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**FULL SCALE FIELD TEST OF THE IN SITU AIR STRIPPING PROCESS AT THE
SAVANNAH RIVER INTEGRATED DEMONSTRATION TEST SITE (U)**

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Date: June 29, 1991

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Abstract

Under sponsorship from the U.S. Department of Energy, technical personnel from the Savannah River Laboratory (SRL) and other DOE laboratories, universities and private industry have completed a full scale demonstration of environmental remediation using horizontal wells. This demonstration was performed as Phase I of an Integrated Demonstration Project designed to evaluate innovative remediation technologies for environmental restoration of sites contaminated with organic contaminants. The demonstration utilized two directionally drilled horizontal wells to deliver gases and extract contaminants from the subsurface. The resulting in situ air stripping process was designed to remediate soils and sediments above and below the water table as well as groundwater contaminated with volatile organic contaminants.

The 139 day long test successfully removed volatile chlorinated solvents from the subsurface using the two horizontal wells. One well, approximately 300 ft (90m) long and 165 ft (50m) deep drilled below a contaminant plume in the groundwater, was used to inject air and strip the contaminants from the groundwater. A second horizontal well, approximately 175 ft (53m) long and 75 ft (23m) deep in the vadose zone, was used to extract residual contamination in the vadose zone along with the material purged from the groundwater.

Pretest and posttest characterization data and monitoring data during the demonstration were collected to aid in interpretation of the test and to provide the information needed for future environmental restorations that employ directionally drilled wells as extraction or delivery systems. Contaminant concentration data and microbiological monitoring data are summarized in this report; the characterization data and geophysical monitoring data are documented in a series of related project reports. The test successfully removed approximately 16000 pounds (7250 kg) of contaminants. The extraction rate increased from approximately 109 pounds/day (50 kg/day) with vacuum extraction only to approximately 130 pounds/day (59 kg/day) during the injection of purge air through the lower horizontal well. Vacuum levels in the bundle tubes in the extraction well indicated that heterogeneities in the subsurface result in variations in the amount of gas extracted in the various monitored sections of the screened interval, and that the well was drawing moisture from the vadose zone due to the vacuum levels within the well. Substantive changes in groundwater concentrations were measured during the test. Most of the monitoring wells at the site exhibited lower concentrations of contaminants and increases in microbial numbers and metabolic activity during the air injection period. Following the completion of the test, the VOC concentrations in the groundwater have remained relatively stable.

Results from the in-situ air stripping test suggest that access to subsurface systems can be improved through the use of directional drilling. Comparison of the horizontal vacuum extraction well to a vertical vacuum extraction well operated at the same test site indicates that the horizontal geometry increased the VOC extraction efficiency by a factor of approximately five. Additionally, the test suggests that in situ sparging operations or addition of reactants to aquifer systems may be a reasonable technology for selected remediation conditions. Further development of directional drilling methods (to reduce costs and minimize drilling fluids) and related characterization and monitoring systems will assist in developing timely technical design data for remediation systems that employ directionally drilled wells. Continued development of this and other emerging environmental technologies will assist in developing a "toolkit" of options for remediation that can be combined in creative ways, resulting in cost effective systems that provide a high level of protection to human and environmental health.

1.0 Objective

The overall objective of the Integrated Demonstration Project for the Remediation of Organics at Nonarid Sites is to evaluate innovative remediation, characterization and monitoring systems to facilitate the restoration of contaminated sites. Phase I of the Integrated Demonstration Project focused on the full scale application/demonstration of an in situ air stripping process to simultaneously remove volatile contaminants from contaminated groundwater and the overlying vadose zone. The objective of this report is to document: 1) the operation of the demonstration system, and 2) the concentration and pressure measurements collected during the test, and 3) the preliminary technical and engineering analysis of the system. Several types of data are presented and discussed in this report, including,

- a site description,
- operations log,
- flow, temperature, pressure and concentration data for the horizontal vacuum extraction well
- flow and pressure data from the injection well
- pressure and concentration data from the vadose zone piezometer network
- contaminant concentrations, water chemistry, and microbiological measurements from groundwater monitoring wells
- results from helium tracer tests.
- preliminary engineering analyses of the system performance.

The pretest characterization data, posttest characterization data, results from the electrical and seismic geophysical tomography studies, results from the single point flow sensors, and detailed modeling and performance evaluation will be documented in a series of related reports (e.g., Kaback et al., 1989; Eddy et al., 1991).

2.0 Background

Remediation of soils and groundwater contaminated with organic and inorganic contaminants is an important objective of the Savannah River Site (SRS - Figure 2.1) environmental restoration efforts. A wide range of technologies are available and emerging technologies are being developed and demonstrated to remediate contaminated subsurface materials. The goal is to provide a wide range of "tools" for this work. Development of a diverse and robust "toolkit" of technologies is the best path toward efficient environmental restoration that provides maximum protection of health and ecology at a minimum cost. Various extraction and in-situ remediations are currently being developed. Recently, applications of directional drilling technologies developed in the oil industry have been identified as a potentially important "tool" to allow improved access to the subsurface for all types of remediations.

Normally, extraction of contaminants or addition of reactants for remediation must be performed through vertical wells or boreholes. Directional drilling, including horizontal wells, offers a new and promising means to optimize these operations. Just as horizontal wells have improved the performance of oil recovery systems, they may similarly improve the performance of in-situ remediation, contaminant extraction, or monitoring technologies for environmental restoration. The geometry of horizontal wells conforms to typical subsurface systems, relatively thin but laterally extensive zones. Horizontal wells can be installed to remediate beneath buildings and waste sites, to remediate linear sources of contamination such as pipelines or streams, to prevent the spread of the edge of a plume, or to introduce reactants (e.g., for bioremediation). A variety of competing directional drilling methods have been developed. Each of these represents a possible new approach to installing delivery/removal systems to improve environmental restoration.

Figure 2.1 Location of Savannah River Site in South Carolina.

3.0 Introduction

The first application of horizontal wells for environmental restoration is the In-Situ Air Stripping test at SRS. For this test, two wells were installed (Figure 3.1). One well, below an area of contaminated groundwater, was used to purge volatile chlorinated solvents from the groundwater by injection of air. The second well was installed in the vadose zone beneath the location of an abandoned process sewer line that was known to have leaked chlorinated solvents; this well was used to remove solvent that has not reached the groundwater and to collect solvent stripped by the purge well. In-Situ Air Stripping has the potential to significantly reduce clean up time when compared to standard groundwater pumping followed by air stripping in an above ground tower. The demonstration site has been carefully characterized and monitored using surface and borehole geophysics, cross hole geophysical tomography, chemical analysis of soil, soil gas and groundwater, microbial characterization of soil and water, and pressure monitoring in all affected areas. Additionally, each of the horizontal wells has been fitted with a bundle of tubes that allow pressure/concentration measurements at various points along the well bore. The data that result from all of these tests will improve the technical basis for design of future directional drilling applications. Kaback et al. (1989) provide a detailed description of the horizontal well installation methods and experiences.

The 139 days of field operation at the demonstration site were successful; the operational and data collection goals identified at the beginning of the demonstration were met. We operated at approximately 90% utility and extracted 100 to 140 pounds of VOC from the subsurface each day. A total of almost 16000 pounds of chlorinated solvents were removed from the subsurface during the test. Pressure and concentration data from the bundle tubes and vadose zone piezometers provide valuable data for future projects of this nature. These data, combined with the helium tracer test data, provide information on the types and importance of various heterogeneities in this typical natural system. Both low permeability and high permeability zones influenced the performance of the system. The importance of these zones to mass transfer in subsurface remediations (both in situ and extractive methods) will be evaluated using the collected data. Initial data from Sandia National Laboratory (SNL) and Lawrence Livermore National Laboratory (LLNL) suggest that the seismic and electrical tomography methods and the single point flow sensors will be able to distinguish changes in moisture and fluid flow in the subsurface caused by the extraction/injection.

3.1 Summary of Field Activities

The following list is a synopsis of the activities at the site during the field demonstration (unless otherwise noted, vadose zone pressure readings, extraction/injection well pressure and temperature readings, and extraction well concentrations were determined at least

three times per day; groundwater, vadose zone piezometer and bundle tube concentrations were measured approximately weekly). Times are provided both in terms of date and elapsed time from startup to facilitate interpretation of the data provided later in the report. Collection of water samples continued following completion of the active demonstration phase in December. A more complete description of site activities is provided in Table 3.1.

Synopsis/Highlights of In Situ Air Stripping Test:

- July 27 - Day 1 - Begin Test - Vacuum Extraction through horizontal extraction well (AMH2) at 580 scfm.
- August 11 - Day 16 - Air Injection through horizontal purge well (AMH1) initiated at low rate (65 scfm)
- August 23 - Day 28 - Air injection rate increased to medium rate (170 scfm)
- September 13 - Day 49 - Heating of injected air to approximately 145 degrees F initiated.
- October 3 - Day 69 - Air injection rate increased to high rate (270 scfm).
- November 16 - Day 113 - Air Injection portion of the test completed - Injection stopped and compressor demobilized
- December 13 - Day 140 - Vacuum Extraction portion of the test completed - extraction stopped and vacuum blower demobilized

The listed activities represent approximately 90% utility for the test system during the test. All planned activities were completed approximately on schedule.

Table 3.1 Detailed listing of Activities at the In-Situ Air Stripping Test Demonstration Site (July 27 through December 18, 1990).

07/27/90	Vacuum Extraction (VE) initiated (approximately 580 scfm)
08/09/90	VE off for 40 minutes to level vacuum blower
08/10/90	VE off for 1 hour 25 minutes for compressor electrical problem
08/11/90	Air Injection (AI) initiated (low rate - approximately 65 scfm)
08/13/90	VE/AI off for 52 minutes for generator maintenance
08/18/90	No samples collected to allow sampling staff time off
08/19/90	No samples collected to allow sampling staff time off
08/23/90	AI off 21 hours to change from 15 HP to 100 HP compressor
08/23/90	VE off 16 hours during compressor change
08/23/90	AI rate increased (medium rate - approximately 170 scfm)
08/26/90	AI off 3 hours 40 minutes for compressor maintenance
08/28/90	VE off 18 hours due to generator solenoid failure
08/28/90	AI off 42 hours due to generator solenoid failure and check compressor oil
08/31/90	VE off 15 minutes to change filter
09/08/90	Vacuum Extraction (VE) and Air Injection (AI) off 21.5 hours (generator failure)
09/09/90	VE and AI off for 11 hours (generator problems)
09/13/90	Heating of the injected air initiated (approximately 145 degrees F)
09/16/90	VE off for 2.75 hours (filter change and generator problem)
09/19/90	AI compressor down for 0.3 hours for hose repair
09/20/90	AI compressor down for 15.1 hours (unknown cause)
09/21/90	VE down for 1.9 hours (routine maintenance)
09/26/90	AI/VE down for 6.9 hours (generator battery failure)
10/02/90	Vacuum Extraction (VE) and Air Injection (AI) off 19.9 hours (generator failure)
10/03/90	Injection increased to high rate (270 scfm)
10/04/90	AI off for 13.9 hours (unknown cause)
10/04/90	VE and AI off for 12.6 hours (generator battery failure)
10/05/90	AI off for 2.2 hours (unknown cause)
10/08/90	VE and AI off for 6.5 hours (generator battery failure)
10/09/90	VE and AI off for 1.1 hours (generator alternator repair)
10/11/90	VE and AI off for 11.8 hours (unknown cause)
10/13/90	AI and VE down for 0.6 hours (generator repair)
10/16/90	AI and VE down for 2.9 hours (fuel supply delay)
10/23/90	VE and AI off for 9 hours (unknown cause)
10/29/90	VE and AI off for 0.6 hours (filter change)
10/30/90	AI and VE down for 0.7 hours (unknown cause)
10/31/90	AI and VE down for 78.4 hours (rebuild vacuum blower added separator tank to vacuum extraction line)

Table 3.1 Detailed listing of Activities at the In-Situ Air Stripping Test Demonstration Site (July 27 through December 18, 1990) - (continued).

11/04/90	AI off for 18 hours (generator problem)
11/08/90	VE off for 5.25 hours (generator service)
11/08/90	AI off for 11.25 hours for generator service
11/11/90	AI and VE down for 41.85 hours (generator failure)
11/15/90	reduced AI to medium rate (170 scfm) for flow sensor test
11/16/90	AI test stopped; VE down 4.5 hours for compressor demobilization
11/27/90	VE down 0.4 hours (drained separator tank)
12/03/90	VE down 5.2 hours (maintenance)
12/07/90	VE down 3.8 hours (drained separator tank)
12/13/90	Test completed.

Figure 3.1 Schematic Diagram of In Situ Air Stripping Using Horizontal Wells, a Flushing Gas, and Vacuum Recovery

4.0 System Performance

4.1 Horizontal Vacuum Extraction Well Concentration and Pressure Data

The flow and vacuum conditions at the vacuum extraction well remained relatively constant throughout the test. The flow (measured by a calibrated pitot tube) generally ranged from 550 to 600 scfm (Figure 4.1). The vacuum at the wellhead was approximately 10 to 11 inches of Hg. The temperature of the extracted gas was relatively constant at approximately 56 degrees F (Figure 4.2). The additional variation in the data at the end of the test is due to the installation of a small collector tank for water and sand upstream of the sampling point. The heating of the injection air had no measurable effect on the temperature of the gas extracted from AMH2.

The concentration and temperature of the contaminated vapors extracted from the horizontal vacuum extraction well (AMH-2) were measured approximately three times per day (more frequently at each change in operating parameters). As shown in Figure 4.3, the total concentration of chlorinated solvents decreased rapidly during the first 2 days of operation and stabilized after approximately 3 days. Initial concentrations were as high as 5000 ppm (volume/volume) in the gas; the total concentration stabilized at approximately 300 ppm. This concentration represents an extraction rate of approximately 100 to 140 pounds of solvent per day. The extraction rate is shown on Figure 4.4. The average extraction rate for each of the injection/extraction conditions (e.g., vacuum only, vacuum plus low injection rate, etc.) was calculated and resulting data are plotted vs injection rate in Figure 4.5. The vacuum extraction process removed contaminants at a rate of about 109 pounds/day; injection of air at the medium and high injection rates appear to result in the stripping/removal of an additional 20 pounds of solvents per day from the groundwater and the vadose zone below the extraction well. The cumulative VOC removal is summarized in Figure 4.6. Almost 16000 pounds of contaminant were removed from the vadose zone and groundwater at the demonstration site during the short testing period.

The concentration and vacuum data from the bundle tubes in the horizontal vacuum extraction well (AMH-2) are presented in Figures 4.7 and 4.8. When the vacuum system is operating, AMH-2 appears to draw water from the vadose zone in a manner similar to a suction lysimeter. Since the well dips to its lowest elevation at the terminal end, the final sampling position (at 219 feet from top of casing) appears to be covered by water and the sampling position at 179 feet may be covered by water periodically. These two sample tubes are more variable than the first four and the vacuum level becomes lower over time at these positions. Nonetheless, the vacuum data suggest that the entry of air into the screen occurs over much of the horizontal section and that heterogeneity in the system results in more air entering in some segments of the well (e.g., 60 to 100 feet) than in others (e.g., 100 to 140 feet). Note that the vadose zone piezometers near the end of AMH-2 have significant drawdowns - suggesting that the water covering the

bundle tubes does not completely fill the wellbore (i.e., air is entering all the way to the end of the well). The bundle tube concentration data (Figure 4.8) support the conclusions from the pressure data. Water covering the final two sampling tubes precludes contaminated air from entering these tubes for sampling. Variations in concentration along the well are a measure of the concentrations of VOCs entering the well and of the amount of air entering the well. The concentrations are relatively stable in the bundle tubes closest to the wellhead; these sampling points represent a composite of the entire well screen.

Transient behavior of the vacuum levels in the AMH2 bundle tubes (e.g., after the system was down or after a large rain event) also supported the above interpretation. For example, the vacuum data in Figure 4.7 were collected during periods of cycling operation. The vacuum levels in the last two tubes were highest when the system was restarted after being off (i.e., no water in the wellbore) and the vacuum levels declined with time as water was drawn into the well following startup.

Problems with plugging of the 1/8" tubes limit the usefulness of the bundle tube data from the injection well (AMH1). Nonetheless, the data indicate that pressure from the injection air was measurable and relatively constant along the length of the perforated tubing.

All of the wellhead and bundle tube pressure and concentration data are provided in Appendix A.

4.2 Vadose Zone Piezometer Data

The pressure in the piezometers respond rapidly to the vacuum system and were relatively stable throughout the test. Vacuum levels of several inches of water or greater were measured in all of the vadose zone piezometer clusters indicating that the zone of capture in the vadose zone extends across the entire demonstration site and that contaminants are not being spread in this zone. These data will be interpreted in detail in the analysis and evaluation publications for the demonstration, however, a few observations are listed below. Concentration vs time plots in the vadose zone gases varied greatly over the demonstration site as contaminated vapors were swept from the system and purge gases entered from below. For example, as shown on Figure 4.9, MHV1A (the lowest tube in one of the vadose zone clusters) exhibited an increase in concentration following the initiation of the medium injection rate. The concentrations in the zone monitored by this tube stabilized after a short time and appeared to decrease following completion of the injection activities. The zone monitored by this tube is between the water table and a clayey zone and is separated from the extraction well by clays. This zone appears to respond to the injection process as the gas migrates up to the extraction well through discontinuities in the clays of the vadose zone. The piezometer tubes that monitor the sandy zone in which the vacuum extraction well is

completed yielded concentrations that were more consistent (e.g., Figure 4.10). These data are consistent with the observed heterogeneity and dispersion of injected gases observed in the helium tracer test discussed later.

All of the vadose zone piezometer data are provided in Table 4.1 and Appendix B.

4.3 Groundwater VOC Data

Groundwater samples for VOCs were collected approximately weekly during the demonstration. Samples for microorganisms and biochemical markers were collected every two weeks. Table 4.1 lists the construction details for all groundwater monitoring wells at the test site. Water samples can be collected from all of the wells screened in the same zone as the horizontal purge well (these wells are designated MHT-##C). The water table wells (MHT-##D) at each cluster generally do not produce sufficient water to sample. Scaled-plan view maps of the groundwater concentrations during the test were prepared for the zone where AMH-1 is completed. A base map of the wells used in the plots is shown in Figure 4.11. Several of the wells could not be sampled at the first sampling period due to equipment problems. The contours for this period are based in part on the pattern of concentrations measured at the second sampling period. Sampling the wells takes approximately 2 to three days; each of the maps is labeled using the elapsed time from the start of the test to the first day of sampling. The time periods and operational conditions at each time are summarized in the figure captions. One map was selected to represent each operational condition for this report.

Figures 4.12 through 4.16 show the groundwater concentrations for trichloroethylene at each of the selected times; figures 4.17 through 4.21 show the groundwater concentrations for tetrachloroethylene. These time series data, combined with other data, provide valuable information about the performance of the demonstration. The plume maps clearly indicate that the air injection is impacting the groundwater. In particular, comparison of the initial conditions to the "final" conditions shows a significant overall improvement in water quality for both trichloroethylene and tetrachloroethylene. Trichloroethylene concentrations ranged from 500 ppb to 1800 ppb at the beginning of the test and from 10 to 1031 ppb at the end of the test. Similarly, tetrachloroethylene ranged from 85 ppb to 184 ppb at the beginning of the test and from 3 to 124 ppb at the end of the test. Concentrations in almost all wells declined between day 28 and 39 (following initiation of injection at the medium rate). This reduction is assumed to represent the purging of the in-situ air stripping process.

Examination of the later time periods reveals the appearance of a high concentration area in the southern and distal portions of the site (near the end of the injection well). While the area of increased concentration is near the edge of the demonstration site, it does not appear to result from lateral spreading of the contaminants (lateral spreading of the plume would have yielded a transitional map for day 39 rather than the relatively low

concentrations at all monitoring points). Two hypotheses are currently being examined to determine the cause of the concentration increases: 1) upward migration of contaminants caused by the injection of air below the monitoring well screen, or 2) slight pressurization of the vadose zone between the water table and a zone of clays resulting in downward migration from the water table to the depth of the screen being measured. The construction data for the wells, combined with depth discrete hydropunch data collected prior to initiation of the test (Table 4.2) provides a reasonable explanation for the high concentration area. The injection well varies between 150 and about 180 feet deep in the horizontal section with the deepest portion at the distal end. All of the monitoring wells are screened between about 155 and 165 feet deep. The hydropunch samples taken from duplicate holes near MHT-9 (MHP9 and MHP9B) show that groundwater concentrations were approximately 6000 ppb at 188 feet deep and approximately 65 ppb at 152 feet. Upward displacement of the higher concentration water as a result of the test would result in higher concentrations in the wells. Similarly, the purge air appears to move slowly through a clayey layer located between the water table and the extraction well. The resulting slight pressure might result in sufficient downward migration of water table water to yield measurable increases in the well screen. Note also that the demonstration site is located within the central area of the much larger permitted A/M-Area groundwater corrective action system; observed changes at the demonstration site represent an overall reduction in groundwater contamination. The observed increases in concentrations do not represent a spreading of the area groundwater plume.

Time series plots of the concentrations of contaminants in each of the measured wells are provided in Figures 4.22 through 4.34. The concentrations at almost all of the monitoring wells have either dropped or remained stable during the test.

All of the groundwater VOC data are provided in Appendix C.

