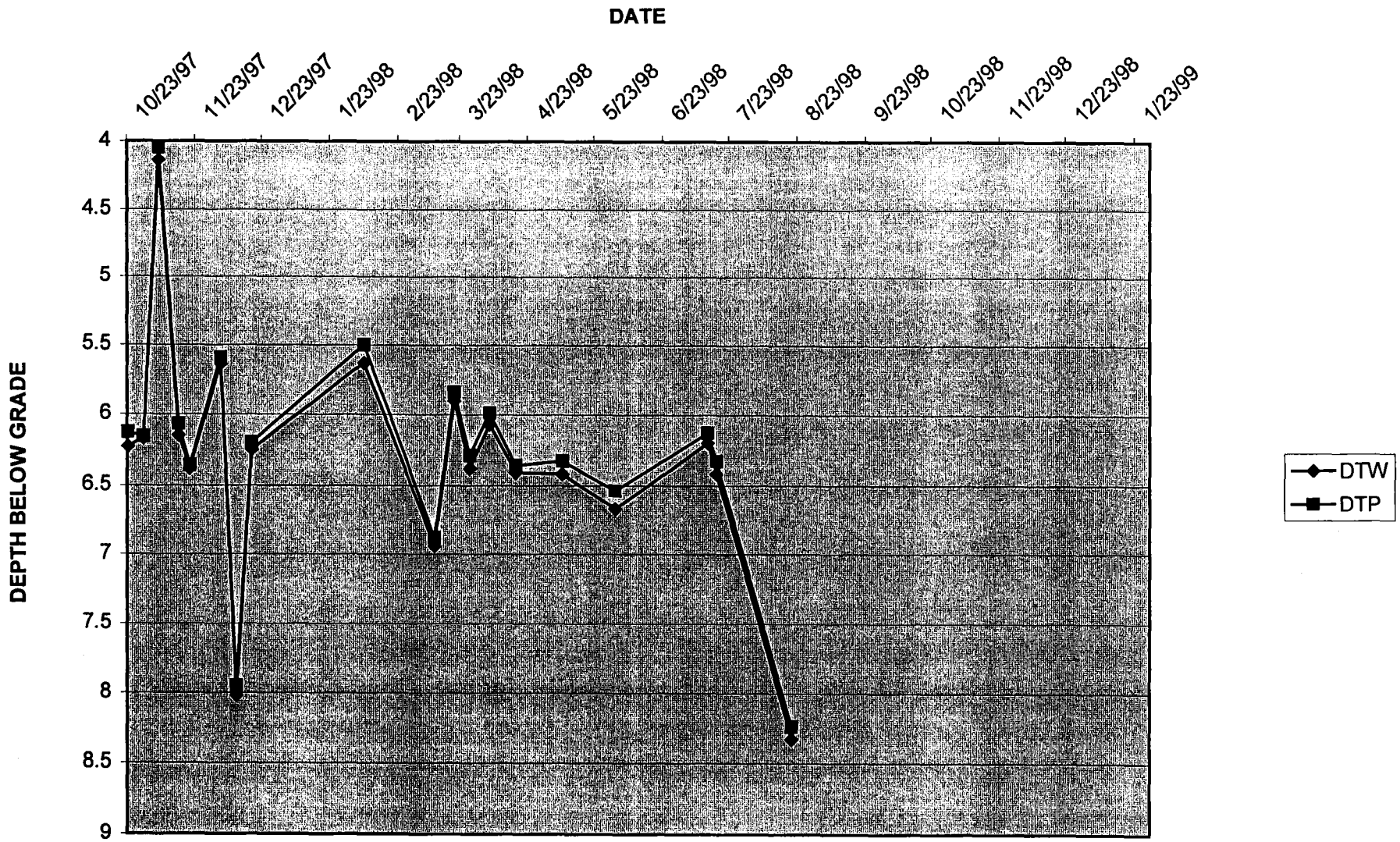
HYDROGRAPH 25GW10/ATLANTIC 7012



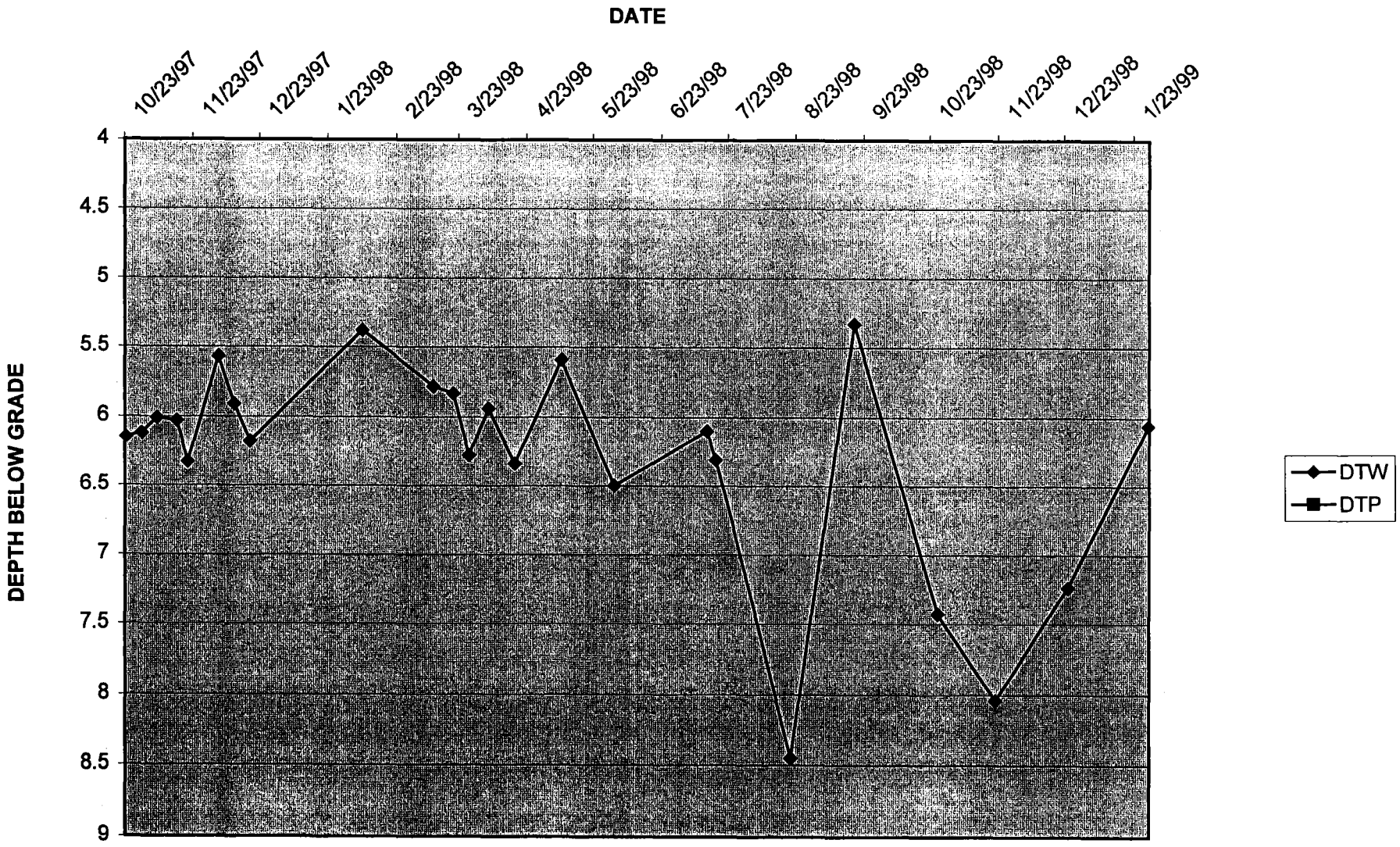
HYDROGRAPH 25GW01/ATLANTIC 7012



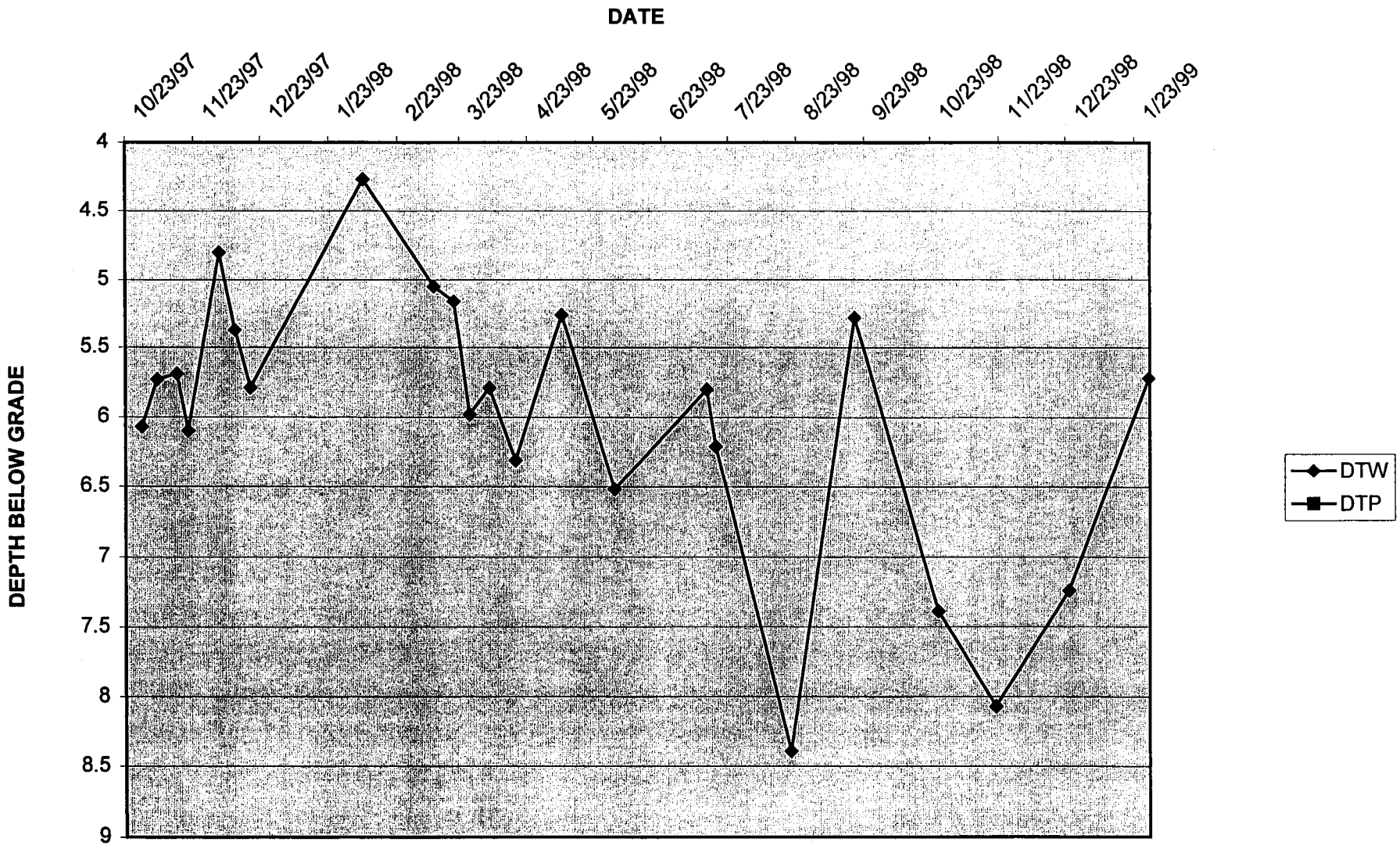
HYDROGRAPH 25GW13/ATLANTIC 7012



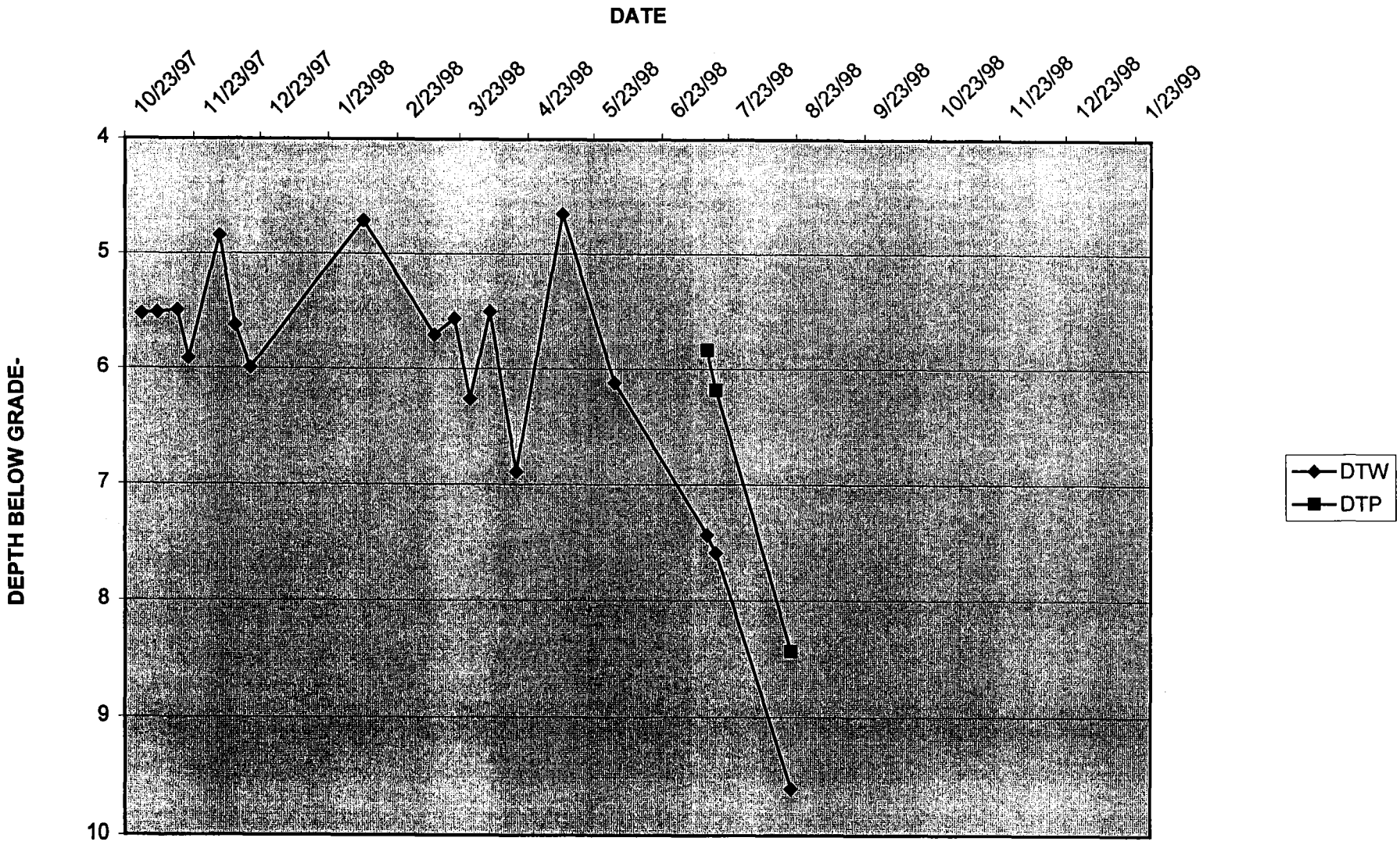
HYDROGRAPH 25GW02/ATLANTIC 7012



HYDROGRAPH 25GW03/ATLANTIC 7012

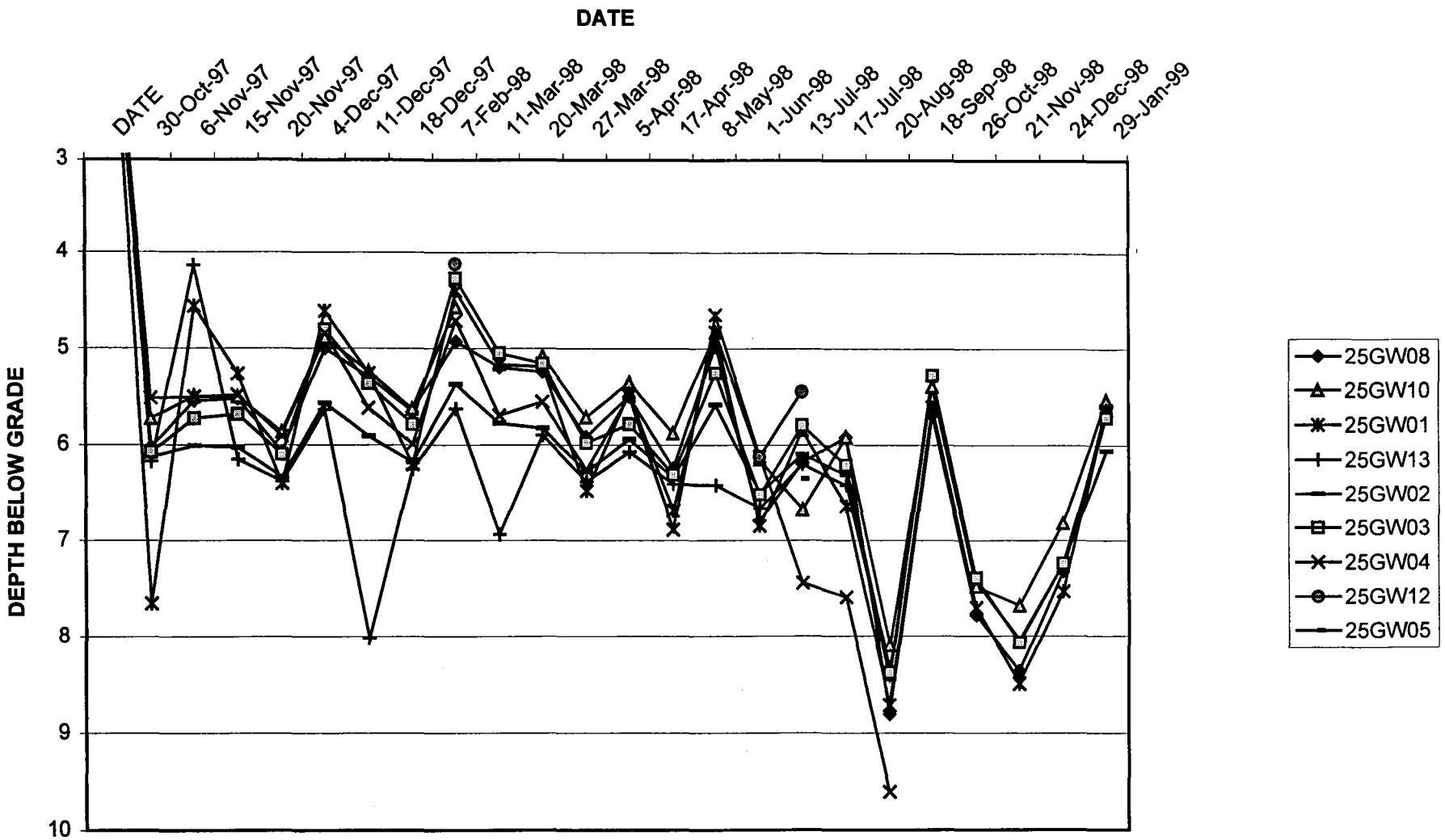


HYDROGRAPH 25GW04/ATLANTIC 7012



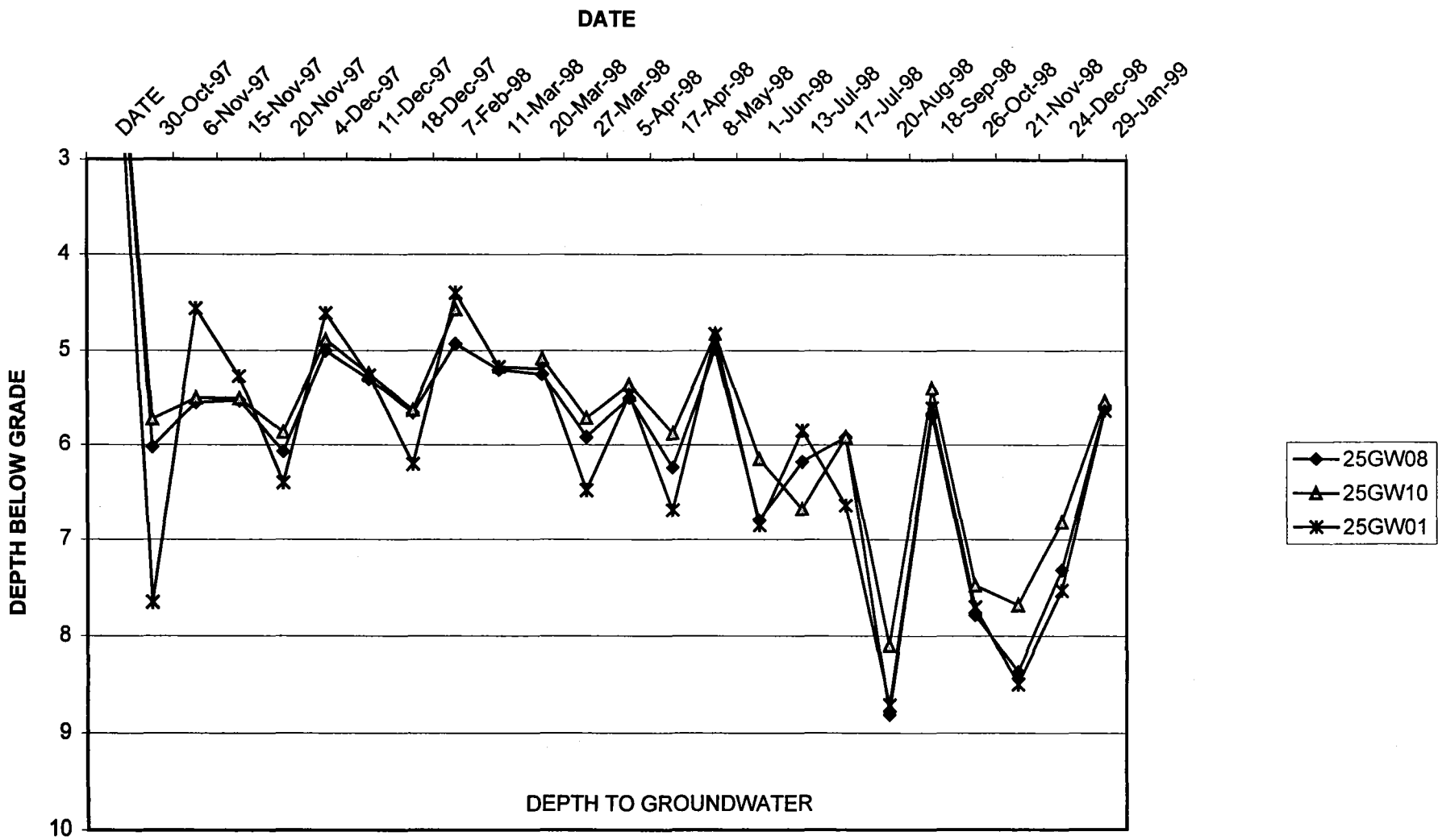
HYDROGRAPH
ATLANTIC 7012 MONITORING WELLS

Depth to groundwater in monitoring wells at Atlantic 7012.



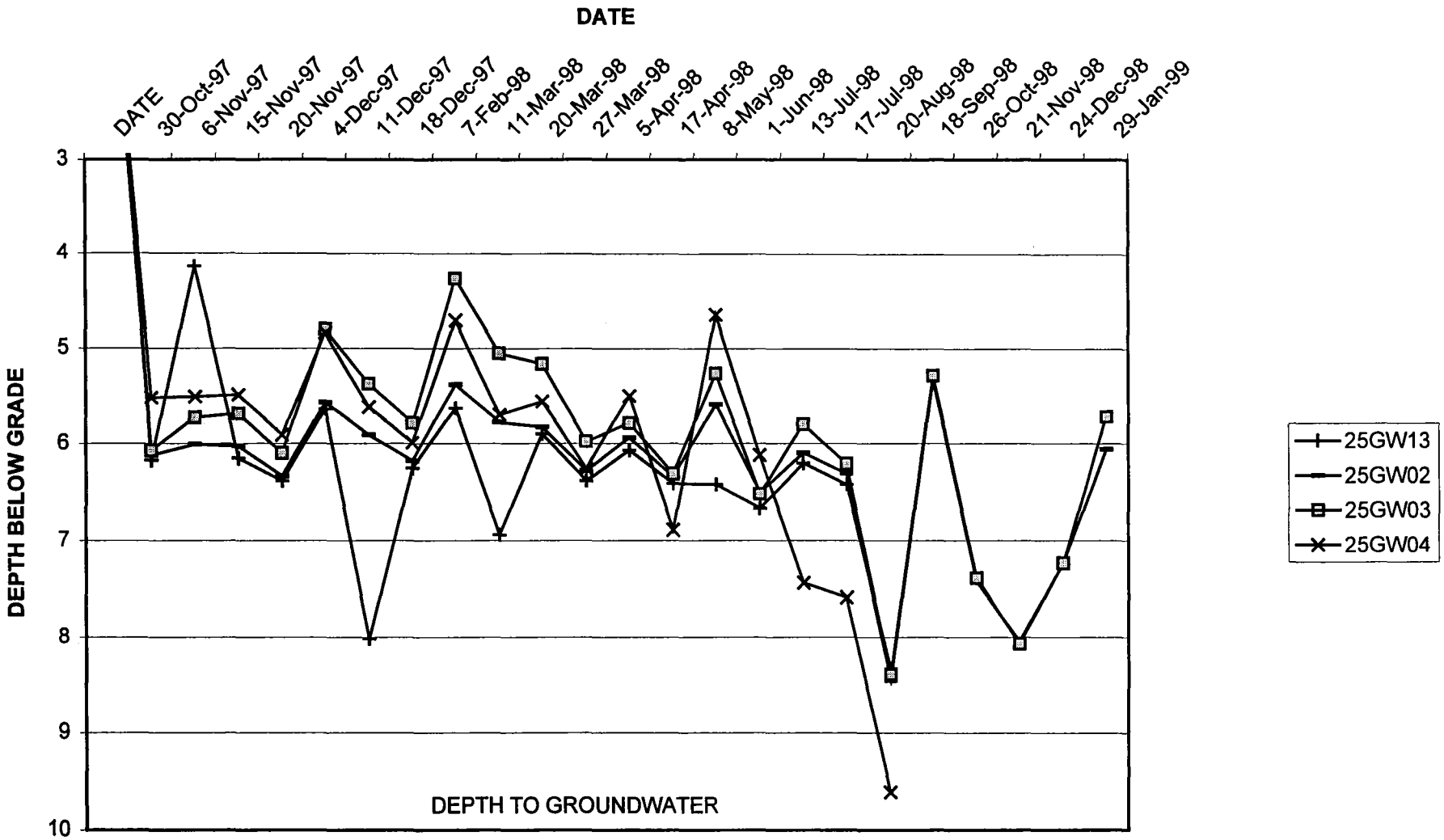
HYDROGRAPH
ATLANTIC 7012 MONITORING WELLS

Monitoring wells: 25GW08
25GW10, 25GW01



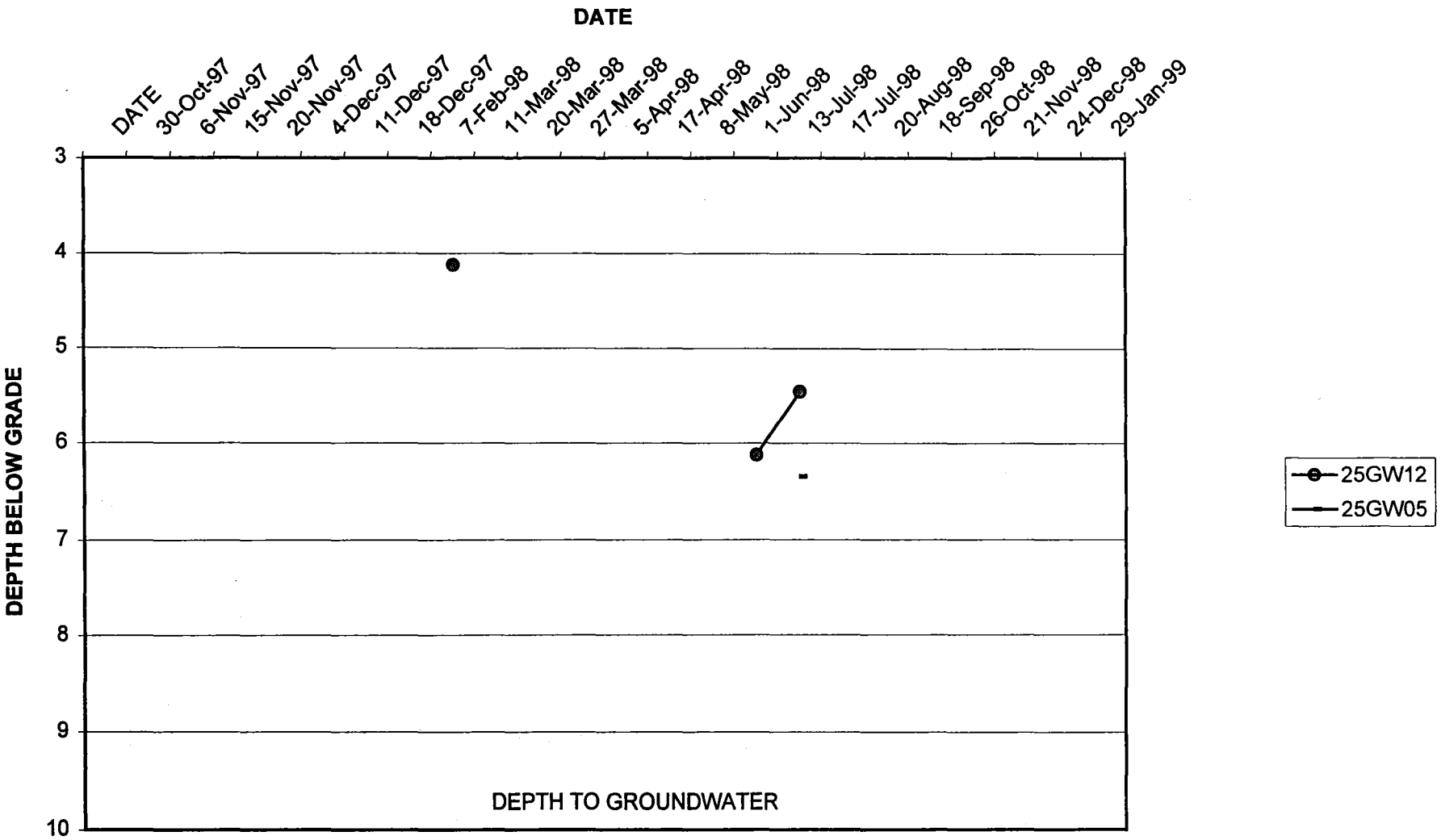
HYDROGRAPH
ATLANTIC 7012 MONITORING WELLS

Monitoring wells: 25GW13, 25GW02, 25GW03, 25GW04



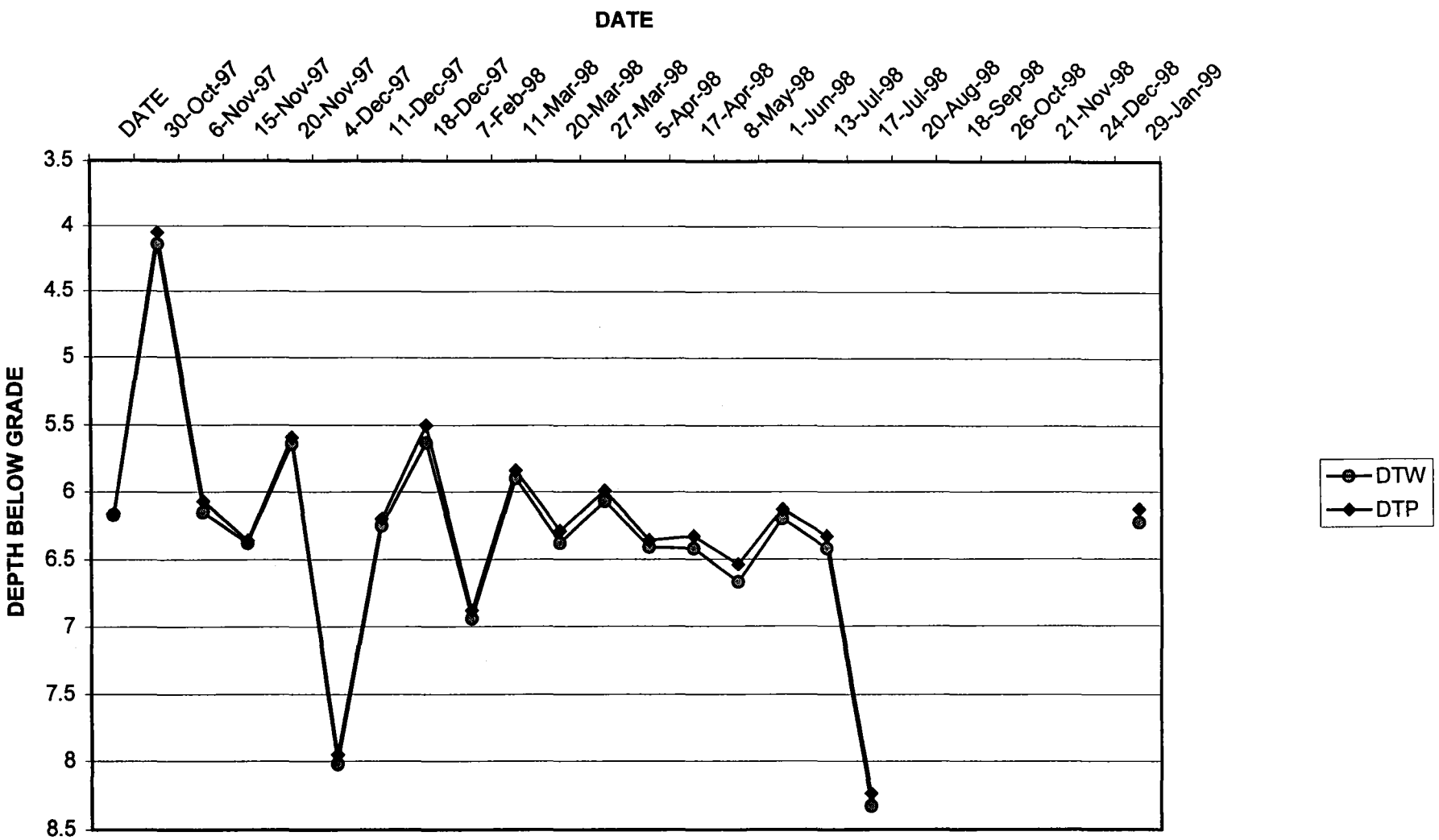
HYDROGRAPH
ATLANTIC 7012 MONITORING WELLS

Monitoring wells: 25GW12, 25GW05. These wells are monitored on an infrequent basis and are not on the normal monitoring schedule.



HYDROGRAPH
ATLANTIC 7012 MONITORING WELLS

Monitoring well: 25GW13 depth to water and depth to product.



Liquid Level Data

Site Name: **Atlantic 7012** **MCAS Cherry Point**

Date: 29-Jan-99 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	5.62			
25GW10	5.54			
25GW01	5.64			
25GW13				NO DATA/SYSTEM DEPLOYED
25GW02	6.06			
25GW03	5.72			
25GW04				NO DATA/SYSTEM DEPLOYED

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Liquid Level Data

Site Name: **Atlantic 7012**

Date: 24-Dec-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	7.32			
25GW10	6.82			
25GW01	7.53			
25GW13				NO DATA/SYSTEM DEPLOYED
25GW02	7.24			
25GW03	7.24			
25GW04				NO DATA/SYSTEM DEPLOYED

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Liquid Level Data

Site Name: **Atlantic 7012**

Date: 21-Nov-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	8.37			
25GW10	7.68			
25GW01	8.50			
25GW13				NO DATA/SYSTEM DEPLOYED
25GW02	8.04			
25GW03	8.07			
25GW04				NO DATA/SYSTEM DEPLOYED

\hydrographs\[ATLANTIC7012.xls]23OCT97

Liquid Level Data

Site Name: **Atlantic 7012**

Date: 26-Oct-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	7.78			
25GW10	7.48			
25GW01	7.70			
25GW13				NO DATA SYSTEM DEPLOYED
25GW02	7.43			
25GW03	7.39			
25GW04				NO DATA SYSTEM DEPLOYED

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Liquid Level Data

Site Name: **Atlantic 7012** **MCAS Cherry Point**

Date: 18-Sep-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	5.69			
25GW10	5.40			
25GW01	5.61			
25GW13				NO DATA SYSTEM DEPLOYED
25GW02	5.33			
25GW03	5.28			
25GW04				NO DATA SYSTEM DEPLOYED

\hydrographs\[ATLANTIC7012.xls]23OCT97

Liquid Level Data

Site Name: **Atlantic 7012**

Date: 20-Aug-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	8.81			
25GW10	8.10			
25GW01	8.72			
25GW13	8.33	8.24	0.09	
25GW02	8.45			
25GW03	8.39			
25GW04	9.61	8.44	1.17	

\hydrographs\[ATLANTIC7012.xls]23OCT97

Liquid Level Data

Site Name: **Atlantic 7012** **MCAS Cherry Point**

Date: 17-Jul-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	6.63			
25GW10	5.92			
25GW01	6.64			
25GW13	6.42	6.33	0.09	
25GW02	6.31			
25GW03	6.21			
25GW04	7.59	6.18	1.41	

\hydrographs\[ATLANTIC7012.xls]23OCT97

Liquid Level Data

Site Name: **Atlantic 7012** **MCAS Cherry Point**

Date: 13-Jul-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	6.18			
25GW10	6.68			
25GW01	5.85			
25GW13	6.20	6.13	0.07	
25GW02	6.10			
25GW03	5.80			
25GW04	7.44	5.83	1.61	
25GW12	5.45			Extra monitoring well gauged
25GW05	6.35			Extra monitoring well gauged

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Liquid Level Data

Site Name: **Atlantic 7012** **MCAS Cherry Point**

Date: 01-Jun-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	6.80			
25GW10	6.15			
25GW01	6.85			
25GW13	6.67	6.54	0.13	
25GW02	6.50			
25GW03	6.52			
25GW04	6.12			
25GW12	6.12			ADDED MONITORING WELL CHECKED

\hydrographs\[ATLANTIC7012.xls]23OCT97

Liquid Level Data

Site Name: **Atlantic 7012** **MCAS Cherry Point**

Date: 08-May-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	4.98			
25GW10	4.83			
25GW01	4.83			
25GW13	6.42	6.33	0.09	
25GW02	5.59			
25GW03	5.26			
25GW04	4.65			

\hydrographs\[ATLANTIC7012.xls]23OCT97

Liquid Level Data

Site Name: **Atlantic 7012** **MCAS Cherry Point**

Date: 17-Apr-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	6.24			
25GW10	5.88			
25GW01	6.69			
25GW13	6.41	6.36	0.05	
25GW02	6.34			
25GW03	6.31			
25GW04	6.89			

\hydrographs\[ATLANTIC7012.xls]23OCT97

Liquid Level Data

Site Name: **Atlantic 7012**

Date: 05-Apr-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	5.50			
25GW10	5.36			
25GW01	5.47			SHEEN
25GW13	6.07	5.99	0.08	
25GW02	5.94			
25GW03	5.79			
25GW04	5.50			

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Liquid Level Data

Site Name: **Atlantic 7012**

Date: 27-Mar-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	5.92			
25GW10	5.72			
25GW01	6.48			SHEEN
25GW13	6.38	6.29	0.09	
25GW02	6.28			
25GW03	5.98			
25GW04	6.26			

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Liquid Level Data

Site Name: **Atlantic 7012** **MCAS Cherry Point**

Date: 20-Mar-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	5.25			
25GW10	5.08			
25GW01	5.19			SHEEN
25GW13	5.90	5.84	0.06	
25GW02	5.83			
25GW03	5.16			
25GW04	5.56			

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Liquid Level Data

Site Name: **Atlantic 7012** **MCAS Cherry Point**

Date: 11-Mar-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	5.20			
25GW10				NO DATA
25GW01	5.17			SHEEN
25GW13	6.94	6.88	0.06	
25GW02	5.78			
25GW03	5.05			
25GW04	5.70			

\hydrographs\[ATLANTIC7012.xls]23OCT97

Liquid Level Data

Site Name: **Atlantic 7012** **MCAS Cherry Point**

Date: 07-Feb-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	4.93			
25GW10	4.57			
25GW01	4.40			SHEEN
25GW13	5.63	5.50	0.13	
25GW02	5.38			
25GW03	4.27			
25GW04	4.71			
25GW07	4.55			ADD'L MW GAUGED
25GW06	4.12			ADD'L MW GAUGED
25GW12	4.12			ADD'L MW GAUGED

\hydrographs\[ATLANTIC7012.xls]23OCT97

Liquid Level Data

Site Name: **Atlantic 7012**

Date: 18-Dec-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	5.66			
25GW10	5.63			
25GW01	6.20			SHEEN
25GW13	6.25	6.20	0.05	
25GW02	6.18			
25GW03	5.79			
25GW04	5.99			

\hydrographs\[ATLANTIC7012.xls]23OCT97

Liquid Level Data

Site Name: **Atlantic 7012**

Date: 11-Dec-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	5.30			
25GW10	5.24			
25GW01	5.26	5.24	0.02	
25GW13	8.02	7.95	0.07	
25GW02	5.91			
25GW03	5.37			
25GW04	5.62			

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Liquid Level Data

Site Name: **Atlantic 7012**

Date: 04-Dec-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	5.00			
25GW10	4.89			
25GW01	4.61			SHEEN
25GW13	5.64	5.59	0.05	
25GW02	5.57			
25GW03	4.80			
25GW04	4.84			

\hydrographs\[ATLANTIC7012.xls]23OCT97

Liquid Level Data

Site Name: **Atlantic 7012**

Date: 20-Nov-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	6.07			
25GW10	5.87			
25GW01	6.40			SHEEN
25GW13	6.38	6.36	0.02	
25GW02	6.33			
25GW03	6.10			
25GW04	5.91			

\hydrographs\[ATLANTIC7012.xls]23OCT97

Liquid Level Data

Site Name: **Atlantic 7012**

Date: 15-Nov-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	5.53			
25GW10	5.51			
25GW01	5.27			SHEEN
25GW13	6.15	6.07	0.08	
25GW02	6.03			
25GW03	5.69			
25GW04	5.49			