4.4 Tracer Tests

A test using an inert tracer (helium) to determine the behavior of the injected gas was performed. The test consisted of adding 3 standard cylinders of helium to the injected air over a 24 hour period using a regulator and flow meter. All of the identifiable potential exit points for gas to leave the system were sampled to determine if: 1) the injected air is reaching the extraction well and 2) significant quantities of helium are being forced out of the system through monitoring wells. Since flow of injected air had been qualitatively noted by field sampling personnel, all 20 monitoring wells and the geophysical access holes that extended below the water table were monitored. Samples were collected using a 50 mL disposable syringe and the samples were placed in 30 mL preevacuated serum vials. These vials were analyzed using a helium mass spectrometer that has been modified to sample the serum vials at a constant rate. The mass spectrometer was calibrated in two steps. First, the mass spectrometer is tuned and the sensitivity adjusted to an internal calibrated leak (diffusion) standard in units of standard

mL of He per second; after this step, gas standards prepared in the serum vials are used to convert the instrument reading to ppm (volume) and check the stability of the tuning. The results of the test are listed below:

Elevated helium concentrations were measured in the horizontal vacuum extraction well (AMH2), confirming "communication" between the wells (Figure 4.35). The maximum concentration in AMH2 was approximately 30 ppm, significantly lower than the maximum injected concentration of approximately 1800 ppm. Additionally, the helium peak in the gas from AMH2 was much broader than the 24 hour injection (helium was still exiting AMH2 at the end of the test period). These observations suggest that the gas traveling between the two wells is dispersed as it flows through the several clayey/fine grained zones between the wells. At the end of the reporting test, approximately 45 percent of the injected helium had been extracted from AMH2 (Figure 4.36).

Elevated helium concentrations have been measured in all 10 water table wells indicating that the dry screen above the water table represents a pathway for the injected gas to flow (e.g., Figure 4.37). In two cases, MHT1D and MHT6D, the arrival times were very rapid (hours) and the concentrations were almost the same as the injected air indicating that the gas exiting these two wells was traveling through relatively high permeability flow paths. The volumetric flow rate was measured for the gas exiting these well heads to allow helium mass balance calculations. Despite the high concentrations and measurable flow, these wells account for loss of under 0.5 percent of the injected gas. No flow was measurable at any of the other water table wells.

Elevated helium concentrations were measured in 6 of the 10 wells completed in the air injection zone (~150-155 feet deep). This suggests that some injected gas is entering the screens and exiting at the wellheads. No volumetric flows could be measured at any of the injection zone wells. Thus, these wells do not represent a significant component in the helium/injected gas mass balance.

In summary, the data confirm the fact that the subsurface at the test site contains high permeability and low permeability heterogeneities (typical of natural systems). Nonetheless, there is communication between the injection well (AMH1) and the extraction well (AMH2). AMH2 represents the largest component of the mass balance.

All of the Helium tracer test data are provided in Appendix D.

4.5 Microbiological Monitoring Data

Samples for microbiological analysis were taken from all MHT wells that could be pumped, biweekly. Samples were analyzed for total bacteria using acridine orange direct counts (AODC), viable bacteria using high, peptone-tryptone-yeast extract-glucose (PTYG), and low, 1% PTYG, nutrient media. Samples were analyzed for the following enzymes: alkaline phosphatase, acid phosphatase, and dehydrogenase. Nucleic acids were directly extracted from filtered water and tested with several DNA probes specific for certain functional capabilities. Samples were filtered for phospholipid fatty acids (PLFA) and for reaction with fluorescent antibodies specific for certain species and groups of bacteria (Hazen et al., 1991; Eddy et al., 1991).

For all wells the densities of viable bacteria estimated by the low nutrient media were always higher than the high nutrient media, except for a few rare events where the densities were the same (Figures 4.38, 4.40, 4.42, 4.44, 4.46, 4.48, 4.50, 4.52, 4.54, 4.56, 4.58, 4.60, 4.62). These findings suggest that microflora in the area are adapted to low nutrient conditions and thus, are able to grow to colony size more rapidly on low nutrient media. In general, density estimates on both high and low nutrient media responded in the same way, i.e. they both increase and decrease at the same time. The densities were generally low, but typical, for low carbon groundwaters at the site (Hazen et al., 1991). Viable count densities in MHT wells 1C, 2C, 3C, 4C, 5C, 5D, 6C, 7C, 8C, and 10C all increased significantly after the injection of air started, and all of these same wells except: 2C, 4C, and 5D, decreased significantly after the injection stopped. This is better seen in the density contour diagrams (Figures 4.64-4.66) showing densities at the start of injection, at the end of injection and 2 months post-injection, respectively. Those wells that seemed to show the greatest effect of injection on viable count densities were 1C, 4C, 5C, and 7C. Qualitatively the diversity of the microbes growing on the media decreased after the injection, with two or three species being dominant at any given time; however the dominant species changed over time and did not appear to remain the same at any of the sites where stimulation was the greatest.

Dehydrogenase concentrations were quite variable and thus were not significantly different for any of the wells over time (data not shown). Alkaline phosphatase was very low in concentration and also did not change significantly over time for any of the wells, nor was it significantly different for any of the wells (Figures 4.39, 4.41, 4.43, 4.45, 4.47, 4.49, 4.51, 4.53, 4.55, 4.57, 4.59, 4.61, 4.63). Unlike the other enzymes, acid phosphatase changed significantly over time and was significantly different between wells. This suggests that acid phosphatase may be an important metabolic enzyme in this environment. The acid nature of this environment would also support the preferential use of acid phosphatase over alkaline phosphatase by the microflora. In general, acid phosphatase concentrations increased with injection of air; however, concentrations were highly variable. This type of variability is not unexpected in such a heterogeneous milieu that is under perturbation. Indeed, these findings suggest that the metabolic patterns are complex and that biomass and microbial activity were increased by the injection. The

greatest acid phosphatase response to injection was seen in wells: 1C, 2C, 2D, 4C, 5C, 6C, 7C, and 8C. This coincides well with increases seen in viable count densities, providing another line of evidence that air injection significantly increased the density and biomass of microbes in the groundwater.

At the time of this report analyses for total direct counts (AODC) were incomplete; however, a pattern similar to viable counts has been observed so far (data not presented).

PLFA analyses done by White and Phelps (Univ. Tennessee, ORNL) as with the other analyses indicated that air injection increased biomass (data not presented). The PLFA analyses also indicated that densities of anaerobes also increased during the air injection. This last finding was not expected but is explainable considering that biofilms created by the increase in biomass could create more anaerobic microhabitats. DNA and fluorescent antibody probes of the groundwater are incomplete and inconclusive at this time.

The air injection significantly increased the biomass of microbes and their metabolic activity, especially at those wells where the greatest stripping effect was seen. After injection stopped densities of microbes in the groundwater slowly declined at those wells showing the greatest stimulation. Some of the wells with only moderate increases have shown little decrease since the injection stopped. It is difficult to demonstrate that the increased microbe densities caused increased rates of biodegradation. Nonetheless, it is likely that the increased densities would correlate with increased degradation rates, if only by fortuitous mechanisms. It is also possible that these changes in microflora had a significant effect on the distribution of TCE/PCE through bioabsorption and modification of subsurface water flow paths. A significant inverse correlation can be seen between viable count densities and TCE concentration, at all wells and it is greatest at the wells most effected by the in situ air stripping. This relationship could be cause-effect due to degradative action of the microbes or due to stripping removal that hence decreased a toxic substance or the relationships could be totally independent of each other, continued analysis may elucidate one or more of these hypotheses.

4.6 Related Tests/Reports:

Kaback et al. (1989) provide detailed documentation of the drilling of the horizontal wells used for the demonstration test; Eddy et al. (1991) document the pretest characterization data and the geology and hydrology of the demonstration site. Ramirez et al. of LLNL indicate that the electromagnetic and electrical resistivity cross hole tomography has successfully mapped the moisture changes in the subsurface as the test conditions have been modified. Also, the Sandia National Laboratory single location 3D flow sensor responded rapidly to changes in injection conditions. The U. S. Army Corps of Engineers have demonstrated their modified SCAPS cone penetrometer system and

correlated the results to the detailed characterization data at the demonstration site. Reports on these and other tests will be prepared in 1991. Horizontal wells AMH1 and AMH2 at the field demonstration site will be used for a full scale test of in situ methanotrophic bioremediation. Additional characterization and monitoring technologies will be demonstrated at full scale during these tests. Finally, a post test characterization report documenting the recoring and reimaging of contaminants and microorganisms at the site is currently in progress. The data from the post test characterization will be compared to the pretest data to quantitatively estimate the effectiveness and zone of influence of the field demonstration.

4.7 Preliminary Conclusions:

The SRS in situ air stripping test successfully removed approximately 16000 pounds of contaminants. Groundwater concentrations over much of the demonstration site decreased during the test. A large amount of characterization and monitoring data was collected to aid in interpretation of the test and to provide the information needed for future environmental restorations that employ directionally drilled wells as extraction or delivery systems. Results from the in-situ air stripping test suggest that access to subsurface systems can be improved through the use of directional drilling. Comparison of the horizontal vacuum extraction well to a vertical vacuum extraction well operated at the same test site indicates that the horizontal geometry increased the VOC extraction efficiency by a factor of approximately five. The field demonstration system (installed to remediate one source area) extracted contaminant from the subsurface at approximately the same rate as an areawide groundwater pump and treat system that treats a plume covering approximately a square mile. Additionally, the test indicates that in situ sparging operations or addition of reactants to aquifer systems may be a reasonable technology for selected remediation conditions. For example, installation of a remediation system consisting of horizontal extraction/delivery wells that are perpendicular to groundwater flow at the leading edge of the plume may be potentially cost effective. In this scenario, with sufficient design data, cycling periods of operation could be employed to reduce energy usage and remediation costs. Further development of directional drilling methods (to reduce costs and minimize drilling fluids) and related characterization and monitoring systems will assist in developing timely technical design data for remediation systems that employ directionally drilled wells. Continued development of this and other emerging environmental technologies will assist in developing a "toolkit" of options for remediation that can be combined in creative ways, resulting in cost effective systems that provide a high level of protection to human and environmental health.

Table 4.1 Well Construction Information for the MHT and MHV Wells at the In Situ Air Stripping Demonstration Site.

Well ID	SRS East (ft)	SRS North (ft)	Ground Elev (ft)	TOC Elev (ft)	Riser Elev* (ft)	Pad Elev (ft)	Top of Screen (ft)	Bottom Screen (ft)	Top of Filter (ft)	Bottom Pack (ft)
MHT-1C	48765.60	102706.80	362.3	364.99	365.17	362.8	209.3	204.3	211.2	200.3
MHT-1D	48760.21	102697.34	362.0	364.47	NA	362.5	237.5	217.5	241.0	216.0
MHT-2C	48780.28	102747.08	363.7	366.28	366.46	364.2	211.7	206.7	215.1	203.7
MHT-2D	48784.24	102756.60	363.9	367.28	367.46	364.4	240.1	219.5	242.7	218.6
MHT-3C	48861.11	102704.33	362.2	364.92	365.09	362.7	209.2	204.2	212.5	200.2
MHT-3D	48856.75	102694.60	361.7	364.36	364.70	362.2	236.7	216.7	240.1	215.3
MHT-4C	48863.53	102778.90	367.2	369.62	369.79	367.5	213.2	208.2	216.3	203.2
MHT-4D	48857.11	102772.12	366.6	368.94	NA	366.9	241.6	221.6	244.9	219.6
MHT-5C	48905.88	102725.11	363.6	366.28	366.45	364.2	209.6	204.6	214.9	201.1
MHT-5D	48893.54	102721.66	363.5	366.05	366.36	364.0	240.0	219.9	218.6	218.5
MHT-6C	48900.03	102810.82	369.3	371.79	371.97	369.6	212.3	207.3	215.3	201.3
MHT-6D	48891.01	102808.16	369.1	371.36	NA	369.5	244.1	224.1	247.0	222.1
MHT-7C	48977.48	102788.85	367.5	370.10	370.30	368.0	211.5	206.5	216.4	200.5
MHT-7D	48967.28	102786.76	367.4	370.09	NA	367.9	239.4	219.4	246.0	219.4
MHT-8C	48970.24	102880.69	368.8	371.64	371.80	369.3	211.8	206.8	214.5	201.8
MHT-8D	48960.71	102875.76	369.1	371.77	NA	369.6	240.1	220.1	243.5	219.1
MHT-9C	49015.58	102814.40	367.3	369.71	369.88	367.8	214.3	209.3	215.7	205.8
MHT-9D	49018.07	102805.14	367.2	369.85	370.02	367.7	242.2	222.2	246.6	220.8
MHT-10C	49011.57	102892.30	368.4	370.82	371.11	368.9	211.4	206.4	213.4	203.4
MHT-10D	49001.21	102890.12	368.5	371.04	NA	369.0	239.5	219.5	242.9	217.5

* = Elevation of the top of the water level monitoring access tube; some water table wells do not have these tubes.

Table 4.1 Well Construction Information for the MHT and MHV Wells at the In Situ Air Stripping Demonstration Site (continued).

Well I.D.	SRS East (ft)	SRS North (ft)	Ground Elev (ft)	TOC Elev (ft)	Pad Elev (ft)	Top of Screen Elev (ft)	Bottom of Screen Elev (ft)	Top of Filter Pack Elev (ft)	Bottom of Filter Pack Elev (ft)
'MHV-1A '	48841.98	102749.34	365.3	367.72	365.7	321.30	316.09	322.00	316.20
'MHV-1B '	48841.98	102749.34	365.3	367.72	365.7	295.30	290.09	298.80	285.90
'MHV-1C '	48841.98	102749.34	365.3	367.71	365.7	270.30	265.09	276.85	262.80
'MHV-2A '	48903.22	102755.87	366.0	368.33	366.5	322.00	316.79	324.10	315.30
'MHV-2B '	48903.22	102755.87	366.0	368.31	366.5	296.00	290.79	297.90	288.40
'MHV-2C '	48903.22	102755.87	366.0	368.32	366.5	271.00	265.79	273.40	262.10
'MHV-3A '	48874.06	102774.69	367.9	370.36	368.3	322.90	317.69	324.90	316.70
'MHV-3B '	48874.06	102774.69	367.9	370.36	368.3	298.55	293.34	303.60	292.60
'MHV-3C '	48874.06	102774.69	367.9	370.35	368.3	272.90	267.69	275.00	262.60
'MHV-4A '	48842.53	102841.68	365.7	368.73	368.3	323.20	317.99	325.70	317.20
'MHV-4B '	48842.53	102841.68	365.7	368.64	368.3	295.70	290.49	297.90	289.30
'MHV-4C '	48842.53	102841.68	365.7	368.79	368.3	271.70	266.49	274.40	265.30
'MHV-5A '	48917.46	102878.82	368.9	371.69	369.3	323.90	318.69	326.50	316.20
'MHV-5B '	48917.46	102878.82	368.9	371.62	369.3	300.90	295.69	304.70	295.50
'MHV-5C '	48917.46	102878.82	368.9	371.67	369.3	283.90	278.69	285.90	275.80

Table 4.2 Groundwater Concentrations Determined Using the Hydropunch Sampler During Site Characterization.

Borehole ID	Depth	hydropunch TCE (ug/L)	hydropunch PCE (ug/L)
MHP2B	143.0	442	29
MHP2B	143.0	503	40
MHP2B	160.0	939	144
MHP2B	160.0	1170	144
MHP2B	196.5	1343	< 1
MHP2B	196.5	1640	< 1
MHP2B	187.5	12200	< 1
MHP2B	187.5	13960	< 1
MHP 3	147.0	2698	24
MHP 3	147.0	2960	27
MHP 3	151.0	708	21
MHP 3	151.0	982	23
MHP 3	151.0	831	22
MHP 3	151.0	925	23
MHP 3	156.0	474	65
MHP 3	156.0	493	71
MHP 3	167.0	581	82
MHP 3	167.0	597	92
MHP 3	170.4	221	37
MHP 3	170.4	217	36
MHP 3	185.0	13200	2
MHP 3	185.0	12900	2
MHP3B	193.0	10200	< 1
MHP3B	193.0	10100	< 1
MHP 4	145.0	8191	197
MHP 4	145.0	7607	210
MHP 4	153.5	3635	155
MHP 4	153.5	5985	162
MHP 4	159.0	444	52
MHP 4	159.0	455	53
MHP 4	163.0	1256	185
MHP 4	163.0	809	163
MHP 4	169.0	445	56
MHP 4	169.0	431	53
MHP 4	172.0	156	87
MHP 4	172.0	144	78
MHP 4	176.0	1928	26
MHP 4	176.0	1934	27
MHP5	144.0	665	157
MHP5	144.0	667	161
MHP5	148.0	579	102
MHP5	148.0	508	75
MHP5	161.0	1760	215
MHP5	161.0	1560	186

Table 4.2 Groundwater Concentrations Determined Using the Hydropunch Sampler During Site Characterization (continued).

Borehole ID	Depth	hydropunch TCE (ug/L)	hydropunch PCE (ug/L)
MHP 7	141.5	64	5
MHP 7	141.5	63	5
MHP 7	150.0	4010	198
MHP 7	150.0	3890	190
MHP 7	155.7	95	118
MHP 7	155.7	106	135
MHP 7	162.0	168	239
MHP 7	162.0	168	239
MHP 7	172.0	130	52
MHP 7	172.0	138	57
MHP 7	179.0	3140	281
MHP 7	179.0	3120	282
MHP 7	195.0	7900	2
MHP 7	195.0	7470	2
MHP 8	155.0	596	101
MHP 8	155.0	572	91
MHP 8	159.0	554	7
MHP 8	159.0	574	8
MHP 8	171.0	617	38
MHP 8	171.0	639	41
MHP 9	142.5	146	19
MHP 9	142.5	199	24
MHP 9	148.0	635	120
MHP 9	148.0	608	116
MHP 9	150.0	350	50
MHP 9	150.0	349	50
MHP 9	153.6	534	115
MHP 9	153.6	560	133
MHP 9 B	145.0	67	15
MHP 9 B	145.0	38	8
MHP 9 B	152.0	55	96
MHP 9 B	152.0	65	111
MHP 9 B	188.0	6100	1
MHP 9 B	188.0	5750	1
MHP 9 B	190.0	4670	1
MHP 9 B	190.0	5400	1
MHP 10	148.0	558	132
MHP 10	148.0	403	72
MHP 10	173.4	43	2
MHP 10	173.4	50	2

Figure 4.1. Flow Rate of Gas from Vacuum Extraction Well AMH-2

Figure 4.2. Temperature of Gas from Vacuum Extraction Well AMH-2

Figure 4.3. VOC Concentrations in Vacuum Extraction Well AMH-2

Figure 4.4. Removal Rate of Chlorinated Solvents During the Test

Figure 4.5. Effect of Air Injection on Removal Rate of Chlorinated Solvents During the Test - Average Removal Rate for Each Condition vs. Flow Rate

Figure 4.6. Cumulative Removal of Chlorinated Solvents During the Test

Figure 4.7. Example Vacuum Data from Bundle Tubes in Horizontal Extraction Well AMH2

Figure 4.8. Example Concentration Data from Bundle Tubes in Horizontal Extraction Well AMH2

Figure 4.9. Concentration of Contaminants in MHV1A, an Example Vadose Piezometer Tube Located Deep in the Vadose Zone

Figure 4.10. Concentration of Contaminants in MHV1B, an Example Vadose Piezometer Tube Centrally Located in the Vadose Zone

Base Map for Wells Contoured at Test Site

Figure 4.11. Base Map - MHT Monitoring Wells Measured and Contoured at the In Situ Air Stripping Demonstration Site

Figure 4.12. Trichloroethylene Concentrations (ug/L) at the In Situ Air Stripping Demonstration Site (Initial Conditions/Vacuum Only)

TCE - DAY 28

Figure 4.13. Trichloroethylene Concentrations (ug/L) at the In Situ Air Stripping Demonstration Site (End of Low Injection Rate).

Figure 4.14. Trichloroethylene Concentrations (ug/L) at the In Situ Air Stripping Demonstration Site (Medium Injection Rate for 11 days).

Figure 4.15. Trichloroethylene Concentrations (ug/L) at the In Situ Air Stripping Demonstration Site (High Injection Rate for 22 Days).

Figure 4.16. Trichloroethylene Concentrations (ug/L) at the In Situ Air Stripping Demonstration Site (31 days after completion of injection).

PCE - DAY 11

Figure 4.17. Tetrachloroethylene Concentrations (ug/L) at the In Situ Air Stripping Demonstration Site (Initial Conditions/Vacuum Only)

Figure 4.18. Tetrachloroethylene Concentrations (ug/L) at the In Situ Air Stripping Demonstration Site (End of Low Injection Rate).

Figure 4.19. Tetrachloroethylene Concentrations (ug/L) at the In Situ Air Stripping Demonstration Site (Medium Injection Rate for 11 days).

Figure 4.20. Tetrachloroethylene Concentrations (ug/L) at the In Situ Air Stripping Demonstration Site (High Injection Rate for 22 Days).

Figure 4.21. Tetrachloroethylene Concentrations (ug/L) at the In Situ Air Stripping Demonstration Site (31 days after completion of injection).

Figure 4.22. Time Series Data for Well MHT-1C

Figure 4.23. Time Series Data for Well MHT-2C

Figure 4.24. Time Series Data for Well MHT-2D

Figure 4.25. Time Series Data for Well MHT-3C

Figure 4.26. Time Series Data for Well MHT-4C

Figure 4.27. Time Series Data for Well MHT-5C

Figure 4.28. Time Series Data for Well MHT-5D

Figure 4.29. Time Series Data for Well MHT-6C

Figure 4.30. Time Series Data for Well MHT-7C

Figure 4.31. Time Series Data for Well MHT-8C

Figure 4.32. Time Series Data for Well MHT-9C

Figure 4.33. Time Series Data for Well MHT-9D

Figure 4.34. Time Series Data for Well MHT-10C

Figure 4.35. Helium Tracer Test Results for AMH-2 (Concentrations)

Figure 4.36. Helium Tracer Test Results for AMH-2 (Percent Recovery)

Figure 4.37. Helium Tracer Test Results for MHT 1D (Concentrations)

Figure 4.38. Densities of Viable Microorganisms in Groundwater Collected from Well MHT 1C.