\hydrographs\[ATLANTIC7012.xls]23OCT97

Liquid Level Data

Site Name: **Atlantic 7012** **MCAS Cherry Point**

Date: 06-Nov-97 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	5.55			
25GW10	5.50			
25GW01	4.56			SHEEN
25GW13	4.14	4.05	0.09	
25GW02	6.01			
25GW03	5.73			
25GW04	5.51			

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Liquid Level Data

Site Name: **Atlantic 7012**

Date: 30-Oct-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	6.02			
25GW10	5.73			
25GW01	7.56			
25GW13	6.17	6.16	0.01	
25GW02	6.12			
25GW03	6.07			
25GW04	5.52			

\hydrographs\[ATLANTIC7012.xls]23OCT97

Liquid Level Data

Site Name: **Atlantic 7012** **MCAS Cherry Point**

Date: 23-Oct-97 Petroleum Oils and Lubricants (POL) Site

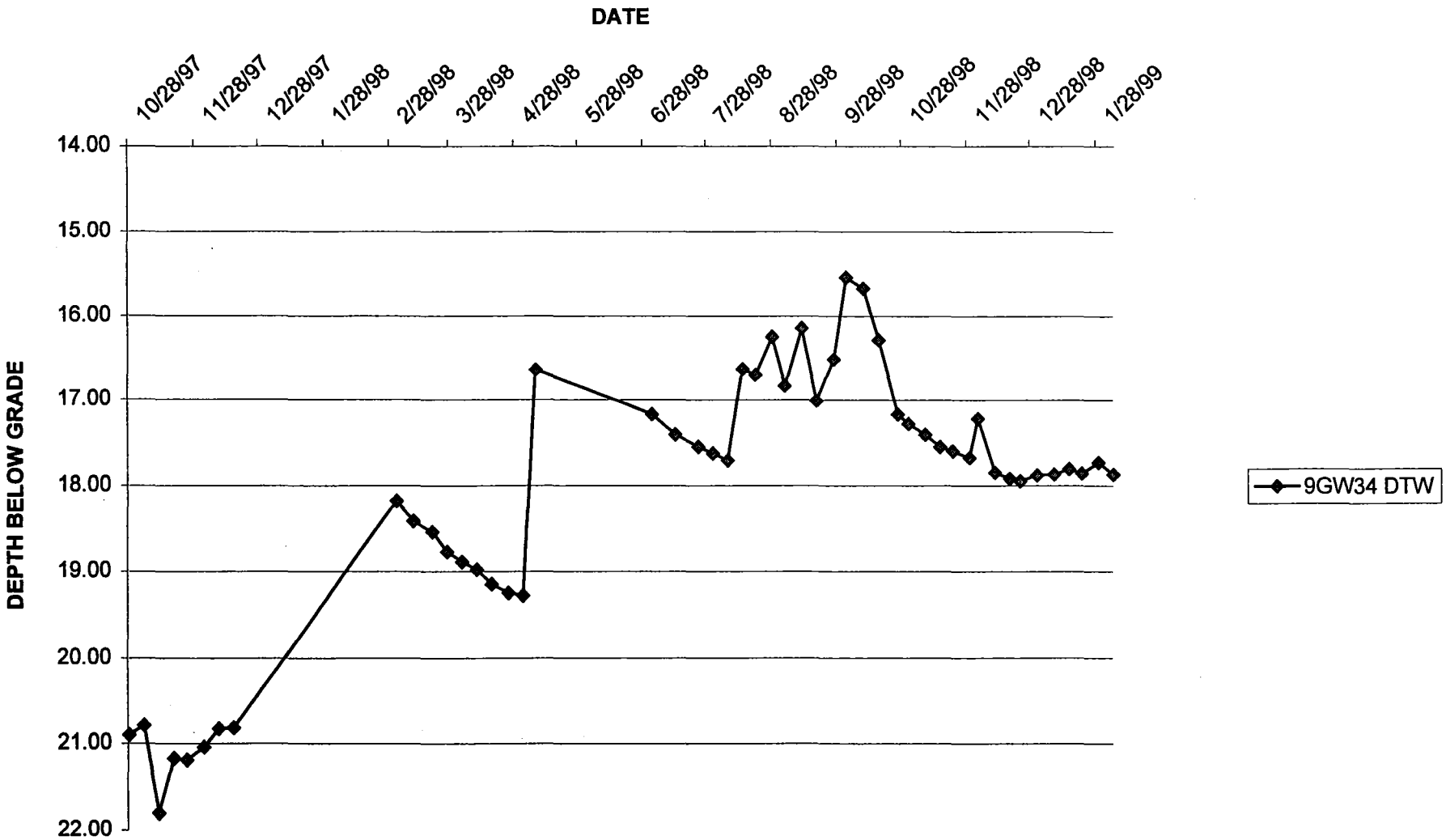
LANTDIV

Well No.	DTW	DTP	PT	NOTES
25GW08	6.00			
25GW10	5.76			
25GW01	5.60			
25GW13	6.23	6.13	0.10	
25GW02	6.15			
25GW03				NO DATA
25GW04				NO DATA

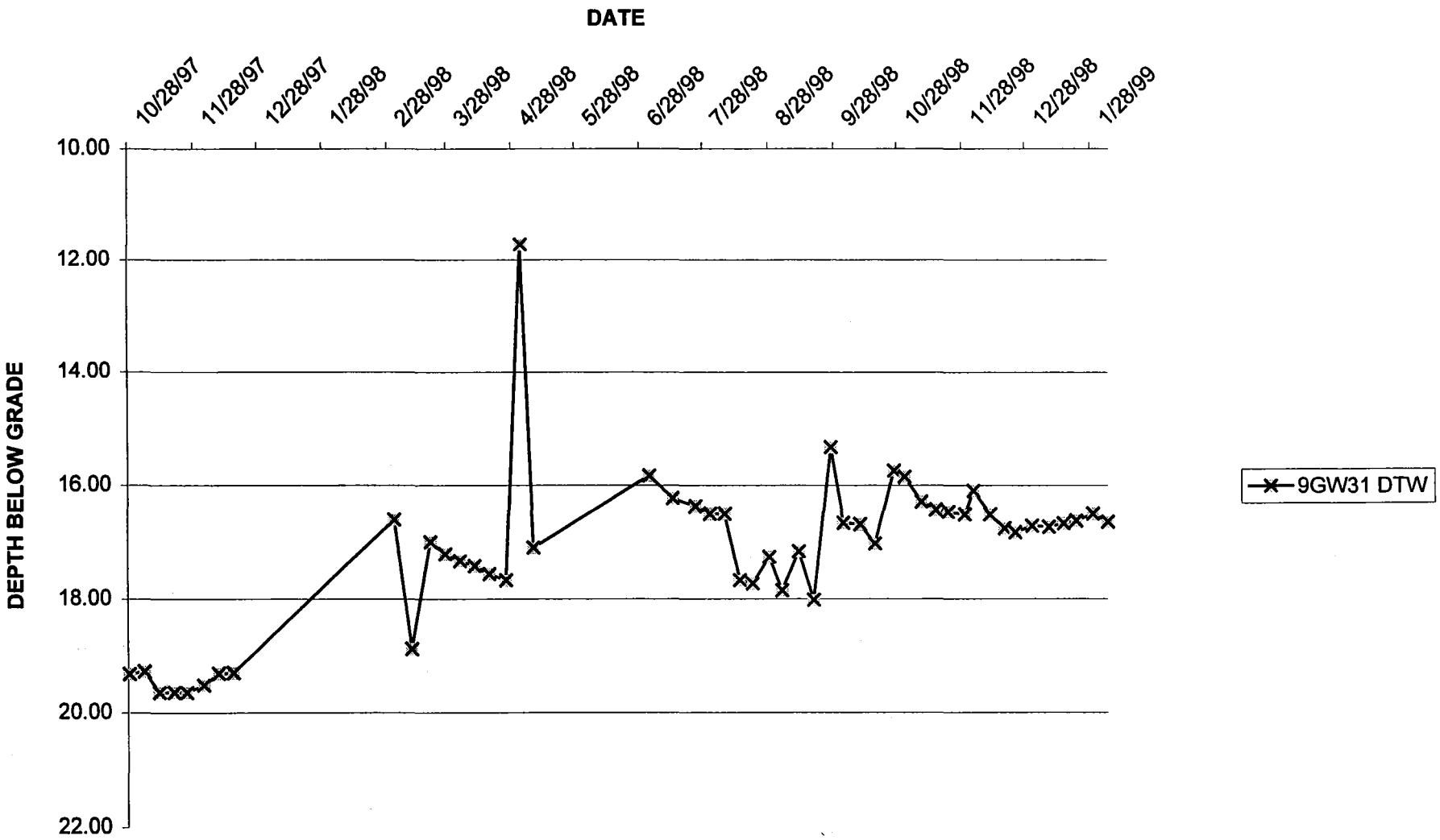
\hydrographs\[ATLANTIC7012.xls]23OCT97

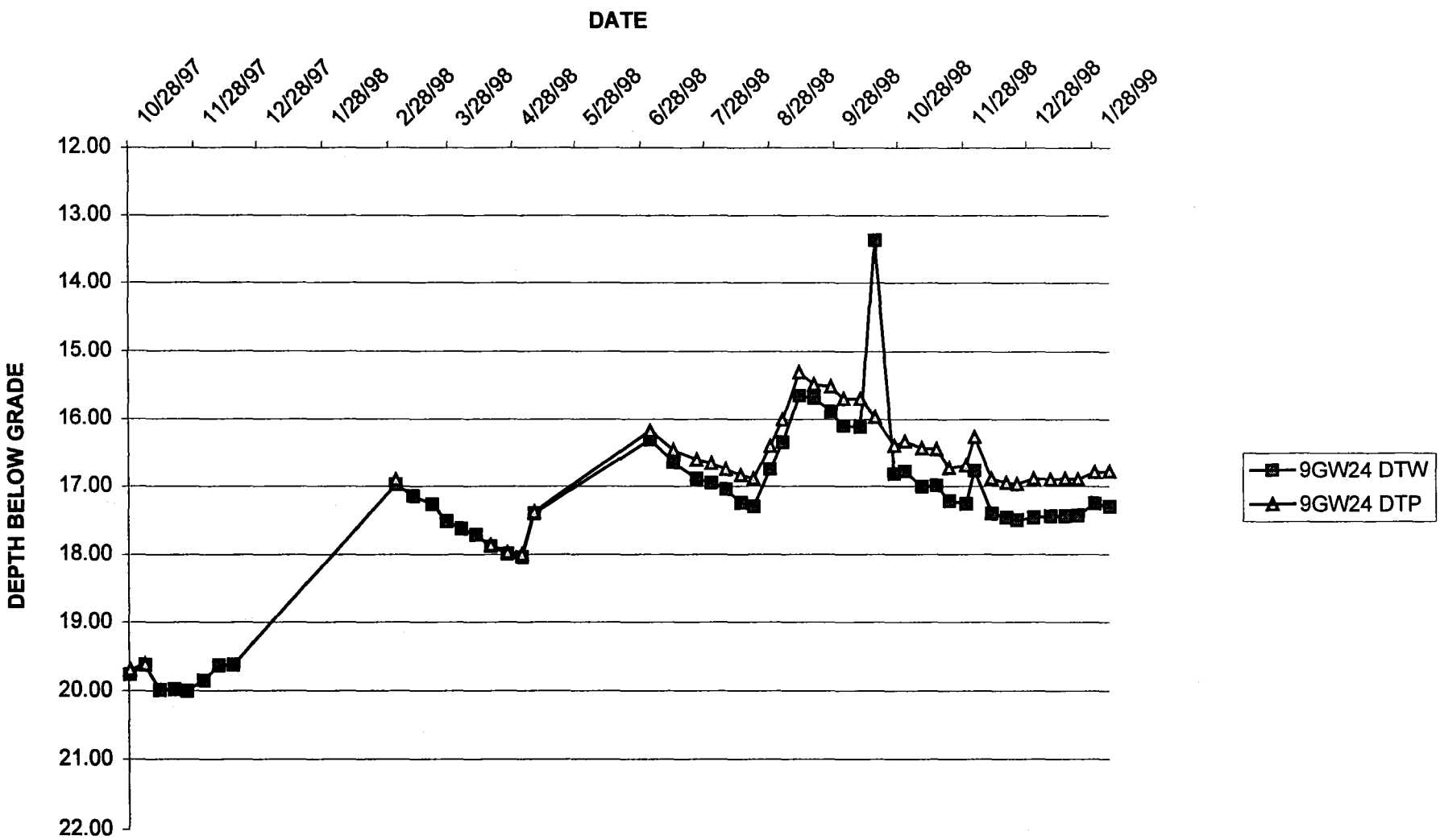
APPENDIX F

TANK FARM D HYDROGRAPH DATA


HYDROGRAPH
9GW34 DTW/DTP TANK FARM D
DATE
10/28/97
11/28/97
12/28/97
1/28/98
2/28/98
3/28/98
4/28/98
5/28/98
6/28/98
7/28/98
8/28/98
9/28/98
10/28/98
11/28/98
12/28/98
1/28/99
DEPTH BELOW GRADE
14.00
15.00
16.00
17.00
18.00
19.00
20.00
21.00
22.00
9GW34 DTW

HYDROGRAPH
9GW31 DTW/DTP TANK FARM D

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9GW24 DTW/DTP TANK FARM D
DATE
10/28/97
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3/28/98
4/28/98
5/28/98
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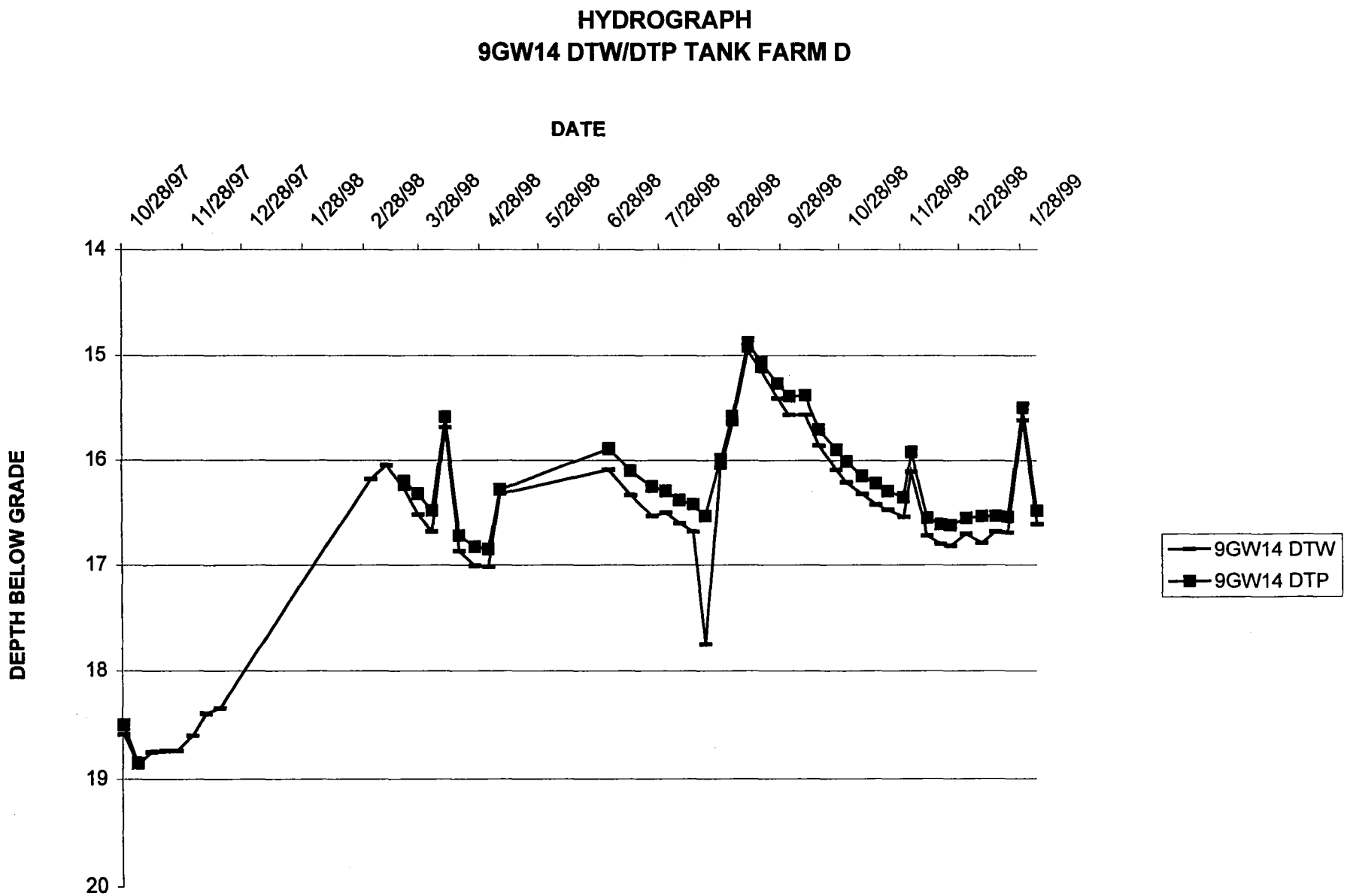
7/28/98
8/28/98
9/28/98
10/28/98
11/28/98
12/28/98
1/28/99
DEPTH BELOW GRADE
12.00
13.00
14.00
15.00
16.00
17.00
18.00
19.00
20.00
21.00
22.00
9GW24 DTW
9GW24 DTP


HYDROGRAPH
9GW14 DTW/DTP TANK FARM D
DATE
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1/28/98
2/28/98
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5/28/98
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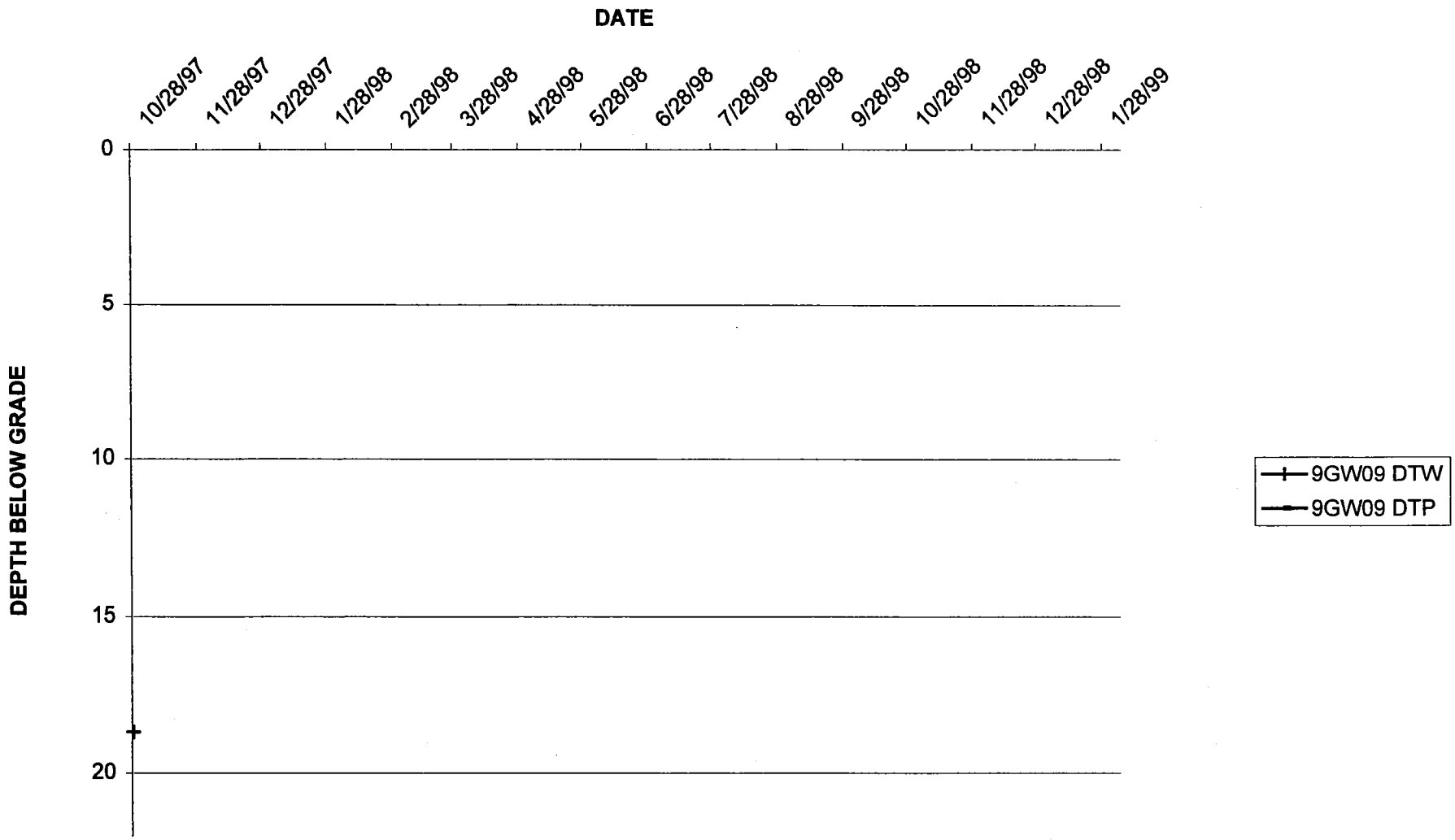
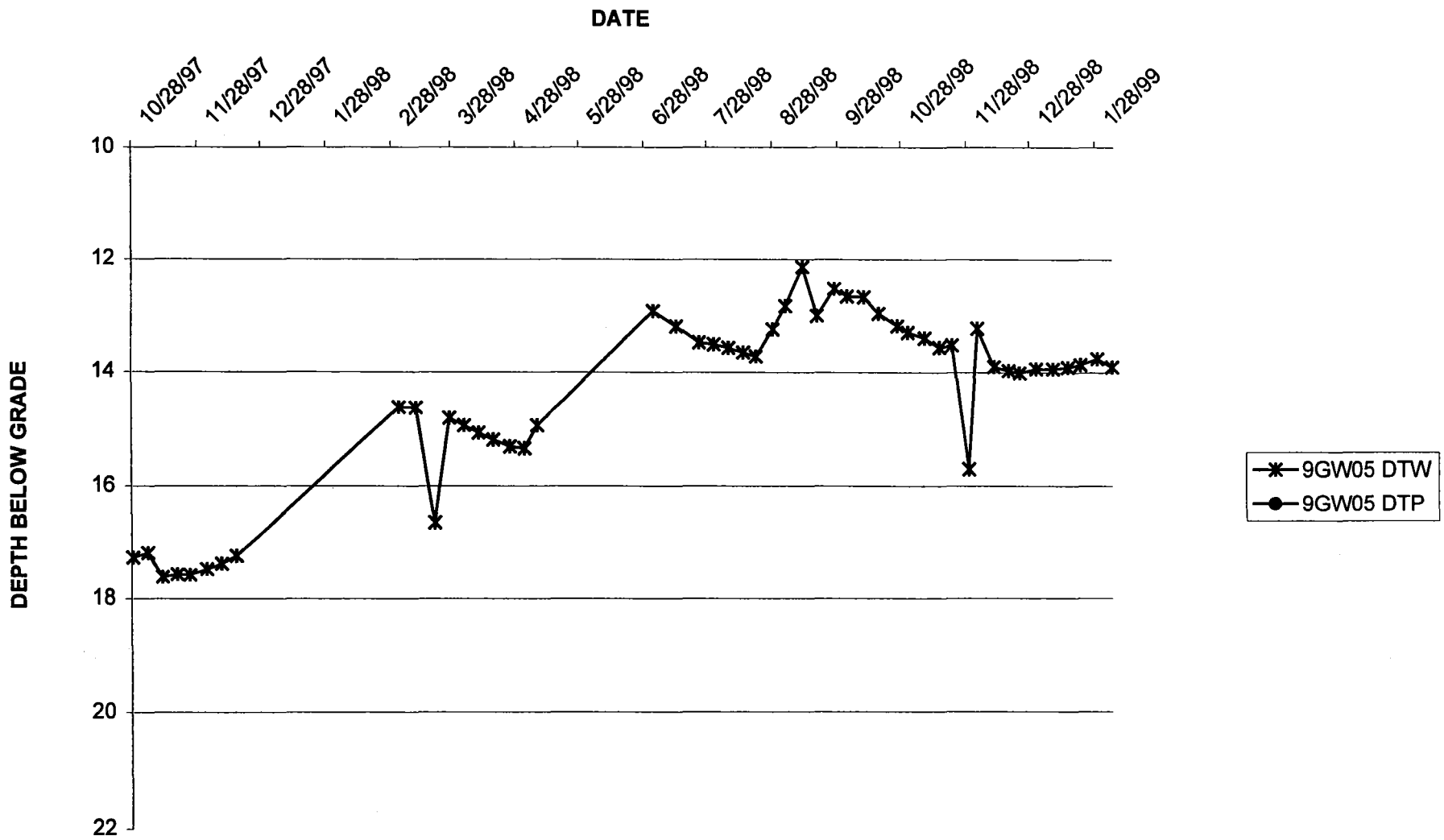
7/28/98
8/28/98
9/28/98
10/28/98
11/28/98
12/28/98
1/28/99
DEPTH BELOW GRADE
14
15
16
17
18
19
20
9GW14 DTW
9GW14 DTP

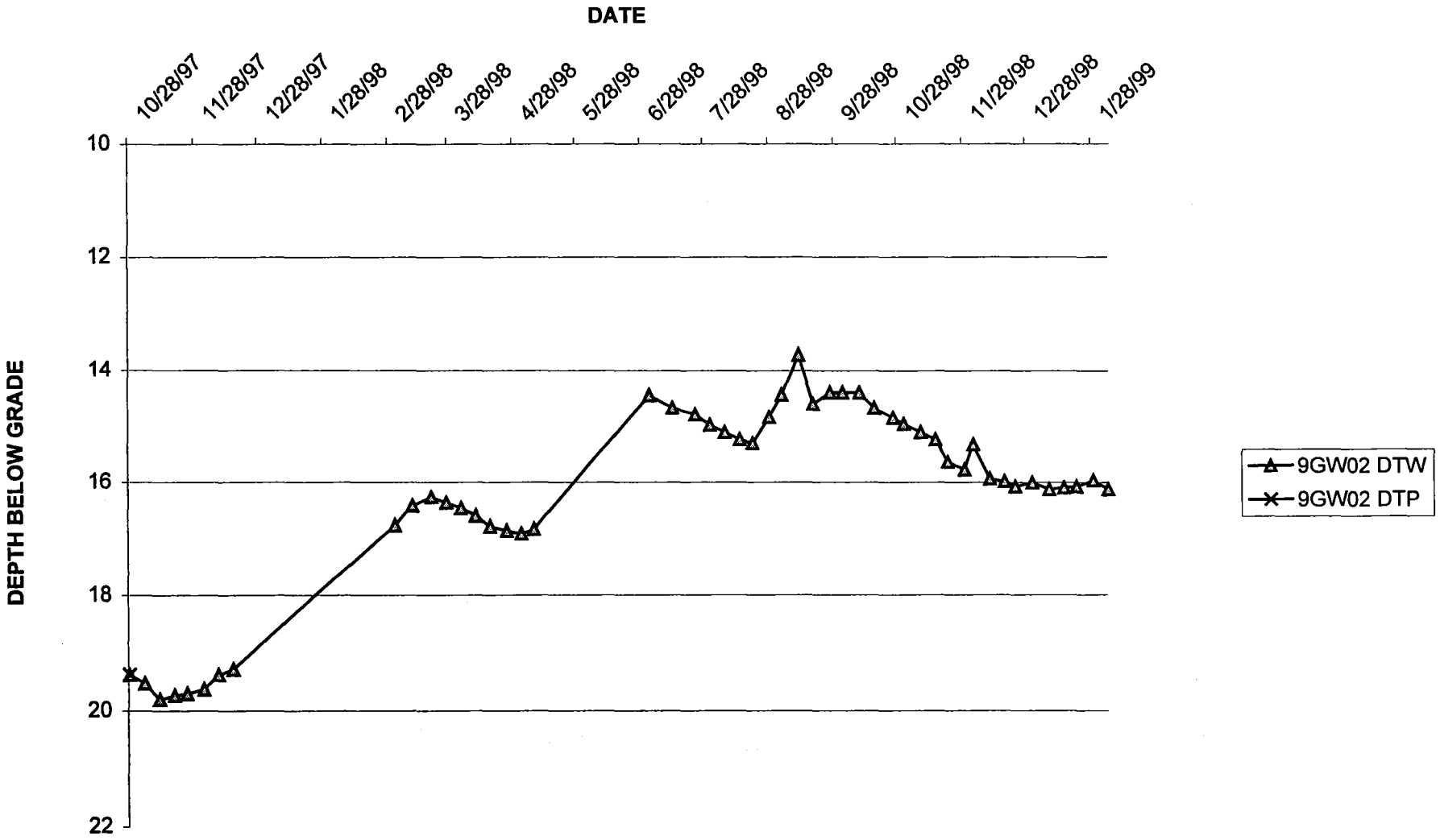
HYDROGRAPH
9GW09 DTW/DTP TANK FARM D

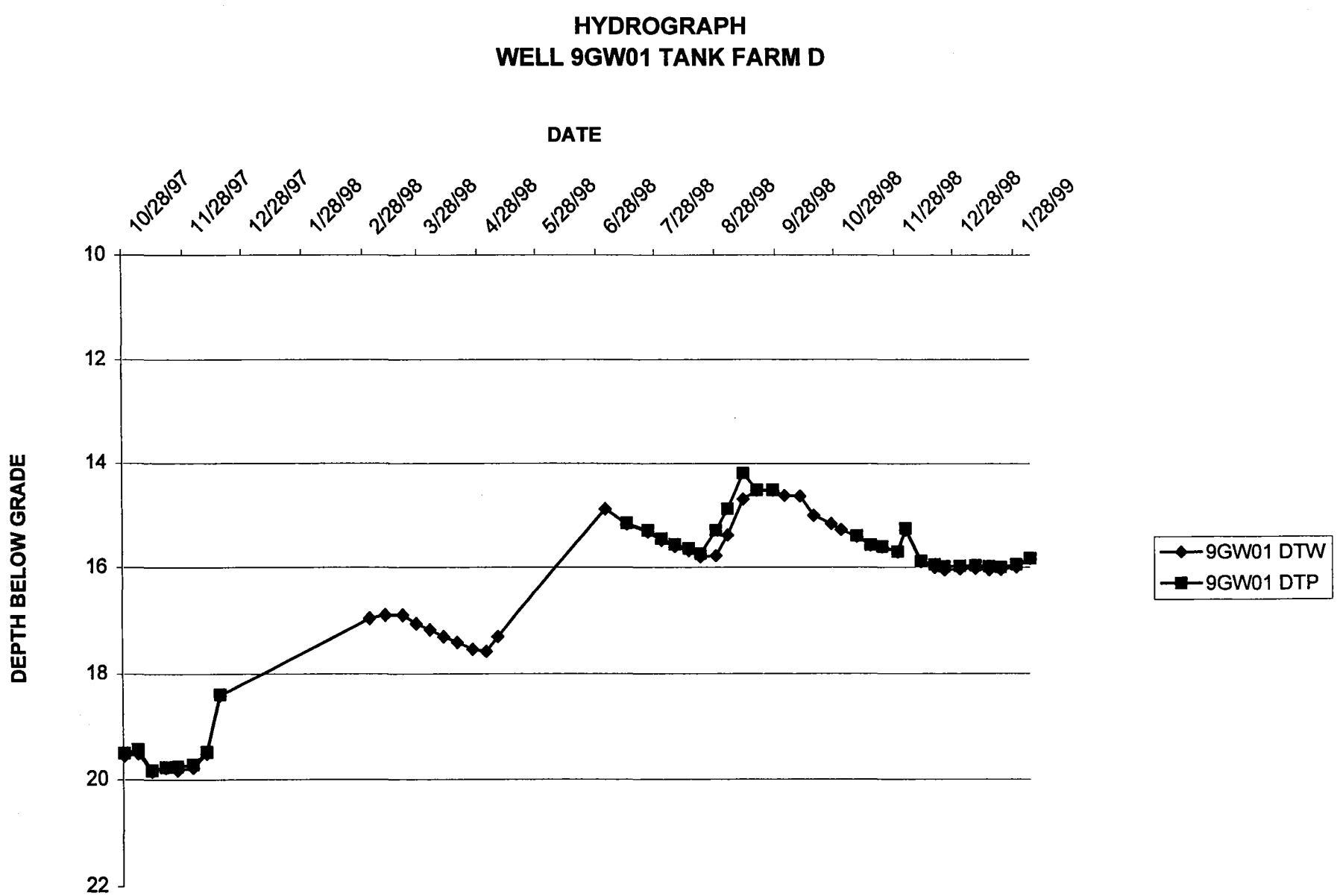


HYDROGRAPH
9GW05 DTW/DTP TANK FARM D



HYDROGRAPH
9GW02 DTW/DTP TANK FARM D




HYDROGRAPH
WELL 9GW01 TANK FARM D
DATE
10/28/97
11/28/97
12/28/97
1/28/98
2/28/98
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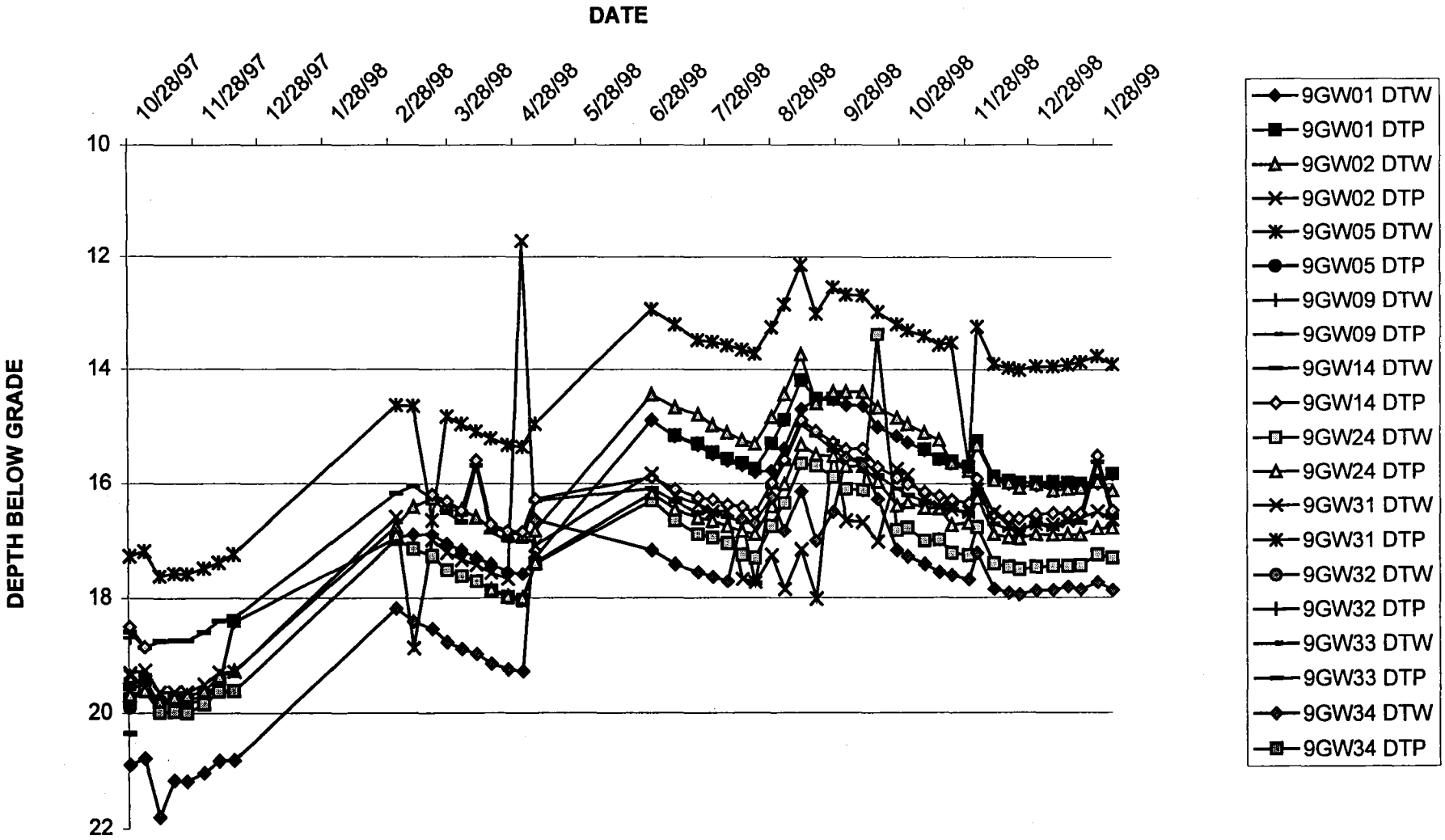
4/28/98
5/28/98
6/28/98
7/28/98
8/28/98
9/28/98
10/28/98
11/28/98
12/28/98
1/28/99
DEPTH BELOW GRADE
10
12
14
16
18
20
22
9GW01 DTW
9GW01 DTP

HYDROGRAPH
ALL WELLS DTW/DTP TANK FARM D



Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 28-Oct-97 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	19.55	19.50	0.05	
9GW02	19.37	19.36	0.01	
9GW05	17.27			
9GW09	18.69			
9GW14	18.59	18.50	0.09	
9GW24	19.76	19.69	0.07	
9GW31	19.31			
9GW32	19.90			
9GW33	20.36	20.35	0.01	
9GW34	20.90			

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Liquid Level Data

Site Name: **TANK FARM D**

Date: 04-Nov-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	19.51	19.43	0.08	
9GW02	19.52			SHEEN
9GW05	17.19			
9GW09				
9GW14	18.86	18.85	0.01	
9GW24	19.62	19.61	0.01	
9GW31	19.26			
9GW32				
9GW33				
9GW34	20.79			

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Liquid Level Data

Site Name: **TANK FARM D**

Date: 11-Nov-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	19.85	19.83	0.02	
9GW02	19.80			SHEEN
9GW05	17.62			
9GW09				
9GW14	18.75			
9GW24	19.99			
9GW31	19.64			
9GW32				
9GW33				
9GW34	21.80			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 18-Nov-97 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	19.78	19.77	0.01	
9GW02	19.73			
9GW05	17.57			
9GW09				
9GW14	18.74			
9GW24	19.98			
9GW31	19.64			
9GW32				
9GW33				
9GW34	21.17			

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Liquid Level Data

Site Name: **TANK FARM D**

Date: 24-Nov-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	19.83	19.76	0.07	
9GW02	19.70			
9GW05	17.58			
9GW09				
9GW14	18.74			
9GW24	20.00			
9GW31	19.64			
9GW32				
9GW33				
9GW34	21.19			

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Liquid Level Data

Site Name: **TANK FARM D**

Date: 02-Dec-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	19.78	19.72	0.06	
9GW02	19.62			
9GW05	17.48			
9GW09				
9GW14	18.60			
9GW24	19.85			
9GW31	19.51			
9GW32				
9GW33				
9GW34	21.04			

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Liquid Level Data

Site Name: **TANK FARM D**

Date: 09-Dec-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	19.51	19.48	0.03	
9GW02	19.37			
9GW05	17.38			
9GW09				
9GW14	18.40			
9GW24	19.63			
9GW31	19.30			
9GW32				
9GW33				
9GW34	20.83			

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Liquid Level Data

Site Name: **TANK FARM D**

Date: 16-Dec-97

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	18.42	18.40	0.02	
9GW02	19.27			
9GW05	17.24			
9GW09				
9GW14	18.35			
9GW24	19.62			
9GW31	19.29			
9GW32				
9GW33				
9GW34	20.82			

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Liquid Level Data

Site Name: **TANK FARM D**

Date: 03-Mar-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	16.96			
9GW02	16.76			
9GW05	14.63			
9GW09				
9GW14	16.18			
9GW24	16.98	16.91	0.07	
9GW31	16.60			
9GW32				
9GW33				
9GW34	18.18			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 11-Mar-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	16.90			
9GW02	16.42			
9GW05	14.64			
9GW09				
9GW14	16.05			
9GW24	17.15			
9GW31	18.87			
9GW32				
9GW33				
9GW34	18.41			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 20-Mar-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	16.90			
9GW02	16.27			
9GW05	16.65			
9GW09				
9GW14	16.27	16.20	0.07	
9GW24	17.27			
9GW31	16.99			
9GW32				
9GW33				
9GW34	18.54			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 27-Mar-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	17.06			
9GW02	16.37			
9GW05	14.82			
9GW09				
9GW14	16.52	16.32	0.20	
9GW24	17.51			
9GW31	17.21			
9GW32				
9GW33				
9GW34	18.77			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 03-Apr-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	17.17			
9GW02	16.47			
9GW05	14.95			
9GW09				
9GW14	16.68	16.48	0.20	
9GW24	17.62			
9GW31	17.33			
9GW32				
9GW33				
9GW34	18.89			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 10-Apr-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	17.30			
9GW02	16.60			
9GW05	15.08			
9GW09				
9GW14	15.69	15.59	0.10	
9GW24	17.71			SHEEN
9GW31	17.42			
9GW32				
9GW33				
9GW34	18.98			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 17-Apr-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	17.41			
9GW02	16.78			
9GW05	15.20			
9GW09				
9GW14	16.87	16.72	0.15	
9GW24	17.88	17.86	0.02	
9GW31	17.56			
9GW32				
9GW33				
9GW34	19.15			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 25-Apr-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	17.54			
9GW02	16.86			
9GW05	15.32			
9GW09				
9GW14	17.01	16.83	0.18	
9GW24	17.99	17.97	0.02	
9GW31	17.67			
9GW32				
9GW33				
9GW34	19.25			

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Liquid Level Data

Site Name: **TANK FARM D**

Date: 02-May-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	17.58			
9GW02	16.91			
9GW05	15.35			
9GW09				
9GW14	17.02	16.85	0.17	
9GW24	18.04	18.00	0.04	
9GW31	11.72			
9GW32				
9GW33				
9GW34	19.28			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 08-May-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	17.30			
9GW02	16.83			ED
9GW05	14.95			
9GW09				
9GW14	16.32	16.28	0.04	
9GW24	17.40	17.38	0.02	
9GW31	17.09			D
9GW32				
9GW33				
9GW34	16.64			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 02-Jul-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	14.88			
9GW02	14.44			
9GW05	12.93			
9GW09				
9GW14	16.09	15.89	0.20	
9GW24	16.31	16.18	0.13	
9GW31	15.83			D
9GW32				
9GW33				
9GW34	17.17			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 13-Jul-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.17	15.15	0.02	
9GW02	14.66			
9GW05	13.20			
9GW09				
9GW14	16.33	16.10	0.23	
9GW24	16.65	16.47	0.18	
9GW31	16.23			D
9GW32				
9GW33				
9GW34	17.41			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 24-Jul-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.32	15.29	0.03	
9GW02	14.78			
9GW05	13.48			
9GW09				
9GW14	16.53	16.25	0.28	
9GW24	16.89	16.61	0.28	
9GW31	16.37			D
9GW32				
9GW33				
9GW34	17.55			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 31-Jul-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.48	15.45	0.03	
9GW02	14.97			
9GW05	13.51		.,	
9GW09				
9GW14	16.50	16.29	0.21	
9GW24	16.95	16.66	0.29	
9GW31	16.50			D
9GW32				
9GW33				
9GW34	17.63			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 07-Aug-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.60	15.56	0.04	
9GW02	15.10			
9GW05	13.57			
9GW09				
9GW14	16.60	16.38	0.22	
9GW24	17.05	16.75	0.30	
9GW31	16.50			D
9GW32				
9GW33				
9GW34	17.71			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 14-Aug-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.68	15.64	0.04	
9GW02	15.23			
9GW05	13.65			
9GW09				
9GW14	16.68	16.42	0.26	
9GW24	17.25	16.84	0.41	
9GW31	17.67			
9GW32				
9GW33				
9GW34	16.63			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 20-Aug-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.80	15.74	0.06	
9GW02	15.30			
9GW05	13.72		.,	
9GW09				
9GW14	17.75	16.53	1.22	
9GW24	17.30	16.89	0.41	
9GW31	17.73			
9GW32				
9GW33				
9GW34	16.70			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 28-Aug-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.78	15.29	0.49	
9GW02	14.83			
9GW05	13.25			
9GW09				
9GW14	16.07	15.99	0.08	
9GW24	16.75	16.41	0.34	
9GW31	17.26			
9GW32				
9GW33				
9GW34	16.24			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 03-Sep-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.38	14.88	0.50	
9GW02	14.43			
9GW05	12.84			
9GW09				
9GW14	15.66	15.58	0.08	
9GW24	16.35	16.01	0.34	
9GW31	17.85			
9GW32				
9GW33				
9GW34	16.83			

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Liquid Level Data

Site Name: **TANK FARM D**

Date: 11-Sep-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	14.69	14.19	0.50	
9GW02	13.73			
9GW05	12.14			
9GW09				
9GW14	14.96	14.88	0.08	
9GW24	15.65	15.31	0.34	
9GW31	17.16			
9GW32				
9GW33				
9GW34	16.14			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 18-Sep-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	14.52	14.51	0.01	
9GW02	14.59			
9GW05	13.01			
9GW09				
9GW14	15.15	15.07	0.08	
9GW24	15.69	15.49	0.20	
9GW31	18.02			
9GW32				
9GW33				
9GW34	17.01			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 26-Sep-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	14.52	14.51	0.01	
9GW02	14.39			
9GW05	12.54			
9GW09				
9GW14	15.41	15.27	0.14	
9GW24	15.89	15.52	0.37	
9GW31	15.33			
9GW32				
9GW33				
9GW34	16.51			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 02-Oct-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	14.62			
9GW02	14.39			
9GW05	12.67			
9GW09				
9GW14	15.57	15.39	0.18	
9GW24	16.10	15.70	0.40	
9GW31	16.66			
9GW32				
9GW33				
9GW34	15.54			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 10-Oct-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	14.63			
9GW02	14.39			
9GW05	12.68			
9GW09				
9GW14	15.57	15.38	0.19	
9GW24	16.12	15.70	0.42	
9GW31	16.68			
9GW32				
9GW33				
9GW34	15.67			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 17-Oct-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.00			
9GW02	14.66			
9GW05	12.97			
9GW09				
9GW14	15.86	15.71	0.15	
9GW24	16.37	15.97	0.40	
9GW31	17.02			
9GW32				
9GW33				
9GW34	16.28			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 26-Oct-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.16			
9GW02	14.84			
9GW05	13.19			
9GW09				
9GW14	16.09	15.90	0.19	
9GW24	16.82	16.40	0.42	
9GW31	15.74			
9GW32				
9GW33				
9GW34	17.17			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 31-Oct-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.27			
9GW02	14.95			
9GW05	13.30			
9GW09				
9GW14	16.21	16.01	0.20	
9GW24	16.78	16.34	0.44	
9GW31	15.85			
9GW32				
9GW33				
9GW34	17.28			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 08-Nov-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.41	15.39	0.02	
9GW02	15.10			
9GW05	13.40			
9GW09				
9GW14	16.32	16.15	0.17	
9GW24	17.01	16.44	0.57	
9GW31	16.29			
9GW32				
9GW33				
9GW34	17.41			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 15-Nov-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.58	15.57	0.01	
9GW02	15.23			
9GW05	13.56			
9GW09				
9GW14	16.42	16.22	0.20	
9GW24	16.99	16.45	0.54	
9GW31	16.43			
9GW32				
9GW33				
9GW34	17.55			

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Liquid Level Data

Site Name: **TANK FARM D**

Date: 21-Nov-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.61	15.60	0.01	
9GW02	15.64			
9GW05	13.52			
9GW09				
9GW14	16.47	16.29	0.18	
9GW24	17.22	16.73	0.49	
9GW31	16.47			
9GW32				
9GW33				
9GW34	17.60			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 29-Nov-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.71	15.70	0.01	
9GW02	15.78			
9GW05	15.71		.,	
9GW09				
9GW14	16.54	16.35	0.19	
9GW24	17.26	16.69	0.57	
9GW31	16.51			
9GW32				
9GW33				
9GW34	17.68			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 03-Dec-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.28	15.25	0.03	
9GW02	15.32			
9GW05	13.23			
9GW09				
9GW14	16.11	15.92	0.19	
9GW24	16.77	16.27	0.50	
9GW31	16.10			
9GW32				
9GW33				
9GW34	17.22			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 11-Dec-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.90	15.88	0.02	
9GW02	15.94			
9GW05	13.90			
9GW09				
9GW14	16.72	16.55	0.17	
9GW24	17.40	16.89	0.51	
9GW31	16.51			
9GW32				
9GW33				
9GW34	17.85			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 18-Dec-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	16.01	15.95	0.06	
9GW02	15.99			
9GW05	13.97			
9GW09				
9GW14	16.80	16.61	0.19	
9GW24	17.46	16.95	0.51	
9GW31	16.75			
9GW32				
9GW33				
9GW34	17.92			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 23-Dec-98 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	16.06	15.99	0.07	
9GW02	16.08			
9GW05	14.01			
9GW09				
9GW14	16.82	16.62	0.20	
9GW24	17.50	16.97	0.53	
9GW31	16.82			
9GW32				
9GW33				
9GW34	17.95			

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Liquid Level Data

Site Name: **TANK FARM D**

Date: 31-Dec-98

MCAS Cherry Point
Petroleum Oils and Lubricants (POL) Site
LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	16.04	15.98	0.06	
9GW02	16.01			
9GW05	13.94			
9GW09				
9GW14	16.70	16.55	0.15	
9GW24	17.46	16.89	0.57	
9GW31	16.71			
9GW32				
9GW33				
9GW34	17.88			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 08-Jan-99 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	16.03	15.97	0.06	
9GW02	16.13			
9GW05	13.94			
9GW09				
9GW14	16.79	16.53	0.26	
9GW24	17.44	16.90	0.54	
9GW31	16.73			
9GW32				
9GW33				
9GW34	17.87			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 15-Jan-99 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	16.06	15.99	0.07	
9GW02	16.10			
9GW05	13.91		.,	
9GW09				
9GW14	16.68	16.53	0.15	
9GW24	17.44	16.89	0.55	
9GW31	16.67			
9GW32				
9GW33				
9GW34	17.81			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 21-Jan-99 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	16.05	16.00	0.05	
9GW02	16.08			
9GW05	13.86			
9GW09				
9GW14	16.69	16.54	0.15	
9GW24	17.43	16.90	0.53	
9GW31	16.62			
9GW32				
9GW33				
9GW34	17.86			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 29-Jan-99 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	16.00	15.95	0.05	
9GW02	15.97			
9GW05	13.76			
9GW09				
9GW14	15.62	15.50	0.12	
9GW24	17.25	16.79	0.46	
9GW31	16.50			
9GW32				
9GW33				
9GW34	17.73			

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Liquid Level Data

Site Name: **TANK FARM D** **MCAS Cherry Point**

Date: 05-Feb-99 Petroleum Oils and Lubricants (POL) Site

LANTDIV

Well No.	DTW	DTP	PT	NOTES
9GW01	15.84	15.83	0.01	
9GW02	16.13			
9GW05	13.90		.,	
9GW09				
9GW14	16.61	16.48	0.13	
9GW24	17.30	16.78	0.52	
9GW31	16.64			
9GW32				
9GW33				
9GW34	17.87			

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APPENDIX G

MASS OF LIQUID PETROLEUM HYDROCARBONS (LPH) ESTIMATES

APPENDIX G LPH MASS ESTIMATES.

Building 1640 LPH Mass Estimate

Site Name: Building 1640

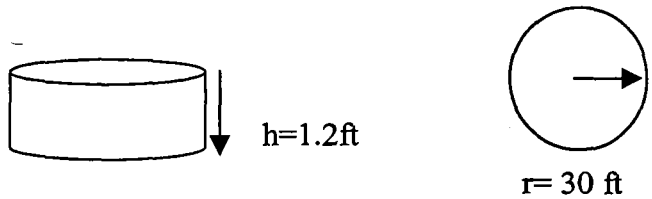
Based on the original site map definition delineating the perimeter of extent of free product (liquid phase hydrocarbons (LPH)) the following is derived.

An approximate radius of extent of LPH. (r) in feet from an approximate center point in the LPH plume (30 feet). The configuration of the plume is roughly round.

From site data and physical measurements the LPH plume is approximated at being 1.2 feet in thickness (h).

An assumption of the free pore space of the subsurface matrix (porosity) is 20%. (0.20)

To then calculate the volume of the LPH at the site:
V=volume
h = LPH thickness in feet
$\pi = 3.14$
r = radius of LPH plume



where:

$$V=2\pi r^2 h$$
$$\therefore V= (2)(3.14)(30)^2(1.2)$$
$$=6{,}782 \text{ ft}^3$$

6,782 ft^3 = total mass without correction for porosity. (6,782 ft^3)x(0.20) [for porosity]
= 1,356.40ft^3 mass of LPH (Contaminant)
= 1,356.40ft^3 convert to gallons of LPH, 1ft^3 =7.4 gallons
= (7.4)(1,356.40ft^3)
= 10,037.36 gallons..... 10,000 gallons.
= 10,000 gallons.

Assume that the LPH weighs 7.13 lb/gallon, then (10,000)(7.13lb) = 71,300 lbs of hydrocarbons are present in liquid phase

Conservatively 40% of the mass is recoverable, thus (0.40)(71,300lbs) = 28,520lbs of hydrocarbons can be recovered.

During AFVR events at Building 1640 on average during an AFVR event 54 lbs of hydrocarbons are removed. So far a total of 809 lbs of hydrocarbons have been removed. Subtract the 809 lbs removed from the 28,520 lbs (that is recoverable) there then remains in the subsurface 27,711 lbs of hydrocarbons to be removed.

Building 296 LPH Mass Estimate

Site Name: Building 296

Based on the original site map definition delineating the perimeter of extent of free product (liquid phase hydrocarbons (LPH) Law Engineering 9/95) the following is derived.

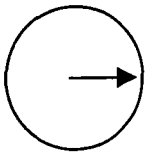
An approximate radius of extent of LPH. (r) in feet from an approximate center point in the LPH plume (22 feet). The configuration of the plume is roughly round.

From site data and physical measurements the LPH plume is approximated at being 1.5 feet in thickness (h).

An assumption of the free pore space of the subsurface matrix (porosity) is 20%. (0.20)

To then calculate the volume of the LPH at the site:
V=volume
h = LPH thickness in feet
$\pi = 3.14$
r = radius of LPH plume

h=1.5ft



r= 22 ft

where:

$$V=2\pi r^2 h$$
$$\therefore V= (2)(3.14)(22)^2(1.5)$$
$$=4{,}559 \text{ ft}^3$$

4,559 ft^3 = total mass without correction for porosity. (4,559 ft^3)x(0.20) [for porosity]
= 911 ft^3 mass of LPH (Contaminant)
= 911ft^3 convert to gallons of LPH, 1ft^3 =7.4 gallons
= (7.4)(911ft^3)
= 6,741 gallons.

Assume that the LPH weighs 7.13 lb/gallon, then (6,741)(7.13lb) = 48,066 lbs of hydrocarbons are present in liquid phase

Conservatively 40% of the mass is recoverable, thus (0.40)(48,066lbs) = 19,226 lbs of hydrocarbons can be recovered.

Building 486 LPH Mass Estimate

Site Name: Building 486

Based on the original site map definition delineating the perimeter of extent of free product (liquid phase hydrocarbons (LPH) Law Engineering 7/95) the following is derived.

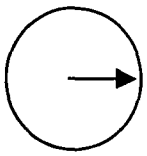
An approximate radius of extent of LPH. (r) in feet from an approximate center point in the LPH plume (12 feet). The configuration of the plume is roughly round.

From site data and physical measurements the LPH plume is approximated at being 0.23 feet in thickness (h).

An assumption of the free pore space of the subsurface matrix (porosity) is 20%. (0.20)

To then calculate the volume of the LPH at the site:
V=volume
h = LPH thickness in feet
$\pi = 3.14$
r = radius of LPH plume

h=0.23f



r= 12 ft

where:

$$V=2\pi r^2 h$$
$$\therefore V= (2)(3.14)(12)^2(0.23)$$
$$=207\ ft^3$$

$207\ ft^3$ = total mass without correction for porosity. $(207\ ft^3)x(0.20)$ [for porosity]
$= 41.5\ ft^3$ mass of LPH (Contaminant)
$= 41.5ft^3$ convert to gallons of LPH, $1ft^3 = 7.4$ gallons
$= (7.4)(41.5ft^3)$
= 307 gallons.

Assume that the LPH weighs 7.13 lb/gallon, then (307)(7.13lb) = 2,188 lbs of hydrocarbons are present in liquid phase

Conservatively 40% of the mass is recoverable, thus (0.40)(2,188 lbs) = 875 lbs of hydrocarbons can be recovered.

Atlantic 7012 LPH Mass Estimate

Site Name: Atlantic 7012

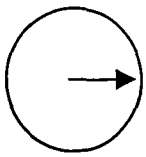
Based on the original site map definition delineating the perimeter of extent of free product (liquid phase hydrocarbons (LPH) Law Engineering 8/95) the following is derived.

An approximate radius of extent of LPH. (r) in feet from an approximate center point in the LPH plume (45 feet). The configuration of the plume is roughly round.

From site data and physical measurements the LPH plume is approximated at being 0.5 feet in thickness (h).

An assumption of the free pore space of the subsurface matrix (porosity) is 20%. (0.20)

To then calculate the volume of the LPH at the site:
V=volume
h = LPH thickness in feet
$\pi = 3.14$
r = radius of LPH plume



where:

$$V=2\pi r^2 h$$
$$\therefore V= (2)(3.14)(45)^2(0.5)$$
$$=6{,}358 \text{ ft}^3$$

6,358 ft^3 = total mass without correction for porosity. (6,358 ft^3)x(0.20) [for porosity]
= 1,272 ft^3 mass of LPH (Contaminant)
= 1,272ft^3 convert to gallons of LPH, 1ft^3 =7.4 gallons
= (7.4)(1,272ft^3)
= 9,412 gallons.

Assume that the LPH weighs 7.13 lb/gallon, then (9,412)(7.13lb) = 67,113 lbs of hydrocarbons are present in liquid phase

Conservatively 40% of the mass is recoverable, thus (0.40)(67,113 lbs) = 26,845 lbs of hydrocarbons can be recovered.

Tank Farm D LPH Mass Estimate

Site Name: Tank Farm D

Based on the original site map definition delineating the perimeter of extent of free product (liquid phase hydrocarbons (LPH) 1995 ref DWG 5.1) the following is derived.

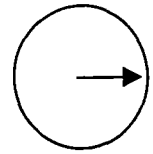
An approximate perimeter of extent of LPH is roughly defined in two plumes, one with a radius of 20 ft and thickness of LPH at approximately 0.070 ft on average [plume A], and the second plume having a radius of 10 ft and thickness of LPH at approximately 0.20 ft on average [plume B]. The separate configurations of the plumes is roughly round.

PLUME A
From site data and physical measurements the LPH plume is approximated at being 0.7 feet in thickness (h).

An assumption of the free pore space of the subsurface matrix (porosity) is 20%. (0.20)

To then calculate the volume of the LPH at the site:
V=volume

h = LPH thickness in feet
$\pi = 3.14$
r = radius of LPH plume



where:

$$V=2\pi r^2 h$$
$$\therefore V= (2)(3.14)(20)^2(0.7)$$
$$=1{,}758\ ft^3$$

$1{,}758\ ft^3$ = total mass without correction for porosity. $(1{,}758\ ft^3)x(0.20)$ [for porosity]
= $351\ ft^3$ mass of LPH (Contaminant)
= $351 ft^3$ convert to gallons of LPH, $1 ft^3 = 7.4$ gallons
= $(7.4)(351 ft^3)$
= 2,597 gallons.

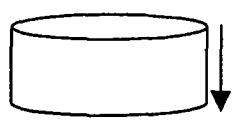
Assume that the LPH weighs 7.13 lb/gallon, then (2,597)(7.13lb) = 18,516 lbs of hydrocarbons are present in liquid phase

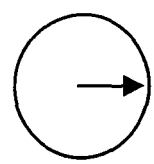
Conservatively 40% of the mass is recoverable, thus (0.40)(18,516 lbs) = 7,406 lbs of hydrocarbons can be recovered.

PLUME B
From site data and physical measurements the LPH plume is approximated at being 0.2 feet in thickness (h).

An assumption of the free pore space of the subsurface matrix (porosity) is 20%. (0.20)

To then calculate the volume of the LPH at the site:
V=volume
h = LPH thickness in feet
$\pi = 3.14$
r = radius of LPH plume





where:

$$V=2\pi r^2 h$$
$$\therefore V= (2)(3.14)(10)^2(0.2)$$
$$= 125.6\ ft^3$$

$125\ ft^3$ = total mass without correction for porosity. $(125\ ft^3)x(0.20)$ [for porosity]
= $25\ ft^3$ mass of LPH (Contaminant)
= $25\ ft^3$ convert to gallons of LPH, $1 ft^3 = 7.4$ gallons
= $(7.4)(25\ ft^3)$

= 185 gallons.

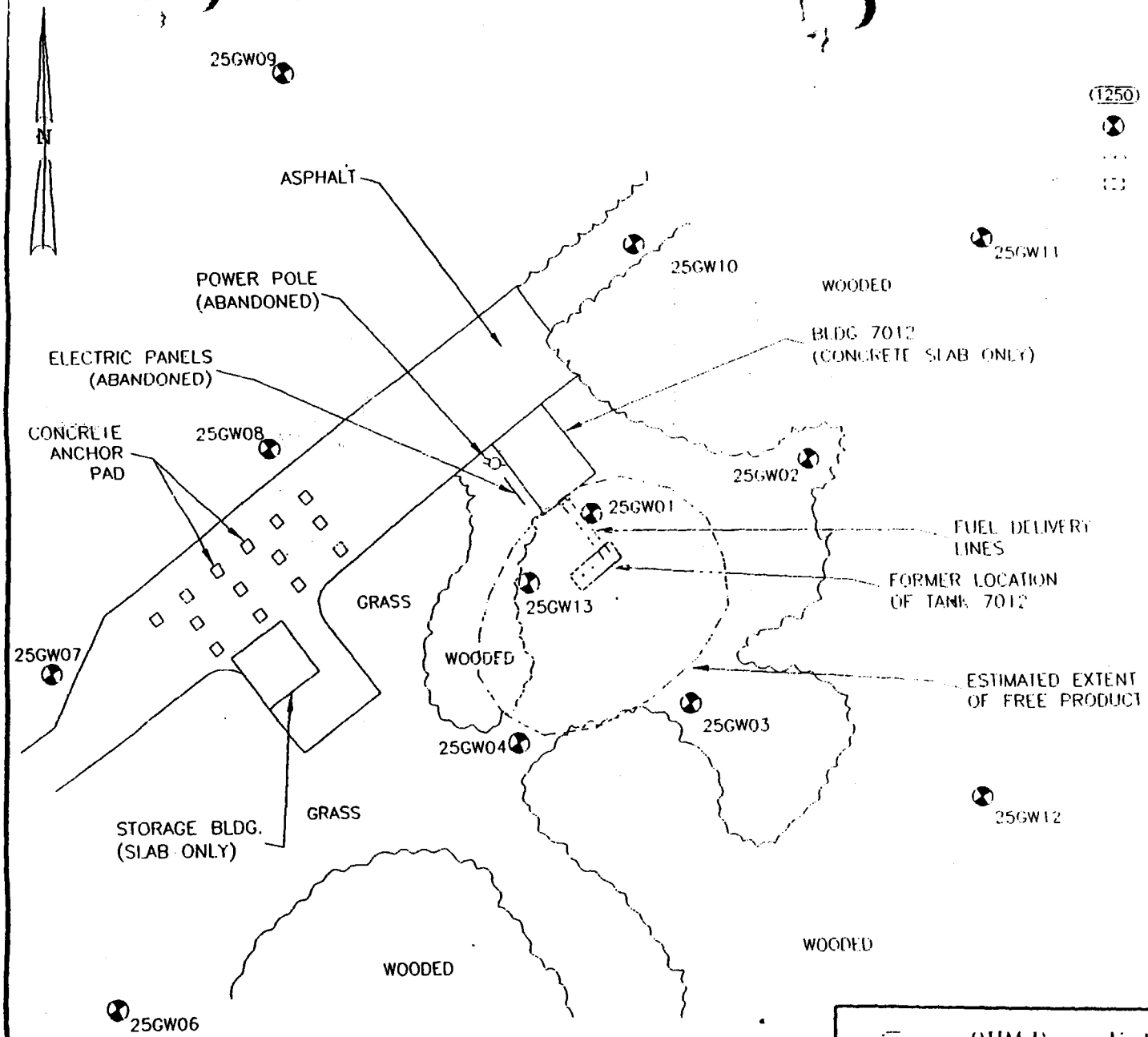
Assume that the LPH weighs 7.13 lb/gallon, then (185)(7.13lb) = 1,319 lbs of hydrocarbons are present in liquid phase

Conservatively 40% of the mass is recoverable, thus (0.40)(1,319 lbs) = 527 lbs of hydrocarbons can be recovered.

TOTALS =

PLUME A = 7,406 lbs
PLUME B = 527 lbs

Total = 7, 933 lbs potentially recoverable at Tank Farm D



Atlantic 7012

LEGEND

(1250)	APPROXIMATE FORMER UST LOCATION
	MONITORING WELL (TYPE II)
	TREE LINE
	FORMER LOCATION OF TANK 7012 AND ASSOCIATED FILL AND DISTRIBUTION LINES

NOTES:

1. PROPOSED EXTRACTION WELLS FOR AFVR INCLUDE EXISTING MONITORING WELLS 25GW01, 25GW04, AND 25GW13
2. EXCLUSION ZONE TO BE ESTABLISHED BASED ON WIND CONDITIONS AT THE SITE.
3. DRAWING ADAPTED FROM LAs ENG. CAP DATED 8/22/95

60 30 0 60

SCALE IN FEET

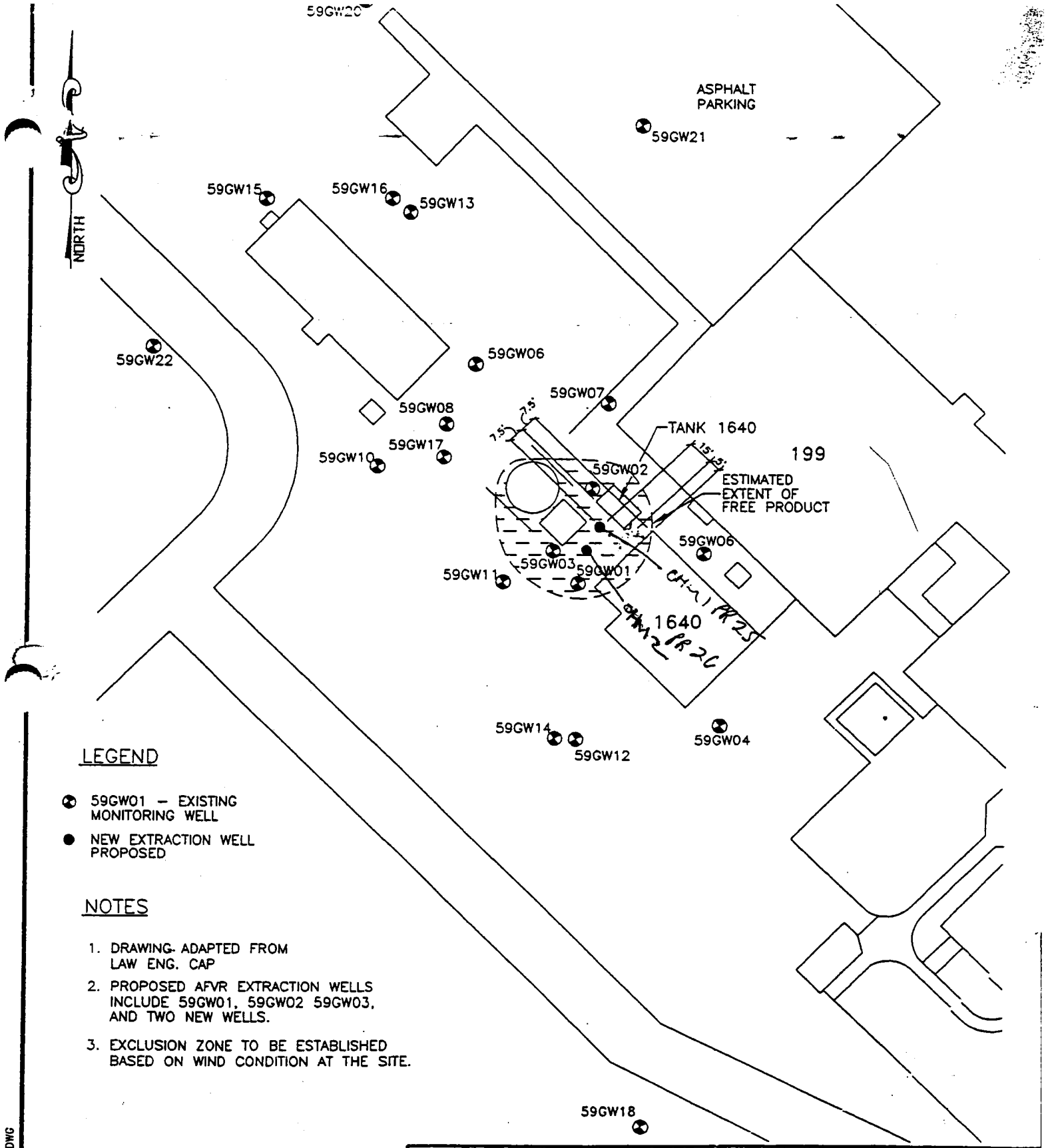
OHM Remediation Services Corp.

DRAWN BY	M D'INDIA	8/6/97
CHECKED BY	A. COLLINS	8/6/97
APPROVED BY	J. DUNN	8/6/97
REV	SHEET #	PROJECT NO.

FIGURE 4

SITE PLAN
UST 7012

PREPARED FOR
LCAS CHERRY POINT
UST 7012 SITE



LEGEND

- 59GW01 – EXISTING MONITORING WELL
- NEW EXTRACTION WELL PROPOSED

NOTES

1. DRAWING ADAPTED FROM LAW ENG. CAP
2. PROPOSED AFVR EXTRACTION WELLS INCLUDE 59GW01, 59GW02 59GW03, AND TWO NEW WELLS.
3. EXCLUSION ZONE TO BE ESTABLISHED BASED ON WIND CONDITION AT THE SITE.

50 0 50

SCALE IN FEET

OHM Remediation Services Corp.

DRAWN BY	J. LANGE	8/6/97
CHECKED BY	A. COLLINS	8/6/97
APPROVED BY	J. DUNN	8/6/97
REV. 0	SHEET # –	PROJECT NO. 19364

FIGURE 2

SITE PLAN
BUILDING 1640

PREPARED FOR
MCAS CHERRY POINT
BUILDING 1640/1286

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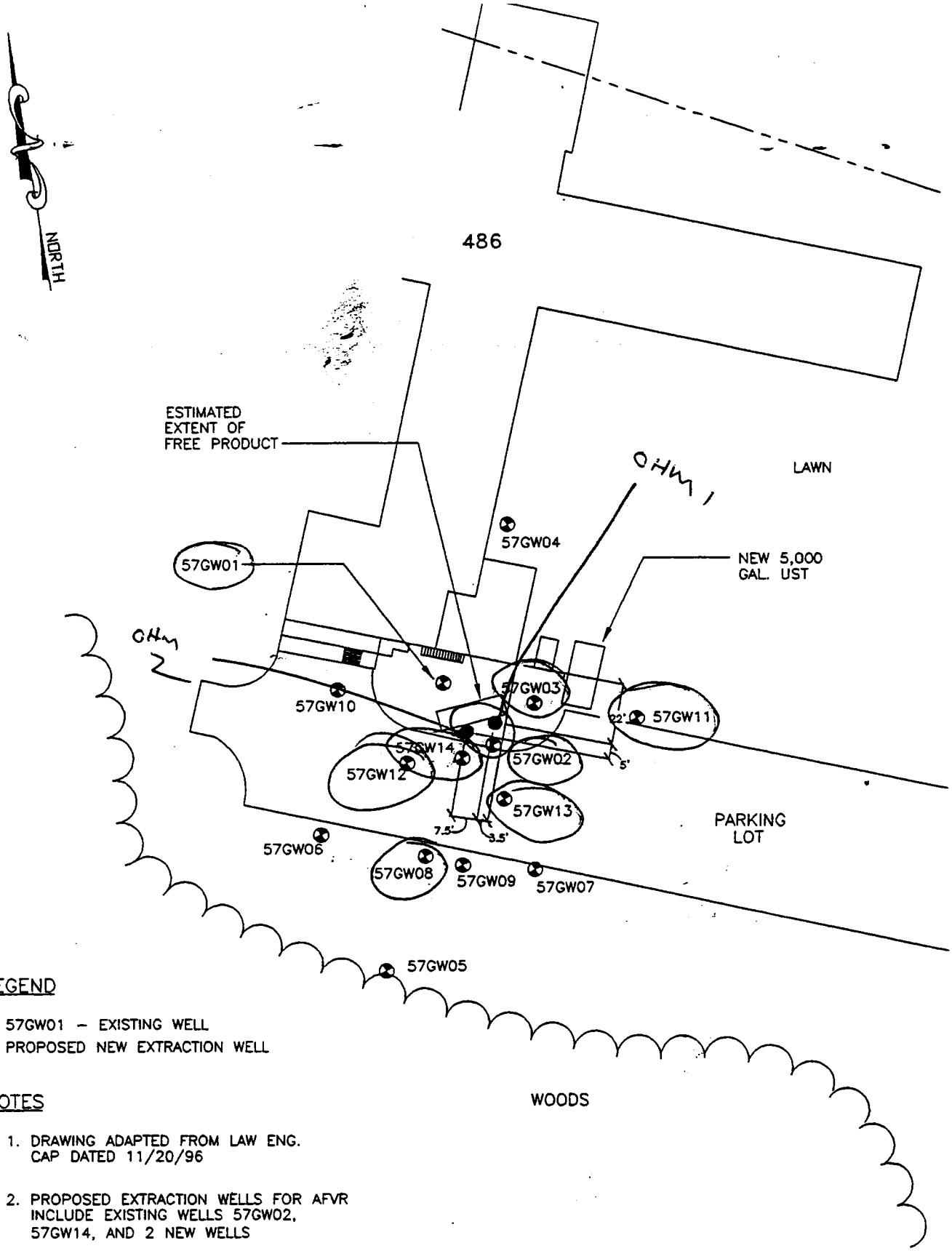


LEGEND

- 57GW01 – EXISTING WELL
- PROPOSED NEW EXTRACTION WELL

NOTES

1. DRAWING ADAPTED FROM LAW ENG. CAP DATED 11/20/96
2. PROPOSED EXTRACTION WELLS FOR AFVR INCLUDE EXISTING WELLS 57GW02, 57GW14, AND 2 NEW WELLS

50 0 50
SCALE IN FEET

OHM Remediation Services Corp.
NORCROSS, GEORGIA
A SUBSIDIARY OF OHM CORPORATION

DRAWN BY	J. LANGE	8/6/97
CHECKED BY	A. COLLINS	8/6/97
APPROVED BY	J. DUNN	8/6/97
REV. 0	SHEET # –	PROJECT NO. 19364

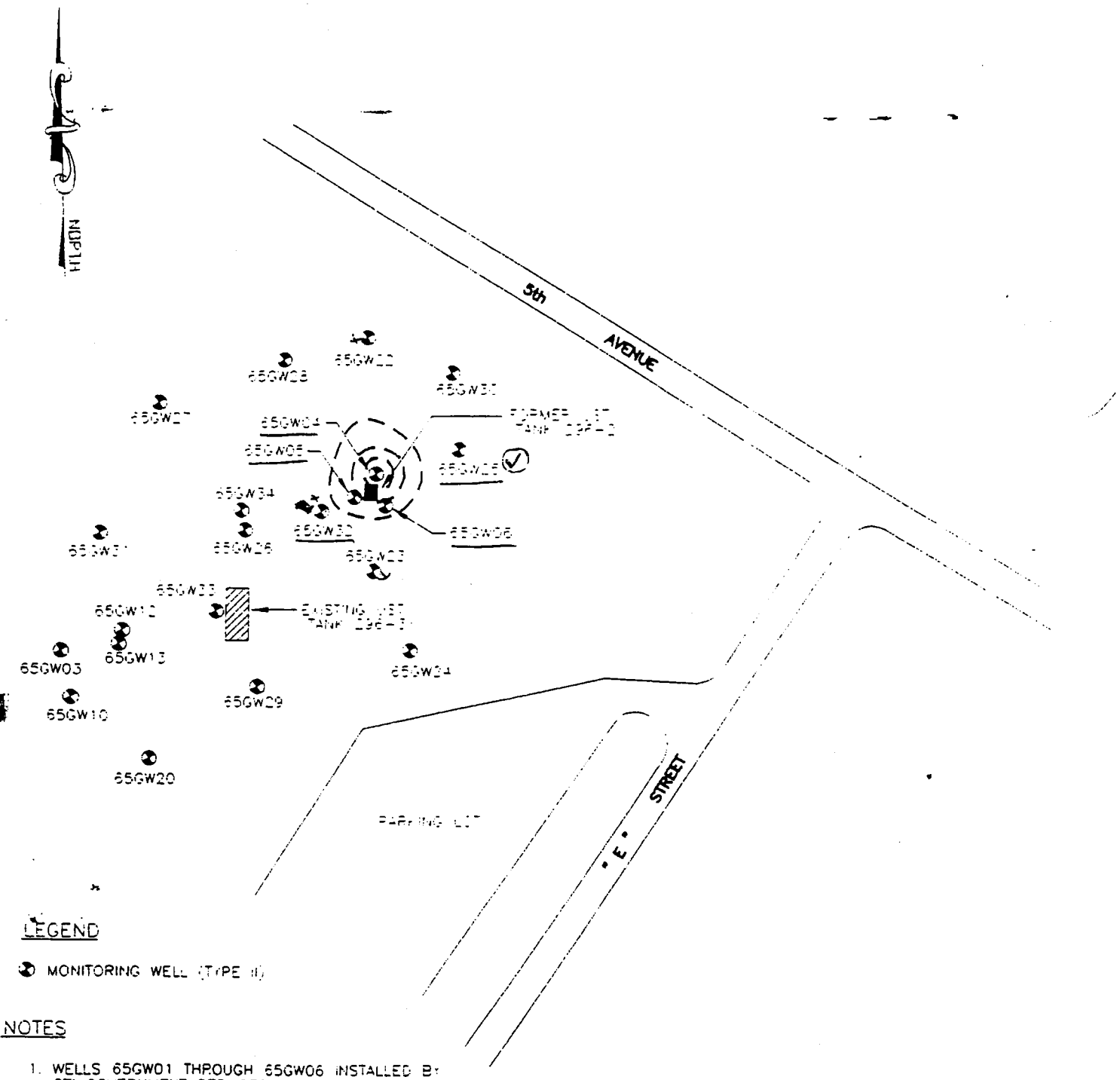
Scott Camp

FIGURE 3

SITE PLAN
UST 486 SITES

PREPARED FOR:
MCAS CHERRY POINT
BUILDING 1640/486

D:\OHM2\CHERP 364\FIG3.DWG



LEGEND

MONITORING WELL (TYPE II)

NOTES

1. WELLS 65GW01 THROUGH 65GW06 INSTALLED BY GTI GOVERNMENT SERVICES, SEPT. 1993.
2. WELLS 65GW07 THROUGH 65GW21 INSTALLED BY LAW ENGINEERING OCT. AND NOV. 1993.
3. WELLS 65GW22 THROUGH 65GW34 INSTALLED BY LAW ENGINEERING JULY, 1994.

2. DRAWING REFERENCED FROM NAVAL FACILITIES ENGINEERING COMMAND DRAWING NO. 1337621.

50 0 50
SCALE IN FEET

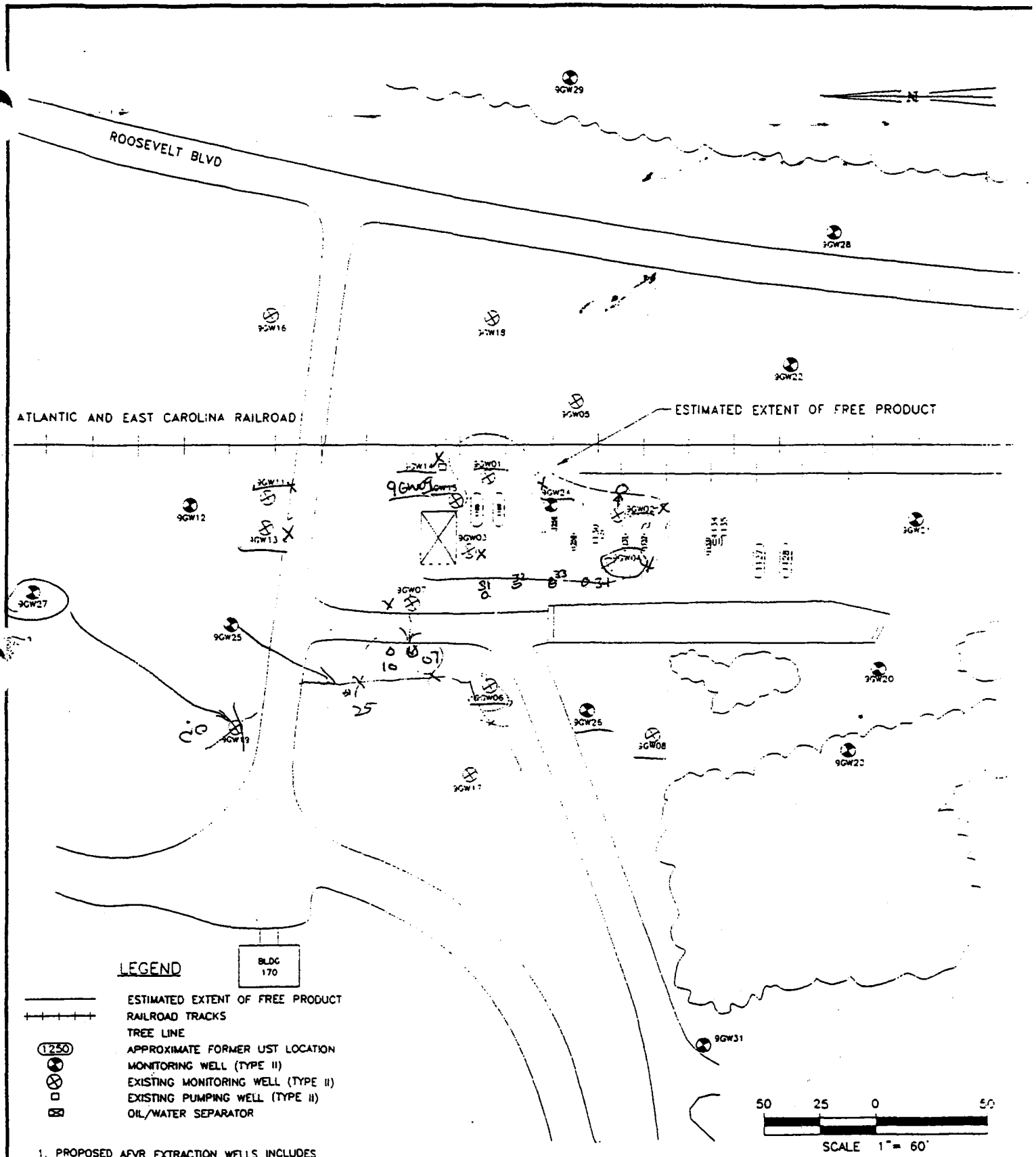
OHM Remediation Services Corp.