Figure 4.39. Concentration of Acid and Alkaline Phosphatase in Groundwater Collected from Well MHT 1C

Figure 4.40. Densities of Viable Microorganisms in Groundwater Collected from Well MHT 2C.

Figure 4.41. Concentration of Acid and Alkaline Phosphatase in Groundwater Collected from Well MHT 2C

Figure 4.42. Densities of Viable Microorganisms in Groundwater Collected from Well MHT 2D.

Figure 4.43. Concentration of Acid and Alkaline Phosphatase in Groundwater Collected from Well MHT 2D

Figure 4.44. Densities of Viable Microorganisms in Groundwater Collected from Well MHT 3C.

Figure 4.45. Concentration of Acid and Alkaline Phosphatase in Groundwater Collected from Well MHT 3C

Figure 4.46. Densities of Viable Microorganisms in Groundwater Collected from Well MHT 4C.

Figure 4.47. Concentration of Acid and Alkaline Phosphatase in Groundwater Collected from Well MHT 4C

Figure 4.48. Densities of Viable Microorganisms in Groundwater Collected from Well MHT 5C.

Figure 4.49. Concentration of Acid and Alkaline Phosphatase in Groundwater Collected from Well MHT 5C

Figure 4.50. Densities of Viable Microorganisms in Groundwater Collected from Well MHT 5D.

Figure 4.51. Concentration of Acid and Alkaline Phosphatase in Groundwater Collected from Well MHT 5D

Figure 4.52. Densities of Viable Microorganisms in Groundwater Collected from Well MHT 6C.

Figure 4.53. Concentration of Acid and Alkaline Phosphatase in Groundwater Collected from Well MHT 6C

Figure 4.54. Densities of Viable Microorganisms in Groundwater Collected from Well MHT 7C.

Figure 4.55. Concentration of Acid and Alkaline Phosphatase in Groundwater Collected from Well MHT 7C

Figure 4.56. Densities of Viable Microorganisms in Groundwater Collected from Well MHT 8C.

Figure 4.57. Concentration of Acid and Alkaline Phosphatase in Groundwater Collected from Well MHT 8C

Figure 4.58. Densities of Viable Microorganisms in Groundwater Collected from Well MHT 9C.

Figure 4.59. Concentration of Acid and Alkaline Phosphatase in Groundwater Collected from Well MHT 9C

Figure 4.60. Densities of Viable Microorganisms in Groundwater Collected from Well MHT 9D.

Figure 4.61. Concentration of Acid and Alkaline Phosphatase in Groundwater Collected from Well MHT 9D

Figure 4.62. Densities of Viable Microorganisms in Groundwater Collected from Well MHT 10C.

Figure 4.63. Concentration of Acid and Alkaline Phosphatase in Groundwater Collected from Well MHT 10C

Figure 4.64. Plan View Map of Log Viable Microorganism Densities Measured Using 1% PTYG - Beginning of Air Injection

Figure 4.65. Plan View Map of Log Viable Microorganism Densities Measured Using 1% PTYG - End of Air Injection

Figure 4.66. Plan View Map of Log Viable Microorganism Densities Measured Using 1% PTYG - Two Months After Completion of Injection

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**FULL SCALE FIELD TEST OF THE IN SITU AIR STRIPPING PROCESS AT THE
SAVANNAH RIVER INTEGRATED DEMONSTRATION TEST SITE (U)**

**Appendix A Vacuum and Injection Wellhead and Bundle Tube Pressure and
Concentration Data.**

TOTAL VOC EXTRACTION RATES AND CONCENTRATIONS

DATE	FLOW (SCFM)	CONCENTRATIONS				POUNDS PER DAY RATE	PUMP RUN TIME (DAYS)	ACCUM. TOTAL POUNDS REMOVED
		t-1,2-DCE (PPM)	TCE (PPM)	PCE (PPM)	TOTAL VOC (PPM)			
27-Jul-90	0					0	0	0
27-Jul-90	630	BDL	40	79	118	44	0	0
27-Jul-90	607	BDL	1052	3969	5021	1863	0	16
27-Jul-90	592	BDL	329	957	1285	460	0	60
27-Jul-90	588	BDL	328	955	1283	456	0	84
27-Jul-90	583	BDL	401	901	1302	454	0	113
27-Jul-90	590	BDL	402	852	1255	441	0	145
27-Jul-90	590	BDL	390	852	1243	437	0	172
27-Jul-90	577	BDL	446	746	1192	405	0	251
28-Jul-90	581	BDL	432	403	834	276	1	430
28-Jul-90	579	BDL	288	326	614	205	1	483
28-Jul-90	574	BDL	178	230	408	136	1	521
29-Jul-90	566	BDL	352	328	680	219	2	631
29-Jul-90	566	BDL	395	392	787	254	2	666
29-Jul-90	566	BDL	346	329	675	218	2	671
29-Jul-90	568	BDL	303	282	585	189	2	709
30-Jul-90	564	BDL	230	212	442	142	3	801
30-Jul-90	564	BDL	230	220	450	145	3	804
30-Jul-90	558	BDL	205	249	454	147	3	833
30-Jul-90	570	BDL	189	190	379	124	3	868
31-Jul-90	559	BDL	248	212	460	146	4	937
31-Jul-90	559	BDL	241	212	453	144	4	939
31-Jul-90	553	BDL	265	210	475	148	4	963
31-Jul-90	576	BDL	209	174	383	125	4	997
1-Aug-90	569	BDL	287	216	504	161	5	1090
1-Aug-90	564	BDL	288	201	489	154	5	1092
1-Aug-90	564	BDL	265	177	442	139	5	1104
1-Aug-90	566	BDL	292	230	522	167	5	1140
2-Aug-90	570	BDL	289	162	451	142	6	1235
2-Aug-90	570	BDL	287	177	465	147	6	1238
2-Aug-90	571	BDL	282	180	462	147	6	1262
2-Aug-90	571	BDL	253	135	389	122	6	1285
3-Aug-90	571	BDL	250	186	436	140	7	1373
3-Aug-90	571	BDL	226	159	385	123	7	1375
3-Aug-90	569	BDL	242	186	428	137	7	1383
3-Aug-90	570	BDL	220	181	401	129	7	1401
4-Aug-90	569	BDL	230	165	395	126	8	1493

TOTAL VOC EXTRACTION RATES AND CONCENTRATIONS

DATE	FLOW (SCFM)	CONCENTRATIONS				POUNDS PER DAY RATE	PUMP RUN TIME (DAYS)	ACCUM. TOTAL POUNDS REMOVED
		t-1,2-DCE (PPM)	TCE (PPM)	PCE (PPM)	TOTAL VOC (PPM)			
4-Aug-90	569	BDL	248	175	423	135	8	1496
4-Aug-90	570	BDL	219	153	372	118	8	1519
4-Aug-90	572	BDL	234	165	399	128	8	1542
5-Aug-90	579	BDL	185	113	299	96	9	1614
5-Aug-90	579	BDL	210	139	349	112	9	1616
5-Aug-90	579	BDL	199	132	331	107	9	1631
5-Aug-90	578	BDL	177	109	286	92	9	1651
6-Aug-90	579	BDL	180	111	291	93	10	1709
6-Aug-90	579	BDL	188	124	312	101	10	1710
6-Aug-90	581	BDL	180	139	319	104	10	1726
6-Aug-90	583	BDL	179	131	310	101	10	1748
7-Aug-90	587	BDL	166	103	269	87	11	1807
7-Aug-90	587	BDL	172	115	287	94	11	1809
7-Aug-90	591	BDL	148	78	227	74	11	1821
7-Aug-90	591	BDL	168	119	287	95	11	1839
8-Aug-90	576	BDL	157	99	257	82	12	1893
8-Aug-90	576	BDL	165	112	277	89	12	1895
8-Aug-90	577	BDL	175	122	297	96	12	1912
8-Aug-90	579	BDL	136	92	229	74	12	1923
9-Aug-90	579	BDL	178	116	293	95	13	1980
9-Aug-90	579	BDL	139	87	226	73	13	1984
9-Aug-90	578	BDL	174	106	281	90	13	1992
9-Aug-90	578	BDL	173	107	280	90	13	1994
9-Aug-90	585	BDL	207	126	332	108	13	2011
10-Aug-90	STOP					108	14	2073
10-Aug-90	START					108	14	2073
10-Aug-90	599	BDL	220	115	335	110	14	2074
10-Aug-90	589	BDL	232	141	373	122	14	2077
10-Aug-90	584	BDL	226	138	365	118	14	2079
10-Aug-90	581	BDL	220	137	357	115	14	2081
10-Aug-90	580	BDL	215	127	342	110	14	2083
10-Aug-90	580	BDL	227	142	369	119	14	2085
10-Aug-90	593	BDL	218	120	337	110	14	2090
10-Aug-90	586	BDL	222	134	357	116	14	2092
10-Aug-90	582	BDL	213	129	342	110	14	2095
10-Aug-90	582	BDL	214	129	343	111	14	2097
10-Aug-90	579	BDL	219	143	362	117	14	2105

TOTAL VOC EXTRACTION RATES AND CONCENTRATIONS

DATE	FLOW (SCFM)	CONCENTRATIONS				POUNDS PER DAY RATE	PUMP RUN TIME (DAYS)	ACCUM. TOTAL POUNDS REMOVED
		t-1,2-DCE (PPM)	TCE (PPM)	PCE (PPM)	TOTAL VOC (PPM)			
11-Aug-90	579	BDL	206	127	333	107	15	2177
11-Aug-90	579	BDL	205	126	331	106	15	2180
11-Aug-90	579	BDL	206	120	326	104	15	2183
11-Aug-90	579	BDL	185	118	303	97	15	2187
11-Aug-90	579	BDL	200	123	323	104	15	2192
11-Aug-90	578	BDL	199	117	316	101	15	2197
11-Aug-90	580	BDL	187	106	293	94	15	2201
11-Aug-90	580	BDL	203	126	329	106	15	2205
11-Aug-90	579	BDL	189	118	307	99	15	2209
11-Aug-90	578	BDL	175	107	282	90	15	2213
12-Aug-90	577	BDL	223	138	360	115	16	2282
12-Aug-90	577	BDL	173	103	277	88	16	2283
12-Aug-90	579	BDL	200	130	329	106	16	2301
12-Aug-90	579	BDL	180	111	291	93	16	2304
12-Aug-90	578	BDL	179	110	289	93	16	2318
13-Aug-90	577	BDL	142	92	235	75	17	2371
13-Aug-90	577	BDL	185	113	298	96	17	2372
13-Aug-90	577	BDL	179	108	287	92	17	2374
13-Aug-90	579	BDL	180	111	291	94	17	2391
13-Aug-90	580	BDL	217	165	382	125	17	2404
14-Aug-90	579	BDL	182	114	297	95	18	2473
14-Aug-90	579	BDL	165	104	269	87	18	2474
14-Aug-90	580	BDL	161	104	265	86	18	2486
14-Aug-90	580	BDL	158	116	274	89	18	2503
15-Aug-90	577	BDL	140	110	250	81	19	2558
15-Aug-90	577	BDL	159	114	273	88	19	2561
15-Aug-90	579	BDL	172	123	294	95	19	2576
15-Aug-90	580	BDL	166	126	292	95	19	2593
16-Aug-90	579	BDL	200	153	353	115	20	2660
16-Aug-90	579	BDL	204	153	357	116	20	2662
16-Aug-90	580	BDL	183	138	321	105	20	2678
16-Aug-90	585	BDL	198	140	337	110	20	2696
17-Aug-90	579	BDL	184	133	318	103	21	2767
17-Aug-90	579	BDL	192	149	341	111	21	2769
17-Aug-90	582	BDL	205	160	364	119	21	2788
17-Aug-90	582	BDL	184	143	328	107	21	2807
20-Aug-90	567	BDL	161	158	319	103	24	3087

TOTAL VOC EXTRACTION RATES AND CONCENTRATIONS

DATE	FLOW (SCFM)	CONCENTRATIONS				POUNDS PER DAY RATE	PUMP RUN TIME (DAYS)	ACCUM. TOTAL POUNDS REMOVED
		t-1,2-DCE (PPM)	TCE (PPM)	PCE (PPM)	TOTAL VOC (PPM)			
20-Aug-90	567	BDL	168	162	330	107	24	3089
20-Aug-90	566	BDL	152	141	293	94	24	3101
20-Aug-90	557	BDL	165	150	315	100	24	3121
21-Aug-90	577	BDL	161	161	322	106	25	3184
21-Aug-90	577	BDL	157	161	318	105	25	3186
21-Aug-90	577	BDL	155	163	318	105	25	3204
21-Aug-90	579	BDL	153	155	308	102	25	3224
22-Aug-90	578	BDL	153	177	330	110	26	3290
22-Aug-90	578	BDL	140	148	288	95	26	3292
22-Aug-90	585	BDL	141	161	302	102	26	3309
22-Aug-90	580	BDL	165	203	368	124	26	3330
23-Aug-90	579	BDL	142	175	318	106	27	3403
23-Aug-90	579	BDL	128	155	283	95	27	3404
23-Aug-90	583	BDL	135	180	316	107	27	3430
24-Aug-90	581	BDL	144	215	358	122	28	3518
24-Aug-90	574	BDL	117	156	272	91	28	3524
24-Aug-90	571	BDL	122	162	284	94	28	3527
24-Aug-90	571	BDL	133	212	344	115	28	3531
24-Aug-90	571	BDL	126	186	312	104	28	3540
25-Aug-90	570	BDL	118	165	283	94	29	3610
25-Aug-90	570	BDL	115	169	284	95	29	3611
25-Aug-90	570	BDL	109	151	260	86	29	3619
25-Aug-90	572	BDL	115	181	296	99	29	3630
25-Aug-90	568	BDL	122	178	299	99	29	3641
26-Aug-90	567	BDL	130	197	326	108	30	3705
26-Aug-90	567	BDL	131	209	339	113	30	3707
26-Aug-90	572	BDL	121	201	322	108	30	3725
26-Aug-90	569	BDL	121	172	293	97	30	3745
27-Aug-90	567	BDL	136	228	364	122	31	3815
27-Aug-90	567	BDL	122	197	318	106	31	3817
27-Aug-90	567	BDL	137	251	388	130	31	3853
28-Aug-90	STOP					130	31	3857
28-Aug-90	START					130	31	3857
28-Aug-90	586	BDL	148	241	389	134	31	3872
28-Aug-90	586	BDL	151	289	440	153	31	3877
29-Aug-90	573	BDL	148	250	398	135	32	3982
29-Aug-90	573	BDL	146	263	409	139	32	3984

TOTAL VOC EXTRACTION RATES AND CONCENTRATIONS

DATE	FLOW (SCFM)	CONCENTRATIONS				POUNDS PER DAY RATE	PUMP RUN TIME (DAYS)	ACCUM. TOTAL POUNDS REMOVED
		t-1,2-DCE (PPM)	TCE (PPM)	PCE (PPM)	TOTAL VOC (PPM)			
29-Aug-90	570	BDL	132	257	389	132	32	4030
30-Aug-90	563	BDL	149	310	458	154	33	4128
30-Aug-90	563	BDL	137	291	429	144	33	4131
30-Aug-90	590	BDL	116	244	360	127	33	4147
31-Aug-90	556	BDL	152	318	470	156	34	4260
31-Aug-90	556	BDL	131	256	387	128	34	4264
31-Aug-90	STOP					128	34	4265
31-Aug-90	START					128	34	4265
31-Aug-90	580	BDL	136	313	449	156	34	4293
1-Sep-90	579	BDL	124	253	378	130	35	4411
1-Sep-90	579	BDL	132	263	395	136	35	4413
2-Sep-90	580	BDL	138	328	466	162	36	4596
3-Sep-90	580	BDL	127	262	389	134	37	4719
3-Sep-90	580	BDL	130	260	390	135	37	4721
4-Sep-90	579	BDL	136	294	430	148	38	4850
5-Sep-90	580	BDL	114	270	384	134	39	4981
5-Sep-90	580	BDL	113	253	365	127	39	4985
5-Sep-90	580	BDL	123	254	377	130	39	5015
6-Sep-90	580	BDL	130	272	403	139	40	5121
6-Sep-90	580	BDL	146	251	397	136	40	5124
6-Sep-90	580	BDL	104	194	298	102	40	5149
7-Sep-90	582	BDL	121	222	343	118	41	5235
7-Sep-90	582	BDL	117	223	340	117	41	5237
7-Sep-90	582	BDL	121	229	351	121	41	5259
7-Sep-90	STOP					121	41	5270
8-Sep-90	START					121	41	5270
8-Sep-90	600	BDL	100	160	260	92	41	5273
8-Sep-90	600	BDL	116	212	328	116	41	5276
9-Sep-90	STOP					116	42	5317
9-Sep-90	START					116	42	5317
9-Sep-90	602	BDL	121	213	334	119	42	5323
9-Sep-90	602	BDL	120	222	342	122	42	5325
10-Sep-90	580	BDL	118	278	396	138	43	5443
10-Sep-90	577	BDL	108	239	347	120	43	5485
11-Sep-90	577	BDL	125	319	444	154	44	5575
11-Sep-90	582	BDL	123	296	418	146	44	5595
12-Sep-90	574	BDL	138	295	433	148	45	5719

TOTAL VOC EXTRACTION RATES AND CONCENTRATIONS

DATE	FLOW (SCFM)	CONCENTRATIONS				POUNDS PER DAY RATE	PUMP RUN TIME (DAYS)	ACCUM. TOTAL POUNDS REMOVED
		t-1,2-DCE (PPM)	TCE (PPM)	PCE (PPM)	TOTAL VOC (PPM)			
12-Sep-90	578	BDL	128	296	424	147	45	5740
12-Sep-90	577	BDL	116	253	369	127	45	5752
13-Sep-90	574	BDL	132	266	397	136	46	5855
13-Sep-90	578	BDL	129	282	412	142	46	5862
13-Sep-90	576	BDL	117	240	357	123	46	5868
13-Sep-90	582	BDL	131	299	431	150	46	5876
13-Sep-90	577	BDL	118	249	367	126	46	5885
14-Sep-90	571	BDL	140	295	435	148	47	5990
14-Sep-90	576	BDL	120	238	358	122	47	6022
15-Sep-90	573	BDL	140	287	427	146	48	6124
15-Sep-90	571	BDL	127	256	383	130	48	6158
16-Sep-90	572	BDL	140	289	429	146	49	6262
16-Sep-90	559	BDL	136	287	423	141	49	6301
17-Sep-90	570	BDL	145	286	432	146	50	6391
17-Sep-90	577	BDL	139	280	418	144	50	6429
18-Sep-90	570	BDL	140	262	402	136	51	6528
18-Sep-90	571	BDL	131	262	393	133	51	6568
19-Sep-90	568	BDL	116	242	358	121	52	6665
19-Sep-90	575	BDL	112	238	350	120	52	6692
20-Sep-90	569	BDL	113	247	361	122	53	6787
20-Sep-90	568	BDL	115	271	386	131	53	6815
21-Sep-90	560	BDL	128	283	411	138	54	6918
21-Sep-90	558	BDL	115	253	369	123	54	6949
24-Sep-90	566	BDL	111	237	348	118	57	7275
24-Sep-90	569	BDL	112	250	362	123	57	7306
25-Sep-90	569	BDL	118	257	375	127	58	7400
25-Sep-90	577	BDL	116	260	376	130	58	7431
26-Sep-90	STOP					130	58	7501
26-Sep-90	START					130	58	7501
26-Sep-90	597	BDL	112	251	362	129	58	7509
26-Sep-90	574	BDL	112	247	359	123	59	7531
27-Sep-90	575	BDL	120	258	378	130	59	7620
27-Sep-90	572	BDL	118	271	389	133	60	7656
28-Sep-90	567	BDL	128	297	424	144	60	7758
28-Sep-90	568	BDL	123	294	416	142	61	7795
29-Sep-90	559	BDL	125	285	409	137	61	7899
30-Sep-90	555	BDL	129	304	433	144	62	8045

TOTAL VOC EXTRACTION RATES AND CONCENTRATIONS

DATE	FLOW (SCFM)	CONCENTRATIONS				POUNDS PER DAY RATE	PUMP RUN TIME (DAYS)	ACCUM. TOTAL POUNDS REMOVED
		t-1,2-DCE (PPM)	TCE (PPM)	PCE (PPM)	TOTAL VOC (PPM)			
30-Sep-90	555		129	304	433	144	62	8045
1-Oct-90	558		133	273	407	135	63	8186
1-Oct-90	541		134	281	415	134	64	8213
2-Oct-90	526		141	280	421	132	64	8313
2-Oct-90	STOP					132	64	8333
3-Oct-90	START					132	64	8333
3-Oct-90	584		142	278	420	146	64	8342
3-Oct-90	576		137	269	406	139	65	8375
4-Oct-90	567		137	267	405	136	65	8477
4-Oct-90	567		138	277	414	140	66	8510
4-Oct-90	STOP					140	66	8537
5-Oct-90	START					140	66	8537
5-Oct-90	585		131	251	383	133	66	8545
5-Oct-90	573		130	246	376	127	66	8574
6-Oct-90	570		133	243	375	127	67	8662
7-Oct-90	555		119	259	378	125	68	8808
8-Oct-90	STOP					125	69	8881
8-Oct-90	START					125	69	8881
8-Oct-90	572		124	272	396	135	69	8888
8-Oct-90	569		121	272	393	133	69	8921
9-Oct-90	557		127	286	413	137	70	9018
9-Oct-90	STOP					137	70	9020
9-Oct-90	START					137	70	9020
9-Oct-90	555		119	273	392	130	70	9051
10-Oct-90	555		125	277	402	133	71	9150
10-Oct-90	555		135	299	434	144	71	9185
10-Oct-90	STOP					144	71	9212
11-Oct-90	START					144	71	9212
11-Oct-90	557		118	265	383	128	71	9222
11-Oct-90	546		114	251	365	119	71	9252
12-Oct-90	542		139	312	451	146	72	9354
12-Oct-90	551		123	276	398	131	72	9387
13-Oct-90	555		117	255	371	123	73	9480
13-Oct-90	STOP					123	73	9483
13-Oct-90	START					123	73	9483
14-Oct-90	552		113	239	351	116	74	9598
15-Oct-90	554		112	236	348	115	75	9716