DRAWN BY	J. COLLINS	10/3/97
CHECKED BY	J. DUNN	10/3/97
APPROVED BY	J. DUNN	10/3/97
REV 0	SHEET # –	PROJECT NO. 19364

FIGURE 0

SITE PLAN
UST 296

PREPARED FOR
MCAS CHERRY POINT
BUILDING 296



LEGEND

- ESTIMATED EXTENT OF FREE PRODUCT
- RAILROAD TRACKS
- TREE LINE
- (1250) APPROXIMATE FORMER UST LOCATION
- MONITORING WELL (TYPE II)
- EXISTING MONITORING WELL (TYPE II)
- EXISTING PUMPING WELL (TYPE II)
- OIL/WATER SEPARATOR

1. PROPOSED AFVR EXTRACTION WELLS INCLUDES 9GW01, 9GW02, 9GW03, 9GW04 AND 9GW24.
2. EXCLUSION ZONE TO BE ESTABLISHED BASED ON SITE SPECIFIC WIND CONDITIONS
3. DRAWING ADAPTED FROM LAW ENG. CAP DATED 8/14/95
4. NOT ALL MONITOR WELLS WHICH EXIST ARE SHOWN DUE TO DRAWING SCALE

OHM Remediation Services Corp.
NORCROSS, GEORGIA
A SUBSIDIARY OF OHM CORPORATION

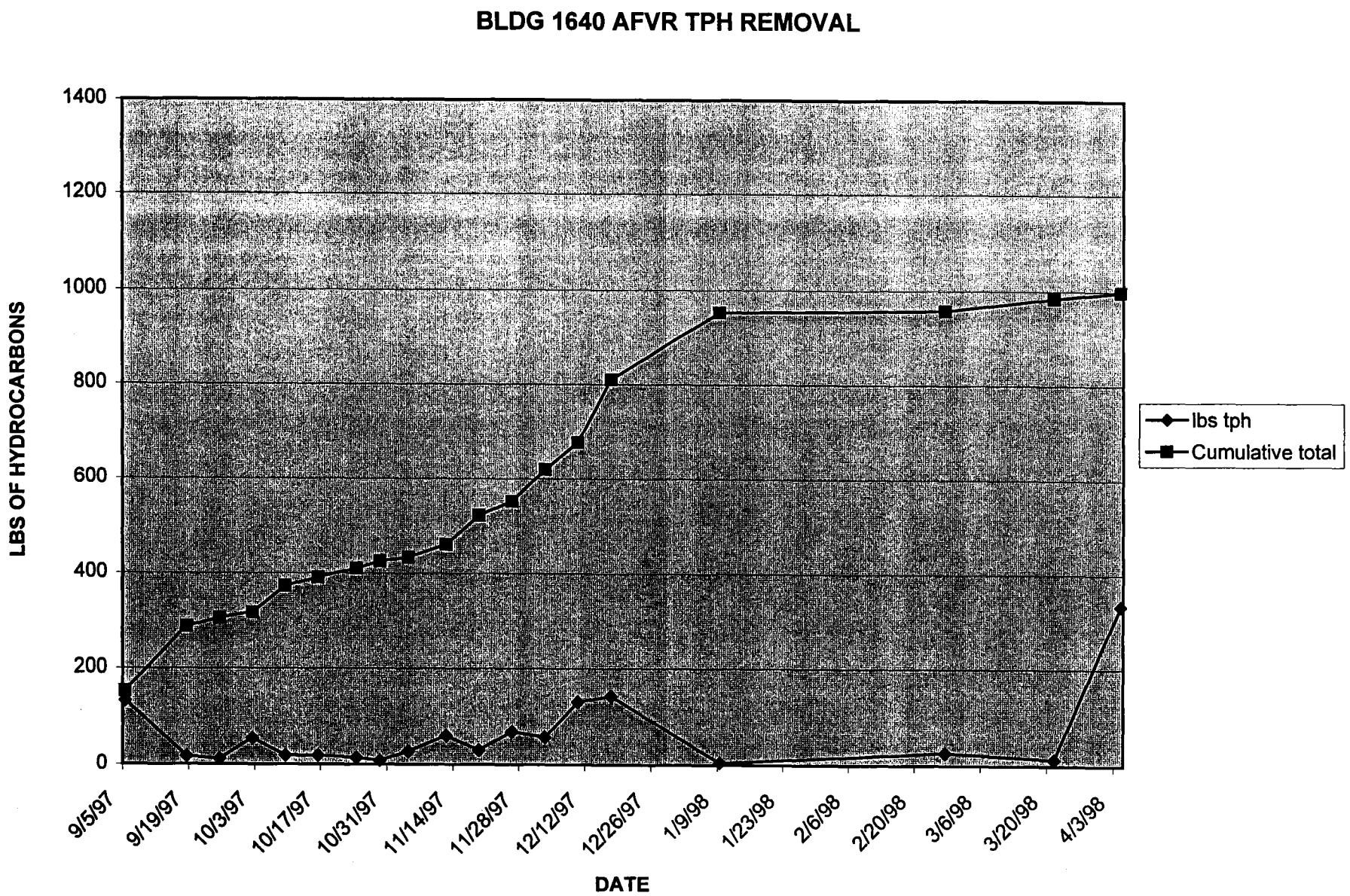
DRAWN BY	M. D'INDIA	8/6/97
CHECKED BY	A. COLLINS	8/6/97
APPROVED BY	J. DUNN	8/6/97
REV. 0	SHEET # –	PROJECT NO. 19559

FIGURE 3

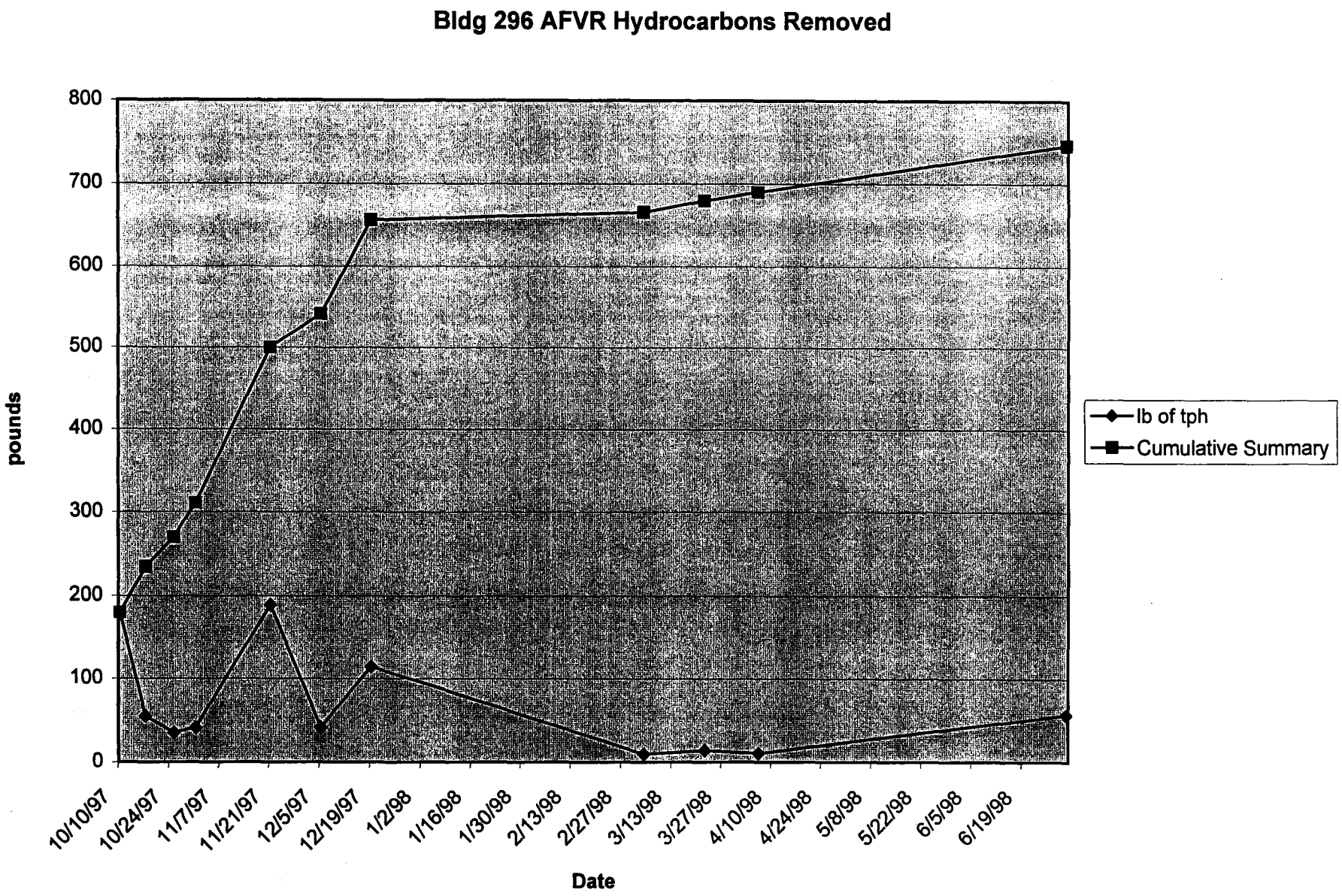
SITE PLAN
TANK FARM D

PREPARED FOR
MCAS CHERRY POINT
TANK FARM D UST [illegible] SITE

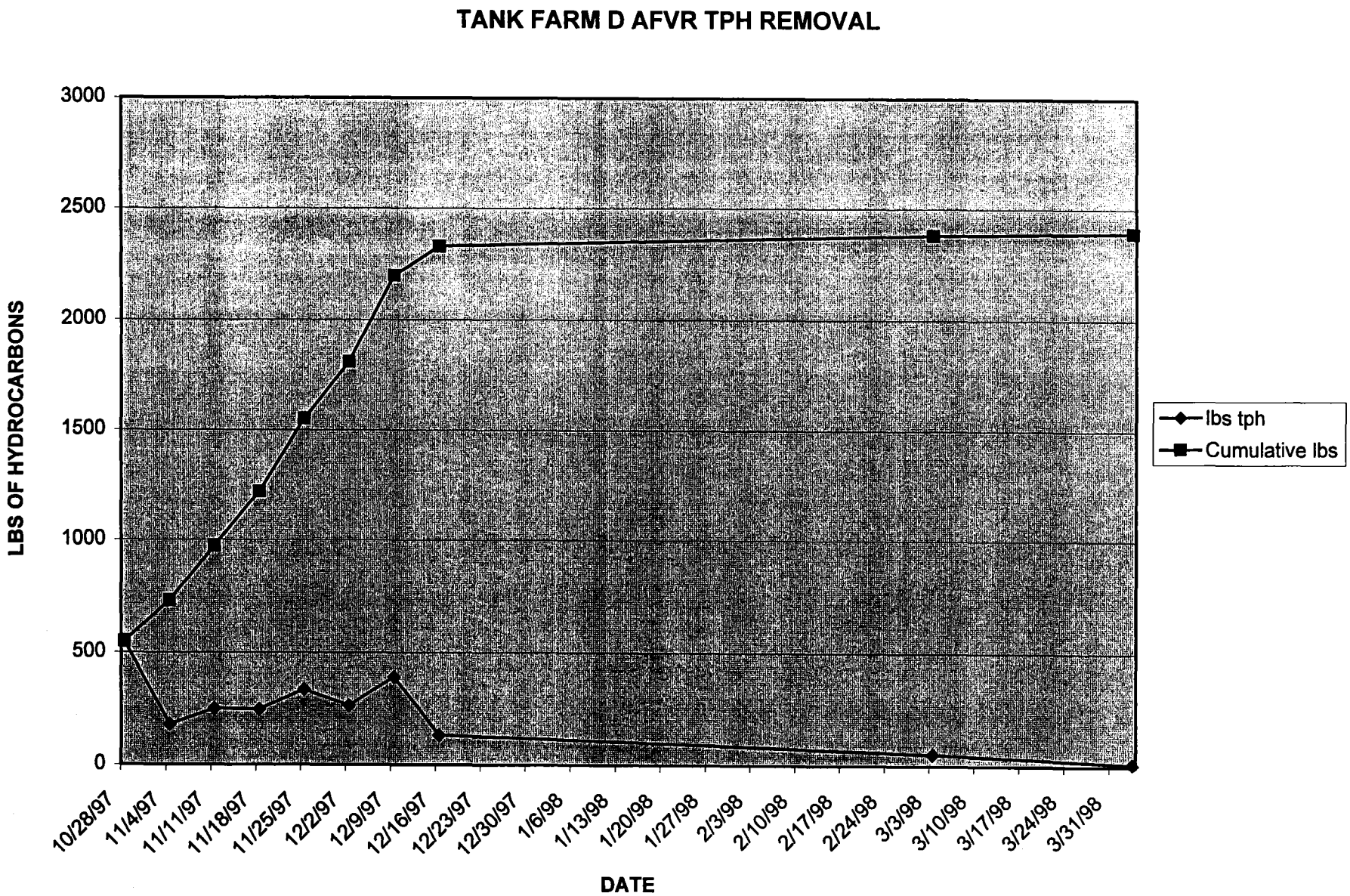
C:\OHM2\19559\


BLDG 1640 AFVR TPH REMOVAL
LBS OF HYDROCARBONS
1400
1200
1000
800
600
400
200
0
9/5/97
9/19/97
10/3/97
10/17/97
10/31/97
11/14/97
11/28/97
12/12/97
12/26/97
1/9/98
1/23/98
2/6/98
2/20/98
3/6/98
3/20/98
4/3/98
DATE
lbs tph
Cumulative total

UST 1640	lbs tph	Cumulative total	
9/5/97	153.2	153.2	66.58
9/18/97	133.8	287	
9/25/97	17.7	304.7	
10/2/97	12	316.7	
10/9/97	55	371.7	
10/16/97	19	390.7	
10/24/97	19	409.7	
10/29/97	14.7	424.4	
11/4/97	8.3	432.7	
11/12/97	27.8	460.5	
11/19/97	60.6	521.1	
11/26/97	30.4	551.5	
12/3/97	68.6	620.1	
12/10/97	58.1	678.2	
12/17/97	131.5	809.7	
1/9/98	143.18	952.88	
2/26/98	4.81	957.69	
3/21/98	26.75	984.44	
4/4/98	13.37	997.81	
10/10/98	333.79	1331.6	


Bldg 296 AFVR Hydrocarbons Removed
pounds
800
700
600
500
400
300
200
100
0
10/10/97
10/24/97
11/7/97
11/21/97
12/5/97
12/19/97
1/2/98
1/16/98
1/30/98
2/13/98
2/27/98
3/13/98
3/27/98
4/10/98
4/24/98
5/8/98
5/22/98
6/5/98
6/19/98
Date
lb of tph
Cumulative Summary

UST 296	lb of tph	Cumulative Summary	67.82545
10/10/97	179.8	179.8	
10/17/97	55.1	234.9	
10/25/97	34.8	269.7	
10/31/97	41.1	310.8	
11/21/97	189.2	500	
12/5/97	41.4	541.4	
12/19/97	114.4	655.8	
3/5/98	9.52	665.32	
3/22/98	13.91	679.23	
4/6/98	10.4	689.63	
7/1/98	56.45	746.08	


TANK FARM D AFVR TPH REMOVAL
LBS OF HYDROCARBONS
3000
2500
2000
1500
1000
500
0
10/28/97
11/4/97
11/11/97
11/18/97
11/25/97
12/2/97
12/9/97
12/16/97
12/23/97
12/30/97
1/6/98
1/13/98
1/20/98
1/27/98
2/3/98
2/10/98
2/17/98
2/24/98
3/3/98
3/10/98
3/17/98
3/24/98
3/31/98
DATE
lbs tph
Cumulative lbs

Date	lbs tph	Cumulative lbs	
10/28/97	548.8	548.8	239.353
11/4/97	177.7	726.5	
11/11/97	245.5	972	
11/18/97	244.3	1216.3	
11/25/97	333.8	1550.1	
12/2/97	261	1811.1	
12/9/97	389.9	2201	
12/16/97	130.6	2331.6	
3/3/98	51.22	2382.82	
4/3/98	10.71	2393.53	

Aggressive Fluid Vapor Recovery Report

MCAS Cherry Point North Carolina

Site Name: MCAS Cherry Point **Incident #:**
Site Location: Atlantic 7012 ***Site Priority Rank:***
Work Plan Ref:

Report Date:
Event #:
Event Date: 3/4/98

Free Prod Type Fuel Oil #2

Wells Gauged:	25GW13	25GW01	25GW02	25GW03	25GW04	25GW08	25GW10				
Free Prod. Thickness:	0.21										
AFVR Wells Selected:	X										
Observ. Wells Selected:			X	X	X	X	X				

Event Duration: 2 hours
Stack TPH Recovery (lbs): 3.00
Stack TPH Recovery (gals): 0.423
Total Est. Fluids Rec.: 1700 gal in vac truck

Conclusions and Recommendations: A total of 3 pounds of hydrocarbons were removed during this AFVR event.

Prepared By: T. Sword

Reviewed By:
OHM Remediation Services

Attachments: Tables 1, 2, calculations

Aggressive Fluid Vapor Recovery (AFVR)
Monitoring Well Data
TABLE 1

Facility: MCAS Cherry Point, North Carolina

Atlantic 7012

Baseline Data - AFVR and Observation Wells **Date** 3/4/98

WELL IDENTIFICATION	25GW13	25GW01	25GW02	25GW03	25GW04	25GW08	25GW10			
AFVR WELL (YES/NO)	YES	NO	NO	NO	NO	NO	NO			
WELL DEPTH (FT BLS)	29.4	14.7	14.4	14.6	14.1	14.2	14.6			
DIAMETER (INCH)	6	2	2	2	2	2	2			
DEPTH TO PRODUCT (FT)	5.75	SHEEN	N	N	N	N	N			
DEPTH TO WATER (FT)	5.96	4.81	5.60	4.64	5.17	5.70	4.84			
PRODUCT THICKNESS (FT)	0.21	0.00								
SCREEN INTERV. (FT BLS)										

Water level Measurements - Observation Wells (from TOC) N = None MeasuredObserved

		25GW02	25GW03	25GW04	25GW08	25GW10	25GW13	25GW01			
Date	Elapsed Time	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20
INITIAL/BASE	0:00	5.60	4.64	5.17	5.7	4.8	6.0	4.8			
9:45	0:15	6.22	5.93	5.84	5.14	5.26					
10:00	0:30	6.41	5.01	5.98	5.18	5.36					
10:15	0:45	6.46	5.02	6.01	5.24	5.44					
10:30	1:00	6.49	5.07	6.01	5.30	5.55					
10:45	1:15	6.48	5.08	6.00	5.31	5.50					
11:00	1:30	6.47	5.08	5.99	5.25	5.51					
11:15	1:45	6.46	5.10	5.97	5.25	5.52					
11:30	2:00	6.46	5.11	5.96	5.24	5.54					
11:45	2:30	6.35	4.98	5.65	5.23	5.38					
	3:00										
	3:30										
	4:00										
	4:30										
	5:00										

Aggressive Fluid Vapor Recovery (AFVR)
Discharge Stack Data
TABLE 2

Facility: Atlantic 7012
MCAS Cherry Point, North Carolina

AFVR Stack Measurements **Date** 3/4/98 **Initials** RM

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes/no	yes
Start Time	930

Date	Elapsed Time	LEL (%)	FID (ppm)	Velocity (ft/sec) (m/sec)	Temp (°F)	Air Flow (DCFM) <calc>	TPH Removal (PMRg) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
	0:00	0%	877.0	1.2	39	13.8	2.05	0.5	
	0:15	5%	998.0	1.2	47	13.8	2.33	1.1	
	0:30	5%	801.0	1.2	52	13.8	1.87	1.6	
	0:45	5%	867.0	1.2	57	13.8	2.03	2.1	
	1:00	0%	467.0	1.4	62	16.2	1.27	2.4	
	1:15	0%	394.0	1.3	62	15.0	1.00	2.6	
	1:30	0%	235.0	1.3	65	15.0	0.60	2.8	
	1:45	0%	176.0	1.3	65	15.0	0.45	2.9	
	2:00	0%	158.0	1.3	65	15.0	0.40	3.0	
	2:30								
	3:00								
	3:30								
	4:00								
	4:30								
	5:00								
	5:30								1700
	6:00								

Facility: MCAS Cherry Point, North Carolina

Date: 3/4/98

Aggressive Fluid Vapor Recovery (AFVR)
Summary of Free Product Recovery Events
TABLE 3

Hydrocarbon = diesel

Event #	Date	Rec Prod (lbs)	Rec Prod (gals)	Total Cum (lbs) to date	Level (ft TOC)	AFVR WELLS					MONITORING WELLS				
INITIAL		3.0	0.4	3.0	Product level										
					Water level										
2				3.0	Product level										
					Water level										
3				3.0	Product level										
					Water level										
4				3.0	Product level										
					Water level										
5				3.0	Product level										
					Water level										
6				3.0	Product level										
					Water level										
7				3.0	Product level										
					Water level										

Notes: N= No product measured/observed
Diesel sp gr = .85 or 7.09 lbs/gal
gas sp gr = .75 or 6.25 lbs/gal

Discharge Stack Hydrocarbon Removal Calculations

Initials _____

Site = Atlantic 7012

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/Interv	Cumulative lbs removed
0	877	13.467	6.2430E-08	46.34	60.00	2.05	0.51	0.51
15	998	13.467	6.2430E-08	46.34	60.00	2.33	0.58	1.10
30	801	13.467	6.2430E-08	46.34	60.00	1.87	0.47	1.56
45	867	13.467	6.2430E-08	46.34	60.00	2.03	0.51	2.07
60	467	13.467	6.2430E-08	54.06	60.00	1.27	0.32	2.39
75	394	13.467	6.2430E-08	50.20	60.00	1.00	0.25	2.64
90	235	13.467	6.2430E-08	50.20	60.00	0.60	0.15	2.79
105	176	13.467	6.2430E-08	50.20	60.00	0.45	0.11	2.90
120	158	13.467	6.2430E-08	50.20	60.00	0.40	0.10	3.00
150	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	3.00
180	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	3.00
210	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	3.00
240	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	3.00

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
1.20	3.937	0.980	0.196	1.021	60	46.34
1.20	3.937	0.980	0.196	1.021	60	46.34
1.20	3.937	0.980	0.196	1.021	60	46.34
1.20	3.937	0.980	0.196	1.021	60	46.34
1.40	4.593	0.980	0.196	1.021	60	54.06
1.30	4.265	0.980	0.196	1.021	60	50.20
1.30	4.265	0.980	0.196	1.021	60	50.20
1.30	4.265	0.980	0.196	1.021	60	50.20
1.30	4.265	0.980	0.196	1.021	60	50.20
0.00	0.000	0.980	0.196	1.021	60	0.00
0.00	0.000	0.980	0.196	1.021	60	0.00
0.00	0.000	0.980	0.196	1.021	60	0.00
0.00	0.000	0.980	0.196	1.021	60	0.00

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type = diesel fuel
K = 1 methane gas
Mg = MW = 202 g/mole
diesel Kg = 15 dsm3/1.0e6 conv factor
Mg/Kg = Cgm= 13.4667

Conversion factor ft/sec 3.2808
Bws = water vapor% (perry's)
68 = 0.003
83= 0.025
87= 0.028
108= 0.058

Temp oR 517
Temp = 57
528/Stack 1.021

Aggressive Fluid Vapor R[illegible]very (AFVR) Data Sheet

Facility Cherry Pt. NC
Location Atlantic

Baseline Data - AFVR and Observation Wells

Date 3/4/98 Initials Rm Project # 19559

WELL IDENTIFICATION	25GW13	25GW01		25GW02	25GW03	25GW04	25GW08	25GW10		
WELL DIAMETER	6"	2"		2"	2"	2"	2"	2"		
WELL DEPTH (FT BTOC)	29.40	14.70		14.40	14.60	14.10	14.20	14.60		
IS VR WELL (YES/NO)	Yes	NO		NO	NO	NO	NO	NO		
DEPTH TO PRODUCT (FT)	5.75	Sheen		Ø	Ø	Ø	Ø	Ø		
DEPTH TO WATER (FT)	5.96	4.81		5.6	4.64	5.17	5.7	4.84		
PRODUCT THICKNESS (FT)	.21	Ø		Ø	Ø	Ø	Ø	Ø		
SCREEN INTERV (FT BLS)										

Water level and Vacuum Measurements - Observation Wells

N = Not observed/present

Actual Time	Elapsed Time	25GW02 Water Depth	25GW02 Vac " H_2O	25GW03 Water Depth	25GW03 Vac " H_2O	25GW04 Water Depth	25GW04 Vac " H_2O	25GW08 Water Depth	25GW08 Vac " H_2O	25GW10 Water Depth	25GW10 Vac " H_2O	25GW13 Water Depth	25GW13 Vac " H_2O	25GW01 Water Depth	25GW01 Vac " H_2O	Water Depth	Vac " H_2O	Water Depth	Vac " H_2O	Water Depth	Vac " H_2O
Initial/base	0 00	5.6		4.64		5.17		5.7		4.84		5.96		4.81							
9:45	0 15	6.22		5.93		5.84		5.14		5.26											
10:00	0 30	6.41		5.01		5.98		5.18		5.36											
10:15	0 45	6.46		5.02		6.01		5.24		5.44											
10:30	1 00	6.49		5.07		6.01		5.30		5.55											
10:45	1:15	6.48		5.08		6.00		5.31		5.50											
11:00	1 30	6.47		5.08		5.99		5.25		5.51											
11:15	1 45	6.46		5.05		5.97		5.25		5.52											
11:30	2 00	6.46		5.11		5.96		5.24		5.54											
11:45 ~~12:00~~	2 30	6.35		4.98		5.65		5.23		5.38	7.15	7.15		5.79							
	3 00																				
	3:30																				
	4 00																				
	4 30																				
	5 00																				

Additional Comments/Observations

Note. Water level measurements are depths from top of casing

MAR 31 '99 04:24PM OHM CHERRY POINT P.2

Aggressive Fluid Vapor R overy (AFVR) Data Sheet

Facility Cherry Pt NC
Location Atlantic

AFVR Stack Measurements

Date 3/4/98 Initials Rmw Project # 19557

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes / no	Yes

Start Time 0930

Actual Time	Elapsed Time	LEL (ppm or %)	FID (ppm)	Velocity (m/sec) (ft/sec)	Temp (°F)	Air Flow (DCFM) <calc>	Mass Conc. C_{gm} <calc>	Mass Conc STP C_g <calc>	TPH Removal (PMR_g) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim gals)
						Calculated From Field Data					
930	0 00	0	877	1.2	39						
9:45	0 15	5	998	1.2	47						
10:00	0.30	5	801	1.2	52						
10:15	0 45	5	867	1.2	57						
10:30	1:00	0	467	1.4	62						
10:45	1.15	0	394	1.3	62						
11:00	1:30	0	235	1.3	65						
11:15	1:45	0	176	1.3	65						
11:30	2 00	0	158	1.3	65						
12:00	2 30										
	3 00										
	3 30										
	4 00										
	4 30										
	5:00										

Q_{std} = Flow in Std dry SCFM
PMR_g = Pollutant Mass Removal lbs/hr

Q_{std} = (60 sec/min)(1-B_{ws})(V)(A)(528°R/T_s)
PMR_g = Cg (Q_{std})(60 min/hr)

System Vacuum Measurements (Vac Truck and AFVR Wells)

Actual Time	Elapsed Time	Vac Truck ("Hg)	Vac Truck (RPM)	Well ("Hg)	Entrai Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth
0930	Start	12	400																		
1030	1 hr.	14	400																		
1130	2hr.	14	405																		

Note Record Entrainment depth of hose in feet below Top of well casing
Note Record Vacuum from AFVR extraction wells in inches mercury

MAR 31 '99 04:24PM OHM CHERRY POINT p.3

R.W. McDonnell Sr.
100303

~~Dt~~ 3/4/98 Atlantic Project 19559

Weather: Clear & Sunny

09:30 25GW13 on line 1 foot below product level
10:30 25GW01 on line 1 foot below sheen. 500 Gallons in VAC TRUCK
11:00 1000 Gallons in VAC TRUCK
11:30 1500 Gallons in VAC TRUCK
11:45 System shutdown 1700 Gallons in VAC TRUCK.
All wells locked

R.W. McDonnell Sr.
100303

Aggressive Fluid Vapor Recovery Report

MCAS Cherry Point, North Carolina

Site Name: MCAS Cherry Point **Incident #:**
Site Location: Atlantic 7012 ***Site Priority Rank:***
Work Plan Ref:

Report Date:
Event #:
Event Date: 4/5/98

Free Prod Type Fuel Oil #2

Wells Gauged:	25GW13	25GW01	25GW02	25GW03	25GW04	25GW08	25GW10				
Free Prod. Thickness:	0.08	<0.01									
AFVR Wells Selected:	x	x									
Observ. Wells Selected:			x	x	x	x	x				

Event Duration: 4 hours
Stack TPH Recovery (lbs): 4.06
Stack TPH Recovery (gals): 0.575
Total Est. Fluids Rec.: 1600 gal in vac truck

Conclusions and Recommendations: A total of 4.1 pounds of hydrocarbons were removed during this AFVR event.

Prepared By: T. Sword

Reviewed By:
OHM Remediation Services

Attachments: Tables 1, 2, 3 calculations

Aggressive Fluid Vapor Recovery (AFVR)
Monitoring Well Data
TABLE 1

Facility: MCAS Cherry Point, North Carolina

Atlantic 7012

Baseline Data - AFVR and Observation Wells **Date** 4/5/98

WELL IDENTIFICATION	25GW13	25GW01	25GW02	25GW03	25GW04	25GW08	25GW10			
AFVR WELL (YES/NO)	YES	YES	NO	NO	NO	NO	NO			
WELL DEPTH (FT BLS)	29.4	14.7	14.4	14.6	14.1	14.2	14.6			
DIAMETER (INCH)	6	2	2	2	2	2	2			
DEPTH TO PRODUCT (FT)	5.99	SHEEN	N	N	N	N	N			
DEPTH TO WATER (FT)	6.07	4.81	5.94	5.79	5.50	5.50	5.36			
PRODUCT THICKNESS (FT)	0.08	<0.01								
SCREEN INTERV. (FT BLS)										

Water level Measurements - Observation Wells (from TOC) N = None MeasuredObserved

Date	Elapsed Time	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20
INITIAL/BASE	0:00	6.07	5.47	5.94	5.8	5.5	5.5	5.4			
9:00	0:15			6.23	6.13	5.80	5.52	5.52			
9:15	0:30			6.37	6.30	5.91	5.53	5.65			
9:30	0:45			6.41	6.32	5.93	5.54	5.72			
9:45	1:00			6.43	6.35	5.94	5.55	5.75			
10:00	1:15			6.45	6.37	5.95	5.56	5.78			
10:15	1:30			6.46	6.38	5.95	5.57	5.78			
10:30	1:45			6.47	6.43	5.95	5.58	5.79			
10:45	2:00			6.48	6.43	5.95	5.58	5.79			
11:15	2:30			6.50	6.42	5.97	5.59	5.80			
11:45	3:00			6.53	6.43	5.99	5.60	5.83			
12:15	3:30			6.54	6.44	5.99	5.61	5.83			
12:45	4:00	6.34	11.20	6.54	6.44	6.00	5.62	5.84			
	4:30										
	5:00										

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt
Location Atlantic

Baseline Data - AFVR and Observation Wells

Date 4/5/98 Initials Ron Project # 19359

Well Designation	25GW13	25GW01		25GW02	25GW03	25GW04	25GW08	25GW10		
Well Diameter	6"	2"		2"	2"	2"	2"	2"		
Well Depth (ft bgs)	29.40	14.70		14.40	14.60	14.10	14.20	14.60		
Is Well Screened	Yes	Yes		No	No	No	No	No		
Depth to Product (ft)	5.79	Sheen		N	N	N	N	N		
Depth to Water (ft)	6.07	5.47		5.94	5.79	5.50	5.50	5.36		
Product Thickness (ft)	.08	<.01								
Sorbent Used (yes/no)										

Water level and Vacuum Measurements - Observation Wells

N = Not observed/present

Actual Time	Elapsed Time	25GW13 Water Depth	25GW13 Vac "H_2O	25GW01 Water Depth	25GW01 Vac "H_2O	Water Depth	Vac "H_2O	25GW02 Water Depth	25GW02 Vac "H_2O	25GW03 Water Depth	25GW03 Vac "H_2O	25GW04 Water Depth	25GW04 Vac "H_2O	25GW08 Water Depth	25GW08 Vac "H_2O	25GW10 Water Depth	25GW10 Vac "H_2O	Water Depth	Vac "H_2O	Water Depth	Vac "H_2O
Initial/Base	0 00	6.07		5.47				5.94		5.79		5.50		5.50		5.36					
0900	0 15							6.23		6.13		5.80		5.52		5.52					
0915	0 30							6.37		6.30		5.91		5.53		5.65					
0930	0 45							6.41		6.32		5.93		5.54		5.72					
0945	1 00					300 Gal		6.43		6.35		5.94		5.55		5.75					
1000	1 15							6.45		6.37		5.95		5.56		5.78					
1015	1 30							6.46		6.38		5.95		5.57		5.78					
1030	1 45							6.47		6.43		5.95		5.58		5.79					
1045	2 00					600 Gal		6.48		6.43		5.95		5.58		5.79					
1115	2 30							6.50		6.42		5.97		5.59		5.80					
1145	3 00							6.53		6.43		5.99		5.60		5.83					
1215	3 30							6.54		6.44		5.99		5.61		5.83					
1245	4 00	6.34		11.20		1600 Gal		6.54		6.44		6.00		5.62		5.84					
	4 30																				
	5 00																				

Additional Comments/Observations

Note Water level measurements are depths from top of casing

MAR 31 '99 04:24PM OHM CHERRY POINT P.4

Aggressive Fluid Vapor Recovery (AFVR)
Discharge Stack Data
TABLE 2

Facility: Atlantic 7012
MCAS Cherry Point, North Carolina

AFVR Stack Measurements **Date** [redacted] **Initials** RM

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes/no	yes
Start Time	845

Date	Elapsed Time	LEL (%)	FID (ppm)	Velocity (ft/sec) (m/sec)	Temp (°F)	Air Flow (DCFM) <calc>	TPH Removal (PMRg) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
	0:00	1%	270.0	2.0	41	77.2	1.05	0.3	
	0:15	3%	534.0	1.6	43	61.8	1.66	0.7	
	0:30	3%	485.0	1.6	47	61.8	1.51	1.1	
	0:45	2%	430.0	1.5	50	57.9	1.26	1.4	
	1:00	1%	397.0	1.5	52	57.9	1.16	1.7	
	1:15	1%	349.0	1.8	52	69.5	1.22	2.0	
	1:30	1%	340.0	1.6	55	61.8	1.06	2.2	
	1:45	1%	319.0	1.6	58	61.8	0.99	2.5	
	2:00	1%	297.0	1.6	58	61.8	0.93	2.7	
	2:30	1%	311.0	1.6	60	61.8	0.97	3.2	
	3:00	0%	333.0	1.6	60	61.8	1.04	3.7	
	3:30	0%	326.0	1.6	60	61.8	1.02	3.7	
	4:00	0%	274.0	1.3	60	50.2	0.69	4.1	
	4:30								
	5:00								
	5:30								1600
	6:00								

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt.
Location Atlantic

AFVR Stack Measurements

Date 4/5/98 Initials RM Project # 19559

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes / no	yes

Start Time 0845

Actual Time	Elapsed Time	LEL (ppm or %)	FID (ppm)	Velocity (m/sec) (ft/sec) @ 30 range	Temp (°F)	Air Flow (DCFM) <calc>	Mass Conc. C_{gm} <calc>	Mass Conc STP C_g <calc>	TPH Removal (PMR_g) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
						Calculated From Field Data					
0845	0.00	1%	270	2.0	41°F						
0900	0.15	3%	534	1.6	43°F						
0915	0.30	3%	485	1.6	47°F						
0930	0:45	2%	430	1.5	50°F						
0945	1:00	1%	397	1.5	52°F						
1000	1:15	1%	349	1.8	52°F						
1015	1:30	1%	340	1.6	55°F						
1030	1:45	1%	319	1.6	58°F						
1045	2 00	1%	297	1.6	58°F						
1115	2:30	1%	311	1.6	60°F						
11:45	3:00	0	333	1.6	60°F						
12:15	3 30	0	326	1.6	60°F						
12:45	4 00	0	274	1.3	60°F						
	4.30										
	5.00										

Q_{std} = Flow in Std dry SCFM Q_{std} = (60 sec/min)(1-B_{ws})(V)(A)(528°R/T_s)
PMR_g = Pollutant Mass Removal lbs/hr PMR_g = Cg (Q_{std})(60 min/hr)

System Vacuum Measurements (Vac Truck and AFVR Wells)

Actual Time	Elapsed Time	Vac Truck ("Hg)	(RPM)	Well ("Hg)	Entrai Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth
0845	Start	18	500																		
0945	1hr.	18	500																		
1045	2hr.	18	500																		
1145	3hr.	18	500																		
1245	4hr.	18	500																		

Note Record Entrainment depth of hose in feet below Top of well casing
Note Record Vacuum from AFVR collection wells in inches mercury

MAR 31 '99 04:25PM OHM CHERRY POINT P.5

Facility: MCAS Cherry Point, North Carolina

Date: 4/5/98

Aggressive Fluid Vapor Recovery (AFVR)
Summary of Free Product Recovery Events
TABLE 3

Hydrocarbon = Fuel Oil #2

						AFVR WELLS					MONITORING WELLS				
Event #	Date	Rec Prod (lbs)	Rec Prod. (gals)	Total Cum (lbs) to date	Level (ft TOC)	25GW13	25GW01				25GW02	25GW03	25GW04	25GW08	25GW10
INITIAL	3/4/98	0.9	0.1	0.9	Product level										
					Water level										
2	4/5/98	4.1	0.6	5.0	Product level	5.99	5.46								
					Water level	6.07	5.47				5.94	5.79	5.5	5.5	5.36
3				5.0	Product level										
					Water level										
4				5.0	Product level										
					Water level										
5				5.0	Product level										
					Water level										
6				5.0	Product level										
					Water level										
7				5.0	Product level										
					Water level										

Notes: N= No product measured/observed
Diesel sp gr = .85 or 7.09 lbs/gal
gas sp gr = .75 or 6.25 lbs/gal

ca

Discharge Stack Hydrocarbon Removal Calculations
Date 4/5/98

Initials _____

Site = Atlantic 7012

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/interv	Cumulative lbs removed
0	270	13.467	6.2430E-08	77.23	60.00	1.05	0.26	0.26
15	534	13.467	6.2430E-08	61.78	60.00	1.66	0.42	0.68
30	485	13.467	6.2430E-08	61.78	60.00	1.51	0.38	1.06
45	430	13.467	6.2430E-08	57.92	60.00	1.26	0.31	1.37
60	397	13.467	6.2430E-08	57.92	60.00	1.16	0.29	1.66
75	349	13.467	6.2430E-08	69.51	60.00	1.22	0.31	1.97
90	340	13.467	6.2430E-08	61.78	60.00	1.06	0.26	2.23
105	319	13.467	6.2430E-08	61.78	60.00	0.99	0.25	2.48
120	297	13.467	6.2430E-08	61.78	60.00	0.93	0.23	2.71
150	311	13.467	6.2430E-08	61.78	60.00	0.97	0.48	3.20
180	333	13.467	6.2430E-08	61.78	60.00	1.04	0.52	3.72
210	326	13.467	6.2430E-08	61.78	60.00	1.02	0.51	3.70
240	274	13.467	6.2430E-08	50.20	60.00	0.69	0.35	4.06

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
2.00	6.562	0.980	0.196	1.021	60	77.23
1.60	5.249	0.980	0.196	1.021	60	61.78
1.60	5.249	0.980	0.196	1.021	60	61.78
1.50	4.921	0.980	0.196	1.021	60	57.92
1.50	4.921	0.980	0.196	1.021	60	57.92
1.80	5.905	0.980	0.196	1.021	60	69.51
1.60	5.249	0.980	0.196	1.021	60	61.78
1.60	5.249	0.980	0.196	1.021	60	61.78
1.60	5.249	0.980	0.196	1.021	60	61.78
1.60	5.249	0.980	0.196	1.021	60	61.78
1.60	5.249	0.980	0.196	1.021	60	61.78
1.60	5.249	0.980	0.196	1.021	60	61.78
1.60	5.249	0.980	0.196	1.021	60	61.78
1.30	4.265	0.980	0.196	1.021	60	50.20

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type = diesel fuel
K = 1 methane gas
Mg = MW = 202 g/mole
diesel Kg = 15 dsm3/1.0e6 conv factor
Mg/Kg = Cgm= 13.4667

Conversion factor ft/sec 3.2808
Bws = water vapor% (perry's)
68 = 0.003
83= 0.025
87= 0.028
108= 0.058

Temp oR 517
Temp = 57
528/Stack 1.021

Field Notes Atlantic 19364 4/5/98

0845 Start up. 25GW13 & 25GW01 on line one foot below product level.

0945 300 gallons. Dropped hoses one additional foot below product.

* Note Used 1" hose on 25GW13 instead of 1½" hose as used previously. Event already underway when noticed.

1045 600 gallons

1145 1100 gallons. Jammed both wells.

1245 1600 gallons. Shutdown event w/ 46 hrs.

R.W. McDonald Sr
100303

TUE 31 '99 04:39PM OHM CHERRY POINT

Aggressive Fluid Vapor Recovery Report

MCAS Cherry Point, North Carolina

Site Name: MCAS Cherry Point **Incident #:**
Site Location: Atlantic 7012 ***Site Priority Rank:***
Work Plan Ref:

Report Date:
Event #:
Event Date: 7/17/98

Free Prod Type Fuel Oil #2

Wells Gauged:	25GW13	25GW01	25GW02	25GW03	25GW04	25GW08	25GW10				
Free Prod. Thickness:	0.09	<0.01			1.41						
AFVR Wells Selected:	x	x			x						
Observ. Wells Selected:			x	x		x	x				

Event Duration: 3 hours
Stack TPH Recovery (lbs): 4.72
Stack TPH Recovery (gals): 0.668
Total Est. Fluids Rec.: 1100 gal in vac truck

Conclusions and Recommendations: A total of 4.7 pounds of hydrocarbons were removed during this AFVR event.