TOTAL VOC EXTRACTION RATES AND CONCENTRATIONS

DATE	FLOW (SCFM)	CONCENTRATIONS				POUNDS PER DAY RATE	PUMP RUN TIME (DAYS)	ACCUM. TOTAL POUNDS REMOVED
		t-1,2-DCE (PPM)	TCE (PPM)	PCE (PPM)	TOTAL VOC (PPM)			
15-Oct-90	552		113	239	352	116	75	9745
16-Oct-90	STOP					116	76	9828
16-Oct-90	START					116	76	9828
16-Oct-90	579		108	220	328	113	76	9835
16-Oct-90	557		112	244	357	119	76	9850
17-Oct-90	551		129	273	402	132	77	9942
17-Oct-90	554		124	255	379	125	77	9975
18-Oct-90	553		127	266	393	130	78	10070
18-Oct-90	557		123	254	376	125	78	10102
19-Oct-90	564		134	295	429	145	79	10208
19-Oct-90	566		126	281	407	138	79	10240
20-Oct-90	568		121	252	373	126	80	10341
21-Oct-90	563		128	266	393	132	81	10472
22-Oct-90	556		133	280	413	137	82	10603
22-Oct-90	563		144	291	435	145	82	10639
23-Oct-90	STOP					145	83	10717
23-Oct-90	START					145	83	10717
23-Oct-90	600		125	259	384	137	83	10724
23-Oct-90	583		122	249	370	129	83	10740
24-Oct-90	579		124	254	378	130	84	10826
24-Oct-90	579		125	257	381	131	84	10860
25-Oct-90	585		132	275	406	142	85	10962
25-Oct-90	579		123	256	379	131	85	10997
26-Oct-90	577		136	273	409	140	86	11105
26-Oct-90	562		122	246	368	123	86	11136
27-Oct-90	562		132	279	411	138	87	11244
28-Oct-90	562		130	257	387	129	88	11387
29-Oct-90	560		150	300	451	150	89	11509
29-Oct-90	556		130	293	423	141	89	11546
29-Oct-90	STOP					141	89	11547
29-Oct-90	START					141	89	11547
30-Oct-90	566		128	257	384	129	90	11643
30-Oct-90	STOP					129	90	11674
30-Oct-90	START					129	90	11674
30-Oct-90	575		110	225	335	115	90	11679
31-Oct-90	STOP					115	91	11756
3-Nov-90	START					115	91	11756

TOTAL VOC EXTRACTION RATES AND CONCENTRATIONS

DATE	FLOW (SCFM)	CONCENTRATIONS				POUNDS PER DAY RATE	PUMP RUN TIME (DAYS)	ACCUM. TOTAL POUNDS REMOVED
		t-1,2-DCE (PPM)	TCE (PPM)	PCE (PPM)	TOTAL VOC (PPM)			
3-Nov-90	545		133	295	428	139	91	11771
4-Nov-90	541		120	263	383	123	92	11890
5-Nov-90	495		118	249	367	108	92	11979
5-Nov-90	489		120	265	384	112	93	12006
6-Nov-90	478		122	268	390	111	93	12090
6-Nov-90	475		127	289	416	118	94	12119
7-Nov-90	445		135	287	422	112	95	12217
7-Nov-90	444		142	300	442	117	95	12229
8-Nov-90	557		133	259	392	130	95	12322
8-Nov-90	STOP					130	96	12345
12-Nov-90	START					130	96	12345
12-Nov-90	574		6.94	3.71	11	3	96	12345
12-Nov-90	574		21.3	24.4	46	15	96	12345
12-Nov-90	574		44.4	62.2	107	36	96	12346
12-Nov-90	574		60.7	86.9	148	49	96	12346
12-Nov-90	574		115	216	331	113	96	12347
12-Nov-90	562		133	260	393	131	96	12348
13-Nov-90	539		152	272	424	135	96	12432
13-Nov-90	537		163	324	487	155	96	12454
14-Nov-90	527		150	274	424	132	97	12579
14-Nov-90	526		145	257	402	125	98	12604
15-Nov-90	527		137	267	404	126	98	12706
15-Nov-90	526		152	298	450	141	98	12721
16-Nov-90	527		152	306	458	144	99	12845
16-Nov-90	STOP					144	99	12855
16-Nov-90	START					144	99	12855
16-Nov-90	583		142	275	417	144	99	12858
17-Nov-90	563		120	250	369	124	100	12959
18-Nov-90	560		129	274	402	134	101	13097
19-Nov-90	555		121	272	393	130	102	13221
19-Nov-90	555		136	249	385	126	102	13244
20-Nov-90	553		132	263	395	130	103	13348
20-Nov-90	552		143	273	416	136	103	13371
21-Nov-90	554		137	271	408	134	104	13475
26-Nov-90	544		124	250	374	121	109	14123
26-Nov-90	548		107	192	299	97	109	14144
27-Nov-90	565		125	204	329	109	110	14228

TOTAL VOC EXTRACTION RATES AND CONCENTRATIONS

DATE	FLOW (SCFM)	CONCENTRATIONS				POUNDS PER DAY RATE	PUMP RUN TIME (DAYS)	ACCUM. TOTAL POUNDS REMOVED
		t-1,2-DCE (PPM)	TCE (PPM)	PCE (PPM)	TOTAL VOC (PPM)			
27-Nov-90	570		139	226	366	122	110	14252
27-Nov-90	STOP					122	110	14253
27-Nov-90	START					122	110	14253
28-Nov-90	547		111	241	352	115	111	14337
28-Nov-90	550		101	217	318	104	111	14364
29-Nov-90	551		107	246	353	116	112	14449
29-Nov-90	548		95	214	310	102	112	14479
30-Nov-90	556		92	245	338	113	113	14560
30-Nov-90	554		106	265	371	123	113	14585
1-Dec-90	561		109	270	379	128	114	14701
2-Dec-90	560		90	214	304	102	115	14818
3-Dec-90	STOP					102	116	14873
3-Dec-90	START					102	116	14873
3-Dec-90	556		78	213	291	97	116	14879
3-Dec-90	549		103	232	335	110	116	14904
4-Dec-90	546		87	224	311	102	117	14988
4-Dec-90	547		83	179	262	86	117	15010
5-Dec-90	553		78	182	260	86	118	15077
5-Dec-90	546		62	156	218	72	118	15095
6-Dec-90	548		84	237	321	106	119	15171
6-Dec-90	548		72	184	256	84	119	15181
7-Dec-90	555		107	235	341	113	120	15256
7-Dec-90	STOP					113	120	15258
7-Dec-90	START					113	120	15258
10-Dec-90	547		109	233	342	112	123	15582
10-Dec-90	STOP					112	123	15583
10-Dec-90	START					112	123	15583
10-Dec-90	539		103	206	309	99	123	15604
11-Dec-90	537		108	236	344	110	124	15682
11-Dec-90	534		113		113	116	124	15710
12-Dec-90	537		112	253	365	117	125	15797
12-Dec-90	539		114	259	373	120	125	15824
13-Dec-90	543		112	249	361	117	126	15910
13-Dec-90	STOP					117	126	15923

BDL = BELOW DETECTION LIMIT

TOTAL VOC EXTRACTION RATES AND CONCENTRATIONS

DATE	FLOW (SCFM)	CONCENTRATIONS				POUNDS PER DAY RATE	PUMP RUN TIME (DAYS)	ACCUM. TOTAL POUNDS REMOVED
		t-1,2-DCE (PPM)	TCE (PPM)	PCE (PPM)	TOTAL VOC (PPM)			

average for early VE	107.46	08/04 to 08/09	0	scfm
average for low inj	109.0443		65	scfm
average for med inj	131.4538		170	scfm
average for high inj	132.122		270	scfm
average for end VE	107.1555		0	scfm

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
AMH-2-22.2	2-Aug-90	351	77.3	428
AMH-2-22.2	9-Aug-90	315	59.1	374
AMH-2-22.2	15-Aug-90	256	84.3	341
AMH-2-22.2	21-Aug-90	211	89.1	300
AMH-2-22.2	29-Aug-90	177	101	278
AMH-2-22.2	3-Sep-90	141	108	249
AMH-2-22.2	11-Sep-90	46.0	67.7	114
AMH-2-22.2	18-Sep-90	133	181	315
AMH-2-22.2	27-Sep-90	96.7	183	280
AMH-2-22.2	4-Oct-90	117	175	292
AMH-2-22.2	11-Oct-90	114	213	327
AMH-2-22.2	18-Oct-90	104	167	271
AMH-2-22.2	25-Oct-90	103	165	268
AMH-2-22.2	3-Nov-90	128	181	309
AMH-2-22.2	8-Nov-90	105	169	273
AMH-2-22.2	15-Nov-90	104	162	266
AMH-2-22.2	20-Nov-90	114	202	316
AMH-2-22.2	30-Nov-90	52.2	86.6	139
AMH-2-22.2	5-Dec-90	9.92	29.1	39.0
AMH-2-22.2	12-Dec-90	90.7	149	240

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
AMH-2-58.5	2-Aug-90	426	144	569
AMH-2-58.5	9-Aug-90	265	37.2	302
AMH-2-58.5	15-Aug-90	340	67.6	408
AMH-2-58.5	21-Aug-90	208	50.0	258
AMH-2-58.5	29-Aug-90	191	50.1	241
AMH-2-58.5	3-Sep-90	183	69.4	253
AMH-2-58.5	11-Sep-90	61.6	42.7	104
AMH-2-58.5	18-Sep-90	188	134	322
AMH-2-58.5	27-Sep-90	1.10	4.62	5.73
AMH-2-58.5	4-Oct-90	78.0	174	252
AMH-2-58.5	11-Oct-90	76.0	136	212
AMH-2-58.5	18-Oct-90	135	198	333
AMH-2-58.5	25-Oct-90	220	331	551
AMH-2-58.5	3-Nov-90	158	224	381
AMH-2-58.5	8-Nov-90	49.3	126	176
AMH-2-58.5	15-Nov-90	115	189	304
AMH-2-58.5	20-Nov-90	199	282	481
AMH-2-58.5	30-Nov-90	62.7	75.7	139
AMH-2-58.5	5-Dec-90	81.0	105	186
AMH-2-58.5	12-Dec-90	0.793	1.66	2.45

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
AMH-2-98.7	2-Aug-90	878	125	1003
AMH-2-98.7	9-Aug-90	179	25.7	205
AMH-2-98.7	15-Aug-90	186	59.9	246
AMH-2-98.7	21-Aug-90	9.93	3.07	13.0
AMH-2-98.7	29-Aug-90	0.590	BDL	0.590
AMH-2-98.7	3-Sep-90	11.2	4.21	15.4
AMH-2-98.7	11-Sep-90	102	142	244
AMH-2-98.7	18-Sep-90	195	112	307
AMH-2-98.7	27-Sep-90	19.9	37.1	57.0
AMH-2-98.7	4-Oct-90	167	230	397
AMH-2-98.7	11-Oct-90	47.1	69.3	116
AMH-2-98.7	18-Oct-90	7.48	11.5	19.0
AMH-2-98.7	25-Oct-90	199	274	473
AMH-2-98.7	3-Nov-90	164	252	416
AMH-2-98.7	8-Nov-90	16.7	47.7	64.5
AMH-2-98.7	15-Nov-90	41.2	73.1	114
AMH-2-98.7	20-Nov-90	116	170	286
AMH-2-98.7	30-Nov-90	35.5	32.8	68.2
AMH-2-98.7	5-Dec-90	19.4	11.1	30.5
AMH-2-98.7	12-Dec-90	3.24	7.36	10.6

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
AMH-2-138.8	2-Aug-90	900	121	1021
AMH-2-138.8	9-Aug-90	407	37.2	444
AMH-2-138.8	15-Aug-90	869	128	997
AMH-2-138.8	21-Aug-90	824	97.2	922
AMH-2-138.8	29-Aug-90	9.35	10.9	20.2
AMH-2-138.8	5-Sep-90	2.43	3.06	5.55
AMH-2-138.8	11-Sep-90	46.3	47.9	94.2
AMH-2-138.8	18-Sep-90	321	207	528
AMH-2-138.8	27-Sep-90	205	159	365
AMH-2-138.8	4-Oct-90	239	196	435
AMH-2-138.8	11-Oct-90	237	187	404
AMH-2-138.8	18-Oct-90	4.23	9.25	13.5
AMH-2-138.8	25-Oct-90	96.9	121	218
AMH-2-138.8	3-Nov-90	200	145	345
AMH-2-138.8	8-Nov-90	39.8	98.1	138
AMH-2-138.8	15-Nov-90	112	160	272
AMH-2-138.8	20-Nov-90	125	160	286
AMH-2-138.8	30-Nov-90	82.1	111	193
AMH-2-138.8	5-Dec-90	41.1	39.3	80.5
AMH-2-138.8	12-Dec-90	0.094	0.193	0.287

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
AMH-2-179.0	2-Aug-90	27.7	9.33	37.1
AMH-2-179.0	9-Aug-90	2.05	1.43	3.47
AMH-2-179.0	15-Aug-90	13.3	7.71	21.0
AMH-2-179.0	21-Aug-90	1.77	0.836	2.60
AMH-2-179.0	29-Aug-90	1.21	1.32	2.53
AMH-2-179.0	3-Sep-90	8.70	6.01	14.7
AMH-2-179.0	11-Sep-90	6.10	16.2	22.3
AMH-2-179.0	18-Sep-90	35.8	67.9	104
AMH-2-179.0	27-Sep-90	76.2	109	185
AMH-2-179.0	4-Oct-90	28.1	82.5	111
AMH-2-179.0	11-Oct-90	71.5	84.3	156
AMH-2-179.0	18-Oct-90	3.58	8.30	11.9
AMH-2-179.0	25-Oct-90	110	156	266
AMH-2-179.0	3-Nov-90	90.0	103	193
AMH-2-179.0	8-Nov-90	50.9	76.3	127
AMH-2-179.0	15-Nov-90	93.8	280	374
AMH-2-179.0	20-Nov-90	115	172	287
AMH-2-179.0	30-Nov-90	34.2	60.6	94.8
AMH-2-179.0	5-Dec-90	38.9	49.9	88.8
AMH-2-179.0	12-Dec-90	1.94	3.00	4.94

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
AMH-2-219.2	2-Aug-90	7.30	2.56	9.85
AMH-2-219.2	9-Aug-90	1.18	0.791	1.97
AMH-2-219.2	15-Aug-90	0.064	0.379	0.444
AMH-2-219.2	21-Aug-90	BDL	BDL	BDL
AMH-2-219.2	29-Aug-90	BDL	0.110	0.110
AMH-2-219.2	3-Sep-90	0.715	0.365	1.08
AMH-2-219.2	11-Sep-90	3.83	10.4	14.2
AMH-2-219.2	18-Sep-90	3.37	7.11	10.5
AMH-2-219.2	27-Sep-90	21.1	55.2	76.3
AMH-2-219.2	4-Oct-90	15.3	39.1	54.5
AMH-2-219.2	11-Oct-90	53.4	70.0	123
AMH-2-219.2	18-Oct-90	5.89	13.7	19.6
AMH-2-219.2	25-Oct-90	23.4	44.7	68.1
AMH-2-219.2	3-Nov-90	36.2	70.8	107
AMH-2-219.2	8-Nov-90	12.7	44.1	56.8
AMH-2-219.2	15-Nov-90	53.7	283	336
AMH-2-219.2	20-Nov-90	20.3	48.3	68.6
AMH-2-219.2	30-Nov-90	21.3	47.3	68.6
AMH-2-219.2	5-Dec-90	12.9	26.2	39.0
AMH-2-219.2	12-Dec-90	BDL	0.166	0.166

[illegible]

[illegible]

DATE	8/1/90	8/1/90	8/2/90	8/2/90	8/2/90	8/2/90	8/3/90	8/3/90	8/3/90	8/4/90
TIME	1400	1933	0805	1032	1450	1900	1104	1307	1600	0822
UNIT HOURS	17281	17338	17462	17486	17529	17570	1773.1	1775.1	1778.0	1794.4
UNIT VOLUME	11.0	11.2	11.6	11.5	11.4	11.4	11.5	11.5	11.5	11.7
filter	11.5	11.6	12.0	10.9	10.7	10.8	10.9	10.9	10.8	11.0
WELL VOLUME	10.8	10.7	11.1	10.4	10.3	10.4	10.4	10.5	10.4	10.5
DELTA P	8.5	8.5	11.5	8.0	7.5	7.0	7.5	7.5	7.7	7.8
TEMPERATURE	57F°	56F°	56F°	57F°	58F°	56F°	56°F	57°F	57.5	56
AN-1-CELL	9.3Hg	9.6Hg	10.0Hg	9.1Hg	9.2Hg	9.2Hg	9.1Hg	9.0Hg	8.9Hg	9.0Hg
AN-2-CELL	9.3Hg	9.6Hg	10.0Hg	9.0Hg	9.6Hg	9.0Hg	8.4Hg	8.4Hg	8.3Hg	8.5Hg
AN-3-CELL	5.7Hg	5.8Hg	6.7Hg	5.8Hg	4.7Hg	5.5Hg	6.0Hg	6.0Hg	5.9Hg	5.7Hg
AN-4-CELL	6.0Hg	6.0Hg	6.8Hg	5.8Hg	5.7Hg	5.2Hg	6.0Hg	6.0Hg	5.8Hg	5.7Hg
AN-5-CELL	3.8Hg	3.8Hg	4.9Hg	4.1Hg	4.1Hg	4.1Hg	4.0Hg	3.9Hg	3.8Hg	4.0Hg
AN-6-CELL	off	4H ₂ O	12.5H ₂ O	11.6H ₂ O	11.3H ₂ O	10.2H ₂ O	11.5H ₂ O	11.15H ₂ O	10.0H ₂ O	10.9H ₂ O
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DATE	8/4/90	8/4/90	8/5/90	8/5/90	8/5/90	8/6/90	8/6/90	8/6/90	8/7/90	8/7/90
TIME	1454	1903	0854	1423	1914	0819	1409	1915	0832	1421
WELL POINT	1800.9	1805.1	1818.9	1824.4	1829.3	1842.4	1848.2	1853.3	1866.6	1872.4
WELL VARIATION	11.6	11.5	11.6	11.4	11.4	11.6	11.4	11.5	11.6	11.5
Filter	10.9	10.8	10.8	10.7	10.7	10.9	10.8	10.7	10.8	10.8
WELL VARIATION	10.4	10.3	10.3	10.2	10.3	10.3	10.3	10.2	10.4	10.3
DEPTH	7.8	7.8 9.0	9.2	9.2	9.2	9.2	9.3	9.3	9.5	9.6
TEMPERATURE	57	56	56	58	57	56	57	56	56	56
WELL-1-1	9.0 Hg	8.9 Hg	9.0 Hg	8.9 Hg	8.8 Hg	9.0 Hg	8.9 Hg	8.9 Hg	9.0 Hg	9.0 Hg
WELL-1-2	8.4 Hg	8.4 Hg	8.4 Hg	8.3 Hg	8.4 Hg	8.5 Hg	8.4 Hg	8.5 Hg	8.6 Hg	8.5 Hg
WELL-1-3	5.6 Hg	5.8 Hg	6.3 Hg	6.0 Hg	5.7 Hg	5.6 Hg	5.4 Hg	5.3 Hg	5.7 Hg	5.5 Hg
WELL-1-4	5.6 Hg	5.9 Hg	6.3 Hg	6.1 Hg	5.8 Hg	5.5 Hg	5.3 Hg	5.2 Hg	5.7 Hg	5.5 Hg
WELL-1-5	4.0 Hg	3.9 Hg	4.0 Hg	3.9 Hg	3.9 Hg	4.1 Hg	4.0 Hg	4.0 Hg	4.1 Hg	4.1 Hg
WELL-1-6	11.65 H ₂ O	10.45 H ₂ O	12.1 H ₂ O	11.3 H ₂ O	10.1 H ₂ O	13.6 H ₂ O	13.35 H ₂ O	11.75 H ₂ O	12.9 H ₂ O	13.9 H ₂ O
WELL-2-1										
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WELL-2-94										
WELL-2-95										
WELL-2-96										
WELL-2-97										
WELL-2-98										
WELL-2-99										
WELL-2-100										

Ana bar out of alignment

Ln 5-
on

DATE	8/10/90	8/10/90	8/10/90	8/10/90	8/10/90	8/10/90	8/10/90	8/11/90	8/11/90	8/11/90
TIME	1040	1257	1319	1424	1450	1550	1801	0838	1009	1151
WIND SPEED	1938.9	1941.2	1941.6	1941.7	1942.1	1943.1	1945.3	1959.9	1961.4	1963.1
WIND DIRECTION	11.0	11.4	11.4	11.4	11.2		11.2	11.7	11.6	11.6
Filter	10.2	10.7	10.7	10.7	10.2		10.4	10.9	10.8	10.8
WIND WAVE	9.7	10.2	10.2	10.2	9.8	10.0	10.0	10.3	10.3	10.3
WIND TYP	9.6	9.2	9.2	9.2	9.5	9.2	9.1	9.2	9.2	9.2
TEMPERATURE	58	56	56	56	60°	58°	57.5	55.5	56	56
						3.55				
AP-1-100.0	8.3 Hg	8.8 Hg	8.8 Hg	8.8 Hg	8.4 Hg	8.5	8.6 Hg	8.9 Hg	8.9 Hg	8.9 Hg
AP-1-101.5	8.1 Hg	8.1 Hg	8.1 Hg	8.1 Hg	7.6 Hg	7.7	7.9 Hg	8.4 Hg	8.4 Hg	8.3 Hg
AP-1-103.0	6.3 Hg	6.2 Hg	6.2 Hg	6.2 Hg	6.2 Hg	6.1	6.3 Hg	6.0 Hg	5.9 Hg	6.0 Hg
AP-1-104.5	6.2 Hg	6.2 Hg	6.2 Hg	6.2 Hg	6.2 Hg	6.1	6.2 Hg	6.0 Hg	6.0 Hg	6.2 Hg
AP-1-106.0	6.2 Hg	5.5 Hg	5.5 Hg	5.5 Hg	6.1 Hg	5.6	5.0 Hg	3.9 Hg	3.7 Hg	3.7 Hg
AP-1-107.5	3.5 Hg	2.0 Hg	2.0 Hg	2.0 Hg	3.1 Hg	1.6	2.0 Hg	1.25 Hg	10.1 Hg	9.25 Hg
TEMPERATURE								0955		
TEMPERATURE								16 psi	15.5	14.0
ΔP								0.4	0.4	0.42
AP-1-120'10"	15 psi							15 psi	14.5	13.5
AP-1-120'9"	14.5 psi							14.5 psi	14.5	13.5
AP-1-180'8"								Ø	Ø	Ø
AP-1-240'8"								Ø	Ø	Ø
AP-1-298'7"	2 psi							2 psi	2	1.9
AP-1-300'6"	18 psi							1.8 psi	1.8	1.8

DATE	8/11/90	8/11/90	8/11/90	8/11/90	8/12/90	8/12/90	8/12/90	8/13/90	8/13/90	8/13/90
TIME	1350	1403	1606	1803	0818	1455	1910	0820	1338	1430
WIND SPEED		1965.3	1967.4	1969.3	1983.6	1990.2	1994.4	2007.6	2013.0	2013.0
WIND DIRECTION		11.5	11.5	11.5	11.8	11.5	11.6	11.7		
Filter	Rugged Atm H-1 Bottle tubes	10.7	10.7	10.7	10.9	10.8	10.8	10.9	10.9	10.9
CELL VOLTAGE		10.3	10.2	10.3	10.4	10.3	10.3	10.4	10.4	10.4
BETA 9		9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2
TEMPERATURE		56.5	56.5	57	55.5	56	56.5	55.5	55.5	55.5
PH-2-121A		8.9 Hg	8.8 Hg	8.9 Hg	9.0 Hg	8.9 Hg	8.9 Hg	9.0 Hg	9.0 Hg	9.0 Hg
PH-2-51.5		8.3 Hg	8.3 Hg	8.4 Hg	8.6 Hg	8.5 Hg	8.6 Hg	8.7 Hg	8.7 Hg	8.7 Hg
PH-2-51.7		6.0 Hg	5.9 Hg	5.9 Hg	5.7 Hg	5.7 Hg	5.5 Hg	5.6 Hg	5.6 Hg	5.6 Hg
PH-2-51.8		6.1 Hg	6.0 Hg	6.0 Hg	5.8 Hg	5.7 Hg	5.6 Hg	5.7 Hg	5.7 Hg	5.7 Hg
PH-2-51.9		3.6 Hg	3.5 Hg	3.4 Hg	3.3 Hg	3.2 Hg	3.1 Hg	3.2 Hg	3.2 Hg	3.2 Hg
PH-2-52.2		7.85 H ₂ O	6.4 H ₂ O	6.15 H ₂ O	1.4 H ₂ O	+1.0 H ₂ O	0.2 H ₂ O	0.0 H ₂ O	0.0 H ₂ O	0.0 H ₂ O
PRESSURE		13.0 psi	12.0	12.0	12.7	11.8	11.5	12.0	12.0	12.0
TEMPERATURE										
ΔP		0.5	0.5	0.45	0.5	0.55	0.5	0.55	0.55	0.55
PH-1-20'10"		12.0	12.0	11.8	11.0	11.0	11.0	11.0	11.0	11.0
PH-1-120'9"		12.2	12.2	11.5	10.5	12.0	11.0	9.8	9.8	9.8
PH-1-180'8"		10.8	9.8	9.5	9.2	9.0	9.0	9.2	9.2	9.2
PH-1-240'8"		8.8	8.2	8.0	7.9	7.8	7.5	7.5	7.5	7.5
PH-1-296'7"		7.8	7.5	7.5	7.0	7.0	6.8	6.8	6.8	6.8
PH-1-360'6"		1.0	1.0	1.0	0.5	1.0	1.0	0.5	0.5	0.5

DATE	8/13/90	8/13/90	8/13/90	8/14/90	8/14/90	8/14/90	8/15/90	8/15/90	8/15/90	8/16/90
TIME	1605	1621	1905	0816	1344	1806	0819	1452	1903	0812
WET WEIGHT		2014.8	2017.6	2030.7	2036.2	2040.6	2054.8	2061.3	2065.5	2078.7
WET VOLUME		11.5	11.5	11.6	11.5	11.5	11.7	11.7	11.6	11.7
Filter	Δ	10.6	10.7	10.8	10.6	10.6	10.9	10.7	10.7	10.8
WELL VOLUME	Δ	10.2	10.2	10.3	10.2	10.2	10.4	10.3	10.2	10.3
VOLUME		9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2
TEMPERATURE		58	56.5	55.5	56.0	56	55.5	56	55.5	55.5
AN-2-10.1	Injecting or .	8.8 Hg	8.8 Hg	8.9 Hg	8.8 Hg	8.8 Hg	9.0 Hg	8.9 Hg	8.8 Hg	8.9 Hg
AN-2-10.5		8.4 Hg	8.5 Hg	8.6 Hg	8.6 Hg	8.5 Hg	8.7 Hg	8.7 Hg	8.6 Hg	8.7 Hg
AN-2-11.7		5.4 Hg	5.2 Hg	5.8 Hg	5.6 Hg	5.5 Hg	5.5 Hg	5.0 Hg	5.2 Hg	5.5 Hg
AN-2-12.1		5.3 Hg	5.1 Hg	5.5 Hg	5.6 Hg	5.5 Hg	5.3 Hg	5.1 Hg	5.2 Hg	5.6 Hg
AN-2-17.1		4.5 Hg	4.0 Hg	4.3 Hg	3.1 Hg	3.0 Hg	3.1 Hg	3.0 Hg	4.1 Hg	3.0 Hg
AN-2-17.2		2.1 H ₂ O	+0.75 H ₂ O	+0.1 H ₂ O	+1.3 H ₂ O	+0.75 H ₂ O	+0.05 H ₂ O	+0.85 H ₂ O	0.0 H ₂ O	+0.05 H ₂ O
AN-2-17.3										
ΔP		0.45	0.45	0.45	0.5	0.45	0.45	0.5	0.45	0.40
TEMPERATURE		13.0	13.0	12.5	12.0	12.0	13.0	12.2	12.5	12.5
TEMPERATURE										
AN-2-1		12.3	12.5	12.1	12.0	12.0	13.0 12.2	12.1	12.1	12.1
AN-2-1		12.5	12.0	10.7	12.2	11.9	10.8	12.0	12.1	11.8
AN-2-1		(5.0)	11.0	10.4	11.2	11.0	10.8	11.5	11.0	11.0
AN-2-1		9.0	9.0	8.5	8.5	8.7	8.7	8.5	8.3	8.5
AN-2-1		8.0	8.0	7.7	8.0	7.8	7.7	7.8	7.5	7.5
AN-2-1		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

purged
10'

DATE	8/16/90	8/16/90	8/17/90	8/17/90	8/17/90	8/20/90	8/20/90	8/20/90	8/20/90	8/20/90
TIME	1436	1820	0822	1406	1804	0809	1346	1847	1915	1945
EXT. MOIST	2085.1	2088.8	2102.9	2108.6	2112.6	2174.6	2180.3	2185.3	2185.8	2185.8
EXT. WIND	11.6	11.6	11.8	11.7	11.8	12.1	12.0	12.1		
Filter	10.6	10.6	10.8	10.6	10.6	10.5	10.3	10.2	System down for line unit filter change	
WELL WIND	10.2	10.1	10.3	10.1	10.1	10.0	9.8	9.8		
WELL P	9.2	9.3	9.2	9.2	9.2	8.7	8.6	8.3		
TEMPERATURE	56	56	55.5	55.5	56	56	57	56		
AN-1-10.1	8.8 Hg	8.8 Hg	8.9 Hg	8.8 Hg	8.8 Hg	8.7 Hg	8.5 Hg	8.5 Hg		
AN-1-10.5	8.5 Hg	8.6 Hg	8.6 Hg	8.6 Hg	8.6 Hg	8.5 Hg	8.3 Hg	8.3 Hg		
AN-1-10.7	5.4 Hg	5.3 Hg	5.3 Hg	5.4 Hg	5.6 Hg	5.4 Hg	5.4 Hg	5.2 Hg		
AN-1-10.8	5.2 Hg	5.2 Hg	5.5 Hg	5.6 Hg	5.6 Hg	5.5 Hg	5.4 Hg	5.1 Hg		
AN-1-10.9	2.8 Hg	2.8 Hg	3.0 Hg	2.9 Hg	2.9 Hg	3.0 Hg	2.9 Hg	2.9 Hg		
AN-1-11.0	0.25 H ₂ O	0.9 H ₂ O	0.25 H ₂ O	0.45 H ₂ O	0.45 H ₂ O	0.05 H ₂ O	0.8 H ₂ O	0.12 H ₂ O		
ΔP	0.5	0.45	0.41	0.45	0.45	0.42	0.52	0.45		
TEMPERATURE	12.2	12.0	12.2	12.2	12.2	12.5	11.8	11.5		
TEMPERATURE										
AN-1-1	12.0	12.0	12.2	12.0	12.0	12.0	11.5	11.5		
AN-1-1	12.5	12.5	12.5	12.2	12.2	12.2	12.1	12.1		
AN-1-1	11.5	11.5	10.7	11.0	11.0	11.0	10.8	10.8		
AN-1-1	8.5	8.5	8.5	8.5	8.5	8.2	7.8	7.8		
AN-1-1	7.8	7.8	7.2	7.5	7.5	6.8	6.2	6.0		
AN-1-1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		

60

PROJECT # 89-201

OPERATIONS FIELD LOG - 1

SAVANNAH RIVER SITE

DATE	8/21/90	8/21/90	8/21/90	8/22/90	8/22/90	8/22/90	8/22/90	8/22/90	8/23/90	8/23/90
TIME	0823	1424	1906	0822	1444	1906	0818	1650	1715	1835
WATER	2198.5	2204.5	2209.2	2222.4	2228.8	2233.2	2246.4	2254.9	2255.4	2255.4
WATER	11.8	11.8	11.7	11.8	11.6	11.5	11.3	11.5		
Filter	10.9	10.9	10.8	10.9	10.8	10.7	10.8	10.7		
WATER	10.4	10.4	10.3	10.4	9.9	10.2	10.3	10.2		
WATER	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.3		
TEMPERATURE	55.5	56.0	55.5	55	55.5	55.5	55.5	56		
WATER	9.0 Hg	9.0 Hg	9.0 Hg	9.0 Hg	9.0 Hg	8.9 Hg	8.9 Hg	8.9 Hg		
WATER	8.9 Hg	8.9 Hg	8.8 Hg	8.8 Hg	8.8 Hg	8.7 Hg	8.8 Hg	8.7 Hg		
WATER	5.3 Hg	5.4 Hg	5.8 Hg	5.5 Hg	5.4 Hg	5.3 Hg	5.2 Hg	5.2 Hg		
WATER	5.2 Hg	5.1 Hg	5.1 Hg	5.2 Hg	5.2 Hg	5.2 Hg	5.2 Hg	5.1 Hg		
WATER	3.4 Hg	3.3 Hg	5.8 Hg	3.1 Hg	3.1 Hg	2.9 Hg	3.0 Hg	3.0 Hg		
WATER	2.75 H ₂ O	1.35 H ₂ O	0.25 H ₂ O	0.85 H ₂ O	0.2 H ₂ O	0.3 H ₂ O	0.2 H ₂ O	0.9 H ₂ O		
ΔP	0.45	0.5	0.45	0.45	0.45	0.48	0.48	0.48		
TEMPERATURE	12.2	11.8	12.0	12.2	12.0	11.9	12.0	11.8		
TEMPERATURE										
WATER	11.5	11.5	11.7	11.8	11.5	11.7	11.5	11.5		
WATER	12.0	12.0	12.1	12.1	12.1	12.1	12.2	12.2		
WATER	11.0	10.6	11.0	11.0	11.0	11.0	11.0	11.0		
WATER	8.0	7.8	8.0	8.0	8.0	7.9	7.9	7.8		
WATER	7.2	7.5	7.5	7.2	7.2	7.2	7.0	6.8		
WATER	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.5		

System down for compressor switch. Unit on line (no compressor)

DATE	8/24/90	8/24/90	8/24/90	8/24/90	8/24/90	8/24/90	8/24/90	8/24/90	8/24/90	8/25/90
TIME	8:18	0910	1030	1344	1415 1502	1502	1544	1652	1846	0920
UNIT PRESS	2269.2	2270.1	2270.1	2273.4	2273.9	2274.7	2275.4	2276.5	2278.4	2293.0
UNIT VOLUME	11.6			11.5		11.4	11.3	11.2	11.2	11.4
Filter	10.9	Unit down for electrical connection of compressor	Unit on line	10.6	Air Inject	10.3	10.4	10.4	10.4	10.5
ELL PRESS	10.3			9.9		9.9	9.9	9.9	10.0	
ELL TEMP	9.2			9.2		8.9	8.8	8.8	8.8	8.8
TEMPERATURE	55°F			57		57	57.5	57	57	56
APH-2-001.2	8.9 Hg			8.7 Hg		8.5 Hg	8.5 Hg	8.5 Hg	8.5 Hg	8.7 Hg
APH-2-01.5	8.7 Hg			8.6 Hg		8.4 Hg	8.3 Hg	8.4 Hg	8.3 Hg	8.4 Hg
APH-2-01.7	5.5 Hg			5.6 Hg		5.4 Hg	5.6 Hg	5.6 Hg	5.6 Hg	5.7 Hg
APH-2-03.1	5.4 Hg			5.5 Hg		5.3 Hg	5.4 Hg	5.5 Hg	5.6 Hg	5.8 Hg
APH-2-07.1	3.5 Hg			4.7 Hg		4.6 Hg	4.3 Hg	4.1 Hg	4.0 Hg	3.2 Hg
APH-2-09.2	0.7 H ₂ O			①0.65 H ₂ O		①1.3 H ₂ O	①0.4 H ₂ O	①0.5 H ₂ O	①0.6 H ₂ O	0.4 H ₂ O
PRESSURE	Compressor off	Compressor off			60 psi	58.5	58	58	57.5	56
TEMPERATURE				103	101	96	99	93		
APH-1-				57	57	57	55.8	54.7		
APH-1-				53.8	53.7	53.8	52.5	51.8		
APH-1-				Ø	Ø	Ø	Ø	Ø		
APH-1-				24	9.2	25.5	25.8	25.2		
APH-1-	off			37.5	22.5	13.8	14.0	13.8		
APH-1-			55	4.8	5.0	5.0	4.8			

DATE	8/25/90	8/25/90	8/25/90	8/26/90	8/26/90	8/26/90	8/27/90	8/27/90	8/28/90	8/28/90
TIME	1403	1651	1926	0827	1445	1912	0825	1808	1900	1300
UNIT VOLUME	2297.7	2300.5	2303.1	2316.1	2322.4	2326.9	2340.1	2349.8	2350.1 2367.7	2363.7
UNIT VOLUME	11.4	11.4	11.4	11.5	11.4	11.5	11.5	11.4		
Filter	10.4	10.4	10.4	10.5	10.4	10.4	10.4	10.4		
WELL VOLUME	10.0	9.9	9.9	10.0	9.9	9.9	10.0	10.0		
DELTA P	8.8	8.8	8.7	8.7	8.8	8.7	8.7	8.7		
TEMPERATURE	56	56	56	55.5	56	55.5	56	56		
AX-1-10.2	8.6 Hg	8.5 Hg	8.6 Hg	8.7 Hg	8.5 Hg	8.6 Hg	8.7 Hg	8.7 Hg		
AX-1-51.5	8.4 Hg	8.4 Hg	8.4 Hg	7.8 Hg	7.2 Hg	6.9 Hg	6.9 Hg	6.9 Hg		
AX-1-91.7	5.5 Hg	5.5 Hg	5.4 Hg	5.5 Hg	5.3 Hg	5.1 Hg	4.9 Hg	5.1 Hg		
AX-1-131.3	5.6 Hg	5.7 Hg	5.6 Hg	5.3 Hg	5.1 Hg	5.0 Hg	5.0 Hg	5.0 Hg		
AX-1-170.1	3.1 Hg	3.0 Hg	3.1 Hg	3.0 Hg	3.0 Hg	2.9 Hg	3.1 Hg	3.1 Hg		
AX-1-219.2	0.6 H ₂ O	0.3 H ₂ O	0.1 H ₂ O	0.3 H ₂ O	1.5 H ₂ O	0.3 H ₂ O	0.25 H ₂ O	0.45 H ₂ O		
PRECIPITATION	56.3	56.2	56.0	55.5	60.5	59.5	62.5	60.5		
TEMPERATURE	100	96	94	91	109	95	94	96		
AX-1-	54.8	54.5	54.5	53.8	59.0	58.0	>60	59.2		
AX-1-	51.5	51.5	51.5	50.5	55.0	53.8	57.8	56.5		
AX-1-	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø		
AX-1-	25.8	25.5	25.2	25.0	26.5	46.3	52.0	52.0		
AX-1-	13.6	13.3	13.0	13.2	14.2	36.5	41.5	41.5		
AX-1-	5.0	5.0	4.8	4.0	5.1	4.3	7.2	8.2		

compressor
shut down

Generator
shut down
Unit
line

DATE	8/28/90	8/29/90	8/29/90	8/29/90	8/30/90	8/30/90	8/31/90	8/31/90	8/31/90	9/1/90
TIME	1558	0800	1300	1745	0835	1430	0830	1130	1145	1230
UNIT WEIGHT	23667	2382.7	2387.8	2392.7	2407.3	2413.4	2431.3	2433.3	2438.5	2434.3
UNIT VOLUME	11.2	11.8	ON LINE	11.4	11.6	11.6	12.0		10.6	11.2
Filter	10.2	10.6		10.2	10.1	10.0	10.1		10.1	10.6
VEL. VOLUME	9.7	10.0		9.8	9.8	9.5	9.6		9.8	10.2
ICLIP	9.2	8.9		8.7	8.5	9.2	8.2		9.2	9.2
TEMPERATURE	58	56	Compressor	56	56	56	56	Filter Change	58	56
AN-1-101A	8.4 Hg	8.7 Hg		8.5 Hg	8.6 Hg	8.3 Hg	8.4 Hg			
AN-1-101B	8.3 Hg	8.3 Hg		8.2 Hg	8.3 Hg	8.0 Hg	8.0 Hg			
AN-1-101C	5.4 Hg	5.3 Hg		5.0 Hg	2.0 Hg	1.9 Hg	4.5 Hg			
AN-1-101D	5.4 Hg	5.5 Hg		4.4 Hg	5.4 Hg	5.6 Hg	5.4 Hg			
AN-1-101E	4.7 Hg	3.4 Hg		4.8 Hg	3.0 Hg	2.8 Hg	3.2 Hg			
AN-1-101F	④ 1.5 H ₂ O	④ 0.8 H ₂ O		3.0 Hg	0.8 Hg	0.2 Hg	2.5 H ₂ O			
Pressure	Compressor off	Compressor off	59.5	60.0	61.8	61.0	61.5	UNIT Down to Change Filter		
Temperature			117	97	79	95	78			
AN-1-1			59 PSI	59.5 PSI	60 PSI	60 PSI	60 PSI			
AN-1-2			59.5 PSI	58 PSI	58 PSI	59 PSI	57.5 PSI			
AN-1-3			2 PSI	1 PSI	1 PSI	1.5 PSI	1 PSI			
AN-1-4			1 PSI	57 PSI	57.5 PSI	59.5 PSI	58 PSI			
AN-1-5			49 PSI	50 PSI	51 PSI	51.5 PSI	51 PSI	ON LINE		
AN-1-6			6.5 PSI	7 PSI	9.5 PSI	11 PSI	11 PSI			

Disco
have
9.5'

[illegible]

— 100 —

DATE	9/13/90	9/14/90	9/14/90	9/15/90	9/15/90	9/16/90	9/16/90	9/16/90	9/16/90	9/17/90
TIME	1552	0818	1610	0815	1612	0816	1638	1715	2000	0815
UNIT HOURS	666.4	677.9	685.8	702.0	710.0	726.1	734.5	735.1	735.1	747.6
UNIT VOLUME	10.8 11.4	11.2	11.5	11.3	11.3	11.6	11.5			12.2
Filter	10.5	10.4	10.5	10.3	10.1	10.4	10.0	system	system	10.8
WELL VOLUME	10.0	10.0	10.1	9.8	9.7	9.9	9.6			10.3
DELTA P	9.0	8.8	9.0	8.8	8.7	8.8	8.3			8.9
TEMPERATURE	56	55.5	55.5	55.5	56	55	56	Down		55
AX-1-22.2	8.6 Hg	8.6 Hg	8.7 Hg	8.5 Hg	8.3 Hg	8.6 Hg	8.4 Hg			9.0 Hg
AX-1-51.5	6.9 Hg	7.0 Hg	7.0 Hg	6.9 Hg	6.7 Hg	6.9 Hg	6.7 Hg			7.1 Hg
AX-1-51.7	5.0 Hg	4.2 Hg	5.0 Hg	4.7 Hg	4.6 Hg	4.8 Hg	4.6 Hg			5.0 Hg
AX-1-73.3	5.0 Hg	5.1 Hg	5.1 Hg	5.0 Hg	4.9 Hg	4.7 Hg	4.8 Hg			5.1 Hg
AX-1-73.1	2.6 Hg	2.5 Hg	2.4 Hg	2.3 Hg	2.3 Hg	2.3 Hg	2.3 Hg			3.0 Hg
AX-1-22.2	0.7 H ₂ O	0.05 H ₂ O	0.05 H ₂ O	0.15 H ₂ O	0.15 H ₂ O	0.15 H ₂ O	0.95 H ₂ O			0.05 H ₂ O
Compressor Hour Meter	4340.5	4356.7	4364.4	4380.1	4387.9	4403.6	4411.7	4412.3	4412.3	4424.4
PRESSURE	60.5	58.5	58.5	59.0	59.0	57.5	57.5	58		58.5
TEMPERATURE	137	124	126	125	136	123	133	Filter		125.5
AX-1-1	59.0	57.7	57.5	58.5	57.9	56.5	56.5			57.2
AX-1-2	58.5	55.0	55.5	56.0	56.0	56.0	56.0			56.2
AX-1-3	5.0	4.8	4.9	4.9	5.5	5.2	5.5			7.8
AX-1-4	7.2	7.8	17.5	25.5	26.5	25.0	25.8			49.2
AX-1-5	36.3	35.5	35.8	35.8	37.0	35.3	36.2			42.0
AX-1-6	12.2	12.0	12.0	12.0	12.5	11.8	12.3			8.5