Prepared By: T. Sword

Reviewed By:
OHM Remediation Services

Attachments: Tables 1, 2, 3 calculations

Facility: MCAS Cherry Point, North Carolina

Atlantic 7012

Aggressive Fluid Vapor Recovery (AFVR)
Monitoring Well Data
TABLE 1

Baseline Data - AFVR and Observation Wells **Date** 7/17/98

WELL IDENTIFICATION	25GW08	25GW10	25GW01	25GW13	24GW02	25GW03	25GW04			
AFVR WELL (YES/NO)	NO	NO	YES	YES	NO	NO	YES			
WELL DEPTH (FT BLS)	14.2	14.6	14.7	29.4	14.4	14.6	14.1			
DIAMETER (INCH)	2	2	2	6	2	2	2			
DEPTH TO PRODUCT (FT)	NO	NO	SHEEN	6.33	NO	NO	6.18			
DEPTH TO WATER (FT)	6.63	5.92	6.64	6.42	6.31	6.21	7.59			
PRODUCT THICKNESS (FT)			<0.01	0.09			1.41			
SCREEN INTERV. (FT BLS)										

Water level Measurements - Observation Wells (from TOC) N = None MeasuredObserved

Date	Elapsed Time	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20
INITIAL/BASE	0:00	6.63	5.92	6.64	6.4	6.3	6.2	7.6			
7:30	0:15	6.06	6.07			6.48	6.28				
7:45	0:30	6.72	6.18			6.61	6.45				
8:00	0:45	6.76	6.17			6.59	6.50				
8:15	1:00	6.82	6.29			6.80	6.69				
8:30	1:15	6.85	6.38			6.83	6.76				
8:45	1:30	6.84	6.37			6.81	6.77				
9:00	1:45	6.87	6.37			6.82	6.76				
9:15	2:00	6.87	6.33			6.83	6.77				
9:45	2:30	6.91	6.43			6.96	6.91				
10:15	3:00	6.97	6.42	13.23	8.50	7.00	7.00	9.15			
10:45	3:30										
	4:00										
	4:30										
	5:00										

Aggressive Fluid Vapor Recovery (AFVR)
Discharge Stack Data
TABLE 2

Facility: Atlantic 7012
MCAS Cherry Point, North Carolina

AFVR Stack Measurements **Date** 7/17/98 **Initials** RM

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes/no	yes
Start Time	715

Date	Elapsed Time	LEL (%)	FID (ppm)	Velocity (ft/sec) (m/sec)	Temp (°F)	Air Flow (DCFM) <calo>	TPH Removal (PMRg) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
	0:00	7%	490.0	2.2	68	81.0	2.00	0.5	
	0:15	0%	452.0	2.2	69	81.0	1.85	1.0	
	0:30	0%	390.0	2.2	70	81.0	1.59	1.4	
	0:45	0%	332.0	2.2	72	81.0	1.36	1.7	
	1:00	0%	465.0	2.1	75	77.4	1.81	2.2	
	1:15	0%	451.0	1.9	81	70.0	1.59	2.6	
	1:30	0%	357.0	2.0	82	73.7	1.33	2.9	
	1:45	0%	331.0	2.0	82	73.7	1.23	3.2	
	2:00	0%	324.0	2.0	82	73.7	1.20	3.5	
	2:30	0%	345.0	2.0	82	73.7	1.28	4.1	
	3:00	0%	332.0	1.9	82	70.0	1.17	4.7	
	3:30								
	4:00								
	4:30								
	5:00								
	5:30								1100
	6:00								

Aggressive Fluid Vapor Recovery (AFVR)
Summary of Free Product Recovery Events
TABLE 3

Facility: MCAS Cherry Point, North Carolina

Date: 4/5/98

1998 events

Hydrocarbon = Fuel Oil #2

						AFVR WELLS					MONITORING WELLS				
Event #	Date	Rec Prod (lbs)	Rec Prod. (gals)	Total Cum (lbs) to date	Level (ft TOC)	25GW08	25GW10				25GW01	25GW13	24GW02	25GW03	25GW04
INITIAL	3/4/98	0.9	0.1	0.9	Product level										
					Water level										
2	4/5/98	4.7	0.7	5.6	Product level	5.99	5.46								
					Water level	6.07	5.47				5.94	5.79	5.5	5.5	5.36
3	7/17/98	1.4	0.2	7.0	Product level							6.33			6.18
					Water level	6.63	5.92				6.64	6.42	6.31	6.21	7.59
4				7.0	Product level										
					Water level										
5				7.0	Product level										
					Water level										
6				7.0	Product level										
					Water level										
7				7.0	Product level										
					Water level										

Notes: N= No product measured/observed
Diesel sp gr = .85 or 7.09 lbs/gal
gas sp gr = .75 or 6.25 lbs/gal

Discharge Stack Hydrocarbon Removal Calculations
Date 7/17/98

Initials _____

Site = Atlantic 7012

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/interv	Cumulative lbs removed
0	490	13.467	6.2430E-08	81.03	60.00	2.00	0.50	0.50
15	452	13.467	6.2430E-08	81.03	60.00	1.85	0.46	0.96
30	390	13.467	6.2430E-08	81.03	60.00	1.59	0.40	1.36
45	332	13.467	6.2430E-08	81.03	60.00	1.36	0.34	1.70
60	465	13.467	6.2430E-08	77.35	60.00	1.81	0.45	2.15
75	451	13.467	6.2430E-08	69.98	60.00	1.59	0.40	2.55
90	357	13.467	6.2430E-08	73.67	60.00	1.33	0.33	2.88
105	331	13.467	6.2430E-08	73.67	60.00	1.23	0.31	3.19
120	324	13.467	6.2430E-08	73.67	60.00	1.20	0.30	3.49
150	345	13.467	6.2430E-08	73.67	60.00	1.28	0.64	4.13
180	332	13.467	6.2430E-08	69.98	60.00	1.17	0.59	4.72
210	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	4.13
240	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	4.72

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
2.20	7.218	0.980	0.196	0.974	60	81.03
2.20	7.218	0.980	0.196	0.974	60	81.03
2.20	7.218	0.980	0.196	0.974	60	81.03
2.20	7.218	0.980	0.196	0.974	60	81.03
2.10	6.890	0.980	0.196	0.974	60	77.35
1.90	6.234	0.980	0.196	0.974	60	69.98
2.00	6.562	0.980	0.196	0.974	60	73.67
2.00	6.562	0.980	0.196	0.974	60	73.67
2.00	6.562	0.980	0.196	0.974	60	73.67
2.00	6.562	0.980	0.196	0.974	60	73.67
1.90	6.234	0.980	0.196	0.974	60	69.98
0.00	0.000	0.980	0.196	0.974	60	0.00
0.00	0.000	0.980	0.196	0.974	60	0.00

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type = diesel fuel
K = 1 methane gas
Mg = MW = 202 g/mole
diesel Kg = 15 dsm3/1.0e6 conv factor
Mg/Kg = Cgm= 13.4667

Conversion factor ft/sec 3.2808
Bws = water vapor% (perry's)
68 = 0.003
83= 0.025
87= 0.028
108= 0.058

Temp oR 542
Temp = 82
528/Stack 0.974

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt.
Location Atlantic

Baseline Data - AFVR and Observation Wells

Date 7/17/98 Initials RW Project # 19559

WELL IDENTIFICATION	256GW08	256GW10	256GW01	256GW13	256GW02	256GW03	256GW04			
WELL DIAMETER	2"	2"	2"	6"	2"	2"	2"			
WELL DEPTH (FT)	14.20	14.60	14.70	29.40	14.40	14.60	14.10			
SHEEN (YES/NO)	No	No	Yes	Yes	No	No	Yes			
DEPTH TO PRODUCT (FT)	N	N	Sheen	6.33	N	N	6.18			
DEPTH TO WATER (FT)	6.63	5.92	6.64	6.42	6.31	6.21	7.59			
PRODUCT THICKNESS (FT)	0	0	<.01	.09	0	0	1.41			
SOIL TEMPERATURE (DEG F)										

Water level and Vacuum Measurements - Observation Wells

N = Not observed/present

Actual Time	Elapsed time	256GW08 Water Depth	256GW08 Vac "H2O	256GW10 Water Depth	256GW10 Vac "H2O	256GW01 Water Depth	256GW01 Vac "H2O	256GW13 Water Depth	256GW13 Vac "H2O	256GW02 Water Depth	256GW02 Vac "H2O	256GW03 Water Depth	256GW03 Vac "H2O	256GW04 Water Depth	256GW04 Vac "H2O	Water Depth	Vac "H2O	Water Depth	Vac "H2O	Water Depth	Vac "H2O
Initial/Base	0:00	6.63		5.92		6.64		6.42		6.31		6.21		7.59							
0730	0:15	6.66		6.02						6.48		6.28									
0745	0:30	6.72		6.18						6.61		6.45									
0800	0:45	6.76	250 gal.	6.17						6.59		6.50									
0815	1:00	6.82		6.29						6.80		6.69									
0830	1:15	6.85		6.38						6.83		6.76									
0845	1:30	6.84		6.37						6.81		6.77									
0900	1:45	6.87	500 gal.	6.37						6.82		6.76									
0915	2:00	6.87		6.33						6.83		6.77									
0945	2:30	6.91		6.43						6.96		6.91									
1015	3:00	6.97	1000 gal.	6.42		13.73		8.50		7.0		7.0		9.15							
1045	3:30																				
Rem	4:00																				
	4:30																				
	5:00														.01 FT TOP						

VAC TRUCK has 1100 GAL H2O

Additional Comments/Observations

Note: Water level measurements are depths from top of casing

MAR 31 '99 04:25PM OHM CHERRY POINT P.6

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility: Cherry Pt
Location: Atlantic

AFVR Stack Measurements

Date 7/17/98 Initials RM Project # 19559

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes / no	Yes

Start Time 0715

Actual Time	Elapsed Time	LEL (ppm or %)	FID (ppm)	Velocity (m/sec) (ft/sec) Range 30	Temp (°F)	Air Flow (DCFM) <calc>	Mass Conc. C_{gm} <calc>	Mass Conc STP C_g <calc>	TPH Removal (PMR_g) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim gals)
0715	0 00	7%	490	2.2	68°						
0730	0.15	0%	452	2.2	69°						
0745	0.30	0%	390	2.2	70°						
0800	0 45	0%	332	2.2	72°						
0815	1:00	0%	465	2.1	75°						
0830	1:15	0%	451	1.9	81°						
0845	1.30	0%	357	2.0	82°						
0900	1:45	0%	331	2.0	82°						
0915	2 00	0%	324	2.0	82°						
0930	2.30	0%	345	2.0	82°						
1000	3 00	0%	332	1.9	82°						
Run 1030	3 30										
	4 00										
	4:30										
	5 00										

Calculated From Field Data

Q_{std} = Flow in Std dry SCFM
PMR_g = Pollutant Mass Removal lbs/hr

Q_{std} = (60 sec/min)(1-B_{ws})(V)(A)(528°R/T_s)
PMR_g = Cg (Q_{std})(60 min/hr)

System Vacuum Measurements (Vac Truck and AFVR Wells)

Actual Time	Elapsed Time	Vac Truck ("Hg)	(RPM)	Well ("Hg)	Entrai Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth
0715	Start	20	500																		
0815	1 hr.	18	500																		
0915	2 hr.	18	500																		
1015	3 hr.	18	500																		

Note: Record Entrainment depth of hose in feet below Top of well casing
Note: Record Vacuum from AFVR extraction wells in inches mercury

MAR 31 '99 04:26PM OHM CHERRY POINT

Field Notes

7/17/98
0715

-- Atlantic

0715 Wells 25GW01/25GW04/25GW13 on line one foot below product level. (1" hose used @ wells)

0800 250 gallons in tank.

0815 Dropped hoses one additional foot below product level.

0900 500 gallons in tank.

0945 Jammed all three wells. 25GW13 was jammed to approx. 26 feet due to limited 1" hose length. 25GW01 + 25GW04 were jammed to well depth. Some sand/~~debris~~ Rag seen in hose. 750 gallons in tank.

1015 Stop. 1000 gallons in tank

VAC has 1100 gal H2O
.01 Fuel

R. W. McDonnell
100303

MAR 31 '99 04:38PM OHM CHERRY POINT P.35

Aggressive Fluid Vapor Recovery Report

MCAS Cherry Point, North Carolina

Site Name: MCAS Cherry Point, NC
Site Location: UST 1640
Work Plan Ref: August, 1997

Incident #:
Site Priority Rank: *70/E*

Report Date:
Event #: 13
Event Date: 1/9/98

Free Prod Type Diesel

Wells Gauged:	59GW01	59GW02	59GW03	OHM 1	OHM2	59GW06	59GW11	59GW17			
Free Prod. Thickness:	0.21	0.35	0.19	<0.01	2.5						
AFVR Wells Selected:	x	x	x	x	x						
Observ. Wells Selected:						x	x	x			

Event Duration: 1.75 hours
Stack TPH Recovery (lbs): 143.18
Stack TPH Recovery (gals): 20.19
Total Est. Fluids Rec.: 1100 +

Conclusions and Recommendations: A total of approximately 143 pounds or 20 gallons of hydrocarbons have been removed from the site during this event.

Prepared By:

Reviewed By:
OHM Remediation Services

Attachments: Tables 1, 2, 3, calculations

Aggressive Fluid Vapor Recovery (AFVR)
Monitoring Well Data
TABLE 1

Facility: UST 1640
MCAS Cherry Point, North Carolina

Baseline Data - AFVR and Observation Wells **Date** 1/9/98

WELL IDENTIFICATION	59GW06	59GW11	59GW17	59GW02	OHM1	OHM2	59GW03	59GW01		
AFVR WELL (YES/NO)	NO	NO	NO	YES	YES	YES	YES	YES		
WELL DEPTH (FT BLS)	15.2	14.65	39.35	18.35	10	20	18.85	15		
DIAMETER (INCH)	2	6	2	4	2	2	4	4		
DEPTH TO PRODUCT (FT)	N	N	N	8.49	SHEEN	7.74	8.27	7.99		
DEPTH TO WATER (FT)	8.48	7.21	7.28	8.84	7.83	10.24	8.46	8.20		
PRODUCT THICKNESS (FT)				0.35	<0.01	2.50	0.19	0.21		
SCREEN INTERV. (FT BLS)										

Water level Measurements - Observation Wells (from TOC) N = None MeasuredObserved

Date	Elapsed Time	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20
01/09/98	0:00	8.48	7.21	7.28	8.84	7.83	10.24	8.46	8.2		
	0:15	8.62	7.32	7.38							
	0:30	8.62	7.33	7.38							
	0:45	8.76	7.55	7.46							
	1:00	8.88	7.59	7.52							
	1:15	9.01	7.69	7.64							
	1:30	9.06	7.75	7.70							
	1:45	9.07	7.76	7.72	9.13	10.00	8.65	8.71	8.38		
	2:00										
	2:30										
	3:00										
	3:30										
	4:00										
	4:30										
	5:00										

Aggressive Fluid Vapor Recovery (AFVR)
Discharge Stack Data
TABLE 2

Facility: UST 1640
MCAS Cherry Point, North Carolina

AFVR Stack Measurements **Date** 1/9/98 **Initials** _____

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes/no	yes
Start Time	0945

Date	Elapsed Time	LEL (%)	FID (ppm)	Velocity (ft/sec)	(m/sec)	Temp (°F)	Air Flow (DCFM) <calc>	TPH Removal (PMRg) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
11/26/97	0:00	53%	10,216.0		6.0	56	231.2	119.17	29.8	
	0:15	17%	8,762.0		14.0	56	539.6	238.48	89.4	
	0:30	6%	2,351.0		14.0	58	539.6	63.99	105.4	
	0:45	6%	1,350.0		14.0	58	539.6	36.74	114.6	
	1:00	6%	1,115.0		14.0	58	539.6	30.35	122.2	
	1:15	6%	983.0		15.0	58	578.1	28.67	129.3	
	1:30	6%	1,078.0		15.0	60	578.1	31.44	137.2	
	1:45	6%	878.0		14.0	60	539.6	23.90	143.2	
	2:00									
	2:30									1100+
	3:00									
	3:30									
	4:00									
	4:30									
	5:00									
	5:30									
	6:00									

Aggressive Fluid Vapor Recovery (AFVR)
Summary of Free Product Recovery Events
TABLE 3

Facility: UST 1640

MCAS Cherry Point, North Carolina

Date: 1/9/98

Hydrocarbon = diesel

						AFVR WELLS					MONITORING WELLS				
Event #	Date	Rec Prod (lbs)	Rec Prod. (gals)	Total Cum (lbs) to date	Level (ft TOC)	59GW01	59GW02	59GW03	59PR25	59PR26	59GW06	59GW11	59GW17		
INITIAL	9/5/97	153.2	21.5	153.2	Product level	8.10	N	8.44	N	7.76	N	N	N		
					Water level	8.11	8.00	11.08	8.08	9.28	8.48	7.18	7.30		
2	9/18/97	133.8	18.8	287.0	Product level	7.95	8.33	7.95	N	7.45	N	N	N		
					Water level	8.12	8.38	8.23	7.70	10.35	8.60	7.01	7.11		
3	9/25/97	17.7	2.5	304.7	Product level	7.99	8.40	8.01	N	7.61	N	N	N		
					Water level	8.15	8.52	8.10	7.60	9.39	8.31	7.02	7.11		
4	10/2/97	12.0	1.7	316.7	Product level	7.90	8.51	7.89	N	7.45	N	N	N		
					Water level	8.02	8.65	8.20	7.44	9.80	8.20	6.43	7.05		
5	10/9/97	55.0	7.7	371.7	Product level	8.01	8.40	8.00	N	7.50	N	N	N		
					Water level	8.10	8.45	8.10	7.70	9.35	8.30	7.13	7.15		
6	10/16/97	19.0	2.8	390.7	Product level	7.91	8.49	8.13	N	7.80	N	N	N		
					Water level	8.02	8.60	8.19	7.83	9.37	8.40	7.10	7.23		
7	10/24/97	19.0	2.8	409.7	Product level	8.10	8.45	8.10	N	7.80	N	N	N		
					Water level	8.17	8.50	8.25	7.90	9.20	8.20	7.10	7.22		
8	10/29/97	14.7	2.4	424.4	Product level	8.16	8.19	8.53	N	7.86	N	N	N		
					Water level	8.30	8.23	8.68	7.75	9.32	8.46	7.18	7.3		
9	11/5/97	8.3	1.2	432.7	Product level	8.01	8.39	8.00	N	8.07	N	N	N		
					Water level	8.06	8.44	8.19	7.94	10.44	8.78	7.56	7.11		
10	11/12/97	27.8	3.9	460.5	Product level	8.39	8.83	8.54	N	8.20	N	N	N		
					Water level	8.46	8.90	8.65	8.13	9.93	8.83	7.56	7.63		
11	11/19/97	60.6	8.5	521.1	Product level	8.26	8.79	8.42	N	8.05	N	N	N		
					Water level	8.31	8.85	8.5	8	9.9	8.7	7.43	7.51		
12	11/26/97	30.4	4.3	551.5	Product level	8.29	8.83	8.45	N	8.10	N	N	N		
					Water level	8.39	8.90	8.50	8.10	9.86	8.71	7.46	7.53		
1998	→					**59GW01**	**59GW02**	**59GW03**	**OHM1**	**OHM2**	**59GW06**	**59GW11**	**59GW17**		
13	1/9/98	143.0	20.0	694.5	Product level	7.99	8.49	8.27	SHEEN	7.74	N	N	N		
					Water level	8.2	8.84	8.46	7.83	10.24	8.48	7.21	7.28		

Notes: N= No product measured/observed Diesel sp gr = .85 or 7.09 lbs/gal gas sp gr = .75 or 6.25 lbs/gal

Discharge Stack Hydrocarbon Removal Calculations

Initials _____

Site = UST 1640 1/9/98

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/interv	Cumulative lbs removed
0	10216	13.467	6.2430E-08	231.24	60.00	119.17	29.79	29.79
15	8762	13.467	6.2430E-08	539.57	60.00	238.48	59.62	89.41
30	2351	13.467	6.2430E-08	539.57	60.00	63.99	16.00	105.41
45	1350	13.467	6.2430E-08	539.57	60.00	36.74	9.19	114.59
60	1115	13.467	6.2430E-08	539.57	60.00	30.35	7.59	122.18
75	983	13.467	6.2430E-08	578.11	60.00	28.67	7.17	129.35
90	1078	13.467	6.2430E-08	578.11	60.00	31.44	7.86	137.21
105	878	13.467	6.2430E-08	539.57	60.00	23.90	5.97	143.18
120		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
150		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
180		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
210		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
240		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
270		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
300		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
360		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
390		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
6.00	19.685	0.980	0.196	1.019	60	231.24
14.00	45.931	0.980	0.196	1.019	60	539.57
14.00	45.931	0.980	0.196	1.019	60	539.57
14.00	45.931	0.980	0.196	1.019	60	539.57
14.00	45.931	0.980	0.196	1.019	60	539.57
15.00	49.212	0.980	0.196	1.019	60	578.11
15.00	49.212	0.980	0.196	1.019	60	578.11
14.00	45.931	0.980	0.196	1.019	60	539.57
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type = diesel
K = 1 methane gas
Mg = MW = 202 g/mole
diesel Kg = 15 dsm3/1.0e6 conv factor
Mg/Kg = Cgm= 13.4667

Conversion factor ft/sec 3.2808
Bws = water vapor% (perry's)
68 = 0.003
83= 0.025
87= 0.028
108= 0.058

Temp oR 518
Temp = 58
528/Stack 1.019

Aggressive Fluid Vapor R(.very (AFVR) Data Sheet

Facility CHERRY Pt.
Location 1640

Baseline Data - AFVR and Observation Wells

Date 1-9-98 Initials [illegible] Project # 19364

WELL IDENTIFICATION	596W06	59 GW11	596W17		596W02	OHM 1	OHM 2	596W03	596W01	
WELL DIAMETER	2"	6"	2"		4"	2"	2"	4"	4"	
WELL DEPTH (FT FROM TOC)	15.20	14.65	39.35		18.35	10.00	20.00	18.85	15.00	
AFVR WELL (YES/NO)	NO	NO	NO		YES	YES	YES	YES	YES	
DEPTH TO PRODUCT (FT)	Ø	Ø	Ø		8.49	SHEEN	7.74	8.27	7.99	
DEPTH TO WATER (FT)	8.48	7.21	7.28		8.84	7.83	10.24	8.46	8.20	
PRODUCT THICKNESS (FT)	Ø	Ø	Ø		.35	Ø	2.50	.19	.21	
SCREEN INTERV (FT BLS)										

Water level and Vacuum Measurements - Observation Wells

N = Not observed/present

Actual Time	Elapsed Time	596W06 Water Depth	596W06 Vac "H_2O	596W11 Water Depth	596W11 Vac "H_2O	596W17 Water Depth	596W17 Vac "H_2O	Water Depth	Vac "H_2O	596W02 Water Depth	596W02 Vac "H_2O	OHM 1 Water Depth	OHM 1 Vac "H_2O	OHM 2 Water Depth	OHM 2 Vac "H_2O	596W03 Water Depth	596W03 Vac "H_2O	596W01 Water Depth	596W01 Vac "H_2O	Water Depth	Vac "H_2O
Initial/base	0 00	8.48		7.21		7.28				8.84		7.83		10.24		8.46		8.20			
10:00	0 15	8.62		7.32		7.38															
10:15	0.30	8.62		7.33		7.38															
10:30	0 45	8.76		7.55		7.46															
10:45	1 00	8.88		7.59		7.52															
11:00	1.15	9.01	110064	7.69		7.64															
11:15	1 30	9.06		7.75		7.70															
11:30	1 45	9.07		7.76		7.72				9.13		10.00		8.65		8.71		8.38			
11:45	2 00																				
12:15	2 30																				
12:45	3 00																				
	3 30																				
	4 00																				
	4 30																				
	5 00																				

Additional Comments/Observations

Note Water level measurements are depths from top of casing

MAR 31 '99 04:26PM OHM CHERRY POINT

Aggressive Fluid Vapor R very (AFVR) Data Sheet

Facility CHERRY Pt.
Location 1640

AFVR Stack Measurements

Date 1-9-98 Initials CC Project # 19364

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes / no	YES

Start Time 9:45

Actual Time	Elapsed Time	LEL (ppm or %)	FID (ppm)	Velocity (m/sec) (ft/sec)	Temp (°F)	Air Flow (DCFM) <calc>	Mass Conc. C_{pm} <calc>	Mass Conc STP C_g <calc>	TPH Removal (PMR_u) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim gals)
						Calculated From Field Data					
945	0 00	53	10216	6	56						
1000	0 15	17	8763	14	56						
1015	0 30	6	2351	14	58						
1030	0 45	6	1350	14	58						
1045	1:00	6	1115	14	58						
1100	1.15	6	983	15	58						
1115	1:30	6	1078	15	60						
1130	1.45	6	878	14	60						
1145	2 00										
	2 30										
	3 00										
	3 30										
	4 00										
	4 30										
	5 00										

Q_{std} = Flow in Std dry SCFM
PMR_u = Pollutant Mass Removal lbs/hr

Q_{std} = (60 sec/min)(1-B_{ws})(V)(A)(528°R/T_s)
PMR_u = Cg (Q_{std})(60 min/hr)

System Vacuum Measurements (Vac Truck and AFVR Wells)

Actual Time	Elapsed Time	Vac Truck ("Hg)	(RPM)	Well ("Hg)	Entrai Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth
945	0	18	600																		
1045	1 HR	18	600																		
1130	2 HR.	20	600																		

Note: Record Entrainment depth of hose in feet below Top of well casing
Note: Record Vacuum from AFVR extraction wells in inches mercury

MAR 31 '99 04:27PM OHM CHERRY POINT P.9

Aggressive Fluid Vapor Recovery Report

MCAS Cherry Point, North Carolina

Site Name: MCAS Cherry Point, NC
Site Location: UST 1640
Work Plan Ref: August, 1997

Incident #:
Site Priority Rank: *70/E*

Report Date:
Event #: 14
Event Date: 2/26/98

Free Prod Type Diesel

Wells Gauged:	59GW01	59GW02	59GW03	OHM 1	OHM2	59GW06	59GW11	59GW17			
Free Prod. Thickness:	0.68	1.91	0.56	<0.01	0.57						
AFVR Wells Selected:	x	x	x	x	x						
Observ. Wells Selected:						x	x	x			

Event Duration: 3 hours
Stack TPH Recovery (lbs): 4.81
Stack TPH Recovery (gals): 0.679
Total Est. Fluids Rec.: 1700

Conclusions and Recommendations: A total of approximately 4.8 pounds or .7 gallons of hydrocarbons have been removed from the site during this event.

Prepared By:

Reviewed By:

OHM Remediation Services

Attachments: Tables 1, 2, 3, calculations

Facility: UST 1640
MCAS Cherry Point, North Carolina

Aggressive Fluid Vapor Recovery (AFVR)
Monitoring Well Data
TABLE 1

Baseline Data - AFVR and Observation Wells **Date** [redacted]

WELL IDENTIFICATION	59GW06	59GW11	59GW17	59GW02	OHM1	OHM2	59GW03			
AFVR WELL (YES/NO)	NO	NO	NO	YES	YES	YES	YES			
WELL DEPTH (FT BLS)	15.2	14.65	39.35	18.35	10	20	18.85			
DIAMETER (INCH)	2	6	2	4	2	2	4			
DEPTH TO PRODUCT (FT)	N	N	N	7.72	SHEEN	7.27	7.54			
DEPTH TO WATER (FT)	8.48	7.21	7.28	9.63	7.38	8.84	8.10			
PRODUCT THICKNESS (FT)				1.91	<0.01	1.57	0.56			
SCREEN INTERV. (FT BLS)										

Water level Measurements - Observation Wells (from TOC) N = None MeasuredObserved

Date	Elapsed Time	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20
02/26/98	0:00	7.87	6.58	6.72	9.63	7.38	8.84	8.10			
1400	0:15	8.00	6.67	6.80							
1415	0:30	8.02	6.70	6.83							
1430	0:45	8.11	6.81	6.87							
1445	1:00	8.16	6.88	6.92							
1500	1:15	8.17	6.89	6.93							
1515	1:30	8.25	6.99	6.99							
1530	1:45	8.31	7.02	7.03							
1545	2:00	8.35	7.01	7.06							
1615	2:30	8.36	7.09	7.08							
1645	3:00	8.37	7.10	7.09	8.43	8.53	8.04	8.10			
	3:30										
	4:00										
	4:30										
	5:00										

Aggressive Fluid Vapor Recovery (AFVR)
Discharge Stack Data
TABLE 2

Facility: UST 1640
MCAS Cherry Point, North Carolina

AFVR Stack Measurements **Date** 2/26/98 **Initials** _____

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes/no	yes
Start Time	1400

Date	Elapsed Time	LEL (%)	FID (ppm)	Velocity (ft/sec) (m/sec)	Temp (°F)	Air Flow (DCFM) <calc>	TPH Removal (PMRg) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
02/26/98	0:00	7%	753.0	2.1	54	80.9	3.07	0.8	
	0:15	3%	259.0	2.7	54	104.1	1.36	1.1	
	0:30	2%	107.0	2.5	54	96.4	0.52	1.2	
	0:45	6%	686.0	2.2	55	84.8	2.93	2.0	
	1:00	6%	603.0	2.4	55	92.5	2.81	2.7	
	1:15	2%	315.0	2.4	55	92.5	1.47	3.0	
	1:30	2%	306.0	3.8	54	146.5	2.26	3.6	
	1:45	0%	217.0	3.4	54	131.0	1.43	4.0	
	2:00	0%	190.0	3.1	54	119.5	1.15	4.3	
	2:30	0%	149.0	2.8	54	107.9	0.81	4.7	
	3:00	0%	67.0	2.4	53	92.5	0.31	4.8	
	3:30								1,700.0
	4:00								
	4:30								
	5:00								
	5:30								
	6:00								

Facility: UST 1640

MCAS Cherry Point, North Carolina

Date: 2/26/98

Aggressive Fluid Vapor Recovery (AFVR)
Summary of Free Product Recovery Events
TABLE 3

Hydrocarbon = diesel

						AFVR WELLS					MONITORING WELLS				
Event #	**Date**	**Rec Prod (lbs)**	**Rec Prod. (gals)**	**Total Cum (lbs) to date**	**Level (ft TOC)**	**59GW01**	**59GW02**	**59GW03**	**59PR25**	**59PR26**	**59GW06**	**59GW11**	**59GW17**		
INITIAL	9/5/97	153.2	21.5	153.2	Product level	8.10	N	8.44	N	7.76	N	N	N		
					Water level	8.11	8.00	11.08	8.08	9.28	8.48	7.18	7.30		
2	9/18/97	133.8	18.8	287.0	Product level	7.95	8.33	7.95	N	7.45	N	N	N		
					Water level	8.12	8.38	8.23	7.70	10.35	8.60	7.01	7.11		
3	9/25/97	17.7	2.5	304.7	Product level	7.99	8.40	8.01	N	7.61	N	N	N		
					Water level	8.15	8.52	8.10	7.60	9.39	8.31	7.02	7.11		
4	10/2/97	12.0	1.7	316.7	Product level	7.90	8.51	7.89	N	7.45	N	N	N		
					Water level	8.02	8.65	8.20	7.44	9.80	8.20	6.43	7.05		
5	10/9/97	55.0	7.7	371.7	Product level	8.01	8.40	8.00	N	7.50	N	N	N		
					Water level	8.10	8.45	8.10	7.70	9.35	8.30	7.13	7.15		
6	10/16/97	19.0	2.8	390.7	Product level	7.91	8.49	8.13	N	7.80	N	N	N		
					Water level	8.02	8.60	8.19	7.83	9.37	8.40	7.10	7.23		
7	10/24/97	19.0	2.8	409.7	Product level	8.10	8.45	8.10	N	7.80	N	N	N		
					Water level	8.17	8.50	8.25	7.90	9.20	8.20	7.10	7.22		
8	10/29/97	14.7	2.4	424.4	Product level	8.16	8.19	8.53	N	7.86	N	N	N		
					Water level	8.30	8.23	8.68	7.75	9.32	8.46	7.18	7.3		
9	11/5/97	8.3	1.2	432.7	Product level	8.01	8.39	8.00	N	8.07	N	N	N		
					Water level	8.06	8.44	8.19	7.94	10.44	8.78	7.56	7.11		
10	11/12/97	27.8	3.9	460.5	Product level	8.39	8.83	8.54	N	8.20	N	N	N		
					Water level	8.46	8.90	8.65	8.13	9.93	8.83	7.56	7.63		
11	11/19/97	60.6	8.5	521.1	Product level	8.26	8.79	8.42	N	8.05	N	N	N		
					Water level	8.31	8.85	8.5	8	9.9	8.7	7.43	7.51		
12	11/26/97	30.4	4.3	551.5	Product level	8.29	8.83	8.45	N	8.10	N	N	N		
					Water level	8.39	8.90	8.50	8.10	9.86	8.71	7.46	7.53		

1998	→					59GW01	59GW02	59GW03	OHM1	OHM2	59GW06	59GW11	59GW17		
13	1/9/98	143.0	20.0	694.5	Product level	7.99	8.49	8.27	SHEEN	7.74	N	N	N		
					Water level	8.2	8.84	8.46	7.83	10.24	8.48	7.21	7.28		
14	2/26/99	4.8	0.7	699.3	Product level	7.12	7.72	7.54	sheen	7.27	N	N	N		
					Water level	7.8	9.63	8.1	7.38	8.84	7.87	6.58	6.72		

Notes: N= No product measured/observed Diesel sp gr = .85 or 7.09 lbs/gal gas sp gr = .75 or 6.25 lbs/gal

Discharge Stack Hydrocarbon Removal Calculations

Initials _____

Site = UST 1640 1/9/98

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/interv	Cumulative lbs removed
0	753	13.467	6.2430E-08	80.94	60.00	3.07	0.77	0.77
15	259	13.467	6.2430E-08	104.06	60.00	1.36	0.34	1.11
30	107	13.467	6.2430E-08	96.35	60.00	0.52	0.13	1.24
45	686	13.467	6.2430E-08	84.79	60.00	2.93	0.73	1.97
60	603	13.467	6.2430E-08	92.50	60.00	2.81	0.70	2.68
75	315	13.467	6.2430E-08	92.50	60.00	1.47	0.37	3.04
90	306	13.467	6.2430E-08	146.45	60.00	2.26	0.57	3.61
105	217	13.467	6.2430E-08	131.04	60.00	1.43	0.36	3.97
120	190	13.467	6.2430E-08	119.48	60.00	1.15	0.29	4.25
150	149	13.467	6.2430E-08	107.91	60.00	0.81	0.41	4.66
180	67	13.467	6.2430E-08	92.50	60.00	0.31	0.16	4.81
210	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
240	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
270		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
300		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
360		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
390		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
2.10	6.890	0.980	0.196	1.019	60	80.94
2.70	8.858	0.980	0.196	1.019	60	104.06
2.50	8.202	0.980	0.196	1.019	60	96.35
2.20	7.218	0.980	0.196	1.019	60	84.79
2.40	7.874	0.980	0.196	1.019	60	92.50
2.40	7.874	0.980	0.196	1.019	60	92.50
3.80	12.467	0.980	0.196	1.019	60	146.45
3.40	11.155	0.980	0.196	1.019	60	131.04
3.10	10.170	0.980	0.196	1.019	60	119.48
2.80	9.186	0.980	0.196	1.019	60	107.91
2.40	7.874	0.980	0.196	1.019	60	92.50
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type = diesel
K = 1 methane gas
Mg = MW = 202 g/mole
diesel Kg = 15 dsm3/1.0e6 conv factor
Mg/Kg = Cgm= 13.4667

Conversion factor ft/sec 3.2808
Bws = water vapor% (perry's)
68 = 0.003
83= 0.025
87= 0.028
108= 0.058

Temp oR 518
Temp = 58
528/Stack 1.019

Aggressive Fluid Vapor R..very (AFVR) Data Sheet

Facility Cherry Pt.
Location 1640 Control Tower

Baseline Data - AFVR and Observation Wells

Date 2/26/98 Initials RM Project # 19364

WELL IDENTIFICATION	59GW06	59GW11	59GW17		OHM 1	OHM 2	59GW01	59GW02	59GW03	
WELL DIAMETER	2"	6"	2"		2"	2"	4"	4"	4"	
WELL DEPTH (FT F/TOC)	15.20	14.65	39.35		10.00	20.00	15.00	18.35	18.85	
AFVR WELL (YES/NO)	No	No	No		Yes	Yes	Yes	Yes	Yes	
DEPTH TO PRODUCT (FT)	Ø	Ø	Ø		Sheen	7.27	7.12	7.72	7.54	
DEPTH TO WATER (FT)	7.87	6.58	6.72		7.38	8.84	7.80	9.63	8.10	
PRODUCT THICKNESS (FT)	Ø	Ø	Ø		Ø	.57	.68	1.91	.56	
SCREEN INTERV (FT BLS)										

Water level and Vacuum Measurements - Observation Wells

N = Not observed/present

Actual Time	Elapsed Time	59GW06 Water Depth	59GW06 Vac " H_2O	59GW11 Water Depth	59GW11 Vac " H_2O	59GW17 Water Depth	59GW17 Vac " H_2O	Water Depth	Vac " H_2O	OHM 1 Water Depth	OHM 1 Vac " H_2O	OHM 2 Water Depth	OHM 2 Vac " H_2O	59GW01 Water Depth	59GW01 Vac " H_2O	59GW02 Water Depth	59GW02 Vac " H_2O	59GW03 Water Depth	59GW03 Vac " H_2O	Water Depth	Vac " H_2O
Initial/base	0 00	7.87		6.58		6.72				7.38		8.84		7.80		9.63		8.10			
1400	0:15	8.00		6.67		6.80															
1415	0:30	8.02		6.70		6.83															
1430	0.45	8.11		6.81		6.87															
1445	1:00	8.16		6.88		6.92															
1500	1:15	8.17		6.89		6.93															
1515	1:30	8.25		6.99		6.99															
1530	1:45	8.31		7.02		7.03															
1545	2:00	8.35		7.07		7.06															
1615 1605	2:30	8.36		7.09		7.08															
1645 1645	3:00	8.37		7.10		7.09				8.53		8.04		7.98		8.43		8.10			
	3:30																				
	4:00																				
	4 30																				
	5.00																				

Additional Comments/Observations

Note. Water level measurements are depths from top of casing

P.10
MAR 31 '99 04:27PM OHM CHERRY POINT

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt.
Location 1646 Control Tower

AFVR Stack Measurements

Date 2/26/98 Initials RM Project # 19364

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes / no	Yes

Start Time 1345

Actual Time	Elapsed Time	LEL (ppm or %)	FID (ppm)	Velocity (m/sec) (ft/sec)	Temp (°F)	Air Flow (DCFM) <calc>	Mass Conc. C_{ppm} <calc>	Mass Conc STP C_g <calc>	TPH Removal (PMR_g) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim gals)
13:45	0.00	7	753	2.1	54						
14:00	0.15	3	259	2.7	54						
14:15	0.30	2	107	2.5	54						
14:30	0.45	6	686	2.2	55						
14:45	1:00	6	603	2.4	55						
15:00	1.15	2	315	2.4	55						
15:15	1:30	2	306	3.8	54						
15:30	1:45	0	217	3.4	54						
15:45	2 00	0	190	3.1	54						
16:00	2 30	0	149	2.8	54						
16:45	3 00	0	67	2.4	53						
	3:30										
	4:00										
	4:30										
	5.00										

Calculated From Field Data

Q_{std} = Flow in Std dry SCFM
PMR_g = Pollutant Mass Removal lbs/hr

Q_{std} = (60 sec/min)(1-B_{ws})(V)(A)(528°R/T_s)
PMR_g = Cg (Q_{std})(60 min/hr)

System Vacuum Measurements (Vac Truck and AFVR Wells)

Actual Time	Elapsed Time	Vac Truck ("Hg)	Vac Truck (RPM)	Well ("Hg)	Entrai Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth
1345	Start	10	400																		
1445	1 hr	10	400																		
1500	1hr. 15min	12	500																		
1600	2hr. 15min	12	500																		
1645	3 hr.	12	500																		

Note: Record Entrainment depth of hose in feet below Top of well casing
Note: Record Vacuum from AFVR extraction wells in inches mercury

MAR 31 '99 04:28PM OHM CHERRY POINT P.11

R.W. McDonnell Sr.
100303

2/26/98 Project #19364 1640 Control Tw-

13:45 Startup OHM 1 & 59GW02 on line 1' below product level, (OHM 1 No Product)

1415 59GW01 & OHM #2 on line 1' below product level

14:45 59GW03 on line 1' below product level. (All 5 wells on line)
Pulled 250 Gallons into VAC TRUCK

1500 Pulled 500 Gallons into VAC TRUCK. Pushed RPMs to 500. VAC at 12

1545 Dropped all wells one additional foot. (OHM 1 dry) 900 Gallons pulled total into VAC TRUCK

1600 1100 Gallons pulled into VAC TRUCK

1645 1700 Gallons. System Shut down.

Aggressive Fluid Vapor Recovery Report

MCAS Cherry Point, North Carolina

Site Name: MCAS Cherry Point, NC
Site Location: UST 1640
Work Plan Ref: August, 1997

Incident #:
Site Priority Rank: *70/E*

Report Date:
Event #: 15
Event Date: 3/21/98

Free Prod Type Diesel

Wells Gauged:	59GW01	59GW02	59GW03	OHM 1	OHM2	59GW06	59GW11	59GW17			
Free Prod. Thickness:	0.3	0.83	0.19	<0.01	2.72						
AFVR Wells Selected:	x	x	x	x	x						
Observ. Wells Selected:						x	x	x			

Event Duration: 3 hours
Stack TPH Recovery (lbs): 26.75
Stack TPH Recovery (gals): 3.774
Total Est. Fluids Rec.: 1850

Conclusions and Recommendations: A total of approximately 26.75 pounds or 3.7 gallons of hydrocarbons have been removed from the site during this event.

Prepared By:

Reviewed By:

OHM Remediation Services

Attachments: Tables 1, 2, 3, calculations

Facility: UST 1640
MCAS Cherry Point, North Carolina

Aggressive Fluid Vapor Recovery (AFVR)
Monitoring Well Data
TABLE 1

Baseline Data - AFVR and Observation Wells **Date** 3/21/98

WELL IDENTIFICATION	59GW06	59GW11	59GW17	59GW02	OHM1	OHM2	59GW03			
AFVR WELL (YES/NO)	NO	NO	NO	YES	YES	YES	YES			
WELL DEPTH (FT BLS)	15.2	14.65	39.35	18.35	10	20	18.85			
DIAMETER (INCH)	2	6	2	4	2	2	4			
DEPTH TO PRODUCT (FT)	N	N	N	7.96	SHEEN	7.24	7.69			
DEPTH TO WATER (FT)	8.00	6.71	6.80	8.79	7.43	9.96	7.88			
PRODUCT THICKNESS (FT)				0.83	<0.01	2.72	0.19			
SCREEN INTERV. (FT BLS)										

Water level Measurements - Observation Wells (from TOC) N = None MeasuredObserved

Date	Elapsed Time	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20
02/26/98	0:00	8.00	6.71	6.80	8.79	7.43	9.96	7.88			
1400	0:15	8.09	6.85	6.80							
1415	0:30	8.35	7.08	6.92							
1430	0:45	8.38	7.12	7.07							
1445	1:00	8.40	7.14	7.09							
1500	1:15	8.40	7.14	7.10							
1515	1:30	8.41	7.14	7.11							
1530	1:45	8.41	7.15	7.12							
1545	2:00	8.45	7.20	7.13							
1615	2:30	8.48	7.20	7.16							
1645	3:00	8.40	7.03	7.05	9.45	dry	8.15	8.30			
	3:30										
	4:00										
	4:30										
	5:00										

Aggressive Fluid Vapor Recovery (AFVR)
Discharge Stack Data
TABLE 2

Facility: UST 1640

MCAS Cherry Point, North Carolina

AFVR Stack Measurements **Date** 3/21/98 **Initials** _____

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes/no	yes
Start Time	830

Date	Elapsed Time	LEL (%)	FID (ppm)	Velocity (ft/sec)	(m/sec)	Temp (°F)	Air Flow (DCFM) <calc>	TPH Removal (PMRg) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
03/21/98	0:00	40%	5,830.0		3.0	59	115.6	34.00	8.5	
	0:15	23%	4,060.0		3.2	59	123.3	25.26	14.8	
	0:30	17%	2,247.0		2.8	60	107.9	12.23	17.9	
	0:45	11%	1,697.0		2.4	60	92.5	7.92	19.9	
	1:00	9%	1,338.0		1.8	64	69.4	4.68	21.0	
	1:15	5%	1,103.0		1.6	67	61.7	3.43	21.9	
	1:30	5%	1,152.0		1.6	69	61.7	3.58	22.8	
	1:45	5%	1,028.0		1.6	70	61.7	3.20	23.6	
	2:00	5%	981.0		1.6	70	61.7	3.05	24.3	
	2:30	5%	799.0		1.6	70	61.7	2.49	25.6	
	3:00	4%	754.0		1.6	70	61.7	2.35	26.8	
	3:30									1,850.0
	4:00									
	4:30									
	5:00									
	5:30									
	6:00									

Facility: UST 1640

MCAS Cherry Point, North Carolina

Date: 1/9/98

Aggressive Fluid Vapor Recovery (AFVR)
Summary of Free Product Recovery Events
TABLE 3

Hydrocarbon = diesel

						AFVR WELLS					MONITORING WELLS				
Event #	Date	Rec Prod (lbs)	Rec Prod. (gals)	Total Cum (lbs) to date	Level (ft TOC)	59GW01	59GW02	59GW03	59PR25	59PR26	59GW06	59GW11	59GW17		
INITIAL	9/5/97	153.2	21.5	153.2	Product level	8.10	N	8.44	N	7.76	N	N	N		
					Water level	8.11	8.00	11.08	8.08	9.28	8.48	7.18	7.30		
2	9/18/97	133.8	18.8	287.0	Product level	7.95	8.33	7.95	N	7.45	N	N	N		
					Water level	8.12	8.38	8.23	7.70	10.35	8.60	7.01	7.11		
3	9/25/97	17.7	2.5	304.7	Product level	7.99	8.40	8.01	N	7.61	N	N	N		
					Water level	8.15	8.52	8.10	7.60	9.39	8.31	7.02	7.11		
4	10/2/97	12.0	1.7	316.7	Product level	7.90	8.51	7.89	N	7.45	N	N	N		
					Water level	8.02	8.65	8.20	7.44	9.80	8.20	6.43	7.05		
5	10/9/97	55.0	7.7	371.7	Product level	8.01	8.40	8.00	N	7.50	N	N	N		
					Water level	8.10	8.45	8.10	7.70	9.35	8.30	7.13	7.15		
6	10/16/97	19.0	2.8	390.7	Product level	7.91	8.49	8.13	N	7.80	N	N	N		
					Water level	8.02	8.60	8.19	7.83	9.37	8.40	7.10	7.23		
7	10/24/97	19.0	2.8	409.7	Product level	8.10	8.45	8.10	N	7.80	N	N	N		
					Water level	8.17	8.50	8.25	7.90	9.20	8.20	7.10	7.22		
8	10/29/97	14.7	2.4	424.4	Product level	8.16	8.19	8.53	N	7.86	N	N	N		
					Water level	8.30	8.23	8.68	7.75	9.32	8.46	7.18	7.3		
9	11/5/97	8.3	1.2	432.7	Product level	8.01	8.39	8.00	N	8.07	N	N	N		
					Water level	8.06	8.44	8.19	7.94	10.44	8.78	7.56	7.11		
10	11/12/97	27.8	3.9	460.5	Product level	8.39	8.83	8.54	N	8.20	N	N	N		
					Water level	8.46	8.90	8.65	8.13	9.93	8.83	7.56	7.63		
11	11/19/97	60.6	8.5	521.1	Product level	8.26	8.79	8.42	N	8.05	N	N	N		
					Water level	8.31	8.85	8.5	8	9.9	8.7	7.43	7.51		
12	11/26/97	30.4	4.3	551.5	Product level	8.29	8.83	8.45	N	8.10	N	N	N		
					Water level	8.39	8.90	8.50	8.10	9.86	8.71	7.46	7.53		

1998	→					59GW01	59GW02	59GW03	OHM1	OHM2	59GW06	59GW11	59GW17		
13	1/9/98	143.0	20.0	694.5	Product level	7.99	8.49	8.27	SHEEN	7.74	N	N	N		
					Water level	8.2	8.84	8.46	7.83	10.24	8.48	7.21	7.28		
14	2/26/99	26.8	3.8	721.3	Product level	7.12	7.72	7.54	sheen	7.27	N	N	N		
					Water level	7.8	9.63	8.1	7.38	8.84	7.87	6.58	6.72		
15	3/21/98	26.8	3.8	748.0	Product level	7.65	7.96	7.67	sheen	7.24	N	N	N		
					Water level	7.95	8.79	7.88	7.43	9.96	8	6.71	6.8		

Notes: N= No product measured/observed Diesel sp gr = .85 or 7.09 lbs/gal gas sp gr = .75 or 6.25 lbs/gal

Discharge Stack Hydrocarbon Removal Calculations

Initials _____

Site = UST 1640 3/21/98

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/interv	Cumulative lbs removed
0	5830	13.467	6.2430E-08	115.62	60.00	34.00	8.50	8.50
15	4060	13.467	6.2430E-08	123.33	60.00	25.26	6.31	14.82
30	2247	13.467	6.2430E-08	107.91	60.00	12.23	3.06	17.87
45	1697	13.467	6.2430E-08	92.50	60.00	7.92	1.98	19.85
60	1338	13.467	6.2430E-08	69.37	60.00	4.68	1.17	21.02
75	1103	13.467	6.2430E-08	61.66	60.00	3.43	0.86	21.88
90	1152	13.467	6.2430E-08	61.66	60.00	3.58	0.90	22.78
105	1028	13.467	6.2430E-08	61.66	60.00	3.20	0.80	23.58
120	981	13.467	6.2430E-08	61.66	60.00	3.05	0.76	24.34
150	799	13.467	6.2430E-08	61.66	60.00	2.49	1.24	25.58
180	754	13.467	6.2430E-08	61.66	60.00	2.35	1.17	26.75
210	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
240	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
270		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
300		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
360		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
390		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
3.00	9.842	0.980	0.196	1.019	60	115.62
3.20	10.499	0.980	0.196	1.019	60	123.33
2.80	9.186	0.980	0.196	1.019	60	107.91
2.40	7.874	0.980	0.196	1.019	60	92.50
1.80	5.905	0.980	0.196	1.019	60	69.37
1.60	5.249	0.980	0.196	1.019	60	61.66
1.60	5.249	0.980	0.196	1.019	60	61.66
1.60	5.249	0.980	0.196	1.019	60	61.66
1.60	5.249	0.980	0.196	1.019	60	61.66
1.60	5.249	0.980	0.196	1.019	60	61.66
1.60	5.249	0.980	0.196	1.019	60	61.66
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00
0.00	0.000	0.980	0.196	1.019	60	0.00

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type = diesel
K = 1 methane gas
Mg = MW = 202 g/mole
diesel Kg = 15 dsm3/1.0e6 conv factor
Mg/Kg = Cgm= 13.4667

Conversion factor ft/sec 3.2808
Bws = water vapor% (perry's)
68 = 0.003
83= 0.025
87= 0.028
108= 0.058

Temp oR 518
Temp = 58
528/Stack 1.019

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt
Location 1640 Control Tower

Baseline Data - AFVR and Observation Wells

Date 3/21/98 Initials RM Project # 19364

WELL IDENTIFICATION	596W06	596W11	596W17		OHM1	OHM2	596W01	596W02	596W03	
WELL DIAMETER	2"	6"	2"		2"	2"	4"	4"	4"	
WELL DEPTH (FT TOC)	15.20	14.65	39.35		10	20	15	18.35	18.85	
AFVR WELL (Y S/N O)	No	No	No		Yes	Yes	Yes	Yes	Yes	
DEPTH TO PRODUCT (FT)	N	N	N		Sheen	7.24	7.65	7.96	7.69	
DEPTH TO WATER (FT)	8.0	6.71	6.80		7.43	9.96	7.95	8.79	7.88	
PRODUCT THICKNESS (FT)	Ø	Ø	Ø		Ø	2.72	.30	.83	.19	
SCREEN INTERV (FT BLS)										

Water level and Vacuum Measurements - Observation Wells

N = Not observed/present

Actual Time	Elapsed Time	Well # Water Depth	Vac "H_2O	Water Depth	Vac "H_2O	Water Depth	Vac "H_2O	Water Depth	Vac "H_2O	Water Depth	Vac "H_2O	Water Depth	Vac "H_2O	Water Depth	Vac "H_2O	Water Depth	Vac "H_2O	Water Depth	Vac "H_2O	Water Depth	Vac "H_2O	
Initial/base	0 00	8.00		6.71		6.80				7.43		9.96		7.95		8.79		7.88				
0845	0 15	8.09	Rm	6.85		6.80																
0900	0.30	8.35	350 Gallons	7.08		6.92																
0915	0 45	8.38		7.12		7.07																
0930	1 00	8.40	750 Gallons	7.14		7.09																
0945	1:15	8.40		7.14		7.10																
10:00	1.30	8.41	750 Gallons	7.14		7.11																
10:15	1 45	8.41		7.15		7.12																
1030	2 00	8.45		7.20		7.13																
1100	2 30	8.48	1600 Gallons	7.20		7.16																
1130	3 00	8.40	1850 Gallons	7.03		7.05				Dry		8.15		7.90		9.45		8.38				
	3 30																					
	4 00																					
	4 30																					
	5 00																					

Additional Comments/Observations

Note Water level measurements are depths from top of casing

3/22/98 0700 hrs. Gauged VAC Truck. .01 Sheen in tank.

MAR 31 '99 04:28PM OHM CHERRY POINT P.12

Aggressive Fluid Vapor R(ery (AFVR) Data Sheet

Facility Cherry Pt
Location 1640 Control Tower

AFVR Stack Measurements

Date 3/21/98 Initials RM Project # 19364

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes / no	Yes

Start Time 0830

Actual Time	Elapsed Time	LEL (ppm or %)	FID (ppm)	Velocity 30 Range (ft/sec) (ft/sec)	Temp (°F)	Air Flow (D)CFM) <calc>	Mass Conc. C_{gm} <calc>	Mass Conc STP C_g <calc>	TPH Removal (PMR_g) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim gals)
0830	0 00	40	5830	3.0	59°F						
0845	0:15	23	4060	3.2	59°F						
0900	0.30	17	2247	2.8	60°F						
0915	0 45	11	1697	2.4	60°F						
0930	1:00	9	1338	1.8	64°F						
0945	1.15	5	1103	1.6	67°F						
1000	1:30	5	1152	1.6	69°F						
1015	1:45	5	1028	1.6	70°F						
1030	2 00	5	981	1.6	70°F						
1100	2.30	5	799	1.6	70°F						
1130	3 00	4	754	1.6	70°F						
1200	3 30										
1230	4 00										
	4:30										
	5 00										

Calculated From Field Data

Q_{std} = Flow in Std dry SCFM
PMR_g = Pollutant Mass Removal lbs/hr

Q_{std} = (60 sec/min)(1-B_{ws})(V)(A)(528°R/T_s)
PMR_g = Cg (Q_{std})(60 min/hr)

System Vacuum Measurements (Vac Truck and AFVR Wells)

Actual Time	Elapsed Time	Vac Truck ("Hg)	Vac Truck (RPM)	Well ("Hg)	Entrai Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth
0830	Start	14	500																		
0930	1hr.	10	500																		
1030	2hr.	10	500																		
1130	3hr.	10	500																		

Note: Record Entrainment depth of hose in feet below Top of well casing
Note: Record Vacuum from AFVR extraction wells in inches mercury

MAR 31 '99 04:29PM OHM CHERRY POINT

3/21/98 1640 Control Tower Field Notes

0830 Startup OHM2/59GW01/59GW02/59GW03 on line, 1 foot below product level.
1100 1500 gallons. OHM1 on line
1115 Abb wells jammed.
11:30 System shut down. 1850 gallons approx.

R.A. McDonnell Sr.
#100303

MAR 31 '99 04:40PM OHM CHERRY POINT

Aggressive Fluid Vapor Recovery Report

MCAS Cherry Point, North Carolina

Site Name: MCAS Cherry Point, NC
Site Location: UST 1640
Work Plan Ref: August, 1997

Incident #:
Site Priority Rank: *70/E*

Report Date:
Event #: 16
Event Date: 4/4/98

Free Prod Type Diesel

Wells Gauged:	59GW01	59GW02	59GW03	OHM 1	OHM2	59GW06	59GW11	59GW17			
Free Prod. Thickness:	0.21	0.33	1.81	0.01	2.19						
AFVR Wells Selected:	x	x	x	x	x						
Observ. Wells Selected:						x	x	x			

Event Duration: 2 hours 30 minutes
Stack TPH Recovery (lbs): 13.37
Stack TPH Recovery (gals): 1.886
Total Est. Fluids Rec.: 1250+

Conclusions and Recommendations: A total of approximately 13.4 pounds or 1.8 gallons of hydrocarbons have been removed from the site during this event.

Prepared By:

Reviewed By:

OHM Remediation Services

Attachments: Tables 1, 2, 3, calculations

Facility: UST 1640
MCAS Cherry Point, North Carolina

Aggressive Fluid Vapor Recovery (AFVR)
Monitoring Well Data
TABLE 1

Baseline Data - AFVR and Observation Wells **Date** 4/4/98

WELL IDENTIFICATION	59GW06	59GW11	59GW17	59GW02	OHM1	OHM2	59GW03			
AFVR WELL (YES/NO)	NO	NO	NO	YES	YES	YES	YES			
WELL DEPTH (FT BLS)	15.2	14.65	39.35	18.35	10	20	18.85			
DIAMETER (INCH)	2	6	2	4	2	2	4			
DEPTH TO PRODUCT (FT)	N	N	N	8.14	7.68	7.43	8.01			
DEPTH TO WATER (FT)	8.12	6.83	6.92	8.47	7.69	9.62	9.82			
PRODUCT THICKNESS (FT)				0.33	0.01	2.19	1.81			
SCREEN INTERV. (FT BLS)										

Water level Measurements - Observation Wells (from TOC) N = None MeasuredObserved

Date	Elapsed Time	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20
04/04/98	0:00	8.12	6.83	6.92	8.47	7.69	9.62	8.01			
0945	0:15	8.46	7.17	7.17							
1000	0:30	8.51	7.21	7.23							
1015	0:45	8.54	7.24	7.25							
1030	1:00	8.54	7.24	7.25							
1045	1:15	8.54	7.24	7.25							
1100	1:30	8.58	7.30	7.29							
1115	1:45	8.63	7.35	7.34							
1130	2:00	8.70	7.39	7.37							
1200	2:30	8.68	7.41	7.39	8.80	10.27	9.30	8.40			
	3:00										
	3:30										
	4:00										
	4:30										
	5:00										

Aggressive Fluid Vapor Recovery (AFVR)
Discharge Stack Data
TABLE 2

Facility: UST 1640
MCAS Cherry Point, North Carolina

AFVR Stack Measurements **Date** 4/4/98 **Initials** _____

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes/no	yes
Start Time	930

Date	Elapsed Time	LEL (%)	FID (ppm)	Velocity (ft/sec)	(m/sec)	Temp (°F)	Air Flow (DCFM)	<calc>	TPH Removal (PMRg) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
04/04/98	0:00	11%	1,741.0		3.1	56	117.2		10.29	2.6	
	0:15	11%	1,474.0		3.0	59	113.4		8.43	4.7	
	0:30	5%	991.0		3.0	62	113.4		5.67	6.1	
	0:45	5%	861.0		2.9	65	109.7		4.76	7.3	
	1:00	5%	810.0		2.8	68	105.9		4.33	8.4	
	1:15	5%	756.0		2.4	68	90.7		3.46	9.2	
	1:30	5%	771.0		2.4	68	90.7		3.53	10.1	
	1:45	5%	712.0		2.6	68	98.3		3.53	11.0	
	2:00	5%	678.0		2.5	68	94.5		3.23	11.8	
	2:30	5%	631.0		2.6	70	98.3		3.13	13.4	
	3:00						0.0		0.00	13.4	
	3:30										1250+
	4:00										truck full
	4:30										
	5:00										
	5:30										
	6:00										

Aggressive Fluid Vapor Recovery (AFVR)
Summary of Free Product Recovery Events
TABLE 3

Facility: UST 1640

MCAS Cherry Point, North Carolina

Date: 1/9/98

Hydrocarbon = diesel

						AFVR WELLS					MONITORING WELLS				
Event #	Date	Rec Prod (lbs)	Rec Prod. (gals)	Total Cum (lbs) to date	Level (ft TOC)	59GW01	59GW02	59GW03	59PR25	59PR26	59GW06	59GW11	59GW17		
INITIAL	9/5/97	153.2	21.5	153.2	Product level	8.10	N	8.44	N	7.76	N	N	N		
					Water level	8.11	8.00	11.08	8.08	9.28	8.48	7.18	7.30		
2	9/18/97	133.8	18.8	287.0	Product level	7.95	8.33	7.95	N	7.45	N	N	N		
					Water level	8.12	8.38	8.23	7.70	10.35	8.60	7.01	7.11		
3	9/25/97	17.7	2.5	304.7	Product level	7.99	8.40	8.01	N	7.61	N	N	N		
					Water level	8.15	8.52	8.10	7.60	9.39	8.31	7.02	7.11		
4	10/2/97	12.0	1.7	316.7	Product level	7.90	8.51	7.89	N	7.45	N	N	N		
					Water level	8.02	8.65	8.20	7.44	9.80	8.20	6.43	7.05		
5	10/9/97	55.0	7.7	371.7	Product level	8.01	8.40	8.00	N	7.50	N	N	N		
					Water level	8.10	8.45	8.10	7.70	9.35	8.30	7.13	7.15		
6	10/16/97	19.0	2.8	390.7	Product level	7.91	8.49	8.13	N	7.80	N	N	N		
					Water level	8.02	8.60	8.19	7.83	9.37	8.40	7.10	7.23		
7	10/24/97	19.0	2.8	409.7	Product level	8.10	8.45	8.10	N	7.80	N	N	N		
					Water level	8.17	8.50	8.25	7.90	9.20	8.20	7.10	7.22		
8	10/29/97	14.7	2.4	424.4	Product level	8.16	8.19	8.53	N	7.86	N	N	N		
					Water level	8.30	8.23	8.68	7.75	9.32	8.46	7.18	7.3		
9	11/5/97	8.3	1.2	432.7	Product level	8.01	8.39	8.00	N	8.07	N	N	N		
					Water level	8.06	8.44	8.19	7.94	10.44	8.78	7.56	7.11		
10	11/12/97	27.8	3.9	460.5	Product level	8.39	8.83	8.54	N	8.20	N	N	N		
					Water level	8.46	8.90	8.65	8.13	9.93	8.83	7.56	7.63		
11	11/19/97	60.6	8.5	521.1	Product level	8.26	8.79	8.42	N	8.05	N	N	N		
					Water level	8.31	8.85	8.5	8	9.9	8.7	7.43	7.51		
12	11/26/97	30.4	4.3	551.5	Product level	8.29	8.83	8.45	N	8.10	N	N	N		
					Water level	8.39	8.90	8.50	8.10	9.86	8.71	7.46	7.53		

1998	→					59GW01	59GW02	59GW03	OHM1	OHM2	59GW06	59GW11	59GW17		
13	1/9/98	143.0	20.0	694.5	Product level	7.99	8.49	8.27	SHEEN	7.74	N	N	N		
					Water level	8.2	8.84	8.46	7.83	10.24	8.48	7.21	7.28		
14	2/26/99	4.8	0.7	699.3	Product level	7.12	7.72	7.54	sheen	7.27	N	N	N		
					Water level	7.8	9.63	8.1	7.38	8.84	7.87	6.58	6.72		
15	3/21/98	26.8	3.8	726.1	Product level	7.65	7.96	7.67	sheen	7.24	N	N	N		
					Water level	7.95	8.79	7.88	7.43	9.96	8	6.71	6.8		
16	4/4/98	13.4	1.9	739.4	Product level	7.57	8.14	9.82	7.68	7.43	N	N	N		
					Water level	7.78	8.47	8.01	7.69	9.62	8.12	6.83	6.92		

Notes: N= No product measured/observed Diesel sp gr = .85 or 7.09 lbs/gal gas sp gr = .75 or 6.25 lbs/gal

Discharge Stack Hydrocarbon Removal Calculations

Initials _____

Site = UST 1640 4/4/98

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/interv	Cumulative lbs removed
0	1741	13.467	6.2430E-08	117.21	60.00	10.29	2.57	2.57
15	1474	13.467	6.2430E-08	113.43	60.00	8.43	2.11	4.68
30	991	13.467	6.2430E-08	113.43	60.00	5.67	1.42	6.10
45	861	13.467	6.2430E-08	109.65	60.00	4.76	1.19	7.29
60	810	13.467	6.2430E-08	105.87	60.00	4.33	1.08	8.37
75	756	13.467	6.2430E-08	90.75	60.00	3.46	0.87	9.24
90	771	13.467	6.2430E-08	90.75	60.00	3.53	0.88	10.12
105	712	13.467	6.2430E-08	98.31	60.00	3.53	0.88	11.00
120	678	13.467	6.2430E-08	94.53	60.00	3.23	0.81	11.81
150	631	13.467	6.2430E-08	98.31	60.00	3.13	1.56	13.37
180	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	13.37
210	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
240	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
270		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
300		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
360		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
390		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
3.10	10.170	0.980	0.196	1.000	60	117.21
3.00	9.842	0.980	0.196	1.000	60	113.43
3.00	9.842	0.980	0.196	1.000	60	113.43
2.90	9.514	0.980	0.196	1.000	60	109.65
2.80	9.186	0.980	0.196	1.000	60	105.87
2.40	7.874	0.980	0.196	1.000	60	90.75
2.40	7.874	0.980	0.196	1.000	60	90.75
2.60	8.530	0.980	0.196	1.000	60	98.31
2.50	8.202	0.980	0.196	1.000	60	94.53
2.60	8.530	0.980	0.196	1.000	60	98.31
0.00	0.000	0.980	0.196	1.000	60	0.00
0.00	0.000	0.980	0.196	1.000	60	0.00
0.00	0.000	0.980	0.196	1.000	60	0.00
0.00	0.000	0.980	0.196	1.000	60	0.00
0.00	0.000	0.980	0.196	1.000	60	0.00
0.00	0.000	0.980	0.196	1.000	60	0.00
0.00	0.000	0.980	0.196	1.000	60	0.00

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type = diesel
K = 1 methane gas
Mg = MW = 202 g/mole
diesel Kg = 15 dsm3/1.0e6 conv factor
Mg/Kg = Cgm= 13.4667

Conversion factor ft/sec 3.2808
Bws = water vapor% (perry's)
68 = 0.003
83= 0.025
87= 0.028
108= 0.058

Temp oR 528
Temp = 68
528/Stack 1.000

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt.
Location 1640 Central Tower

Baseline Data - AFVR and Observation Wells

Date 4/4/98 Initials Rm Project # 17364

WELL IDENTIFICATION	596W06	596W11	596W17		OHM1	OHM2	596W01	596W02	596W03	
WELL DIAMETER	2"	6"	2"		2"	2"	4"	4"	4"	
WELL DEPTH (FEET)	15.20	14.65	39.35		10.0	20.0	15.0	18.35	18.85	
SCREWED (YES/NO)	No	No	No		Yes	Yes	Yes	Yes	Yes	
DEPTH TO PRODUCT (FT)	N	N	N		7.68	7.43	7.57	8.14	9.82	
DEPTH TO WATER (FT)	8.12	6.83	6.92		7.69	9.62	7.78	8.47	8.01	
PRODUCT THICKNESS (FT)	0	0	0		.01	2.19	.21	.33	1.81	
SCREEN INTERV (FT BLS)										

Water level and Vacuum Measurements - Observation Wells

N = Not observed/present

Actual Time	Elapsed Time	596W06 Water Depth	596W06 Vac "H2O	596W11 Water Depth	596W11 Vac "H2O	596W17 Water Depth	596W17 Vac "H2O	Well # Water Depth	Well # Vac "H2O	OHM1 Water Depth	OHM1 Vac "H2O	OHM2 Water Depth	OHM2 Vac "H2O	596W01 Water Depth	596W01 Vac "H2O	596W02 Water Depth	596W02 Vac "H2O	596W03 Water Depth	596W03 Vac "H2O	Water Depth	Vac "H2O	
Initial/base	0 00	8.12		6.83		6.92				7.69		9.62		7.78		8.47		8.01				
0945	0 15	8.46		7.17		7.17																
10:00	0 30	8.51	250 Gal	7.21		7.23																
10:15	0 45	8.54		7.24		7.25																
10:30	1 00	8.54	300 Gal	7.24		7.25																
10:45	1 15	8.54		7.24		7.25																
11:00	1 30	8.58		7.30		7.29																
11:15	1 45	8.68		7.35		7.34																
11:30	2 00	8.70		7.39		7.37																
12:00	2 30	8.68	FULL	7.41		7.39				10.27		9.30		8.14		8.80		8.40				
	3 00																					
	3 30																					
	4 00																					
	4 30																					
	5 00																					

Additional Comments/Observations

Note Water level measurements are depths from top of casing

MAR 31 '99 04:29PM OHM CHERRY POINT

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt.
Location 1646 Control Tower

AFVR Stack Measurements

Date 4/4/98 Initials Rm Project # 19364

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes / no	yes

Start Time 0930

Actual Time	Elapsed Time	LEL (ppm or %)	FID (ppm)	Velocity (m/sec) (ft/sec) Range 0-30	Temp (°F)	Air Flow (DCFM) <calc>	Mass Conc. C_{ppm} <calc>	Mass Conc STP C_g <calc>	TPH Removal (PMR_g) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim gals)
						Calculated From Field Data					
0930	0 00	11	1741	3.1	56°F						
0945	0 15	11	1474	3.0	59°F						
1000	0 30	5	991	3.0	62°F						
1015	0 45	5	861	2.9	65°F						
1030	1 00	5	810	2.8	68°F						
1045	1 15	5	756	2.4	68°F						
11:00	1.30	5	771	2.4	68°F						
1115	1 45	5	712	2.6	68°F						
1130	2 00	5	678	2.5	68°F						
1200	2 30	5	631	2.6	70°F						
1230	3 00										
1:00	3 30										
1:30	4 00										
	4 30										
	5 00										

Q_{std} = Flow in Std dry SCFM
PMR_g = Pollutant Mass Removal lbs/hr

Q_{std} = (60 sec/min)(1-B_{ws})(V)(A)(528°R/T_s)
PMR_g = Cg (Q_{std})(60 min/hr)

System Vacuum Measurements (Vac Truck and AFVR Wells)

Actual Time	Elapsed Time	Vac Truck (Hg)	Vac Truck (RPM)	Well (Hg)	Entrai Depth	Well (Hg)	Entrain Depth	Well (Hg)	Entrain Depth	Well (Hg)	Entrain Depth	Well (Hg)	Entrain Depth	Well (Hg)	Entrain Depth	Well (Hg)	Entrain Depth	Well (Hg)	Entrain Depth	Well (Hg)	Entrain Depth
0930	Start	12	400																		
1030	1 hr.	20	400																		
1130	2 hr.	17	500																		

Note: Record Entrainment depth of hose in feet below Top of well casing
Note: Record Vacuum from AFVR extraction wells in inches mercury

P.15
MAR 31 '99 04:30PM OHM CHERRY POINT

4/4/98

1640 Control Tower 19364 Field Notes

0930 Start. All wells on line. Hose 1 foot below product level

1000 250 gallons, OHM 1 dry

1030 500 gallons

1045 Increased RPMs' to 500 VAC at 12

1115 All wells (except OHM 1/Dry) dropped hose one additional foot.

1130 1250 gallons

1200 Truck full event stopped.

R. W. McDonald

100303

Aggressive Fluid Vapor Recovery Report

MCAS Cherry Point, North Carolina

Site Name: MCAS Cherry Point, NC
Site Location: UST 1640
Work Plan Ref: August, 1997

Incident #:
Site Priority Rank: *70/E*

Report Date:
Event #: 17
Event Date: 10/10/98

Free Prod Type Diesel

Wells Gauged:	59GW01	59GW02	59GW03	OHM 1	OHM2	59GW06	59GW11	59GW17			
Free Prod. Thickness:	1.18	2.61		0.01							
AFVR Wells Selected:	x	x		x							
Observ. Wells Selected:						x	x	x			

Event Duration: 2 hours
Stack TPH Recovery (lbs): 333.79
Stack TPH Recovery (gals): 47.08
Total Est. Fluids Rec.: 1250+ tank full

Conclusions and Recommendations: A total of approximately 333.8 pounds or 47 gallons of hydrocarbons have been removed from the site during this event.

Portable recovery systems deployed in wells: OHM 2 and 59GW03.

Prepared By:

Reviewed By:

OHM Remediation Services

Attachments: Tables 1, 2, 3, calculations

Aggressive Fluid Vapor Recovery (AFVR)
Monitoring Well Data
TABLE 1

Facility: UST 1640
MCAS Cherry Point, North Carolina

Baseline Data - AFVR and Observation Wells **Date** 10/10/98

WELL IDENTIFICATION	59GW06	59GW11	59GW17	59GW02	OHM1	OHM2	59GW03			
AFVR WELL (YES/NO)	NO	NO	NO	YES	YES	no recovery sys.	no recovery sys.			
WELL DEPTH (FT BLS)	15.2	14.65	39.35	18.35	10	20	18.85			
DIAMETER (INCH)	2	6	2	4	2	2	4			
DEPTH TO PRODUCT (FT)	N	N	N	8.11	7.88					
DEPTH TO WATER (FT)	8.34	7.09	7.21	10.72	7.89					
PRODUCT THICKNESS (FT)				2.61	0.01	0.00	0.00			
SCREEN INTERV. (FT BLS)										

Water level Measurements - Observation Wells (from TOC) N = None MeasuredObserved

Date	Elapsed Time	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20
10/10/98	0:00	8.34	7.09	7.21	10.72	7.88					
0930	0:15	8.41	7.26	7.30							
0945	0:30	8.77	7.54	7.57							
1000	0:45	8.96	7.63	7.62							
1015	1:00	9.05	7.71	7.64							
1030	1:15	9.08	7.72	7.65							
1045	1:30	9.08	7.75	7.71							
1100	1:45	9.17	7.85	7.78							
1115	2:00	9.02	7.61	7.66	9.49	10.32					
	2:30										
	3:00										
	3:30										
	4:00										
	4:30										
	5:00										

Aggressive Fluid Vapor Recovery (AFVR)
Discharge Stack Data
TABLE 2

Facility: UST 1640
MCAS Cherry Point, North Carolina

AFVR Stack Measurements **Date** 10/10/98 **Initials** _____

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes/no	yes
Start Time	915

Date	Elapsed Time	LEL (%)	FID (ppm)	Velocity (ft/sec)	Velocity (m/sec)	Temp (°F)	Air Flow (DCFM) <calc>	TPH Removal (PMRg) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
10/10/98	0:00	39%	1,957.0	62.0	18.9	50	714.5	70.54	17.6	
	0:15	39%	1,945.0	62.0	18.9	50	714.5	70.11	35.2	
	0:30	33%	5,508.0	62.0	18.9	52	714.5	198.53	84.8	
	0:45	27%	5,279.0	62.0	18.9	54	714.5	190.27	132.4	
	1:00	21%	4,664.0	62.0	18.9	54	714.5	168.11	174.4	
	1:15	17%	4,279.0	62.0	18.9	54	714.5	154.23	212.9	
	1:30	21%	4,257.0	68.0	20.7	58	783.7	168.29	255.0	
	1:45	15%	4,075.0	68.0	20.7	60	783.7	161.09	295.3	
	2:00	12%	3,895.0	68.0	20.7	60	783.7	153.98	333.8	
	2:30						0.0	0.00		
	3:00						0.0	0.00		
	3:30									1250+
	4:00									truck full
	4:30									
	5:00									
	5:30									
	6:00									

Aggressive Fluid Vapor Recovery (AFVR)
Summary of Free Product Recovery Events
TABLE 3

Facility: UST 1640

MCAS Cherry Point, North Carolina

Date: 10/10/98

Hydrocarbon = diesel

						AFVR WELLS					MONITORING WELLS				
Event #	Date	Rec Prod (lbs)	Rec Prod. (gals)	Total Cum (lbs) to date	Level (ft TOC)	59GW01	59GW02	59GW03	59PR25	59PR26	59GW06	59GW11	59GW17		
INITIAL	9/5/97	153.2	21.5	153.2	Product level	8.10	N	8.44	N	7.76	N	N	N		
					Water level	8.11	8.00	11.08	8.08	9.28	8.48	7.18	7.30		
2	9/18/97	133.8	18.8	287.0	Product level	7.95	8.33	7.95	N	7.45	N	N	N		
					Water level	8.12	8.38	8.23	7.70	10.35	8.60	7.01	7.11		
3	9/25/97	17.7	2.5	304.7	Product level	7.99	8.40	8.01	N	7.61	N	N	N		
					Water level	8.15	8.52	8.10	7.60	9.39	8.31	7.02	7.11		
4	10/2/97	12.0	1.7	316.7	Product level	7.90	8.51	7.89	N	7.45	N	N	N		
					Water level	8.02	8.65	8.20	7.44	9.80	8.20	6.43	7.05		
5	10/9/97	55.0	7.7	371.7	Product level	8.01	8.40	8.00	N	7.50	N	N	N		
					Water level	8.10	8.45	8.10	7.70	9.35	8.30	7.13	7.15		
6	10/16/97	19.0	2.8	390.7	Product level	7.91	8.49	8.13	N	7.80	N	N	N		
					Water level	8.02	8.60	8.19	7.83	9.37	8.40	7.10	7.23		
7	10/24/97	19.0	2.8	409.7	Product level	8.10	8.45	8.10	N	7.80	N	N	N		
					Water level	8.17	8.50	8.25	7.90	9.20	8.20	7.10	7.22		
8	10/29/97	14.7	2.4	424.4	Product level	8.16	8.19	8.53	N	7.86	N	N	N		
					Water level	8.30	8.23	8.68	7.75	9.32	8.46	7.18	7.3		
9	11/5/97	8.3	1.2	432.7	Product level	8.01	8.39	8.00	N	8.07	N	N	N		
					Water level	8.06	8.44	8.19	7.94	10.44	8.78	7.56	7.11		
10	11/12/97	27.8	3.9	460.5	Product level	8.39	8.83	8.54	N	8.20	N	N	N		
					Water level	8.46	8.90	8.65	8.13	9.93	8.83	7.56	7.63		
11	11/19/97	60.6	8.5	521.1	Product level	8.26	8.79	8.42	N	8.05	N	N	N		
					Water level	8.31	8.85	8.5	8	9.9	8.7	7.43	7.51		
12	11/26/97	30.4	4.3	551.5	Product level	8.29	8.83	8.45	N	8.10	N	N	N		
					Water level	8.39	8.90	8.50	8.10	9.86	8.71	7.46	7.53		

1998	→					59GW01	59GW02	59GW03	OHM1	OHM2	59GW06	59GW11	59GW17		
13	1/9/98	143.0	20.0	694.5	Product level	7.99	8.49	8.27	SHEEN	7.74	N	N	N		
					Water level	8.2	8.84	8.46	7.83	10.24	8.48	7.21	7.28		
14	2/26/99	4.8	0.7	699.3	Product level	7.12	7.72	7.54	sheen	7.27	N	N	N		
					Water level	7.8	9.63	8.1	7.38	8.84	7.87	6.58	6.72		
15	3/21/98	26.8	3.8	726.1	Product level	7.65	7.96	7.67	sheen	7.24	N	N	N		
					Water level	7.95	8.79	7.88	7.43	9.96	8	6.71	6.8		
16	4/4/98	13.4	1.9	739.4	Product level	7.57	8.14	9.82	7.68	7.43	N	N	N		
					Water level	7.78	8.47	8.01	7.69	9.62	8.12	6.83	6.92		
17	10/10/98	333.8	47.1	1073.2	Product level	7.75	8.11		7.88		N	N	N		
					Water level	8.93	10.72		7.89		8.34	7.09	7.21		

Notes: N= No product measured/observed Diesel sp gr = .85 or 7.09 lbs/gal gas sp gr = .75 or 6.25 lbs/gal

Discharge Stack Hydrocarbon Removal Calculations

Initials _____

Site = UST 1640 10/10/98

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/interv	Cumulative lbs removed
0	1957	13.467	6.2430E-08	714.54	60.00	70.54	17.63	17.63
15	1945	13.467	6.2430E-08	714.54	60.00	70.11	17.53	35.16
30	5508	13.467	6.2430E-08	714.54	60.00	198.53	49.63	84.79
45	5279	13.467	6.2430E-08	714.54	60.00	190.27	47.57	132.36
60	4664	13.467	6.2430E-08	714.54	60.00	168.11	42.03	174.39
75	4279	13.467	6.2430E-08	714.54	60.00	154.23	38.56	212.95
90	4257	13.467	6.2430E-08	783.69	60.00	168.29	42.07	255.02
105	4075	13.467	6.2430E-08	783.69	60.00	161.09	40.27	295.29
120	3895	13.467	6.2430E-08	783.69	60.00	153.98	38.49	333.79
150	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	333.79
180	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	333.79
210	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
240	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
270		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
300		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
360		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
390		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
18.90	62.000	0.980	0.196	1.000	60	714.54
18.90	62.000	0.980	0.196	1.000	60	714.54
18.90	62.000	0.980	0.196	1.000	60	714.54
18.90	62.000	0.980	0.196	1.000	60	714.54
18.90	62.000	0.980	0.196	1.000	60	714.54
18.90	62.000	0.980	0.196	1.000	60	714.54
20.73	68.000	0.980	0.196	1.000	60	783.69
20.73	68.000	0.980	0.196	1.000	60	783.69
20.73	68.000	0.980	0.196	1.000	60	783.69
0.00	0.000	0.980	0.196	1.000	60	0.00
0.00	0.000	0.980	0.196	1.000	60	0.00
0.00	0.000	0.980	0.196	1.000	60	0.00
0.00	0.000	0.980	0.196	1.000	60	0.00
0.00	0.000	0.980	0.196	1.000	60	0.00
0.00	0.000	0.980	0.196	1.000	60	0.00
0.00	0.000	0.980	0.196	1.000	60	0.00
0.00	0.000	0.980	0.196	1.000	60	0.00

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type = diesel
K = 1 methane gas
Mg = MW = 202 g/mole
diesel Kg = 15 dsm3/1.0e6 conv factor
Mg/Kg = Cgm= 13.4667

Conversion factor ft/sec 3.2808
Bws = water vapor% (perry's)
68 = 0.003
83= 0.025
87= 0.028
108= 0.058

Temp oR 528
Temp = 68
528/Stack 1.000

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt
Location Bldg. 1640 Control Tower

Baseline Data - AFVR and Observation Wells Date 10/10/98 Initials RM Project # 19364

WELL IDENTIFICATION	596W06	596W11	596W17		OHM1	OHM2	596W01	596W02	596W03	
WELL DIAMETER	2"	2"	6"		2"		4"	4"		
WELL DEPTH (FT BGS)	15.20	14.65	39.35		10.0	Recovery	15.0	18.35	Recovery	
SEAL WELL (YES/NO)	No	No	No		Yes	System	Yes	Yes	System	
DEPTH TO PRODUCT (FT)	N	N	N		7.88		7.75	8.11		
DEPTH TO WATER (FT)	8.34	7.09	7.21		7.89		8.93	10.72		
PRODUCT THICKNESS (FT)	0	0	0		.01		1.18	2.61		
SCREEN INTERV (FT BLS)										

Water level and Vacuum Measurements - Observation Wells N = Not observed/present

Actual Time	Elapsed Time	596W06 Water Depth	596W06 Vac "H_2O	596W11 Water Depth	596W11 Vac "H_2O	596W17 Water Depth	596W17 Vac "H_2O	Water Depth	Vac "H_2O	OHM1 Water Depth	OHM1 Vac "H_2O	Water Depth	Vac "H_2O	596W01 Water Depth	596W01 Vac "H_2O	596W02 Water Depth	596W02 Vac "H_2O	Water Depth	Vac "H_2O	Water Depth	Vac "H_2O
Initial/base	0 00	8.34		7.09		7.21				7.88				8.93		10.72					
0930	0 15	8.41		7.26		7.30															
0945	0 30	8.77		7.54		7.57															
1000	0 45	8.96		7.63		7.62															
1015	1 00	9.05		7.71		7.64															
1030	1 15	9.08		7.72		7.65															
1045	1 30	9.08		7.75		7.71															
1100	1 45	9.17		7.85		7.78															
1115	2 00	9.02		7.61		7.66				10.32				9.17		9.49					
1145	2 30																				
	3 00																				
	3 30																				
	4 00																				
	4 30																				
	5 00																				

Additional Comments/Observations

Note Water level measurements are depths from top of casing

No measurable sheen in VAC Truck

MAR 31 '99 04:30PM OHM CHERRY POINT

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt.
Location: Bldg 1640 Control Tower

AFVR Stack Measurements

Date 10/14/98 Initials RM Project # 19364

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes / no	yes

Start Time 0915

Actual Time	Elapsed Time	LEL (ppm or %)	FID (ppm)	Velocity FPM (m/sec) (ft/sec)	Temp (°F)	Air Flow (DCFM) <calc>	Mass Conc. C_{vm} <calc>	Mass Conc STP C_g <calc>	TPH Removal (PMR_v) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim gals)
0915	0 00	39%	1957	62	50°						
0930	0 15	39%	19.45	62	50°						
0945	0.30	33%	5508	62	52°						
1000	0 45	27%	5279	62	54°						
1015	1:00	21%	4664	62	54°						
1030	1.15	17%	4279	62	54°						
1045	1 30	21%	4257	68	58°						
1100	1:45	15%	4075	68	60°						
1115	2 00	12%	3895	68	60°						
1145	2:30										
1215	3 00										
	3 30										
	4 00										
	4 30										
	5 00										

Calculated From Field Data

Q_{std} = Flow in Std dry SCFM
PMR_v = Pollutant Mass Removal lbs/hr

Q_{std} = (60 sec/min)(1-B_{ws})(V)(A)(528°R/T_s)
PMR_v = Cg (Q_{std})(60 min/hr)

System Vacuum Measurements (Vac Truck and AFVR Wells)

Actual Time	Elapsed Time	Vac Truck (" Hg)	Vac Truck (RPM)	Well (" Hg)	Entrai Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth
0915	Start	20	400																		
1015	1 hr.	18	400																		
1045	1½ hr.	20	500																		
1115	2 hr.	18	500																		
STOP																					

Note Record Entrainment depth of hose in feet below Top of well casing
Note Record Vacuum from AFVR extraction wells in inches mercury

10/10/98

Field Notes

Bldg 1640 - Control Tower Project # 19364

0900 On site

0915 Set up. Start with hoses one foot below product level in wells OHM.1 596W01 & 596W02.

1015 650 gallons

1045 Increased RPMs to 500.

1115 Shut down event. Tank full.

R.W. McDonald
95695

MAR 31 '99 04:38PM OHM CHERRY POINT

Aggressive Fluid Vapor Recovery Report

MCAS Cherry Point, North Carolina

Site Name: MCAS Cherry Point, NC
Site Location: Tank Farm D
Work Plan Ref:

Incident #:
Site Priority Rank:

Report Date:
Event #:
Event Date: 3/3/98

Free Prod Type Diesel

Wells Gauged:	96GW31	96GW34	96GW02	96GW24	96GW05	96GW14	96GW01				
Free Prod. Thickness:				0.07							
AFVR Wells Selected:				X		X	X				
Observ. Wells Selected:	X	X	X		X						

Event Duration: 4 HOURS
Stack TPH Recovery (lbs): 51.22
Stack TPH Recovery (gals): 7.224
Total Est. Fluids Rec.: 1300

Conclusions and Recommendations: A total of approximately 51.2 pounds or 7.2 gallons of hydrocarbons have been removed from the site during this event.