DATE	9/17/90	9/18/90	9/18/90	9/19/90	9/19/90	9/19/90	9/19/90	9/20/90	9/20/90	9/20/90
TIME	1630	0730	1627	0819	1500	1520	1604	0817	0835	1509
UNIT VOLUME	755.9	771.0	780.0	795.9	802.7	803.0	803.7	820.0	822.3	826.9
UNIT VOLUME	12.0	12.0	11.6	11.9			11.7	11.7	11.6	11.6
Filter	10.8	10.8	10.7	10.4	Compressor down for repair		10.4	10.4	10.3	10.3
WELL VOLUME	10.4	10.3	10.2	10.0			9.9	9.9	9.9	9.9
DELTA P	9.2	8.9	8.9	8.7			8.9	8.7	8.7	8.7
TEMPERATURE	55.5	55	56	55			56	55.5	57	57
AP-1-102.2	9.0 Hg	8.9 Hg	8.9 Hg	8.7 Hg	Compressor on - check		8.6 Hg	8.6 Hg	X	8.5 Hg
AP-1-101.5	7.2 Hg	(6.4) Hg	6.8 Hg	6.2 Hg			6.2 Hg	6.6 Hg		(4.0) Hg
AP-1-101.7	5.0 Hg	5.2 Hg	(4.1) Hg	4.8 Hg			4.6 Hg	5.1 Hg		4.5 Hg
AP-1-101.3	5.2 Hg	5.2 Hg	5.1 Hg	4.8 Hg			4.7 Hg	5.1 Hg		5.0 Hg
AP-1-101.1	2.8 Hg	2.6 Hg	(4.0) Hg	2.2 Hg			2.8 Hg	2.4 Hg		2.4 Hg
AP-1-101.0	0.3 H ₂ O	0.5 H ₂ O	0.3 H ₂ O	2.0 H ₂ O			0.05 H ₂ O	0.4 H ₂ O		0.135 H ₂ O
Compressor Hour meter	4432.4	4447.0	4455.7	4471.0	repair		4478.2	4479.4	4481.6	4486.0
PRESSURE	58.5	59.0	60.5	61.5			62.2	Compressor down at arrival. Restarted	58.8	58.5
TEMPERATURE	138.5	123	138	127			145		146	144
AP-1-1	58.2	57.2	59.5	59.5	~61.0			Compressor down at arrival. Restarted	57.0	56.8
AP-1-2	56.5	56.7	56.8	58.5	60.2				56.2	56.2
AP-1-3	1.7	1.7	2.8	2.8	3.6				0	0.5
AP-1-4	50.5	50.5	52.8	53.0	59.0				8.3	8.7
AP-1-5	42.2	42.0	44.2	44.0	26.5				41.0	41.3
AP-1-6	9.7	9.3	11.0	10.9	10.2				0	0.8

DATE	9/21/90	9/21/90	9/21/90	9/21/90	9/24/90	9/24/90	9/25/90	9/25/90	9/26/90	9/26/90
TIME	0822	1506	1605	1745	0823	1607	0815	1531	0800	1155
UNIT HOURS	844.2	851.0	852.0	852.0	915.1	922.9	939.1	946.4	959.4	963.2
UNIT VACUUM	11.8	11.9			11.8	11.8	12.0	11.8		
Filter	10.3	10.2	System Down for maintenance		10.6	10.6	10.5	10.6	11.5	11.5
WELL VACUUM	9.8	9.7			10.1	10.1	10.1	10.2	11.5	11.5
DELTA P	8.4	8.3			8.7	8.8	8.8	9.1	11.5	11.5
TEMPERATURE	55.5	56			55	55.5	55	55.5	11.5	11.5
AMH-2-02.2	8.6 Hg	8.5 Hg			8.8 Hg	8.8 Hg	8.7 Hg	8.8 Hg		
AMH-2-03.5	3.9 Hg	4.4 Hg			4.7 Hg	4.5 Hg	5.1 Hg	5.0 Hg		
AMH-2-06.7	4.8 Hg	4.9 Hg			5.1 Hg	5.0 Hg	5.1 Hg	5.0 Hg		
AMH-2-101.8	4.8 Hg	4.8 Hg			5.0 Hg	5.0 Hg	5.0 Hg	4.8 Hg		
AMH-2-175.0	2.4 Hg	2.4 Hg			2.5 Hg	2.4 Hg	2.4 Hg	2.3 Hg		
AMH-2-019.2	0.65 H ₂ O	0.8 H ₂ O			0.15 H ₂ O	0.7 H ₂ O	0.4 H ₂ O	0.7 H ₂ O		
Compressor Hour meter	4502.7	4509.2		4510.2	4570.9	4578.4	4594.0	4601.1	4614.6	
PRESSURE	58.5	58.5			60.5	60.2	61.5	61.5		
TEMPERATURE	136.5	146			119	136.5	119	140.5		
AMH-1- 1	57.0	56.7			59.2	58.5	59.0	58.9		
AMH-1- 2	56.2	56.2			57.9	57.3	57.5	57.5		
AMH-1- 3	0.7	0.7			4.5	5.5	4.5	6.0		
AMH-1- 4	8.8	9.2			45.0	47.2	45.2	47.8		
AMH-1- 5	40.5	41.8			42.2	42.7	42.0	43.5		
AMH-1- 6	2.5	3.5			8.5	10.0	10.0	10.5		

tubing
cracked

DATE	9/26/90	9/26/90	9/27/90	9/27/90	9/28/90	9/28/90	9/29/90	9/30/90	10/1/90	10/1/90
TIME	1328	1713	0818	1627	0815	1642	0849	0912	0831	1539
UNIT HOURS	964.9	968.6	983.8	992.0	1007.9	1016.4	1032.6	1057.1	1080.5	1087.7
UNIT VACUUM	11.0	11.3	11.8	11.8	11.8	11.8	11.9	11.9	12.1	12.2
Filter	10.1	10.3	10.4	10.6	10.5	10.4	10.4	10.3	10.2	9.8
WELL VACUUM	9.8	9.9	9.9	10.1	10.0	9.9	9.9	9.9	9.7	9.4
DELTA P	9.6	8.9	8.4	8.9	8.7	8.7	8.4	8.3	8.3	7.7
TEMPERATURE	58	57	55.5	56	55.5	56	55.5	55.5	55.5	56.5
AMH-2-22.2	8.4 Hg	8.5 Hg	8.7 Hg	8.8 Hg	8.7 Hg	8.6 Hg	8.6 Hg	8.5 Hg	8.5 Hg	8.2 Hg
AMH-2-53.5	4.7 Hg	4.7 Hg	5.1 Hg	5.2 Hg	5.3 Hg	5.1 Hg	5.6 Hg	6.3 Hg	6.4 Hg	6.1 Hg
AMH-2-51.7	5.4 Hg	5.2 Hg	4.8 Hg	5.1 Hg	5.1 Hg	5.2 Hg	5.0 Hg	4.8 Hg	5.0 Hg	4.8 Hg
AMH-2-103.0	5.2 Hg	5.0 Hg	4.8 Hg	5.1 Hg	5.1 Hg	5.0 Hg	4.9 Hg	4.7 Hg	4.8 Hg	4.7 Hg
AMH-2-179.0	3.8 Hg	3.2 Hg	2.7 Hg	2.7 Hg	2.6 Hg	2.5 Hg	2.5 Hg	2.4 Hg	2.3 Hg	2.2 Hg
AMH-2-219.2	0.85 H ₂ O	0.25 H ₂ O	0.6 H ₂ O	0.05 H ₂ O	0.25 H ₂ O	0.15 H ₂ O	0.1 H ₂ O	0.3 H ₂ O	0.05 H ₂ O	0.85 H ₂ O
Compressor Hour Meter	4616.1	4619.7	4634.3	4642.2	4657.5	4665.6	4681.2	4704.7	4727.2	4734.1
PRESSURE	60.0	60.5	61.5	61.0	61.5	62.0	61.8	62.0	60.5	60.5
TEMPERATURE	141	136.5	112.5	139	126	137	127	126.5	124.5	138
ΔP ("H ₂ O)							2.35	2.25	2.20	2.25
AMH-1- 1	57.5	58.0	58.5	58.3	59.0	59.0	59.0	59.3	57.5	57.5
AMH-1- 2	56.5	56.8	57.3	57.2	57.5	57.7	57.5	58.7	56.0	55.9
AMH-1- 3	7.5	7.0	5.8	6.8	5.7	6.3	5.5	5.3	5.1	6.0
AMH-1- 4	43.3	43.3	42.0	43.8	42.7	43.5	42.7	42.8	42.5	43.8
AMH-1- 5	25.7	26.3	24.7	38.0	38.5	39.5	38.7	38.8	38.7	39.9
AMH-1- 6	8.0	8.2	8.2	8.4	8.3	8.7	8.5	8.7	7.9	8.0

DATE	10/2/90	10/2/90	10/3/90	10/3/90	10/3/90	10/3/90	10/3/90	10/4/90	10/4/90	10/4/90
TIME	0823	1345	0940	1107	1630	1707	~1825	0815	0834	1535
WATER	1104.5	1109.9	1110.3	1111.8	1117.2	1117.8	~1119.1	1133.1	1133.3	1140.4
WATER	12.5			11.1	11.3				11.3	11.4
Filter	9.3	system down for filter	system or line	10.3	10.4	Increased Injection to Compressor Down	Started Compressor		10.5	10.5
WATER	8.9			9.8	10.0				10.0	10.0
WATER	7.1			9.2	9.0				8.7	8.7
TEMPERATURE	56			59	58				55.5	56
WATER	7.8 Hg	system down for filter	system or line	8.3	8.6	Increased Injection to Compressor Down	Started Compressor		8.7	8.7
WATER	4.3 Hg			7.0 Hg	6.5				6.4	6.4
WATER	4.8 Hg			6.1 Hg	5.5				5.1	4.9
WATER	4.7 Hg			5.9	5.3				5.0	5.0
WATER	2.3 Hg			4.8	3.7				2.7	2.7
WATER	0.05 H ₂ O			0.65 H ₂ O	0.2				0.6	0.25
Compressor Hour Meter	4750.2	4755.4	4755.4	4756.8	4762.0	4762.6	4763.9	4763.9	4764.2	4770.1
WATER	60.5	change		56.5	56.5	100 psi			97.5	92.5
TEMPERATURE	123			135	136				151	151
ΔP (H ₂ O)	2.15			2.20	2.25				5.45	5.6
1	57.9			53.4	53.5				760	>60
2	56.8			53.0	53.0				>60	>60
3	5.0			4.0	4.3				0.5	1.0
4	42.7			19.1	20.5				0.8	11.0
5	38.5			27.7	28.0				4.4	46.7
6	7.8			<0	<0				20.7	2.5

DATE	10/4/90	10/5/90	10/5/90	10/5/90	10/5/90	10/5/90	10/6/90	10/7/90	10/8/90	10/8/90
TIME	~2055	0930	1052	~1322	1520	1612	0714	1035	~0230	0900
WATER LEVEL	1145.7	1145.7	1147.1	1149.6	1151.6	1152.5	1167.6	1195.0	1210.9	1210.9
AIR WINDS			10.8			11.1	11.3	11.3		
Filter	System Down		10.1	Compressor Down		10.3	10.3	10.4	System Down	
ALL PRESS			9.6			9.8	9.8	9.9		
DELTA P			9.1			8.8	8.7	8.3		
TEMPERATURE			58			57	55	56		
WATER FLOW			8.3			8.5	8.5	8.5		
WATER FLOW			6.1			6.2	6.5	6.3		
WATER FLOW			5.6			5.2	5.3	5.1		
WATER FLOW			5.4			5.1	5.2	5.1		
WATER FLOW			4.6			3.7	2.5	2.5		
WATER FLOW			0.6			0.15	0.15	0.1		
Compressor Hour Meter	4773.9	4773.9	4774.9	4777.4	4477.4	4778.2	4792.7	4818.9	4834.1	4834.1
TEMPERATURE PSI			94.0			83.5	84.5	85.0		
TEMPERATURE OF			156			155	142	154		
ΔP ("H ₂ O)			5.1			5.25	5.1	5.1		
1			>60			>60	>60	>60		
2			>60			>60	>60	>60		
3			6.7			3.0	0.8	6.0		
4			14.8			7.3	2.0	1.0		
5			7.8			5.5	30.5	40.3		
6			<0			0.5	15.0	4.0		

DATE	10/8/90	10/8/90	10/9/90	10/9/90	10/9/90	10/9/90	10/10/90
TIME	1015	1547	0818	0925	1030	1502	0819
UNIT HOUR	1212.2	1212.8	1234.4	1235.5	1235.5	1240.1	1257.5
NET VOLUME	10.9	11.0	11.2			11.1	11.1
Filter	10.0	10.2	10.2	System down for repair		10.1	10.1
ELL VOLUME	9.6	9.8	9.8			9.7	9.7
DELTA P	8.7	8.7	8.3			8.2	8.2
TEMPERATURE	57.5	58	55.5			56	55.5
1-1-1	8.3	8.5	8.5	System down for repair		8.4	8.4
1-2-1	6.5	6.8	6.9			7.0	6.7
1-3-1	5.3	5.0	4.9			5.3	4.8
1-4-1	5.2	5.0	5.0			4.8	4.6
1-5-1	4.2	2.9	2.5	Com. repair		2.8	2.4
"H ₂ O"	0.55	0.4	0.7			0.6	0.1
Compressor Hour Meter	4835.2	4840.6	4856.5	4857.5	4857.5	4861.9	4878.5
PSI	84.5	84.5	84.5	Com. repair		84.5	84.5
TEMPERATURE	157	153	150			150	150
ΔP ("H ₂ O")	5.25	5.15	5.25			5.2	5.25
1	>60	>60	>60			>60	>60
2	>60	>60	>60	Com. repair		>60	>60
3	4.0	1.0	1.9			2.7	3.8
4	3.5	57.8	>60			>60	>60
5	>60	>60	>60			>60	>60
6	<0	9.2	5.5	Com. repair		2.1	6.2

DATE	10/8/90	10/8/90	10/9/90	10/9/90	10/9/90	10/9/90	10/10/90	10/10/90	10/10/90	10/11/90
TIME	1015	1547	0818	0925	1030	1502	0819	1626	~2030	0820
LAST HOUR	1212.2	1217.8	1234.4	1235.5	1235.5	1240.1	1257.5	1265.6	1267.7	1269.7
LAST VACUUM	10.9	11.0	11.2	System down for	System down for	11.1	11.1	11.3	System down for	System on line
Filter	10.0	10.2	10.2			10.1	10.1	10.1		
CELL VACUUM	9.6	9.8	9.8			9.7	9.7	9.7		
DELTA P	8.7	8.7	8.3			8.2	8.2	8.2		
TEMPERATURE	57.5	58	55.5	Gen. repair	Gen. repair	56	55.5	55.5	overspeed	overspeed
AVG. INLET	8.3	8.5	8.5			8.4	8.4	8.5		
AVG. FUEL	6.5	6.8	6.9			7.0	6.7	6.4		
AVG. EXHAUST	5.3	5.0	4.9			5.3	4.8	4.6		
AVG. INLET	5.2	5.0	5.0			4.8	4.6	4.5		
AVG. EXHAUST	4.2	2.9	2.5			2.8	2.4	2.3		
H ₂ O	0.55	0.4	0.7			0.6	0.1	0.35		
Compressor Hour Meter	4835.2	4840.6	4856.5	4857.5	4857.5	4861.9	4878.5	4886.4	4890.2	4890.2
PSI	84.5	84.5	84.5	repair	repair	84.5	84.5	84.5	overspeed	overspeed
TEMPERATURE	157	153	150			150	150	128		
ΔP (H ₂ O)	5.25	5.15	5.25			5.2	5.25	4.95		
1	>60	>60	>60			>60	>60	>60		
2	>60	>60	>60			>60	>60	>60		
3	4.0	1.0	1.9			2.7	3.8	2.7		
4	3.5	57.8	>60			>60	>60	>60		
5	>60	>60	>60			>60	>60	>60		
6	<0	9.2	5.5			2.1	6.2	4.0		

DATE	10/11/90	10/11/90	10/12/90	10/12/90	10/13/90	10/13/90	10/13/90	10/14/90	10/15/90	10/15/90
TIME	1026	1511	1017	1516	0801	1005	1040	0812	0819	1517
UNIT MERE	1271.8	1276.6	1295.8	1300.8	1317.6	1319.7	1319.7	1341.4	1365.7	1372.7
UNIT VACUUM	10.7	11.0	11.4	11.3	11.4			11.4	11.6	11.6
Filter	9.6	9.9	10.0	10.1	10.4	System down for 6 hrs.		10.3	10.4	10.5
WELL VACUUM	9.2	9.5	9.6	9.7	9.9			9.9	10.0	10.1
DELTA P	8.1	7.9	7.8	8.1	8.3			8.2	8.3	8.3
TEMPERATURE	57	57	56	56	55.5			55.5	55.5	56
AX-2-22.2	7.9	8.2	8.4	8.4	8.6	System on line		8.6	8.7	8.8
AX-2-51.5	6.2	0.4	5.1	5.7	5.1			5.0	5.7	5.9
AX-2-33.7	5.5	5.7	4.8	5.0	5.0			5.2	5.1	4.5
AX-2-13.1	5.3	5.1	4.9	5.0	5.0			5.1	5.1	5.0
AX-2-10.1	4.3	5.8	2.4	2.4	2.0	Repair		0.65 H ₂ O	0.05 H ₂ O	0.05 H ₂ O
AX-2-1.2	0.55	0.9	0.3	0.75	0.1			9.7	1.45	0.95
Compressor Hour Meter	4892.1	4896.7	4915.1	4919.9	4936.0	4938.0	4938.0	4958.7	4981.9	4988.6
Pressure psi	86	86	86.5	86.5	86.5	Repair		86.5	87.5	86.5
Temperature °F	147	151	147	151	148			146.5	144.5	157
ΔP "H ₂ O	4.45	4.7	4.35	4.5	4.6			4.9	4.85	4.85
AX-1-1	>60	>60	>60	>60	>60			>60	>60	>60
AX-1-2	>60	>60	>60	>60	>60	Repair		>60	>60	>60
AX-1-3	4.2	4.7	4.7	6.4	6.8			1.2	1.2	1.6
AX-1-4	47.3	52.1	53.0	54.5	54.5			>60	>60	>60
AX-1-5	13.0	17.8	42.9	46.2	49.5			>60	>60	>60
AX-1-6	<0	3.0	3.3	3.7	4.0	Repair		14.8	15.3	14.8

DATE	10/16/90	10/16/90	10/16/90	10/16/90	10/17/90	10/17/90	10/18/90	10/18/90	10/19/90	10/19/90
TIME	0843	0900	1155	1603	0820	1518	0828	1509	0812	1503
UNIT PRESS	1390.2	1390.5	1390.5	1394.8	1411.2	1418.2	1435.4	1442.1	1459.3	1466.2
UNIT VACUUM	11.8			11.5	11.7	11.6	11.5	11.3	11.9	12.0
Filter	10.6	system down	system on line	10.4	10.4	10.4	10.3	10.3	10.5	10.5
WELL VACUUM	10.2			10.0	10.0	10.0	9.8	9.8	10.0	10.1
DELTA P	8.4			8.4	8.2	8.3	8.2	8.3	8.6	8.7
TEMPERATURE	55.5			56	55.5	56	55.5	56	55	55.5
H ₂ O	AY-2-2-1	8.9		8.7	8.7	8.7	8.6	8.5	8.7	8.8
	AY-2-2-1.5	5.2		6.5	6.6	6.9	6.3	6.4	6.3	7.1
	AY-2-2-1.7	4.7		5.4	5.3	4.3	5.0	4.5	4.3	4.6
	AY-2-2-1.9	5.0		5.3	5.2	5.2	5.0	4.8	4.8	5.1
	AY-2-2-1.7.1	⊕0.8		⊕1.0	⊕0.25	⊕0.65	0.1	⊕0.1	0.4	0.2
H ₂ O	AY-2-2-1.2	⊕0.1		⊕1.4	0.25	⊕0.1	⊕0.2	⊕0.4	0.8	⊕0.6
Compressor Hour Meter	5005.3	5005.6	5005.6	5009.5	5025.1	5031.8	5048.1	5054.4	5070.6	5077.1
Pressure psi	87.5			85.5	86.0	86.0	86.5	86.0	85.5	85.5
TEMPERATURE of	146			156	148	154	147.5	153.5	137	151
ΔP "H ₂ O	4.75			5.2	5.15	5.15	5.1	5.15	5.2	5.2
psi	AY-1-1	>60		>60	>60	>60	>60	>60	>60	>60
	AY-1-2	>60		>60	>60	>60	>60	>60	>60	>60
	AY-1-3	1.3		10.0	14.2	20.7	7.7	9.1	6.5	8.7
	AY-1-4	>60		>60	>60	>60	>60	>60	>60	>60
	AY-1-5	>60		>60	>60	>60	>60	>60	>60	>60
	AY-1-6	15.2		12.2	12.7	13.2	10.2	12.1	10.5	13.1