Prepared By:

Reviewed By:
OHM Remediation Services

Attachments: Tables 1, 2, 3, calculations

Facility: Tank Farm D
MCAS Cherry Point, North Carolina

Aggressive Fluid Vapor Recovery (AFVR)
Monitoring Well Data
TABLE 1

Baseline Data - AFVR and Observation Wells **Date** 3/3/98

WELL IDENTIFICATION	96GW31	96GW34	96GW02	96GW24	96GW05	96GW14	96GW01			
AFVR WELL (YES/NO)	NO	NO	NO	YES	NO	YES	YES			
WELL DEPTH (FT BLS)	29.02	38.5	21.8	27.8	23.2	39.2	23.1			
DIAMETER (INCH)	2	2	4	2	4	6	4			
DEPTH TO PRODUCT (FT)	N	N	N	16.91	0.00	0.00	0.00			
DEPTH TO WATER (FT)	16.60	18.18	16.76	16.98	14.63	16.18	16.96			
PRODUCT THICKNESS (FT)				0.07						
SCREEN INTERV. (FT BLS)	23.5-26	22.5-35	10-20	15-25	10-20	13-33				

Water level Measurements - Observation Wells (from TOC) N = None MeasuredObserved

Date	Elapsed Time	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20
03/03/98	0:00	16.60	18.18	16.76	16.98	14.63	16.18	16.96			
0915	0:15	16.75	18.19	16.76		14.68					
0930	0:30	16.79	18.27	16.77		14.70					
0945	0:45	16.81	18.28	16.78		14.70					
1000	1:00	17.00	18.29	16.79		14.71					
1015	1:15	17.12	18.50	17.00		14.71					
1030	1:30	17.16	18.52	16.79		14.75					
1045	1:45	17.19	18.56	16.79		14.77					
1100	2:00	17.04	18.49	16.79		14.76					
1130	2:30	17.01	18.47	16.81		14.80					
1200	3:00	17.02	18.47	16.83		14.85					
1230	3:30	17.08	18.49	16.84		14.86					
1300	4:00	16.84	18.38	16.85	17.50	14.84	16.58	17.95			
	4:30										
	5:00										

TANK FARM D

Facility: ~~UST 1640~~

MCAS Cherry Point, North Carolina

Aggressive Fluid Vapor Recovery (AFVR)
Discharge Stack Data
TABLE 2

AFVR Stack Measurements **Date** 3/3/98 **Initials** _____

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes/no	yes
Start Time	915

Date	Elapsed Time	LEL (%)	FID (ppm)	Velocity (ft/sec) (m/sec)	Temp (°F)	Air Flow (DCFM) <calo>	TPH Removal (PMRg) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
03/03/98	0:00	0%	789.0	1.8	37	72.0	2.87	0.7	
0915	0:15	0%	0.0	1.8	37	72.0	0.00	0.7	
0930	0:30	0%	0.0	1.8	37	72.0	0.00	0.7	
0945	0:45	0%	0.0	1.8	37	72.0	0.00	0.7	
1000	1:00	5%	1,921.0	2.9	37	116.0	11.24	3.5	
1015	1:15	7%	2,325.0	2.7	39	108.0	12.67	6.7	
1030	1:30	8%	2,370.0	2.4	39	96.0	11.48	9.6	
1045	1:45	8%	2,366.0	2.1	38	84.0	10.03	12.1	
1100	2:00	8%	845.0	3.0	38	120.0	5.12	13.4	
1130	2:30	16%	4,926.0	2.4	44	96.0	23.86	25.3	
1200	3:00	14%	4,462.0	2.2	52	88.0	19.81	35.2	
1230	3:30	12%	3,823.0	2.1	60	84.0	16.20	43.3	1,300.0
1300	4:00	12%	3,744.0	2.1	60	84.0	15.87	51.2	
	4:30								
	5:00								
	5:30								
	6:00								

Aggressive Fluid Vapor Recovery (AFVR)
Summary of Free Product Recovery Events
TABLE 3

Facility: Tank Farm D

MCAS Cherry Point, North Carolina

Date: 3/3/98

Hydrocarbon = diesel

						AFVR WELLS					MONITORING WELLS				
Event #	Date	Rec Prod (lbs)	Rec Prod. (gals)	Total Cum (lbs) to date	Level (ft TOC)	96GW24	96GW14	96GW01			96GW31	96GW34	96GW02	96GW05	
INITIAL	3/3/98	51.2	7.2	51.2	Product level	16.91	0	0			N	N	N	N	
					Water level	16.98	16.18	16.96			16.6	18.18	16.76	14.63	
2					Product level										
					Water level										
3					Product level										
					Water level										
4					Product level										
					Water level										
5					Product level										
					Water level										
6					Product level										
					Water level										
7					Product level										
					Water level										
8					Product level										
					Water level										

Notes: N= No product measured/observed Diesel sp gr = .85 or 7.09 lbs/gal gas sp gr = .75 or 6.25 lbs/gal

Discharge Stack Hydrocarbon Removal Calculations

Initials _____

Site = TANK FARM D 3/3/98

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/interv	Cumulative lbs removed
0	789	13.467	6.2430E-08	72.01	60.00	2.87	0.72	0.72
15	0	13.467	6.2430E-08	72.01	60.00	0.00	0.00	0.72
30	0	13.467	6.2430E-08	72.01	60.00	0.00	0.00	0.72
45	0	13.467	6.2430E-08	72.01	60.00	0.00	0.00	0.72
60	1921	13.467	6.2430E-08	116.02	60.00	11.24	2.81	3.53
75	2325	13.467	6.2430E-08	108.02	60.00	12.67	3.17	6.69
90	2370	13.467	6.2430E-08	96.02	60.00	11.48	2.87	9.56
105	2366	13.467	6.2430E-08	84.02	60.00	10.03	2.51	12.07
120	845	13.467	6.2430E-08	120.02	60.00	5.12	1.28	13.35
150	4926	13.467	6.2430E-08	96.02	60.00	23.86	11.93	25.28
180	4462	13.467	6.2430E-08	88.02	60.00	19.81	9.91	35.19
210	3823	13.467	6.2430E-08	84.02	60.00	16.20	8.10	43.29
240	3744	13.467	6.2430E-08	84.02	60.00	15.87	7.93	51.22
270		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
300		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
360		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
390		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
1.80	5.905	0.980	0.196	1.058	60	72.01
1.80	5.905	0.980	0.196	1.058	60	72.01
1.80	5.905	0.980	0.196	1.058	60	72.01
1.80	5.905	0.980	0.196	1.058	60	72.01
2.90	9.514	0.980	0.196	1.058	60	116.02
2.70	8.858	0.980	0.196	1.058	60	108.02
2.40	7.874	0.980	0.196	1.058	60	96.02
2.10	6.890	0.980	0.196	1.058	60	84.02
3.00	9.842	0.980	0.196	1.058	60	120.02
2.40	7.874	0.980	0.196	1.058	60	96.02
2.20	7.218	0.980	0.196	1.058	60	88.02
2.10	6.890	0.980	0.196	1.058	60	84.02
2.10	6.890	0.980	0.196	1.058	60	84.02
0.00	0.000	0.980	0.196	1.058	60	0.00
0.00	0.000	0.980	0.196	1.058	60	0.00
0.00	0.000	0.980	0.196	1.058	60	0.00
0.00	0.000	0.980	0.196	1.058	60	0.00

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type = diesel
K = 1 methane gas
Mg = MW = 202 g/mole
diesel Kg = 15 dsm3/1.0e6 conv factor
Mg/Kg = Cgm= 13.4667

Conversion factor ft/sec 3.2808
Bws = water vapor% (perry's)
68 = 0.003
83= 0.025
87= 0.028
108= 0.058

Temp oR 499
Temp = 39
528/Stack 1.058

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt NC
Location Tank Farm D

AFVR Stack Measurements

Date 3/3/98 Initials Rm Project # 19559

Start Time 0900

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes / no	yes

Actual Time	Elapsed Time	LEL (ppm or %)	FID (ppm)	Velocity (in/sec) (ft/sec)	Temp (°F)	Air Flow (DCFM) <calc>	Mass Conc. C_{pm} <calc>	Mass Conc STP C_p <calc>	TPH Removal (PMR_p) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim gals)
						Calculated From Field Data					
9:00	0 00	0	789	1.8	37						
9:15	0 15	0	0	1.8	37						
9:30	0:30	0	0	1.8	37						
9:45	0 45	0	0	1.8	37						
10:00	1:00	5	1921	2.4	~~X~~ 37 Rm						
10:15	1.15	7	2325	2.7	39 Rm						
10:30	1.30	8	2370	2.4	39						
10:45	1:45	8	2366	2.1	38						
11:00	2 00	8	845	3.0	38						
11:30	2 30	16	4926	2.4	44						
12:00	3 00	14	4462	2.2	52						
12:30	3 30	12	3823	2.1	60						
13:00	4 00	12	3744	2.1	60						
	4 30										
	5 00										

Q_{std} = Flow in Std dry SCFM
PMR_p = Pollutant Mass Removal lbs/hr

Q_{std} = (60 sec/min)(1-B_{ws})(V)(A)(528°R/T_s)
PMR_p = Cg (Q_{std})(60 min/hr)

System Vacuum Measurements (Vac Truck and AFVR Wells)

Actual Time	Elapsed Time	Vac Truck (" Hg)	Vac Truck (RPM)	Well (" Hg)	Entrai Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth
0900	Start	18	400																		
10:00	1 hr.	18	400																		
10:30	1½ hr.	12	400																		
11:00	2 hr.	9	400																		
12:00	3 hr.	10	500																		
1300	4 hr.	10	500																		

Note: Record Entrainment depth of hose in feet below Top of well casing
Note: Record Vacuum from AFVR extraction wells in inches mercury

P.19
MAR 31 '99 04:32PM OHM CHERRY POINT

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt, NC
Location Tank Farm D

Baseline Data - AFVR and Observation Wells

Date 3/3/98 Initials [illegible] Project # 19559

WELL IDENTIFICATION	96GW31	96GW34	96GW02	96GW24	96GW05	96GW14	96GW01			
WELL DIAMETER	2"	2"	4"	2"	4"	6"	4"			
WELL DEPTH (FT F/TOC)	29.02	38.5	21.8	27.8	23.2	39.2	23.1			
AFVR WELL (YES/NO)	No	No	Yes	Yes	No	Yes	Yes			
DEPTH TO PRODUCT (FT)	Ø	Ø	Ø	16.91	Ø	Ø	Ø			
DEPTH TO WATER (FT)	16.6	18.18	16.76	16.98	14.63	16.18	16.96			
PRODUCT THICKNESS (FT)	Ø	Ø	Ø	.07	Ø	Ø	Ø			
SCREEN INTERV (FT BLS)	23.5-26	22.5-35	10-20	15-25	10-20	13-33				

Water level and Vacuum Measurements - Observation Wells

N = Not observed/present

Actual Time	Elapsed Time	96GW31 Water Depth	96GW31 Vac "H_2O	96GW34 Water Depth	96GW34 Vac "H_2O	96GW02 Water Depth	96GW02 Vac "H_2O	96GW24 Water Depth	96GW24 Vac "H_2O	96GW05 Water Depth	96GW05 Vac "H_2O	96GW14 Water Depth	96GW14 Vac "H_2O	96GW01 Water Depth	96GW01 Vac "H_2O	Water Depth	Vac "H_2O	Water Depth	Vac "H_2O	Water Depth	Vac "H_2O
Initial/base	0.00	16.6		18.18		16.76		16.98		14.63		16.18		16.96							
9:15	0:15	16.75		18.19		16.76				14.69											
9:30	0.30	16.77		18.27		16.77				14.7											
9:45	0:45	16.81		18.28		16.78				14.7											
10:00	1 00	17.00		18.29		16.79				14.71											
10:15	1:15	17.12		18.50		17.00				14.71											
10:30	1.30	17.16		18.52		16.79				14.75											
10:45	1:45	17.19		18.56		16.79				14.77											
11:00	2:00	17.04		18.49		16.79				14.76											
11:30	2.30	17.01		18.47		16.81				14.8											
12:00	3:00	17.02		18.47		16.83				14.85											
12:30	3:30	17.08		18.49		16.84				14.86											
13:00	4.00	16.84		18.38		16.85		17.5		14.84		16.58		17.95							
	4.30																				
	5:00																				

Additional Comments/Observations

Note. Water level measurements are depths from top of casing

MAR 31 '99 04:31PM OHM CHERRY POINT P.18

Weather: Overcast, light rain intermittently.
Standing water in ditch between railroad tracks as usual (3")
No other standing water on site.

3/3/98 0900 Startup Tank Farm D R.W. McDonnell Sr.
100303

0900 Startup 96GW24 .07 product
1st. on line 1' below product

1000 96GW14 on line 1' below H_2O level
250 Gallons in VAC TRUCK

11:00 96GW01 on line 1' below water level
500 Gallons in VAC TRUCK

11:15 VAC at 10 / 500 RPMs

12:15 Dropped 96GW14 / 96GW01 / 96GW24 1 additional foot
1000 Gallons

1300 System Shut down End Event 1300 Gallons in
VAC TRUCK
All wells locked.

R.W. McDonnell Sr.
100303

Aggressive Fluid Vapor Recovery Report

MCAS Cherry Point, North Carolina

Site Name: MCAS Cherry Point, NC **Incident #:**
Site Location: Tank Farm D ***Site Priority Rank:***
Work Plan Ref:

Report Date:
Event #:
Event Date: 4/3/98

Free Prod Type Diesel

Wells Gauged:	96GW31	96GW34	96GW02	96GW24	96GW05	96GW14	96GW01				
Free Prod. Thickness:						0.2					
AFVR Wells Selected:						X					
Observ. Wells Selected:	X	X	X	X	X		X				

Event Duration: 3 HOURS
Stack TPH Recovery (lbs): 10.71
Stack TPH Recovery (gals): 1.51
Total Est. Fluids Rec.: 1000+

Conclusions and Recommendations: A total of approximately 10.71 pounds or 1.5 gallons of hydrocarbons have been removed from the site during this event.

Prepared By:

Reviewed By:

OHM Remediation Services

Attachments: Tables 1, 2, 3, calculations

Aggressive Fluid Vapor Recovery (AFVR)
Discharge Stack Data
TABLE 2

Facility: TANK FARM D
MCAS Cherry Point, North Carolina

AFVR Stack Measurements **Date** 4/3/98 **Initials** _____

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes/no	yes
Start Time	845

Date	Elapsed Time	LEL (%)	FID (ppm)	Velocity (ft/sec) (m/sec)	Temp (°F)	Air Flow (DCFM) <calc>	TPH Removal (PMRg) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
04/03/98	0:00	0%	702.0	1.8	62	72.0	2.55	0.6	
0900	0:15	12%	1,274.0	1.8	63	72.0	4.63	1.8	
0915	0:30	13%	1,104.0	1.7	64	68.0	3.79	2.7	
0930	0:45	12%	839.0	1.7	64	68.0	2.88	3.5	
0945	1:00	12%	745.0	1.7	64	68.0	2.56	4.1	
1000	1:15	12%	684.0	1.8	64	72.0	2.48	4.7	
1015	1:30	12%	981.0	1.6	65	64.0	3.17	5.5	
1030	1:45	12%	1,087.0	1.7	68	68.0	3.73	6.4	
1045	2:00	12%	910.0	1.6	70	64.0	2.94	7.2	
1115	2:30	12%	945.0	1.7	70	68.0	3.24	8.8	
1145	3:00	23%	1,112.0	1.7	70	68.0	3.82	10.7	
	3:30					0.0	0.00		1,300.0
	4:00					0.0	0.00		
	4:30								
	5:00								
	5:30								
	6:00								

Aggressive Fluid Vapor Recovery (AFVR)
Summary of Free Product Recovery Events
TABLE 3

Facility: Tank Farm D

MCAS Cherry Point, North Carolina

Date: 4/3/98

Hydrocarbon = diesel

						AFVR WELLS					MONITORING WELLS				
Event #	Date	Rec Prod (lbs)	Rec Prod. (gals)	Total Cum (lbs) to date	Level (ft TOC)	96GW24	96GW14	96GW01			96GW31	96GW34	96GW02	96GW05	
INITIAL	3/3/98	51.2	7.2	51.2	Product level	16.91	0	0			N	N	N	N	
					Water level	16.98	16.18	16.96			16.6	18.18	16.76	14.63	
2	4/3/98	10.7	1.5	61.9	Product level		16.48				N	N	N	N	
					Water level	17.62	16.68	17.17			17.33	18.89	16.47	14.95	
3					Product level										
					Water level										
4					Product level										
					Water level										
5					Product level										
					Water level										
6					Product level										
					Water level										
7					Product level										
					Water level										
8					Product level										
					Water level										

Notes: N= No product measured/observed Diesel sp gr = .85 or 7.09 lbs/gal gas sp gr = .75 or 6.25 lbs/gal

Discharge Stack Hydrocarbon Removal Calculations

Initials _____

Site = TANK FARM D 4/3/98

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/interv	Cumulative lbs removed
0	702	13.467	6.2430E-08	72.01	60.00	2.55	0.64	0.64
15	1274	13.467	6.2430E-08	72.01	60.00	4.63	1.16	1.79
30	1104	13.467	6.2430E-08	68.01	60.00	3.79	0.95	2.74
45	839	13.467	6.2430E-08	68.01	60.00	2.88	0.72	3.46
60	745	13.467	6.2430E-08	68.01	60.00	2.56	0.64	4.10
75	684	13.467	6.2430E-08	72.01	60.00	2.48	0.62	4.72
90	981	13.467	6.2430E-08	64.01	60.00	3.17	0.79	5.51
105	1087	13.467	6.2430E-08	68.01	60.00	3.73	0.93	6.45
120	910	13.467	6.2430E-08	64.01	60.00	2.94	0.73	7.18
150	945	13.467	6.2430E-08	68.01	60.00	3.24	1.62	8.80
180	1112	13.467	6.2430E-08	68.01	60.00	3.82	1.91	10.71
210	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	10.71
240	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	10.71
270		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
300		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
360		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
390		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
1.80	5.905	0.980	0.196	1.058	60	72.01
1.80	5.905	0.980	0.196	1.058	60	72.01
1.70	5.577	0.980	0.196	1.058	60	68.01
1.70	5.577	0.980	0.196	1.058	60	68.01
1.70	5.577	0.980	0.196	1.058	60	68.01
1.80	5.905	0.980	0.196	1.058	60	72.01
1.60	5.249	0.980	0.196	1.058	60	64.01
1.70	5.577	0.980	0.196	1.058	60	68.01
1.60	5.249	0.980	0.196	1.058	60	64.01
1.70	5.577	0.980	0.196	1.058	60	68.01
1.70	5.577	0.980	0.196	1.058	60	68.01
0.00	0.000	0.980	0.196	1.058	60	0.00
0.00	0.000	0.980	0.196	1.058	60	0.00
0.00	0.000	0.980	0.196	1.058	60	0.00
0.00	0.000	0.980	0.196	1.058	60	0.00
0.00	0.000	0.980	0.196	1.058	60	0.00
0.00	0.000	0.980	0.196	1.058	60	0.00

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type = diesel
K = 1 methane gas
Mg = MW = 202 g/mole
diesel Kg = 15 dsm3/1.0e6 conv factor
Mg/Kg = Cgm= 13.4667

Conversion factor ft/sec 3.2808
Bws = water vapor% (perry's)
68 = 0.003
83= 0.025
87= 0.028
108= 0.058

Temp oR 499
Temp = 39
528/Stack 1.058

Discharge Stack Hydrocarbon Removal Calculations

Initials _____

Site =

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/interv	Cumulative lbs removed
0	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
15	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
30	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
45	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
60	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
75	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
90	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
105	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
120	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
150	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
180	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
210	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
240	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
0.00	0.000	0.980	0.196	0.978	60	0.00
0.00	0.000	0.980	0.196	0.978	60	0.00
0.00	0.000	0.980	0.196	0.978	60	0.00
0.00	0.000	0.980	0.196	0.978	60	0.00
0.00	0.000	0.980	0.196	0.978	60	0.00
0.00	0.000	0.980	0.196	0.978	60	0.00
0.00	0.000	0.980	0.196	0.978	60	0.00
0.00	0.000	0.980	0.196	0.978	60	0.00
0.00	0.000	0.980	0.196	0.978	60	0.00
0.00	0.000	0.980	0.196	0.978	60	0.00
0.00	0.000	0.980	0.196	0.978	60	0.00
0.00	0.000	0.980	0.196	0.978	60	0.00
0.00	0.000	0.980	0.196	0.978	60	0.00

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type =		diesel fuel	
	K = 1	methane gas	
Mg =	MW =	202	g/mole
diesel	Kg =	15	dsm3/1.0e6 conv factor
Mg/Kg =	Cgm=	13.466667	

Conversion factor ft/sec	3.2808	Temp oR	540
Bws = water vapor%	(perry's)	Temp =	80
68 =	0.003	528/Stack T	0.978
83=	0.025		
87=	0.028		
108=	0.058		

Aggressive Fluid Vapor ...very (AFVR) Data Sheet

Facility Cherry Pt
Location Tank Farm D

Baseline Data - AFVR and Observation Wells

Date 4/3/98 Initials RM Project # 19559

WELL IDENTIFICATION	96GW31	96GW34	96GW02	96GW24	96GW05	96GW14	96GW01			
WELL DIAMETER	2"	2"	4"	2"	4"	6"	4"			
WELL DEPTH (FT/BOL)	29.02	38.5	21.8	27.8	23.2	39.2	23.1			
SLOTTED WELL (YES/NO)	NO	NO	NO	NO	NO	Yes	NO			
DEPTH TO PRODUCT (FT)	N	N	N	N	N RM	16.48	N			
DEPTH TO WATER (FT)	17.33	18.89	16.47	17.62	~~16.47~~ 14.95	16.68	17.17			
PRODUCT THICKNESS (FT)	Ø	Ø	Ø	Ø	Ø	.20	Ø			
SCREEN INTERV (FT BLS)										

Water level and Vacuum Measurements - Observation Wells

N = Not observed/present

Actual Time	Elapsed Time	96GW31 Water Depth	96GW31 Vac "H2O	96GW34 Water Depth	96GW34 Vac "H2O	96GW02 Water Depth	96GW02 Vac "H2O	96GW24 Water Depth	96GW24 Vac "H2O	96GW05 Water Depth	96GW05 Vac "H2O	96GW14 Water Depth	96GW14 Vac "H2O	96GW01 Water Depth	96GW01 Vac "H2O	Water Depth	Vac "H2O	Water Depth	Vac "H2O	Water Depth	Vac "H2O
Initial/Base	0 00	17.33		18.89		16.47		17.62		14.95		16.68		17.17							
0900	0 15	17.33		18.89		16.47		17.74		14.95				17.17							
0915	0 30	17.68		19.01		16.47		17.92		14.98				17.20							
0930	0 45	17.83		19.26		16.47		18.06		15.09				17.27							
0945	1 00	17.85	5" Hg	19.29		16.47		18.08		15.05				17.29							
1000	1 15	17.88		19.34		16.47		18.10		15.07				17.31							
1015	1 30	17.91		19.37		16.47		18.13		15.08				17.33							
1030	1 45	17.97		19.31		16.47		18.16		15.08				17.36							
1045	2 00	18.00	10" Hg	19.39		16.47		18.17		15.09				17.36							
1115	2 30	18.03		19.41		16.47		18.21		15.10				17.38							
1145	3 00	18.05	19" Hg	19.45		16.47		18.23		15.11				17.40							
1210	3 30		0"								*	17.05									
~~1230~~	4 00																				
	4 30																				
	5 00																				

Additional Comments/Observations

Note Water level measurements are depths from top of casing

* Sheen on 96GW14 at end of event on Final gauging

MAR 31 '99 04:32PM OHM CHERRY POINT

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility: Cherry Pt
Location: Tank Farm D

AFVR Stack Measurements

Date: 4/3/98 Initials: Rmm Project #: 19559

Start Time: 0845

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes / no	yes

Actual Time	Elapsed Time	I.E. (ppm or %)	FID (ppm)	Velocity (in/sec) (ft/sec) Range @ 30	Temp (°F)	Air Flow (DCFM) <calc>	Mass Conc. C_{ppm} <calc>	Mass Conc STP C_g <calc>	TPH Removal (PMR_u) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim gals)
						Calculated From Field Data					
0845	0 00	0	702	1.8	62°F						
0900	0 15	12	1274	1.8	63°F						
0915	0 30	13	1104	1.7	64°F						
0930	0 45	12	839	1.7	64°F						
0945	1 00	12	745	1.7	64°F						
1000	1 15	12	684	1.8	64°F						
1030	1 30	12	981	1.6	65°F						
1030	1.45	12	1087	1.7	68°F						
1045	2 00	12	910	1.6	70°F						
1115	2 30	12	945	1.7	70°F						
1145	3 00	23	1112	1.7	70°F						
1215	3 30										
	4 00										
	4 30										
	5 00										

Q_{std} = Flow in Std dry SCFM
PMR_u = Pollutant Mass Removal lbs/hr

Q_{std} = (60 sec/min)(1-B_{ws})(V)(A)(528°R/T_s)
PMR_u = Cg (Q_{std})(60 min/hr)

System Vacuum Measurements (Vac Truck and AFVR Wells)

Actual Time	Elapsed Time	Vac Truck (" Hg)	Vac Truck (RPM)	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth
Start	0	18	500																		
0945	1 hr.	18	500																		
1045	2 hr.	18	500																		
1145	3 hr.	18	500																		

Note: Record Entrainment depth of hose in feet below Top of well casing
Note: Record Vacuum from AFVR extraction wells in inches water

MAR 31 '99 04:33PM OHM CHERRY POINT

4/3/98 Tank Farm D 19559

0845 Start time. Hose 1 foot below product level

0945 500 gallons

1015 Dropped hose 1 additional foot

1045 1000 gallons

1130 Dropped hose 3 additional feet to jam well (23LE 1174 PP

1145 Truck full. Stop event

R. W. McDonald

100303

Aggressive Fluid Vapor Recovery Report

MCAS Cherry Point, North Carolina

Site Name: MCAS Cherry Point, NC **Incident #:**
Site Location: Bldg 296 ***Site Priority Rank:***
Work Plan Ref:

Report Date:
Event #:
Event Date: 3/5/98

Free Prod Type Diesel

Wells Gauged:	65GW25	65GW22	65GW23	65GW32	65GW04	65GW05	65GW06				
Free Prod. Thickness:					1.37		1.56				
AFVR Wells Selected:					X	X	X				
Observ. Wells Selected:	X	X	X	X							

Event Duration: 4 HOURS
Stack TPH Recovery (lbs): 9.52
Stack TPH Recovery (gals): 1.342
Total Est. Fluids Rec.: 600

Conclusions and Recommendations: A total of approximately 13.9 pounds or 1.9 gallons of hydrocarbons have been removed from the site during this event.

Prepared By:

Reviewed By:

OHM Remediation Services

Attachments: Tables 1, 2, 3, calculations

Aggressive Fluid Vapor Recovery (AFVR)
Monitoring Well Data
TABLE 1

Facility: Bldg 296
MCAS Cherry Point, North Carolina

Baseline Data - AFVR and Observation Wells **Date** 3/5/98

WELL IDENTIFICATION	65GW25	65GW22	65GW23	65GW32	65GW04	65GW05	65GW06			
AFVR WELL (YES/NO)	NO	NO	NO	NO	YES	YES	YES			
WELL DEPTH (FT BLS)	17.66	17.3	16.8	16.45	21.4	21.4	19.2			
DIAMETER (INCH)	2	2	2	2	2	2	2			
DEPTH TO PRODUCT (FT)	N	N	N	0.00	11.82	0.00	11.80			
DEPTH TO WATER (FT)	9.74	9.20	9.21	9.23	13.19	11.65	13.36			
PRODUCT THICKNESS (FT)					1.37		1.56			
SCREEN INTERV. (FT BLS)										

Water level Measurements - Observation Wells (from TOC) N = None MeasuredObserved

Date	Elapsed Time	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20
03/05/98	0:00	9.74	9.20	9.21	9.23	13.19	11.65	13.36			
1315	0:15	9.83	9.30	9.36	9.42		12.02				
1330	0:30	9.83	9.30	9.38	9.43		12.01				
1345	0:45	9.84	9.33	9.39	9.44		12.06				
1400	1:00	9.85	9.35	9.39	9.45		12.08				
1415	1:15	9.86	9.33	9.41	9.45		12.09				
1430	1:30	9.86	9.34	9.40	9.46		12.09				
1445	1:45	9.86	9.35	9.40	9.35		12.10				
1500	2:00	9.88	9.35	9.46	9.42		12.11				
1530	2:30	9.88	9.37	9.41	9.46		12.11				
1600	3:00	9.88	9.37	9.41	9.47		12.11				
1630	3:30	9.88	9.37	9.41	9.47		12.12				
1700	4:00	9.85	9.36	9.38	9.37	12.37	11.98	12.61			
	4:30										
	5:00										

Aggressive Fluid Vapor Recovery (AFVR)
Discharge Stack Data
TABLE 2

Facility: Bldg 296
MCAS Cherry Point, North Carolina

AFVR Stack Measurements **Date** 3/5/98 **Initials** _____

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes/no	yes
Start Time	845

Date	Elapsed Time	LEL (%)	FID (ppm)	Velocity (ft/sec)	(m/sec)	Temp (°F)	Air Flow (DCFM) <calc>	TPH Removal (PMRg) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
03/05/98	0:00	5%	1,811.0		1.3	61	49.9	4.56	1.1	
1315	0:15	5%	1,312.0		2.1	61	80.6	5.34	2.5	
1330	0:30	5%	701.0		2.3	60	88.3	3.12	3.3	
1345	0:45	4%	612.0		2.3	60	88.3	2.73	3.9	
1400	1:00	0%	676.0		2.3	60	88.3	3.01	4.7	
1415	1:15	0%	879.0		2.0	60	76.8	3.40	5.5	
1430	1:30	0%	535.0		1.8	60	69.1	1.86	6.0	
1445	1:45	0%	529.0		2.0	60	76.8	2.05	6.5	
1500	2:00	0%	386.0		2.1	58	80.6	1.57	6.9	
1530	2:30	0%	365.0		2.1	56	80.6	1.48	7.7	
1600	3:00	0%	333.0		2.1	54	80.6	1.35	8.3	
1630	3:30	0%	316.0		2.1	54	80.6	1.29	9.0	600.0
1700	4:00	0%	267.0		2.1	53	80.6	1.09	9.5	
	4:30									
	5:00									
	5:30									
	6:00									

Aggressive Fluid Vapor Recovery (AFVR)
Summary of Free Product Recovery Events
TABLE 3

Facility: Bldg 296

MCAS Cherry Point, North Carolina

Date: 3/5/98

Hydrocarbon = diesel

						AFVR WELLS					MONITORING WELLS				
Event #	Date	Rec Prod (lbs)	Rec Prod. (gals)	Total Cum (lbs) to date	Level (ft TOC)	65GW04	65GW05	65GW06			65GW25	65GW22	65GW23	65GW32	
INITIAL	7/1/98	56.5	7.9	56.5	Product level	12.86	12.65	12.91							
					Water level	14.18	12.93	13.78			10.81	10.21	10.26	10.23	
2	4/6/98	10.4	1.4	57.9	Product level	12.29	12.02	12.33							
					Water level	12.94	12.05	12.63			10.15	9.57	9.59	9.59	
3	3/22/98	13.9	1.9	59.8	Product level	11.86		12							
					Water level	13.23	11.69	12.23			9.82	9.23	9.26	9.27	
4	3/5/98	9.5	1.3	61.1	Product level	11.82		11.8							
					Water level	13.19	11.65	13.36			9.74	9.2	9.21	9.23	
5					Product level										
					Water level										
6					Product level										
					Water level										
7					Product level										
					Water level										
8					Product level										
					Water level										

Notes: N= No product measured/observed Diesel sp gr = .85 or 7.09 lbs/gal gas sp gr = .75 or 6.25 lbs/gal

Discharge Stack Hydrocarbon Removal Calculations

Initials _____

Site = Bldg 296 3/5/98

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/interv	Cumulative lbs removed
0	1811	13.467	6.2430E-08	49.91	60.00	4.56	1.14	1.14
15	1312	13.467	6.2430E-08	80.62	60.00	5.34	1.33	2.47
30	701	13.467	6.2430E-08	88.30	60.00	3.12	0.78	3.25
45	612	13.467	6.2430E-08	88.30	60.00	2.73	0.68	3.94
60	676	13.467	6.2430E-08	88.30	60.00	3.01	0.75	4.69
75	879	13.467	6.2430E-08	76.78	60.00	3.40	0.85	5.54
90	535	13.467	6.2430E-08	69.11	60.00	1.86	0.47	6.01
105	529	13.467	6.2430E-08	76.78	60.00	2.05	0.51	6.52
120	386	13.467	6.2430E-08	80.62	60.00	1.57	0.39	6.91
150	365	13.467	6.2430E-08	80.62	60.00	1.48	0.74	7.65
180	333	13.467	6.2430E-08	80.62	60.00	1.35	0.68	8.33
210	316	13.467	6.2430E-08	80.62	60.00	1.29	0.64	8.97
240	267	13.467	6.2430E-08	80.62	60.00	1.09	0.54	9.52
270		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
300		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
360		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
390		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
1.30	4.265	0.980	0.196	1.015	60	49.91
2.10	6.890	0.980	0.196	1.015	60	80.62
2.30	7.546	0.980	0.196	1.015	60	88.30
2.30	7.546	0.980	0.196	1.015	60	88.30
2.30	7.546	0.980	0.196	1.015	60	88.30
2.00	6.562	0.980	0.196	1.015	60	76.78
1.80	5.905	0.980	0.196	1.015	60	69.11
2.00	6.562	0.980	0.196	1.015	60	76.78
2.10	6.890	0.980	0.196	1.015	60	80.62
2.10	6.890	0.980	0.196	1.015	60	80.62
2.10	6.890	0.980	0.196	1.015	60	80.62
2.10	6.890	0.980	0.196	1.015	60	80.62
2.10	6.890	0.980	0.196	1.015	60	80.62
0.00	0.000	0.980	0.196	1.015	60	0.00
0.00	0.000	0.980	0.196	1.015	60	0.00
0.00	0.000	0.980	0.196	1.015	60	0.00
0.00	0.000	0.980	0.196	1.015	60	0.00

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type = diesel
K = 1 methane gas
Mg = MW = 202 g/mole
diesel Kg = 15 dsm3/1.0e6 conv factor
Mg/Kg = Cgm= 13.4667

Conversion factor ft/sec	3.2808	Temp oR	520
Bws = water vapor%	(perry's)	Temp =	60
68 =	0.003	528/Stack	1.015
83=	0.025		
87=	0.028		
108=	0.058		

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt NC
Location 296

Baseline Data - AFVR and Observation Wells

Date 3/5/98 Initials Am Project # 19364

WELL IDENTIFICATION	65GW25	65GW22	65GW23	65GW32		65GW04	65GW05	65GW06		
WELL DIAMETER	2"	2"	2"	2"		2"	2"	2"		
WELL DEPTH (FT F/TOC)	17.66	17.30	16.80	16.45		21.40	21.40	19.20		
AFVR WELL (YES/NO)	No	No	No	No		Yes	Yes	Yes		
DEPTH TO PRODUCT (FT)	Ø	Ø	Ø	Ø		11.82	Ø	11.8		
DEPTH TO WATER (FT)	9.74	9.2	9.21	9.23		13.19	11.65	13.36		
PRODUCT THICKNESS (FT)	Ø	Ø	Ø	Ø		1.37	Ø	2.56		
SCREEN INTERV (FT BLS)										

Water level and Vacuum Measurements - Observation Wells

N = Not observed/present

Actual Time	Elapsed Time	65GW25 Water Depth	65GW25 Vac " H_2O	65GW22 Water Depth	65GW22 Vac " H_2O	65GW23 Water Depth	65GW23 Vac " H_2O	65GW32 Water Depth	65GW32 Vac " H_2O	Water Depth	Vac " H_2O	65GW04 Water Depth	65GW04 Vac " H_2O	65GW05 Water Depth	65GW05 Vac " H_2O	65GW06 Water Depth	65GW06 Vac " H_2O	Water Depth	Vac " H_2O	Water Depth	Vac " H_2O
Initial/base	0 00	9.74		9.2		9.21		9.23				13.19		11.65		13.36					
1315	0.15	9.83		9.3		9.36		9.42						12.02							
1330	0:30	9.83		9.3		9.38		9.43						12.01							
1345	0:45	9.84		9.33		9.39		9.44						12.06							
1400	1:00	9.85		9.35		9.39		9.45						12.08							
1415	1:15	9.86		9.33		9.41		9.45						12.09							
1430	1:30	9.86		9.34		9.40		9.46						12.09							
1445	1:45	9.86		9.35		9.4		9.35						12.1							
1500	2.00	9.88		9.35		9.46		9.42						12.11							
1530	2.30	9.88		9.37		9.41		9.46						12.11							
1600	3:00	9.88		9.37		9.41		9.47						12.11							
1630	3:30	9.88		9.37		9.41		9.42						12.12							
1700	4.00	9.85		9.36		9.38		9.37				12.37		11.98		12.61					
	4:30																				
	5.00																				

Additional Comments/Observations

Note: Water level measurements are depths from top of casing

MAR 31 '99 04:36PM OHM CHERRY POINT P.28

Aggressive Fluid Vapor R. .very (AFVR) Data Sheet

Facility Cherry Pt NC
Location 296

AFVR Stack Measurements

Date 3/5/98 Initials RM Project # 19364

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes / no	yes

Start Time 1300

Actual Time	Elapsed Time	LEL (ppm or %)	FID (ppm)	Velocity (m/sec) (ft/sec)	Temp (°F)	Air Flow (DCFM) <calc>	Mass Conc. C_{ppm} <calc>	Mass Conc STP C_g <calc>	TPH Removal (PMR_u) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim gals)
						Calculated From Field Data					
1300	0 00	5	1811	1.3	61						
1315	0 15	5	1312	2.1	61						
1330	0.30	5	701	2.3	60						
1345	0 45	4	612	2.3	60						
14:00	1:00	0	676	2.3	60						
14:15	1.15	0	879	2.0	60						
14:30	1:30	0	535	1.8	60						
14:45	1:45	0	527	2.0	60						
15:00	2.00	0	386	2.1	58						
15:30	2:30	0	365	2.1	56						
16:00	3 00	0	333	2.1	54						
16:30	3 30	0	316	2.1	54						
1700	4:00	0	267	2.1	53						
	4 30										
	5 00										

Q_{std} = Flow in Std dry SCFM
PMR_u = Pollutant Mass Removal lbs/hr

Q_{std} = (60 sec/min)(1-B_{ws})(V)(A)(528°R/T_s)
PMR_u = Cg (Q_{std})(60 min/hr)

System Vacuum Measurements (Vac Truck and AFVR Wells)

Actual Time	Elapsed Time	Vac Truck (" Hg)	(RPM)	Well (" Hg)	Entrai Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth	Well (" Hg)	Entrain Depth
1300	Start	20	400																		
1400	1 hr.	14	400																		
1500	2 hr.	12	400																		
1600	3 hr.	12	400																		
1700	4 hr.	12	400																		

Note: Record Entrainment depth of hose in feet below Top of well casing
Note: Record Vacuum from AFVR extraction wells in inches mercury

MAR 31 '99 04:36PM OHM CHERRY POINT P.29

296 Project 19364 R.W. McDonnell Sr.

100303

3/5/98

Weather: Sunny / Cloudy / Windy 10-25 Knots gusting.