DATE	10/20/90	10/21/90	10/22/90	10/22/90	10/23/90	10/23/90	10/23/90	10/3/90	10/24/90	10/24/90
TIME	0823	0826	0809	1506	~0500	1400	1518	1728	0816	1533
WATER	1483.6	1507.8	1531.6	1538.6	1552.5	1552.8	1554.1	1556.3	1571.2	1578.5
ACT VOLUME	12.1	12.2	12.2	12.2			11.1	11.2	11.6	11.6
Filter	10.6	10.7	10.6	10.5	System down		10.4	10.5	10.7	10.8
WATER	10.2	10.3	10.1	10.1			9.9	10.0	10.3	10.3
TEMPERATURE	8.8	8.7	8.4	8.6			9.7	9.2	9.2	9.2
TEMPERATURE	55	55	55.5	55.5			56	55.5	55	55.5
WATER	8.9	8.9	8.9	8.8	on-line		8.5	8.6	9.0	9.0
WATER	6.7	6.9	6.3	6.8			5.9	6.6	7.1	6.9
WATER	5.1	4.7	4.5	4.9			5.7	5.5	5.3	5.2
WATER	5.1	5.0	4.2	4.6			5.5	5.6	5.2	5.1
WATER	0.5	0.3	0.05	0.2	Filter & Oil change		0.2	0.55	0.5	0.75
WATER	0.45	0.15	0.15	0.4			0.1	0.1	0.25	0.75
Compressor Hour Meter	5093.6	5116.4	5138.9	5145.5	5158.6	5158.6	5159.8	5161.9	5175.9	5182.8
TEMPERATURE psi	86.0	86.0	86.5	85.5	Filter & Oil change		88.5	88.5	89.0	89.0
TEMPERATURE °F	139	145	149	149			146.5	145.5	141	152
ΔP "H ₂ O	5.25	5.15	5.15	4.9			4.6	4.55	4.45	4.5
WATER	>60	>60	>60	>60			>60	>60	>60	>60
WATER	>60	>60	>60	>60	Filter & Oil change		>60	>60	>60	>60
WATER	6.7	8.1	9.0	8.9			18.2	7.0	8.3	10.8
WATER	>60	>60	>60	>60			8.0	5.5	14.0	44.0
WATER	>60	>60	>60	>60			>60	>60	>60	>60
WATER	10.5	12.0	12.7	12.8	Filter & Oil change		11.7	11.8	11.0	13.8

E.S.T. →

DATE	10/25/90	10/25/90	10/26/90	10/26/90	10/27/90	10/28/90	10/29/90	10/29/90	10/29/90	10/29/90
TIME	0820	1607	0828	1604	1100	1145	0815	1529	1610	1645
INLET PRESS	1595.4	1603.2	1619.6	1627.3	1646.3	1672.2	1692.8	1700.1	1700.8	1701.4
OUTLET PRESS	11.5	11.8	12.0	11.9	12.3	12.4	12.5	12.4		
Filter	10.6	10.7	10.9	10.8	11.0	10.9	10.6	10.5		
WELL PRESS	10.1	10.3	10.5	10.4	10.6	10.4	10.3	10.1		
DELTA P	9.3	9.2	9.2	8.7	8.8	8.7	8.6	8.4		
TEMPERATURE	55	55	54.5	55	55	55	55	55.5		
INLET TEMP	8.9	8.9	9.2	9.1	9.3	9.1	9.0	8.8		
OUTLET TEMP	6.5	2.1	7.1	7.2	7.4	7.3	7.1	7.1		
INLET TEMP	4.8	9.1	5.1	5.2	5.1	5.0	5.1	4.8		
OUTLET TEMP	4.8	5.0	5.1	5.1	5.0	5.0	4.9	4.8		
INLET TEMP	0.75	2.3 Hg	2.6 Hg	2.8 Hg	2.8 Hg	2.8 Hg	2.4 Hg	2.4 Hg		
OUTLET TEMP	0.3	0.25	1.25	0.1	0.8	0.7	0.7	0.5		
Compressor Hour Meter	5198.7	5206.1	5221.6	5228.8	5246.8	5271.3	5290.8	5297.7	5298.3	5298.9
TEMPERATURE	89.0	88.0	88.0	88.0	88.5	88.5	88.5	88.5		
TEMPERATURE	139	129	131	142	143	151	137	146		
ΔP "H ₂ O"	4.4	4.4	4.45	4.45	4.55	4.55	4.5	4.5		
INLET PRESS	>60	>60	>60	>60	>60	>60	>60	>60		
INLET PRESS	>60	>60	>60	>60	>60	>60	>60	>60		
INLET PRESS	9.5	8.0	8.0	9.3	9.5	10.8	9.2	10.2		
INLET PRESS	>60	>60	>60	>60	>60	>60	>60	>60		
INLET PRESS	>60	>60	>60	>60	>60	>60	>60	>60		
INLET PRESS	11.0	13.5	13.8	13.5	14.2	13.6	14.3	13.7		

Shut down for filter change

System on line

Change

DATE	10/30/90	10/30/90	10/30/90	10/30/90	10/31/90	10/31/90	11/3/90	11/3/90	11/3/90	11/4/90
TIME	0818	~1530	1610	1711	0154	~0905	1530	1744	~1915	1320
UNIT VALUE	1717.0	1724.2	1724.2	1725.3	1740.1	1741.3	1741.6	1743.8	1745.3	1763.6
UNIT VALUE	12.1			11.4	11.8			11.8		
Filter ^{Hg}	10.7			10.3	10.5			10.3		
WELL ^{Hg}	10.3			9.9	10.1			10.8		
DELTA ^{H2O}	8.8			8.9	8.8			8.4		
TEMPERATURE OF	55			55	55			57		
WELL ^{Hg}	9.1			8.7	8.9			7.3		
WELL ^{Hg}	7.2			7.3	7.2			6.4		
WELL ^{Hg}	5.3			5.2	5.0			6.4		
WELL ^{Hg}	5.2			5.2	5.0			6.1		
WELL ^{Hg}	2.7			3.5	2.8			5.0		
WELL ^{Hg}	0.35			1.5	0.45			1.0		
Compression Hour Meter	5313.6	5320.5	5320.5	5321.4	5335.4	5336.5	5336.5	5338.4	5339.9	5339.9
PSI	88.0			88.5	88.0			88.0		
TEMPERATURE OF	141			144.5	136			146		
AP ^{H2O}	4.85			4.9	4.9			4.6		
PSI	>60			>60	>60			>60		
PSI	>60			>60	>60			>60		
PSI	14.1			14.4	13.5			12.3		
PSI	>60			56.0	59.9			30.4		
PSI	>60			>60	>60			34.3		
PSI	13.4			<0	2.6			<0		

DATE	11/4/90	11/5/90	11/5/90	11/5/90	11/6/90	11/6/90	11/7/90	11/7/90	11/8/90	11/8/90
TIME	1504	0819	0930	1549	0810	1600	1105	1500	1435	1835
UNIT METER	1765.3	1782.6	1783.8	1790.2	1806.6	1814.5	1833.7	1837.6	1855.6	1860.0
NET VOLUME	11.1	11.1	10.0	9.9	10.2	10.2	9.1	9.1	11.0	
Filter	10.3	10.3		8.9	9.2	9.5	8.0	8.0	10.2	
Flow	10.6	10.8		9.0	9.8	9.5	8.0	8.0	10.2	
DELTA	8.2	8.2		6.2	6.1	6.00	4.9	4.9	8.5	
TEMPERATURE	59	55.5		60	54	59	60	61	57	
Wellhead Vacuum						8.0	7.1	7.1	8.6	
1-1-1-1	7.9	8.0		7.0	7.3	7.0	6.2	6.2	7.5	
1-1-1-2	6.6	6.8		5.8	5.5	5.7	4.6	4.5	5.0	
1-1-1-3	5.5	5.0		4.1	3.6	3.7	3.1	3.2	4.6	
1-1-1-4	5.3	4.8		4.0	3.6	3.7	4.1	4.1	5.3	
1-1-1-5	3.4	2.8		2.2	2.2	2.3	2.2	1.8	4.1	
1-1-1-6	0.55	0.45		0.4	0.5	0.0	0.4	0.4	0.05	
Time						1622	1115	1515	1425	
Compressor Hour Meter	5341.6	5358.1	5359.2	5365.3	5380.9	5388.8	5406.7	5410.7	5424.2	5428
PRESSURE	85.5	87.0		86.0	86.5	86.5	86.5	86.5	86	
TEMPERATURE	149.5	141		143.5	133	143	149	147	140	
ΔP	4.35	4.15		4.1	4.05	4.05	4.10	4.05	4.35	
1-1-1-1	>60	>60		>60	>60	53.5	>60	>60	>60	
1-1-1-2	>60	>60		>60	>60	760	>60	>60	>60	
1-1-1-3	9.2	10.0		59.5	42.5	760	>60	>60	>60	
1-1-1-4	>60	>60		55.0	59.7	760	>60	>60	>60	
1-1-1-5	9.7	6.3		1.6	40.8	42.5	58.0	56.5	>60	
1-1-1-6	<0	10.8		3.5	5.2	6.0	1.0	8.0	2.5	

Generator

Failure

System Down

DATE	2/27/90	→					2/27/90	2/28/90	2/28/90	2/28/90
TIME	1018	1050	1149	1246	1349	1608	1732	0854	1037	2057
WIND	.4	.8	1.6	1.0	2.6	3.0	3.2	5.7	5.7	5.8
WIND-10	.6	.25	.9	1.3	0.0	0.0	0.3	8.6	10.0	16.5
WIND-100	.6	.7	4.5	.3	0.0	0.0	0.0	0.0	0.0	0.1
TIME	1020	1051	1150	1247	1350	1612	1733	0857	1039	2059
WIND	.5	.35	.6	.3	0.2	0.2	0.35	.9	1.3	5.3
WIND-10	.15	.2	.5	.7	.55	0.8	0.9	1.2	1.4	7.7
WIND-100	1.7	.6	3.4	3.9	3.8	11.7	14.7	(2.7)	(5.1)	200 > 1
TIME	1021	1052	1151	1249	1351	1615	1734	0904	1040	2102
WIND	0.0	0.0	0.0	0.0	0.0	0.1	0.1	.4	0.5	0.9
WIND-10	.3	.9	1.6	2.0	2.1	2.6	2.7	4.0	4.2	4.5
WIND-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
TIME	1022	1053	1152	1250	1352	1617	1735	0906	1042	2104
WIND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
WIND-10	.5	.4	1.4	1.4	3.1	3.2	2.8	6.1	6.5	6.4
WIND-100	2.9	1.7	3.9	7.8	8.7	8.1	10.5	12.7	12.8	218.0
TIME	1023	1054	1153	1251	1354	1620	1736	0910	1043	2106
WIND	.5	1.1	2.2	2.8	3.1	3.4	3.5	6.0	6.2	5.2
WIND-10	2.1	2.2	6.0	8.4	7.7	8.9	9.1	11.3	11.3	11.4
WIND-100	1.6	1.7	4.9	6.4	9.7	13.7	13.8	14.2	14.3	12.75
TIME	1023	1055	1154	1252	1355	1623	1738	0912	1045	2108
WIND	0.0	2.4	4.5	5.3	5.3	4.9	6.4	8.2	8.3	> 16
TIME	1024	1055	1154	1252	1355	1624	1738	0913	1046	2109
WIND	.3	.35	.35	.35	.5	.2	0.2	1.9	2.1	1.6
TIME	1024	1055	1154	1252	1355	1625	1738	0914	1047	2110
WIND	.9	1.9	3.2	4.0	4.2	4.6	4.8	7.4	7.6	6.8
TIME	1025	1056	1156	1254	1357	1626	1739	0915	1048	2111
WIND	.9	1.8	3.1	3.8	4.1	4.4	4.6	7.1	7.4	6.5

**FULL SCALE FIELD TEST OF THE IN SITU AIR STRIPPING PROCESS AT THE
SAVANNAH RIVER INTEGRATED DEMONSTRATION TEST SITE (U)**

Appendix B Vadose Zone Piezometer Data.

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
MHV-1A	28-Jul-90	656	346	1002
MHV-1A	7-Aug-90	296	301	597
MHV-1A	13-Aug-90	412	373	785
MHV-1A	20-Aug-90	403	456	859
MHV-1A	27-Aug-90	472	450	923
MHV-1A	4-Sep-90	869	796	1665
MHV-1A	10-Sep-90	413	325	738
MHV-1A	17-Sep-90	449	382	831
MHV-1A	24-Sep-90	421	373	794
MHV-1A	1-Oct-90	410	290	700
MHV-1A	8-Oct-90	404	267	670
MHV-1A	15-Oct-90	387	249	636
MHV-1A	22-Oct-90	407	227	634
MHV-1A	29-Oct-90	413	141	554
MHV-1A	5-Nov-90	343	102	445
MHV-1A	13-Nov-90	469	146	616
MHV-1A	19-Nov-90	390	145	534
MHV-1A	28-Nov-90	267	71.6	339
MHV-1A	3-Dec-90	265	86.7	352
MHV-1A	10-Dec-90	193	22.7	215

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
MHV-1B	28-Jul-90	173	233	406
MHV-1B	7-Aug-90	117	17.2	134
MHV-1B	13-Aug-90	87.7	5.53	93.3
MHV-1B	20-Aug-90	103	5.39	108
MHV-1B	27-Aug-90	107	4.29	111
MHV-1B	4-Sep-90	82.1	2.82	84.9
MHV-1B	10-Sep-90	78.6	5.11	83.7
MHV-1B	17-Sep-90	71.8	9.39	81.2
MHV-1B	24-Sep-90	53.5	3.93	57.4
MHV-1B	1-Oct-90	63.3	7.94	71.2
MHV-1B	8-Oct-90	58.3	9.07	67.3
MHV-1B	15-Oct-90	54.7	19.1	73.7
MHV-1B	22-Oct-90	75.8	19.5	95.3
MHV-1B	29-Oct-90	74.9	19.7	94.6
MHV-1B	5-Nov-90	82.1	19.1	101
MHV-1B	13-Nov-90	113	28.1	141
MHV-1B	19-Nov-90	122	41.9	163
MHV-1B	28-Nov-90	109	24.3	133
MHV-1B	3-Dec-90	116	37.8	154
MHV-1B	10-Dec-90	114	50.0	164

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
MHV-1C	28-Jul-90	2.61	5.03	7.64
MHV-1C	7-Aug-90	0.639	0.639	1.28
MHV-1C	13-Aug-90	0.655	1.21	1.87
MHV-1C	20-Aug-90	BDL	BDL	BDL
MHV-1C	27-Aug-90	BDL	BDL	BDL
MHV-1C	4-Sep-90	0.041	0.132	0.173
MHV-1C	10-Sep-90	0.097	0.175	0.272
MHV-1C	17-Sep-90	0.042	0.203	0.245
MHV-1C	24-Sep-90	0.009	0.018	0.027
MHV-1C	1-Oct-90	0.122	0.275	0.397
MHV-1C	8-Oct-90	1.37	0.776	2.15
MHV-1C	15-Oct-90	2.77	1.41	4.17
MHV-1C	22-Oct-90	2.82	1.50	4.32
MHV-1C	29-Oct-90	0.678	0.300	0.977
MHV-1C	5-Nov-90	1.24	0.515	1.75
MHV-1C	13-Nov-90	0.852	0.316	1.17
MHV-1C	20-Nov-90	1.06	0.286	1.34
MHV-1C	28-Nov-90	0.510	0.202	0.712
MHV-1C	3-Dec-90	0.669	0.335	1.00
MHV-1C	10-Dec-90	0.042	0.060	0.102

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
MHV-2A	28-Jul-90	209	108	317
MHV-2A	7-Aug-90	260	93.2	353
MHV-2A	13-Aug-90	275	85.4	361
MHV-2A	20-Aug-90	269	74.2	344
MHV-2A	27-Aug-90	310	96.4	407
MHV-2A	4-Sep-90	243	74.8	318
MHV-2A	10-Sep-90	271	79.2	350
MHV-2A	17-Sep-90	270	78.8	349
MHV-2A	24-Sep-90	228	92.4	320
MHV-2A	1-Oct-90	256	99.5	356
MHV-2A	8-Oct-90	212	90.4	303
MHV-2A	15-Oct-90	211	98.6	310
MHV-2A	22-Oct-90	252	160	412
MHV-2A	29-Oct-90	227	165	392
MHV-2A	5-Nov-90	221	146	367
MHV-2A	13-Nov-90	262	164	426
MHV-2A	19-Nov-90	95.3	104	200
MHV-2A	28-Nov-90	202	118	321
MHV-2A	3-Dec-90	239	184	423
MHV-2A	10-Dec-90	230	134	364

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
MHV-2B	28-Jul-90	70.5	40.0	111
MHV-2B	7-Aug-90	24.1	1.48	25.6
MHV-2B	13-Aug-90	34.9	1.50	36.4
MHV-2B	20-Aug-90	37.8	1.46	39.3
MHV-2B	27-Aug-90	37.3	1.20	38.5
MHV-2B	4-Sep-90	15.7	1.43	17.1
MHV-2B	10-Sep-90	34.8	1.65	36.5
MHV-2B	17-Sep-90	40.1	2.75	42.9
MHV-2B	24-Sep-90	32.4	4.15	36.5
MHV-2B	1-Oct-90	40.1	9.59	49.7
MHV-2B	8-Oct-90	37.4	12.2	49.6
MHV-2B	15-Oct-90	38.6	14.8	53.4
MHV-2B	22-Oct-90	45.8	19.1	64.9
MHV-2B	29-Oct-90	47.8	20.6	68.5
MHV-2B	5-Nov-90	42.5	22.2	64.7
MHV-2B	13-Nov-90	44.6	25.1	69.7
MHV-2B	19-Nov-90	37.9	33.5	71.5
MHV-2B	28-Nov-90	29.1	42.6	71.8
MHV-2B	3-Dec-90	27.5	59.6	87.1
MHV-2B	10-Dec-90	24.3	78.6	103

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
MHV-2C	28-Jul-90	1.22	2.30	3.52
MHV-2C	7-Aug-90	0.749	2.01	2.76
MHV-2C	13-Aug-90	1.63	4.24	5.87
MHV-2C	20-Aug-90	2.79	2.78	5.56
MHV-2C	27-Aug-90	2.90	1.24	4.14
MHV-2C	4-Sep-90	2.98	0.646	3.63
MHV-2C	10-Sep-90	2.86	0.617	3.48
MHV-2C	17-Sep-90	3.40	0.485	3.88
MHV-2C	24-Sep-90	3.18	0.355	3.53
MHV-2C	1-Oct-90	5.32	0.473	5.79
MHV-2C	8-Oct-90	4.85	0.376	5.23
MHV-2C	15-Oct-90	4.62	0.328	4.94
MHV-2C	22-Oct-90	5.10	0.430	5.53
MHV-2C	29-Oct-90	5.32	0.806	6.13
MHV-2C	5-Nov-90	4.97	1.11	6.08
MHV-2C	13-Nov-90	5.78	1.44	7.22
MHV-2C	19-Nov-90	5.53	2.38	7.92
MHV-2C	28-Nov-90	5.14	2.50	7.64
MHV-2C	3-Dec-90	5.42	3.08	8.50
MHV-2C	10-Dec-90	3.86	2.56	6.42

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
MHV-3A	28-Jul-90	186	94.6	280
MHV-3A	7-Aug-90	413	207	620
MHV-3A	13-Aug-90	532	225	757
MHV-3A	20-Aug-90	362	118	480
MHV-3A	27-Aug-90	217	85.3	303
MHV-3A	5-Sep-90	14.3	5.62	20.0
MHV-3A	10-Sep-90	187	79.6	267
MHV-3A	17-Sep-90	5.62	2.06	7.68
MHV-3A	25-Sep-90	13.4	5.52	18.9
MHV-3A	2-Oct-90	27.8	12.8	40.5
MHV-3A	9-Oct-90	48.4	38.3	86.8
MHV-3A	16-Oct-90	16.9	8.44	25.3
MHV-3A	24-Oct-90	243	229	472
MHV-3A	30-Oct-90	18.0	16.2	34.2
MHV-3A	6-Nov-90	114	95.6	210
MHV-3A	13-Nov-90	10.2	6.21	16.5
MHV-3A	19-Nov-90	9.53	6.26	15.8
MHV-3A	28-Nov-90	108	84.3	192
MHV-3A	3-Dec-90	115	96.3	211
MHV-3A	10-Dec-90	71.8	46.6	118

SAMPLE POINT	DATE	TCE (PPM)	POE (PPM)	TOTAL (PPM)
MHV-3B	28-Jul-90	46.4	64.7	111
MHV-3B	7-Aug-90	59.8	5.49	65.3
MHV-3B	13-Aug-90	53.1	2.99	56.1
MHV-3B	20-Aug-90	77.2	3.34	80.5
MHV-3B	27-Aug-90	69.7	1.78	71.5
MHV-3B	4-Sep-90	49.8	1.40	51.2
MHV-3B	10-Sep-90	51.4	1.75	53.1
MHV-3B	17-Sep-90	59.4	2.67	62.1
MHV-3B	25-Sep-90	49.7	3.30	53.0
MHV-3B	2-Oct-90	66.5	7.45	73.9
MHV-3B	9-Oct-90	58.7	8.23	66.9
MHV-3B	16-Oct-90	46.2	7.31	53.5
MHV-3B	24-Oct-90	74.5	12.4	86.9
MHV-3B	30-Oct-90	73.8	16.7	90.4
MHV-3B	6-Nov-90	98.7	26.2	125
MHV-3B	13-Nov-90	96.9	24.1	121
MHV-3B	19-Nov-90	118	37.4	156
MHV-3B	28-Nov-90	89.0	44.2	133
MHV-3B	3-Dec-90	78.3	51.2	129
MHV-3B	10-Dec-90	84.6	66.9	152