1300 Startup. Wells 65GW04 & 65GW06 on line 1 Foot below product No product found in 65GW05

1400 100 gallons in VAC Truck

1500 250 gallons in VAC Truck

1600 500 gallons in VAC Truck

1700 600 gallons in VAC Truck

System Shut down All wells locked

R.W. McDonnell Sr.

100303

Aggressive Fluid Vapor Recovery Report

MCAS Cherry Point, North Carolina

Site Name: MCAS Cherry Point, NC **Incident #:**
Site Location: Bldg 296 ***Site Priority Rank:***
Work Plan Ref:

Report Date:
Event #:
Event Date: 3/22/98

Free Prod Type Diesel

Wells Gauged:	65GW25	65GW22	65GW23	65GW32	65GW04	65GW05	65GW06				
Free Prod. Thickness:					1.37		0.23				
AFVR Wells Selected:					X		X				
Observ. Wells Selected:	X	X	X	X		X					

Event Duration: 4 HOURS
Stack TPH Recovery (lbs): 13.91
Stack TPH Recovery (gals): 1.962
Total Est. Fluids Rec.: 600

Conclusions and Recommendations: A total of approximately 13.9 pounds or 1.9 gallons of hydrocarbons have been removed from the site during this event.

Prepared By:

Reviewed By:

OHM Remediation Services

Attachments: Tables 1, 2, 3, calculations

Facility: Bldg 296
MCAS Cherry Point, North Carolina

Aggressive Fluid Vapor Recovery (AFVR)
Monitoring Well Data
TABLE 1

Baseline Data - AFVR and Observation Wells **Date** 3/22/98

WELL IDENTIFICATION	65GW25	65GW22	65GW23	65GW32	65GW04	65GW05	65GW06			
AFVR WELL (YES/NO)	NO	NO	NO	NO	YES	NO	YES			
WELL DEPTH (FT BLS)	17.66	17.3	16.8	16.45	21.4	21.4	19.2			
DIAMETER (INCH)	2	2	2	2	2	2	2			
DEPTH TO PRODUCT (FT)	N	N	N	0.00	11.86	0.00	12.00			
DEPTH TO WATER (FT)	9.82	9.23	9.26	9.59	13.23	11.69	12.23			
PRODUCT THICKNESS (FT)					1.37		0.23			
SCREEN INTERV. (FT BLS)										

Water level Measurements - Observation Wells (from TOC) N = None MeasuredObserved

Date	Elapsed Time	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20
03/22/98	0:00	9.82	9.23	9.26	9.27	13.23	11.69	12.23			
1000	0:15	9.89	9.31	9.34	9.33		11.84				
1015	0:30	9.91	9.35	9.42	9.44		11.96				
1030	0:45	9.98	9.33	9.45	9.45		12.04				
1045	1:00	9.94	9.41	9.45	9.45		12.07				
1100	1:15	9.95	9.41	9.46	9.48		12.12				
1115	1:30	9.95	9.42	9.46	9.48		12.12				
1130	1:45	9.96	9.40	9.47	9.49		12.12				
1145	2:00	9.96	9.43	9.47	9.49		12.14				
1215	2:30	93.98	9.43	9.47	9.50		12.23				
1245	3:00	10.00	9.45	9.54	9.51		12.23				
1315	3:30	10.01	9.45	9.60	9.53		12.23				
1345	4:00	10.03	9.49	9.63	9.58		12.32				
	4:30	10.08	9.58	9.75	9.72	14.23	12.60	12.79			
	5:00										

Aggressive Fluid Vapor Recovery (AFVR)
Discharge Stack Data
TABLE 2

Facility: Bldg 296
MCAS Cherry Point, North Carolina

AFVR Stack Measurements **Date** 3/22/98 **Initials** _____

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes/no	yes
Start Time	845

Date	Elapsed Time	LEL (%)	FID (ppm)	Velocity (ft/sec)	(m/sec)	Temp (°F)	Air Flow (DCFM) <calc>	TPH Removal (PMRg) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
03/22/98	0:00	8%	1,858.0		2.6	50	99.1	9.28	2.3	
0900	0:15	5%	1,813.0		2.6	50	99.1	9.06	4.6	
0915	0:30	5%	1,509.0		1.9	51	72.4	5.51	6.0	
0930	0:45	5%	1,083.0		2.2	57	83.8	4.58	7.1	
0945	1:00	5%	870.0		2.7	59	102.9	4.51	8.2	
1000	1:15	5%	688.0		2.4	62	91.4	3.17	9.0	
1015	1:30	5%	655.0		2.6	64	99.1	3.27	9.8	
1030	1:45	4%	546.0		2.2	64	83.8	2.31	10.4	
1045	2:00	4%	512.0		2.4	64	91.4	2.36	11.0	
1115	2:30	4%	585.0		2.3	64	87.6	2.59	12.3	
1145	3:00	4%	428.0		2.2	64	83.8	1.81	13.2	
1215	3:30	1%	101.0		2.1	65	80.0	0.41	13.4	600.0
1245	4:00	1%	213.0		2.4	68	91.4	0.98	13.9	
1315	4:30									
1345	5:00									
	5:30									
	6:00									

Facility: Bldg 296

MCAS Cherry Point, North Carolina

Date: 3/22/98

Aggressive Fluid Vapor Recovery (AFVR)
Summary of Free Product Recovery Events
TABLE 3

Hydrocarbon = diesel

						AFVR WELLS					MONITORING WELLS				
Event #	Date	Rec Prod (lbs)	Rec Prod. (gals)	Total Cum (lbs) to date	Level (ft TOC)	65GW04	65GW05	65GW06			65GW25	65GW22	65GW23	65GW32	
INITIAL	7/1/98	56.5	7.9	56.5	Product level	12.86	12.65	12.91							
					Water level	14.18	12.93	13.78			10.81	10.21	10.26	10.23	
2	4/6/98	10.4	1.4	57.9	Product level	12.29	12.02	12.33							
					Water level	12.94	12.05	12.63			10.15	9.57	9.59	9.59	
3	3/22/98	13.9	1.9	59.8	Product level	11.86		12							
					Water level	13.23	11.69	12.23			9.82	9.23	9.26	9.27	
4					Product level										
					Water level										
5					Product level										
					Water level										
6					Product level										
					Water level										
7					Product level										
					Water level										
8					Product level										
					Water level										

Notes: N= No product measured/observed Diesel sp gr = .85 or 7.09 lbs/gal gas sp gr = .75 or 6.25 lbs/gal

Discharge Stack Hydrocarbon Removal Calculations

Initials _____

Site = Bldg 296 3/22/98

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/interv	Cumulative lbs removed
0	1858	13.467	6.2430E-08	99.06	60.00	9.28	2.32	2.32
15	1813	13.467	6.2430E-08	99.06	60.00	9.06	2.26	4.59
30	1509	13.467	6.2430E-08	72.39	60.00	5.51	1.38	5.96
45	1083	13.467	6.2430E-08	83.82	60.00	4.58	1.14	7.11
60	870	13.467	6.2430E-08	102.87	60.00	4.51	1.13	8.24
75	688	13.467	6.2430E-08	91.44	60.00	3.17	0.79	9.03
90	655	13.467	6.2430E-08	99.06	60.00	3.27	0.82	9.85
105	546	13.467	6.2430E-08	83.82	60.00	2.31	0.58	10.43
120	512	13.467	6.2430E-08	91.44	60.00	2.36	0.59	11.02
150	585	13.467	6.2430E-08	87.63	60.00	2.59	1.29	12.31
180	428	13.467	6.2430E-08	83.82	60.00	1.81	0.90	13.21
210	101	13.467	6.2430E-08	80.01	60.00	0.41	0.20	13.42
240	213	13.467	6.2430E-08	91.44	60.00	0.98	0.49	13.91
270		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
300		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
360		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
390		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
2.60	8.530	0.980	0.196	1.008	60	99.06
2.60	8.530	0.980	0.196	1.008	60	99.06
1.90	6.234	0.980	0.196	1.008	60	72.39
2.20	7.218	0.980	0.196	1.008	60	83.82
2.70	8.858	0.980	0.196	1.008	60	102.87
2.40	7.874	0.980	0.196	1.008	60	91.44
2.60	8.530	0.980	0.196	1.008	60	99.06
2.20	7.218	0.980	0.196	1.008	60	83.82
2.40	7.874	0.980	0.196	1.008	60	91.44
2.30	7.546	0.980	0.196	1.008	60	87.63
2.20	7.218	0.980	0.196	1.008	60	83.82
2.10	6.890	0.980	0.196	1.008	60	80.01
2.40	7.874	0.980	0.196	1.008	60	91.44
0.00	0.000	0.980	0.196	1.008	60	0.00
0.00	0.000	0.980	0.196	1.008	60	0.00
0.00	0.000	0.980	0.196	1.008	60	0.00
0.00	0.000	0.980	0.196	1.008	60	0.00

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type = diesel
K = 1 methane gas
Mg = MW = 202 g/mole
diesel Kg = 15 dsm3/1.0e6 conv factor
Mg/Kg = Cgm= 13.4667

Conversion factor ft/sec 3.2808
Bws = water vapor% (perry's)
68 = 0.003
83= 0.025
87= 0.028
108= 0.058

Temp oR 524
Temp = 64
528/Stack 1.008

Aggressive Fluid Vapor R... ery (AFVR) Data Sheet

Facility Cherry Pt
Location Bldg 296

Baseline Data - AFVR and Observation Wells

Date 3/23/98 Initials RM Project # 19364

WELL IDENTIFICATION	656W25	656W22	656W23	656W32		656W04	656W05	656W06		
WELL DIAMETER	2"	2"	2"	2"		2"	2"	2"		
WELL DEPTH (FT TOC)	17.66	17.30	16.80	16.45		21.40	21.40	19.20		
AFVR WELL (YES/NO)	NO	NO	NO	NO		Yes	RM ~~Yes~~ NO	RM ~~NO~~ Yes		
DEPTH TO PRODUCT (FT)	N	N	N	N		11.86	N	12.0		
DEPTH TO WATER (FT)	9.82	9.23	9.26	9.27		13.23	11.69	12.23		
PRODUCT THICKNESS (FT)	Ø	Ø	Ø	Ø		1.37	Ø	.23		
SCREEN INTERV (FT BLS)										

Water level and Vacuum Measurements - Observation Wells

N = Not observed/present

Actual Time	Elapsed Time	656W25 Water Depth	656W25 Vac "H_2O	656W22 Water Depth	656W22 Vac "H_2O	656W23 Water Depth	656W23 Vac "H_2O	656W32 Water Depth	656W32 Vac "H_2O	Water Depth	Vac "H_2O	656W04 Water Depth	656W04 Vac "H_2O	656W05 Water Depth	656W05 Vac "H_2O	656W06 Water Depth	656W06 Vac "H_2O	Water Depth	Vac "H_2O	Water Depth	Vac "H_2O
Initial/base	0 00	9.82		9.23		9.26		9.27				13.23		11.69		12.23					
0900	0 15	9.89		9.31		9.34		9.33						11.84							
0915	0 30	9.91		9.35		9.42		9.44						11.96							
0930	0 45	9.98		9.33		9.45		9.45						12.04							
0945	1.00	9.94		9.41		9.45		9.45						12.07							
1000	1 15	9.95		9.41		9.46		9.48						12.12							
1015	1.30	9.95		9.42		9.46		9.48						12.12							
1030	1 45	9.96		9.40		9.47		9.49						12.12							
1045	2 00	9.96		9.43		9.47		9.49						12.14							
1115	2 30	9.98		9.43		9.47		9.50						12.23							
1145	3 00	10.00		9.45		9.54		9.51						12.23							
1215	3 30	10.01		9.45		9.60		9.53						12.23							
1305	4 00	10.03		9.49		9.63		9.58						12.32							
1345	4 30	10.08		9.58		9.75		9.72				14.23		12.60		12.79					
	5 00																				

Additional Comments/Observations

Note Water level measurements are depths from top of casing

3/23/98 0700hrs Gauged VAC TRUCK .01 Sheen in Tank.

MAR 31 '99 04:35PM OHM CHERRY POINT P.26

Aggressive Fluid Vapor R (ery (AFVR) Data Sheet

Facility Cherry Pt
Location Bldg 246

AFVR Stack Measurements

Date 3/22/96 Initials Rm Project # 19364

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes / no	yes

Start Time 0845

Actual Time	Elapsed Time	LEL (ppm or %)	FID (ppm)	Velocity (m/sec) Range 30 (ft/sec)	Temp (°F)	Air Flow (DCFM) <calc>	Mass Conc. C_{ym} <calc>	Mass Conc STP C_y <calc>	TPH Removal (PMR_y) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim gals)
0845	0.00	8	1858	2.6	50°F						
0900	0.15	5	1813	2.6	50F						
0915	0.30	5	1509	1.9	51°F						
0930	0.45	5	1083	2.2	57°F						
0945	1:00	5	870	2.7	59°F						
1000	1.15	5	688	2.4	62°F						
1015	1.30	5	655	2.6	64°F						
1030	1:45	4	546	2.2	64°F						
1045	2.00	4	512	2.4	64°F						
1115	2:30	4	585	2.3	64°F						
1145	3.00	4	428	2.2	64°F						
1215	3.30	1	101	2.1	65°F						
1245	4:00	1	213	2.4	68°F						
1315	4:30										
1345	5.00										

Calculated From Field Data

Q_{std} = Flow in Std dry SCFM
PMR_y = Pollutant Mass Removal lbs/hr

Q_{std} = (60 sec/min)(1-B_{ws})(V)(A)(528°R/T_s)
PMR_y = Cg (Q_{std})(60 min/hr)

System Vacuum Measurements (Vac Truck and AFVR Wells)

Actual Time	Elapsed Time	Vac Truck ("Hg)	Vac Truck (RPM)	Well ("Hg)	Entrai Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth
0845	Start	16	500																		
0945	1 hr.	16	500																		
1045	2 hr.	16	500																		
1145	3 hr.	16	500																		
1215	3½ hr	16	600																		
1245	4 hr.	16	600																		

Note Record Entrainment depth of hose in feet below Top of well casing
Note Record Vacuum from AFVR extraction wells in inches mercury

Field Notes Bldg 296 3/22/92

0845 Startup. Wells 656W04 + 656W05 on line
one foot below product level
0945 Dropped one additional foot below product level
1045 Dropped one additional foot below product level. 250 gallons
1145 Dropped one additional foot below product level
1215 Increased RPM to 600 (16" Hg) and jammed wells.
1245 600 gallons. Shutdown with 4 hours

R. W. McDonald Jr.
100303

Aggressive Fluid Vapor Recovery Report

MCAS Cherry Point, North Carolina

Site Name: MCAS Cherry Point, NC **Incident #:**
Site Location: Bldg 296 ***Site Priority Rank:***
Work Plan Ref:

Report Date:
Event #:
Event Date: 4/6/98

Free Prod Type Diesel

Wells Gauged:	65GW25	65GW22	65GW23	65GW32	65GW04	65GW05	65GW06				
Free Prod. Thickness:					0.65	0.03	0.3				
AFVR Wells Selected:					X	X	X				
Observ. Wells Selected:	X	X	X	X							

Event Duration: 4 HOURS
Stack TPH Recovery (lbs): 10.40
Stack TPH Recovery (gals): 1.466
Total Est. Fluids Rec.: 750

Conclusions and Recommendations: A total of approximately 56.4 pounds or 7.9 gallons of hydrocarbons have been removed from the site during this event.

Prepared By:

Reviewed By:
OHM Remediation Services

Attachments: Tables 1, 2, 3, calculations

Facility: Bldg 296
MCAS Cherry Point, North Carolina

Aggressive Fluid Vapor Recovery (AFVR)
Monitoring Well Data
TABLE 1

Baseline Data - AFVR and Observation Wells **Date** 4/6/98

WELL IDENTIFICATION	65GW25	65GW22	65GW23	65GW32	65GW04	65GW05	65GW06			
AFVR WELL (YES/NO)	NO	NO	NO	NO	YES	YES	YES			
WELL DEPTH (FT BLS)	17.66	17.3	16.8	16.45	21.4	21.4	19.2			
DIAMETER (INCH)	2	2	2	2	2	2	2			
DEPTH TO PRODUCT (FT)	N	N	N	0.00	12.29	12.02	12.33			
DEPTH TO WATER (FT)	10.15	9.57	9.59	9.59	12.94	12.05	12.63			
PRODUCT THICKNESS (FT)					0.65	0.03	0.30			
SCREEN INTERV. (FT BLS)										

Water level Measurements - Observation Wells (from TOC) N = None MeasuredObserved

Date	Elapsed Time	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20
04/06/98	0:00	10.15	9.57	9.59	9.59	12.94	12.05	12.63			
1000	0:15	10.23	9.69	9.81	9.92						
1015	0:30	10.24	9.74	9.85	9.95						
1030	0:45	10.25	9.75	9.86	9.98						
1045	1:00	10.25	9.76	9.86	9.99						
1100	1:15	10.26	9.77	9.87	10.00						
1115	1:30	10.27	9.80	9.87	10.01						
1130	1:45	10.27	9.88	9.89	10.01						
1145	2:00	10.28	9.88	9.90	10.02						
1215	2:30	10.29	9.88	9.91	10.04						
1245	3:00	10.31	9.88	9.92	10.06						
1315	3:30	10.31	9.89	9.92	10.07						
1345	4:00	10.38	10.06	10.05	10.22	13.30	13.02	15.08			
	4:30										
	5:00										

Aggressive Fluid Vapor Recovery (AFVR)
Discharge Stack Data
TABLE 2

Facility: Bldg 296
MCAS Cherry Point, North Carolina

AFVR Stack Measurements **Date** 4/6/98 **Initials** _____

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes/no	yes
Start Time	945

Date	Elapsed Time	LEL (%)	FID (ppm)	Velocity (ft/sec) (m/sec)	Temp (°F)	Air Flow (DCFM) <calc>	TPH Removal (PMRg) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
04/06/98	0:00	9%	1,674.0	2.4	59	89.9	7.59	1.9	
1000	0:15	11%	1,257.0	1.8	59	67.4	4.27	3.0	
1015	0:30	2%	868.0	1.7	64	63.7	2.79	3.7	
1030	0:45	0%	787.0	2.8	70	104.9	4.16	4.7	
1045	1:00	4%	637.0	3.0	72	112.4	3.61	5.6	
1100	1:15	0%	587.0	2.7	72	101.1	2.99	6.4	
1115	1:30	0%	494.0	2.3	74	86.1	2.15	6.9	
1130	1:45	0%	484.0	2.3	73	86.1	2.10	7.4	
1145	2:00	0%	404.0	2.3	73	86.1	1.76	7.9	
1215	2:30	0%	409.0	2.3	73	86.1	1.78	8.7	
1245	3:00	0%	312.0	2.2	73	82.4	1.30	9.4	
1315	3:30	0%	273.0	2.2	76	82.4	1.13	10.0	750.0
1345	4:00	0%	219.0	2.1	76	78.7	0.87		
	4:30								
	5:00								
	5:30								
	6:00								

Facility: Bldg 296

MCAS Cherry Point, North Carolina

Date: 4/6/98

Aggressive Fluid Vapor Recovery (AFVR)
Summary of Free Product Recovery Events
TABLE 3

Hydrocarbon = diesel

						AFVR WELLS					MONITORING WELLS				
Event #	Date	Rec Prod (lbs)	Rec Prod. (gals)	Total Cum (lbs) to date	Level (ft TOC)	65GW04	65GW05	65GW06			65GW25	65GW22	65GW23	65GW32	
INITIAL	7/1/98	56.5	7.9	56.5	Product level	12.86	12.65	12.91							
					Water level	14.18	12.93	13.78			10.81	10.21	10.26	10.23	
2	4/6/98	10.4	1.4	57.9	Product level	12.29	12.02	12.33							
					Water level	12.94	12.05	12.63			10.15	9.57	9.59	9.59	
3					Product level										
					Water level										
4					Product level										
					Water level										
5					Product level										
					Water level										
6					Product level										
					Water level										
7					Product level										
					Water level										
8					Product level										
					Water level										

Notes: N= No product measured/observed Diesel sp gr = .85 or 7.09 lbs/gal gas sp gr = .75 or 6.25 lbs/gal

Discharge Stack Hydrocarbon Removal Calculations

Initials _____

Site = Bldg 296 4/6/98

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/interv	Cumulative lbs removed
0	1674	13.467	6.2430E-08	89.89	60.00	7.59	1.90	1.90
15	1257	13.467	6.2430E-08	67.42	60.00	4.27	1.07	2.97
30	868	13.467	6.2430E-08	63.67	60.00	2.79	0.70	3.66
45	787	13.467	6.2430E-08	104.88	60.00	4.16	1.04	4.70
60	637	13.467	6.2430E-08	112.37	60.00	3.61	0.90	5.61
75	587	13.467	6.2430E-08	101.13	60.00	2.99	0.75	6.36
90	494	13.467	6.2430E-08	86.15	60.00	2.15	0.54	6.89
105	484	13.467	6.2430E-08	86.15	60.00	2.10	0.53	7.42
120	404	13.467	6.2430E-08	86.15	60.00	1.76	0.44	7.86
150	409	13.467	6.2430E-08	86.15	60.00	1.78	0.89	8.75
180	312	13.467	6.2430E-08	82.40	60.00	1.30	0.65	9.39
210	273	13.467	6.2430E-08	82.40	60.00	1.13	0.57	9.96
240	219	13.467	6.2430E-08	78.66	60.00	0.87	0.43	10.40
270		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
300		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
360		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
390		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
2.40	7.874	0.980	0.196	0.991	60	89.89
1.80	5.905	0.980	0.196	0.991	60	67.42
1.70	5.577	0.980	0.196	0.991	60	63.67
2.80	9.186	0.980	0.196	0.991	60	104.88
3.00	9.842	0.980	0.196	0.991	60	112.37
2.70	8.858	0.980	0.196	0.991	60	101.13
2.30	7.546	0.980	0.196	0.991	60	86.15
2.30	7.546	0.980	0.196	0.991	60	86.15
2.30	7.546	0.980	0.196	0.991	60	86.15
2.30	7.546	0.980	0.196	0.991	60	86.15
2.20	7.218	0.980	0.196	0.991	60	82.40
2.20	7.218	0.980	0.196	0.991	60	82.40
2.10	6.890	0.980	0.196	0.991	60	78.66
0.00	0.000	0.980	0.196	0.991	60	0.00
0.00	0.000	0.980	0.196	0.991	60	0.00
0.00	0.000	0.980	0.196	0.991	60	0.00
0.00	0.000	0.980	0.196	0.991	60	0.00

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type = diesel
K = 1 methane gas
Mg = MW = 202 g/mole
diesel Kg = 15 dsm3/1.0e6 conv factor
Mg/Kg = Cgm= 13.4667

Conversion factor ft/sec 3.2808
Bws = water vapor% (perry's)
68 = 0.003
83= 0.025
87= 0.028
108= 0.058

Temp oR 533
Temp = 73
528/Stack 0.991

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt.
Location Bldg. 296

Baseline Data - AFVR and Observation Wells

Date 4/6/98 Initials RM Project # 19364

WELL IDENTIFICATION	656W25	656W22	656W23	656W32		656W04	656W05	656W06		
WELL DIAMETER	2"	2"	2"	2"		2"	2"	2"		
WELL DEPTH (FEET)	17.66	17.30	16.80	16.45		21.40	21.40	19.20		
SEAL WELL (YES/NO)	No	No	No	No		Yes	Yes	Yes		
DEPTH TO PRODUCT (FT)	N	N	N	N		12.29	12.02	12.33		
DEPTH TO WATER (FT)	10.15	9.57	9.59	9.59		12.94	12.05	12.63		
PRODUCT THICKNESS (FT)	0	0	0	0		.65	.03	.30		
SHEEN/SMELL (YES/NO)										

Water level and Vacuum Measurements - Observation Wells

N = Not observed/present

Actual Time	Elapsed Time	656W25 Water Depth	656W25 Vac "H2O	656W22 Water Depth	656W22 Vac "H2O	656W23 Water Depth	656W23 Vac "H2O	656W32 Water Depth	656W32 Vac "H2O	Water Depth	Vac "H2O	656W04 Water Depth	656W04 Vac "H2O	656W05 Water Depth	656W05 Vac "H2O	656W06 Water Depth	656W06 Vac "H2O	Water Depth	Vac "H2O	Water Depth	Vac "H2O	
Initial Meas.	0:00	10.15		9.57		9.59		9.59				12.94		12.05		12.63						
10:00	0:15	10.23		9.69		9.81		9.92														
10:15	0:30	10.24		9.74		9.85		9.95														
10:30	0:45	10.25		9.75		9.86		9.98														
10:45	1:00	10.25		9.76		9.86		9.99														
11:00	1:15	10.26		9.77		9.87		10.0														
11:15	1:30	10.27		9.80		9.87		10.01														
11:30	1:45	10.27		9.88		9.89		10.01														
11:45	2:00	10.28	250 Gal.	9.88		9.90		10.02														
12:15	2:30	10.29		9.89		9.91		10.04														
12:45	3:00	10.31	500 Gal.	9.89		9.92		10.06														
13:15	3:30	10.31		9.89		9.92		10.07														
13:45	4:00	10.38	750 Gal.	10.06		10.05		10.22				13.3		13.02		15.08						
	4:30																					
	5:00																					

Additional Comments/Observations

Note: Water level measurements are depths from top of casing

P.24
MAR 31 '99 04:34PM OHM CHERRY POINT

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt
Location Bldg 296

AFVR Stack Measurements

Date 4/6/98 Initials Rm Project # 19.364

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes / no	Yes

Start Time 0945

Actual Time	Elapsed Time	LEL (ppm or %)	FID (ppm)	Velocity Range @ 30 (in/sec) (ft/sec)	Temp (°F)	Air Flow (DCFM) <calc>	Mass Conc. C_{ppm} <calc>	Mass Conc STP C_g <calc>	TPH Removal (PMR_v) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim gals)
0945	0.00	9%	1674	2.4	59°F						
1000	0.15	11%	1257	1.8	59°F						
1015	0.30	2%	868	1.7	64°F						
1030	0.45	0%	787	2.8	70°F						
1045	1.00	4%	673	3.0	72°F						
1100	1.15	0%	587	2.7	72°F						
1115	1:30	0%	494	2.3	74°F						
1130	1:45	0%	484	2.3	73°F						
11:45	2.00	0%	404	2.3	73°F						
1215	2.30	0%	409	2.3	73°F						
1245	3.00	0%	312	2.2	73°F						
1315	3.30	0%	273	2.2	76°F						
1345	4.00	0%	219	2.1	76°F						
	4.30										
	5.00										

Calculated From Field Data

Q_{std} = Flow in Std dry SCFM
PMR_v = Pollutant Mass Removal lbs/hr

Q_{std} = (60 sec/min)(1-B_{ws})(V)(A)(520°R/T_s)
PMR_v = Cg (Q_{std})(60 min/hr)

System Vacuum Measurements (Vac Truck and AFVR Wells)

Actual Time	Elapsed Time	Vac Truck (Hg)	Vac Truck (RPM)	Well (Hg)	Entrai Depth	Well (Hg)	Entrain Depth	Well (Hg)	Entrain Depth	Well (Hg)	Entrain Depth	Well (Hg)	Entrain Depth	Well (Hg)	Entrain Depth	Well (Hg)	Entrain Depth	Well (Hg)	Entrain Depth	Well (Hg)	Entrain Depth
0945	Start	20	500																		
1045	1hr	18	550																		
1145	2hr	16	550																		
1245	3hr	16	550																		
1345	4hr	16	550																		

Note: Record Entrainment depth of liquid in feet below Top of well casing
Note: Record Vacuum in inch Hg [illegible] well, [illegible] manifold

P.25
MAR 31 '99 04:34PM OHM CHERRY POINT

Field Notes Bldg 296 Project 19364 4/6/98

0945 Startup. AFVR wells on line one foot below product level.

1045 Dropped wells one additional foot.

1145 250 gallons

1245 500 gallons

13:15 Jammed all AFVR wells

1345 4hrs completed 750 gallons

R. W. McFarrell
100303

Aggressive Fluid Vapor Recovery Report

MCAS Cherry Point, North Carolina

Site Name: MCAS Cherry Point, NC **Incident #:**
Site Location: Bldg 296 ***Site Priority Rank:***
Work Plan Ref:

Report Date:
Event #:
Event Date: 7/1/98

Free Prod Type Diesel

Wells Gauged:	65GW25	65GW22	65GW23	65GW32	65GW04	65GW05	65GW06				
Free Prod. Thickness:					1.32	0.28	0.87				
AFVR Wells Selected:					X	X	X				
Observ. Wells Selected:	X	X	X	X							

Event Duration: 3-1/2 HOURS
Stack TPH Recovery (lbs): 56.45
Stack TPH Recovery (gals): 7.962
Total Est. Fluids Rec.: 500

Conclusions and Recommendations: A total of approximately 56.4 pounds or 7.9 gallons of hydrocarbons have been removed from the site during this event.

Prepared By:

Reviewed By:
OHM Remediation Services

Attachments: Tables 1, 2, 3, calculations

Facility: Bldg 296
MCAS Cherry Point, North Carolina

Aggressive Fluid Vapor Recovery (AFVR)
Monitoring Well Data
TABLE 1

Baseline Data - AFVR and Observation Wells **Date** 7/1/98

WELL IDENTIFICATION	65GW25	65GW22	65GW23	65GW32	65GW04	65GW05	65GW06			
AFVR WELL (YES/NO)	NO	NO	NO	NO	YES	YES	YES			
WELL DEPTH (FT BLS)	17.66	17.3	16.8	16.45	21.4	21.4	19.2			
DIAMETER (INCH)	2	2	2	2	2	2	2			
DEPTH TO PRODUCT (FT)	N	N	N	0.00	12.86	12.65	12.91			
DEPTH TO WATER (FT)	10.81	10.21	10.26	10.23	14.18	12.93	13.78			
PRODUCT THICKNESS (FT)					1.32	0.28	0.87			
SCREEN INTERV. (FT BLS)										

Water level Measurements - Observation Wells (from TOC) N = None MeasuredObserved

Date	Elapsed Time	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20	Well Depth to H20
07/01/98	0:00	10.81	10.21	10.26	10.23	14.18	12.93	13.78			
0900	0:15	10.80	10.40	10.43	10.49						
0915	0:30	10.90	10.45	10.47	10.57						
0930	0:45	10.90	10.46	10.48	10.58						
0945	1:00	10.91	10.46	10.49	10.58						
1000	1:15	10.91	10.46	10.49	10.58						
1015	1:30	10.92	10.47	10.50	10.58						
1030	1:45	10.92	10.47	10.50	10.58						
1045	2:00	10.92	10.47	10.50	10.59						
1115	2:30	10.94	10.49	10.52	10.59						
1145	3:00	10.95	10.53	10.55	10.65						
1215	3:30	10.96	10.59	10.54	10.62	15.00	14.10	14.93			
	4:00										
	4:30										
	5:00										

Aggressive Fluid Vapor Recovery (AFVR)
Discharge Stack Data
TABLE 2

Facility: Bldg 296
MCAS Cherry Point, North Carolina

AFVR Stack Measurements

Date 7/1/98 **Initials** _____

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes/no	yes
Start Time	845

Date	Elapsed Time	LEL (%)	FID (ppm)	Velocity (ft/sec)	(m/sec)	Temp (°F)	Air Flow (DCFM) <calc>	TPH Removal (PMRg) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim. gals)
07/01/98	0:00	23%	11,967.0		2.5	82	91.6	55.28	13.8	
0900	0:15	20%	9,678.0		2.3	82	84.3	41.13	24.1	
0915	0:30	18%	6,658.0		2.4	84	87.9	29.53	31.5	
0930	0:45	16%	4,547.0		2.5	84	91.6	21.00	36.7	
0945	1:00	16%	3,718.0		2.3	86	84.3	15.80	40.7	
1000	1:15	16%	2,237.0		2.4	86	87.9	9.92	43.2	
1015	1:30	8%	2,023.0		2.4	86	87.9	8.97	45.4	
1030	1:45	8%	2,006.0		2.4	86	87.9	8.90	47.6	
1045	2:00	8%	1,820.0		2.4	87	87.9	8.07	49.7	
1115	2:30	8%	1,555.0		2.3	90	84.3	6.61	53.0	
1145	3:00	0%	840.0		2.4	93	87.9	3.73	54.8	
	3:30	0%	737.0		2.4	93	87.9	3.27	56.5	500.0
	4:00						0.0	0.00		
	4:30									
	5:00									
	5:30									
	6:00									

Facility: Bldg 296

MCAS Cherry Point, North Carolina

Date: 7/1/98

Aggressive Fluid Vapor Recovery (AFVR)
Summary of Free Product Recovery Events
TABLE 3

Hydrocarbon = diesel

						AFVR WELLS					MONITORING WELLS				
Event #	Date	Rec Prod (lbs)	Rec Prod. (gals)	Total Cum (lbs) to date	Level (ft TOC)	65GW04	65GW05	65GW06			65GW25	65GW22	65GW23	65GW32	
INITIAL	7/1/98	56.5	7.9	56.5	Product level	12.86	12.65	12.91							
					Water level	14.18	12.93	13.78			10.81	10.21	10.26	10.23	
2					Product level										
					Water level										
3					Product level										
					Water level										
4					Product level										
					Water level										
5					Product level										
					Water level										
6					Product level										
					Water level										
7					Product level										
					Water level										
8					Product level										
					Water level										

Notes: N= No product measured/observed Diesel sp gr = .85 or 7.09 lbs/gal gas sp gr = .75 or 6.25 lbs/gal

Discharge Stack Hydrocarbon Removal Calculations

Initials _____

Site = Bldg 296 7/1/98

Elap Time	FID (PPM)	M_g/K_g	Conv Factor	Flow Q_{std}	con.fac	Rem Rate lbs/hr	lbs/interv	Cumulative lbs removed
0	11967	13.467	6.2430E-08	91.58	60.00	55.28	13.82	13.82
15	9678	13.467	6.2430E-08	84.25	60.00	41.13	10.28	24.10
30	6658	13.467	6.2430E-08	87.91	60.00	29.53	7.38	31.48
45	4547	13.467	6.2430E-08	91.58	60.00	21.00	5.25	36.74
60	3718	13.467	6.2430E-08	84.25	60.00	15.80	3.95	40.69
75	2237	13.467	6.2430E-08	87.91	60.00	9.92	2.48	43.17
90	2023	13.467	6.2430E-08	87.91	60.00	8.97	2.24	45.41
105	2006	13.467	6.2430E-08	87.91	60.00	8.90	2.22	47.63
120	1820	13.467	6.2430E-08	87.91	60.00	8.07	2.02	49.65
150	1555	13.467	6.2430E-08	84.25	60.00	6.61	3.30	52.96
180	840	13.467	6.2430E-08	87.91	60.00	3.73	1.86	54.82
210	737	13.467	6.2430E-08	87.91	60.00	3.27	1.63	56.45
240	0	13.467	6.2430E-08	0.00	60.00	0.00	0.00	56.45
270		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
300		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
360		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00
390		13.467	6.2430E-08	0.00	60.00	0.00	0.00	0.00

Qstd Calc Worksheet

velocity (m/sec)	velocity (ft/sec)	1-Bws	Area (ft2)	temp factor 528/stack T	Con fa.	Flow Qstd
2.50	8.202	0.980	0.196	0.969	60	91.58
2.30	7.546	0.980	0.196	0.969	60	84.25
2.40	7.874	0.980	0.196	0.969	60	87.91
2.50	8.202	0.980	0.196	0.969	60	91.58
2.30	7.546	0.980	0.196	0.969	60	84.25
2.40	7.874	0.980	0.196	0.969	60	87.91
2.40	7.874	0.980	0.196	0.969	60	87.91
2.40	7.874	0.980	0.196	0.969	60	87.91
2.40	7.874	0.980	0.196	0.969	60	87.91
2.30	7.546	0.980	0.196	0.969	60	84.25
2.40	7.874	0.980	0.196	0.969	60	87.91
2.40	7.874	0.980	0.196	0.969	60	87.91
0.00	0.000	0.980	0.196	0.969	60	0.00
0.00	0.000	0.980	0.196	0.969	60	0.00
0.00	0.000	0.980	0.196	0.969	60	0.00
0.00	0.000	0.980	0.196	0.969	60	0.00
0.00	0.000	0.980	0.196	0.969	60	0.00

a) gasoline 128 g/mole
b) diesel 202 g/mole

Hydrocarbon type = diesel
K = 1 methane gas
Mg = MW = 202 g/mole
diesel Kg = 15 dsm3/1.0e6 conv factor
Mg/Kg = Cgm= 13.4667

Conversion factor ft/sec 3.2808
Bws = water vapor% (perry's)
68 = 0.003
83= 0.025
87= 0.028
108= 0.058

Temp oR 545
Temp = 85
528/Stack 0.969

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt.
Location Bldg 296

Baseline Data - AFVR and Observation Wells

Date 7/1/98 Initials Rn Project # 19364

WELL IDENTIFICATION	656W25	656W22	656W23	656W32		656W04	656W05	656W06		
WELL DIAMETER	2"	2"	2"	2"		2"	2"	2"		
WELL DEPTH (FEET)	17.66	17.30	16.80	16.45		21.40	21.40	19.20		
SEAL WELL (YES/NO)	No	No	No	No		Yes	Yes	Yes		
DEPTH TO PRODUCT (FT)	N	N	N	N		12.86	12.65	12.81		
DEPTH TO WATER (FT)	10.81	10.21	10.26	10.23		14.18	12.93	13.78		
PRODUCT THICKNESS (FT)	0	0	0	0		1.32	.28	.87		
SCREEN INTERVAL (FT BLS)										

Water level and Vacuum Measurements - Observation Wells

N = Not observed/present

Actual Time	Elapsed Time	656W25 Water Depth	656W25 Vac " H_2O	656W22 Water Depth	656W22 Vac " H_2O	656W23 Water Depth	656W23 Vac " H_2O	656W32 Water Depth	656W32 Vac " H_2O	Water Depth	Vac " H_2O	656W04 Water Depth	656W04 Vac " H_2O	656W05 Water Depth	656W05 Vac " H_2O	656W06 Water Depth	656W06 Vac " H_2O	Water Depth	Vac " H_2O	Water Depth	Vac " H_2O	
Initial Meas.	0 00	10.81		10.21		10.26		10.23														
0900	0 15	10.80		10.40		10.43		10.49														
0915	0 30	10.90		10.45		10.47		10.57														
0930	0 45	10.90		10.46		10.48		10.58														
0945	1 00	10.91		10.46		10.49		10.58														
10:00	1 15	10.91		10.46		10.49		10.58														
1015	1 30	10.92		10.47		10.50		10.58														
1030	1 45	10.92	200 Gal.	10.47		10.50		10.58														
1045	2 00	10.92		10.47		10.50		10.59														
1115	2 30	10.94		10.49		10.52		10.57														
1145	3 00	10.95	500 Gal.	10.53		10.55		10.65														
1215	3 30	10.96	550 Gal.	10.59		10.54		10.62				15.0		14.1		14.93						
	4 00																					
	4 30																					
	5 00																					

Additional Comments/Observations

Note Water level measurements are depths from top of casing

7/2/98 Gauged VAC TRUCK

Immeasurable product Level <.01

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MAR 31 '99 04:33PM OHM CHERRY POINT

Aggressive Fluid Vapor Recovery (AFVR) Data Sheet

Facility Cherry Pt.
Location Bldg 296

AFVR Stack Measurements

Date 7/1/98 Initials Ron Project # 19364

Start Time 0845

Stack Diameter	6 inches
FID Calibration Gas	Methane
Calibrated yes / no	Yes

Actual Time	Elapsed Time	I El (ppm or %)	FID (ppm)	Velocity (m/sec) Range 30 (ft/sec)	Temp (°F)	Air Flow (DCFM) <calc>	Mass Conc. C_{gm} <calc>	Mass Conc STP C_g <calc>	TPH Removal (PMR_g) lbs/hr	Total TPH Rem. (cumulative lbs)	Fluids Recov. (Estim gals)
0845	0 00	23%	11,967	2.5	82°						
0900	0.15	20%	9,678	2.3	82°						
0915	0 30	18%	6658	2.4	84°						
0930	0 45	16%	4,547	2.5	84°						
0945	1 00	16%	3,718	2.3	86°						
1000	1 15	16%	2237	2.4	86°						
1015	1 30	8%	2023	2.4	86°						
1030	1 45	8%	2006	2.4	86°						
1045	2 00	8%	1820	2.4	87°						
1115	2 30	8%	1555	2.3	90°						
1145	3 00	0%	840	2.4	93°						
1215	3 30	0%	737	2.4	93°						
	4 00										
	4 30										
	5 00										

Calculated From Field Data

Q_{std} = Flow in Std dry SCFM
PMR_g = Pollutant Mass Removal lbs/hr

Q_{std} = (60 sec/min)(1-B_{wo})(V)(A)(520°R/T_s)
PMR_g = Cg (Q_{std})(60 min/hr)

System Vacuum Measurements (Vac Truck and AFVR Wells)

Actual Time	Elapsed Time	Vac Truck ("Hg)	Vac Truck (RPM)	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth	Well ("Hg)	Entrain Depth
0845	Start	20	500																		
0945	1hr	18	500																		
1045	2hr.	18	500																		
1145	3hr.	18	500																		
1215	3½ hr.	18	500																		

Note: Record Entrainment depth of hose in feet below Top of well casing
[illegible]

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P.O.L. Bldg 296 7/1/98 Project # 19364

08:45 Wells gauged. System start up. All AFVR wells on line one foot below product level.

11:00 Dropped hoses one additional foot.

11:45 Jammed wells.

12:15 Shut down system with 3½ hrs operating time.

Total gallons collected = 500 gallons

R/S

Robert W. McDonald

100303