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
MHV-3C	28-Jul-90	0.236	0.461	0.697
MHV-3C	7-Aug-90	0.168	0.401	0.569
MHV-3C	13-Aug-90	0.089	0.391	0.479
MHV-3C	20-Aug-90	0.055	0.032	0.087
MHV-3C	27-Aug-90	BDL	0.047	0.047
MHV-3C	4-Sep-90	BDL	0.064	0.064
MHV-3C	10-Sep-90	BDL	0.038	0.038
MHV-3C	17-Sep-90	BDL	0.028	0.028
MHV-3C	25-Sep-90	BDL	0.046	0.046
MHV-3C	2-Oct-90	BDL	0.104	0.104
MHV-3C	9-Oct-90	BDL	0.064	0.064
MHV-3C	16-Oct-90	BDL	0.034	0.034
MHV-3C	24-Oct-90	BDL	0.188	0.188
MHV-3C	30-Oct-90	BDL	0.104	0.104
MHV-3C	6-Nov-90	0.842	0.823	1.67
MHV-3C	13-Nov-90	BDL	0.100	0.100
MHV-3C	19-Nov-90	0.099	0.161	0.260
MHV-3C	28-Nov-90	0.053	0.176	0.229
MHV-3C	3-Dec-90	0.232	0.261	0.492
MHV-3C	10-Dec-90	BDL	0.038	0.038

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
MHV-4A	28-Jul-90	15.9	4.72	20.7
MHV-4A	7-Aug-90	207	22.9	230
MHV-4A	14-Aug-90	236	23.5	260
MHV-4A	20-Aug-90	145	14.6	160
MHV-4A	27-Aug-90	162	17.4	179
MHV-4A	5-Sep-90	108	23.2	131
MHV-4A	10-Sep-90	82.2	18.1	100
MHV-4A	17-Sep-90	109	34.5	144
MHV-4A	25-Sep-90	70.4	22.2	92.6
MHV-4A	2-Oct-90	170	45.3	215
MHV-4A	9-Oct-90	210	40.4	251
MHV-4A	16-Oct-90	255	49.2	304
MHV-4A	24-Oct-90	250	48.2	298
MHV-4A	30-Oct-90	332	61.6	393
MHV-4A	6-Nov-90	344	110	454
MHV-4A	13-Nov-90	498	98.5	597
MHV-4A	20-Nov-90	422	92.6	515
MHV-4A	29-Nov-90	553	143	696
MHV-4A	4-Dec-90	622	188	811
MHV-4A	11-Dec-90	1150	136	1286

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
MHV-4B	28-Jul-90	1193	200	1393
MHV-4B	7-Aug-90	352	57.2	409
MHV-4B	14-Aug-90	307	44.5	351
MHV-4B	20-Aug-90	83.4	16.3	99.7
MHV-4B	29-Aug-90	49.6	28.2	77.8
MHV-4B	4-Sep-90	9.15	8.68	17.8
MHV-4B	10-Sep-90	13.5	16.9	30.5
MHV-4B	17-Sep-90	23.8	27.0	50.7
MHV-4B	25-Sep-90	18.6	22.6	41.2
MHV-4B	2-Oct-90	26.3	29.1	55.4
MHV-4B	9-Oct-90	23.6	23.0	46.6
MHV-4B	16-Oct-90	31.7	33.1	64.8
MHV-4B	24-Oct-90	37.7	23.1	60.8
MHV-4B	30-Oct-90	38.1	21.8	59.9
MHV-4B	6-Nov-90	39.5	26.0	65.6
MHV-4B	13-Nov-90	45.2	24.2	69.4
MHV-4B	20-Nov-90	35.2	16.8	52.0
MHV-4B	29-Nov-90	19.5	5.14	24.6
MHV-4B	4-Dec-90	15.7	3.29	19.0
MHV-4B	11-Dec-90	10.6	3.08	13.7

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
MHV-4C	28-Jul-90	454	229	683
MHV-4C	2-Aug-90	1105	440	1545
MHV-4C	7-Aug-90	634	491	1124
MHV-4C	14-Aug-90	704	360	1064
MHV-4C	20-Aug-90	825	413	1238
MHV-4C	29-Aug-90	2944	963	3908
MHV-4C	4-Sep-90	456	270	726
MHV-4C	10-Sep-90	528	360	889
MHV-4C	17-Sep-90	436	260	696
MHV-4C	25-Sep-90	418	357	776
MHV-4C	2-Oct-90	379	321	700
MHV-4C	9-Oct-90	350	338	688
MHV-4C	16-Oct-90	326	335	661
MHV-4C	24-Oct-90	298	304	602
MHV-4C	30-Oct-90	331	370	700
MHV-4C	6-Nov-90	303	576	879
MHV-4C	13-Nov-90	777	686	1463
MHV-4C	19-Nov-90	400	461	861
MHV-4C	29-Nov-90	293	348	641
MHV-4C	4-Dec-90	217	253	470
MHV-4C	11-Dec-90	369	280	649

SAMPLE POINT	DATE	TOE (PPM)	PCE (PPM)	TOTAL (PPM)
MHV-5A	28-Jul-90	871	65.9	937
MHV-5A	7-Aug-90	60.3	9.13	69.5
MHV-5A	14-Aug-90	52.1	5.36	57.5
MHV-5A	21-Aug-90	19.6	1.13	20.7
MHV-5A	29-Aug-90	21.6	6.14	27.7
MHV-5A	5-Sep-90	6.13	1.88	8.01
MHV-5A	11-Sep-90	7.79	4.57	12.4
MHV-5A	18-Sep-90	10.7	4.91	15.6
MHV-5A	26-Sep-90	8.79	4.16	12.9
MHV-5A	3-Oct-90	10.8	4.68	15.5
MHV-5A	10-Oct-90	10.4	4.75	15.1
MHV-5A	17-Oct-90	10.9	4.68	15.6
MHV-5A	24-Oct-90	10.3	3.92	14.2
MHV-5A	30-Oct-90	10.0	3.76	13.8
MHV-5A	7-Nov-90	11.2	4.33	15.5
MHV-5A	14-Nov-90	11.3	4.05	15.4
MHV-5A	19-Nov-90	10.8	3.81	14.6
MHV-5A	29-Nov-90	6.15	2.58	8.73
MHV-5A	4-Dec-90	4.31	2.42	6.73
MHV-5A	11-Dec-90	3.28	1.72	5.00

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
MHV-5B	28-Jul-90	1118	138	1256
MHV-5B	7-Aug-90	227	27.9	255
MHV-5B	13-Aug-90	287	23.1	310
MHV-5B	21-Aug-90	320	21.6	342
MHV-5B	29-Aug-90	317	16.9	334
MHV-5B	5-Sep-90	301	15.7	317
MHV-5B	11-Sep-90	163	7.72	171
MHV-5B	18-Sep-90	190	7.47	198
MHV-5B	26-Sep-90	133	5.99	139
MHV-5B	3-Oct-90	139	7.89	146
MHV-5B	10-Oct-90	134	10.2	144
MHV-5B	17-Oct-90	103	6.92	109
MHV-5B	24-Oct-90	84.7	4.88	89.6
MHV-5B	30-Oct-90	76.4	5.37	81.8
MHV-5B	7-Nov-90	71.4	6.76	78.1
MHV-5B	14-Nov-90	65.5	6.49	72.0
MHV-5B	19-Nov-90	68.8	28.2	97.0
MHV-5B	29-Nov-90	35.6	3.91	39.5
MHV-5B	4-Dec-90	31.4	4.17	35.6
MHV-5B	11-Dec-90	35.7	7.30	43.0

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
MHV-5C	28-Jul-90	33.1	26.9	59.9
MHV-5C	7-Aug-90	112	86.6	198
MHV-5C	13-Aug-90	268	89.6	357
MHV-5C	21-Aug-90	213	44.9	258
MHV-5C	29-Aug-90	220	52.6	272
MHV-5C	5-Sep-90	127	26.0	153
MHV-5C	11-Sep-90	75.0	17.1	92.1
MHV-5C	18-Sep-90	84.0	15.9	99.9
MHV-5C	26-Sep-90	59.8	12.4	72.2
MHV-5C	3-Oct-90	71.3	17.1	88.5
MHV-5C	10-Oct-90	60.4	15.9	76.4
MHV-5C	17-Oct-90	56.5	14.0	70.4
MHV-5C	24-Oct-90	48.6	10.8	59.4
MHV-5C	30-Oct-90	43.8	9.85	53.6
MHV-5C	7-Nov-90	44.3	11.5	55.8
MHV-5C	14-Nov-90	45.9	11.6	57.5
MHV-5C	19-Nov-90	40.8	14.2	55.1
MHV-5C	29-Nov-90	28.7	6.62	35.3
MHV-5C	4-Dec-90	31.5	8.77	40.3
MHV-5C	11-Dec-90	24.1	6.36	30.4

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
PZ-1	28-Jul-90	111	308	419
PZ-1	7-Aug-90	345	144	489
PZ-1	13-Aug-90	314	123	437
PZ-1	21-Aug-90	261	104	364
PZ-1	29-Aug-90	405	248	653
PZ-1	5-Sep-90	247	141	387
PZ-1	11-Sep-90	154	72.3	226
PZ-1	18-Sep-90	257	137	394
PZ-1	26-Sep-90	201	100	301
PZ-1	3-Oct-90	239	133	372
PZ-1	10-Oct-90	233	182	415
PZ-1	17-Oct-90	231	146	377
PZ-1	25-Oct-90	219	154	373
PZ-1	3-Nov-90	159	136	294
PZ-1	7-Nov-90	184	171	356
PZ-1	14-Nov-90	155	127	282
PZ-1	20-Nov-90	155	145	299
PZ-1	29-Nov-90	100	101	201
PZ-1	4-Dec-90	76.8	75.5	152
PZ-1	11-Dec-90	171	182	353

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
PZ-2	28-Jul-90	181	41.4	223
PZ-2	7-Aug-90	397	72.6	469
PZ-2	13-Aug-90	426	31.5	458
PZ-2	21-Aug-90	217	13.8	231
PZ-2	29-Aug-90	171	2.77	174
PZ-2	5-Sep-90	75.9	1.18	77.1
PZ-2	11-Sep-90	24.1	0.679	24.8
PZ-2	18-Sep-90	10.8	0.372	11.2
PZ-2	26-Sep-90	18.1	0.649	18.7
PZ-2	3-Oct-90	16.8	0.754	17.6
PZ-2	10-Oct-90	9.48	0.572	10.0
PZ-2	17-Oct-90	4.70	0.524	5.22
PZ-2	25-Oct-90	3.43	0.152	3.58
PZ-2	3-Nov-90	4.10	0.173	4.27
PZ-2	7-Nov-90	10.3	0.178	10.4
PZ-2	14-Nov-90	4.33	0.119	4.45
PZ-2	20-Nov-90	10.3	0.860	11.2
PZ-2	29-Nov-90	49.3	8.52	57.8
PZ-2	4-Dec-90	60.5	12.3	72.8
PZ-2	11-Dec-90	90.9	21.5	112

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
PZ-3	28-Jul-90	345	155	500
PZ-3	7-Aug-90	574	91.3	665
PZ-3	13-Aug-90	391	65.3	456
PZ-3	21-Aug-90	261	50.8	312
PZ-3	29-Aug-90	182	58.3	240
PZ-3	5-Sep-90	124	86.5	211
PZ-3	11-Sep-90	59.8	51.0	111
PZ-3	18-Sep-90	88.5	89.7	178
PZ-3	26-Sep-90	90.6	140	230
PZ-3	3-Oct-90	101	163	264
PZ-3	10-Oct-90	109	174	283
PZ-3	17-Oct-90	118	214	331
PZ-3	25-Oct-90	114	265	379
PZ-3	3-Nov-90	137	165	302
PZ-3	7-Nov-90	122	234	356
PZ-3	14-Nov-90	146	188	334
PZ-3	20-Nov-90	136	343	478
PZ-3	29-Nov-90	117	279	396
PZ-3	4-Dec-90	162	419	580
PZ-3	11-Dec-90	225	403	628

SAMPLE POINT	DATE	TCE (PPM)	PCE (PPM)	TOTAL (PPM)
PZ-4	28-Jul-90	2123	271	2394
PZ-4	7-Aug-90	329	116	445
PZ-4	13-Aug-90	764	203	967
PZ-4	21-Aug-90	373	90.9	463
PZ-4	29-Aug-90	318	307	625
PZ-4	5-Sep-90	199	424	623
PZ-4	11-Sep-90	143	199	343
PZ-4	18-Sep-90	195	267	462
PZ-4	26-Sep-90	163	284	447
PZ-4	3-Oct-90	189	285	473
PZ-4	10-Oct-90	236	587	823
PZ-4	17-Oct-90	205	362	567
PZ-4	25-Oct-90	258	514	773
PZ-4	3-Nov-90	254	539	793
PZ-4	7-Nov-90	218	420	638
PZ-4	14-Nov-90	280	436	716
PZ-4	20-Nov-90	247	329	576
PZ-4	29-Nov-90	294	385	679
PZ-4	4-Dec-90	297	375	672
PZ-4	11-Dec-90	355	297	652

7255190

PROJECT # 04-211

OPERATIONS FIELD LOG - 1

SAVING TIME
Loc 6. new
61.4 (zero) gauge

DATE	7/29/90	7/29/90	7/29/90	7/29/90	7/30/90	7/30/90	7/30/90	7/31/90	7/31/90	7/31/90
TIME	0842	1221	1551	2048	0827	1525	2146	0835	1412	2006
WIND	7.1	6.9	6.1	6.0	6.85	6.1	6.2	6.8	6.3	6.1
WIND	12.8	12.6	11.5	11.8	12.45	11.5	11.6	12.2	11.9	11.4
WIND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TIME	0844	1222	1552	2050	0828	1528	2148	0837	1413	2007
WIND	5.9	5.8	5.1	5.0	5.7	4.75	5.0	5.7	5.35	5.1
WIND	8.9	8.6	7.5	7.8	8.45	7.7	7.6	8.4	8.1	7.6
WIND	1.1hg	2.1hg	2.1hg	1.5hg	1.4hg	2.4hg	1.6hg	1.6hg	2.4hg	1.0hg
TIME	0847	1223	1555	2051	0830	1531	2150	0839	1415	2008
WIND	5.2	5.1	4.3	4.2	5.1	4.4	4.4	5.1	4.8	4.5
WIND	5.9	6.6	6.4	6.25	6.85	6.9	6.1	6.7	6.65	6.5
WIND	1.1	1.25	1.2	1.25	1.5	1.5	1.3	1.45	1.65	1.5
TIME	0849	1225	1556	2052	0832	1532	2152	0841	1416	2009
WIND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WIND	7.7	7.4	6.5	6.6	7.4	6.7	6.65	7.45	7.1	6.9
WIND	1.9hg	2.1hg	2.2hg	1.4hg	1.5hg	2.4hg	1.6hg	1.7hg	2.6hg	0.4hg
TIME	0851	1227	1558	2053	0834	1535	2154	0843	1417	2010
WIND	6.95	6.65	5.6	5.6	6.4	5.5	5.65	6.4	6.0	5.7
WIND	12.5	12.4	11.6	11.4	13.1	11.4	11.1	12.2	11.6	10.8
WIND	14.0	13.85	12.95	12.9	13.75	12.9	12.9	13.7	13.2	12.8
TIME	0854	1228	1601	2055	0837	1536	2156	0844	1418	2011
WIND	1.6hg	1.9hg	2.0hg	1.5hg	1.4hg	2.2hg	1.6hg	1.6hg	2.1hg	0.2hg
TIME	0854	1229	1602	2055	0837	1537	2156	0845	1418	2011
WIND	2.0	2.45	1.6	1.6	2.35	1.7	1.7	2.45	2.15	1.75
TIME	0855	1229	1602	2055	0838	1538	2157	0846	1418	2011
WIND	7.95	7.8	6.95	6.95	7.75	6.9	7.0	7.75	7.45	4.15
TIME	0856	1230	1603	2056	0840	1540	2157	0847	1419	2012
WIND	7.8	7.6	6.8	6.7	7.5	6.7	6.75	7.5	7.15	6.85

DATE	8/1/90	8/1/90	8/1/90	8/2/90	8/2/90	8/2/90	8/3/90	8/3/90	8/3/90	8/4/90
TIME	0826	1413	1942	0823	1501	1911	1133	1327	1417	0833
WIND	8.0	7.8	7.5	8.0	7.0	7.3	7.4	7.05	6.4	7.4
WAVE	13.25	13.0	13.8	13.4	12.4	12.6	12.8	12.55	11.85	12.7
WAVE	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.05	0.05
TIME	0829	1414	1944	0826	1503	1912	1136	1329	1620	0837
WIND	9.5	6.4	6.2	6.6	5.85	6.13	6.2	5.9	5.3	6.2
WAVE	9.45	8.25	9.1	9.5	8.5	9.2	8.95	8.55	7.95	8.9
WAVE	1.2 hg	1.5 hg	1.6 hg	1.6 hg	1.5 hg	1.5 hg	1.5 hg	1.6 hg	1.5 hg	1.6 hg
TIME	0830	1416	1945	0827	1504	1913	1140	1332	1622	0839
WIND	6.2	6.2	6.0	6.5	5.5	5.8	6.0	5.6	5.1	6.0
WAVE	7.9	8.1	7.7	8.3	7.7	7.7	9.15	7.3	7.4	8.65
WAVE	1.55	1.8	1.7	1.85	1.6	1.65	3.2	1.85	1.85	2.4
TIME	0832	1418	1946	0829	1505	1915	1142	1335	1625	0842
WIND	0.0	0.0	0.0	0.0	0.0	0.0	0.05	0.05	0.05	0.05
WAVE	8.5	8.35	8.1	8.6	7.65	7.95	8.0	7.65	7.00	8.05
WAVE	7 hg	1.4 hg	1.5 hg	1.5 hg	1.4 hg	1.4 hg	1.5 hg	1.5 hg	1.4 hg	1.5 hg
TIME	0834	1420	1947	0831	1506	1916	1145	1338	1628	0844
WIND	7.5	7.2	7.05	7.6	6.65	6.9	6.95	6.65	5.95	7.0
WAVE	13.25	12.8	12.8	13.35	11.95	12.65	12.6	12.2	11.5	12.8
WAVE	14.85	14.5	14.3	14.9	13.9	14.2	14.25	13.9	13.2	14.15
TIME	0835	1422	1948	0832	1508	1917	1148	1341	1630	0847
WAVE	8 hg	1.4 hg	1.5 hg	1.5 hg	1.4 hg	1.4 hg	1.4 hg	1.5 hg	1.3 hg	1.5 hg
TIME	0836	1423	1948	0833	1508	1918	1148	1342	1631	0847
WIND	3.6	3.3	3.15	3.55	2.65	2.9	2.95	2.6	1.95	3.0
TIME	0837	1424	1948	0834	1508	1918	1149	1343	1632	0847
WAVE	8.9	8.6	8.4	8.9	8.0	8.3	8.35	8.0	7.25	8.35
TIME	0839	1425	1949	0835	1509	1919	1150	1344	1633	0848
WAVE	8.45	8.4	8.15	8.7	7.75	8.1	8.1	7.75	7.05	8.15

DATE	8/4/90	8/4/90	8/5/90	8/5/90	8/5/90	8/6/90	8/6/90	8/6/90	8/7/90	8/7/90
TIME	1505	1917	0904	1433	1924	0830	1418	1925	0842	1429
WIND-10	6.45	6.05	7.2	6.55	5.7	6.55	5.9	5.3	6.7	6.7
WIND-15	11.8	11.35	12.7	12.0	11.2	11.85	11.25	10.7	12.0	12.05
WIND-20	0.05	0.05	0.05	0.05	0.0	0.05	0.05	0.1	0.0	0.0
TIME	1508	1919	0907	1436	1926	0832	1420	1928	0844	1432
WIND-10	5.35	4.85	5.9	5.45	4.8	5.4	5.0	4.55	5.5	5.9
WIND-15	7.85	7.4	8.7	8.0	7.25	8.05	7.4	7.0	8.2	8.05
WIND-20	1.5 Hg	1.4 Hg	1.5 Hg	1.4 Hg	1.4 Hg	1.4 Hg	1.4 Hg	1.3 Hg	1.5 Hg	1.4 Hg
TIME	1510	1921	0909	1438	1928	0834	1422	1930	0846	1434
WIND-10	5.05	4.65	5.8	5.15	4.35	5.15	4.3	4.35	5.35	5.3
WIND-15	7.4	7.05	7.75	7.4	6.9	7.15	7.05	6.8	8.2	7.7
WIND-20	1.9	1.75	1.8	1.9	1.7	1.75	1.8	1.75	2.45	1.95
TIME	1513	1923	0912	1440	1930	0837	1424	1932	0854	1436
WIND-10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.35	0.3
WIND-15	7.0	6.6	7.8	7.05	6.4	7.1	6.4	6.1	7.35	7.3
WIND-20	1.4 Hg	1.4 Hg	1.5 Hg	1.4 Hg	1.3 Hg	1.3 Hg	1.3 Hg	1.3 Hg	1.4 Hg	1.4 Hg
TIME	1515	1925	0914	1443	1932	0839	1426	1935	0857	1438
WIND-10	5.95	5.6	6.75	6.0	5.4	6.1	5.35	5.15	6.3	6.2
WIND-15	11.65	11.15	12.45	11.5	11.1	11.85	11.1	10.75	12.05	11.95
WIND-20	13.15	12.85	14.1	13.2	12.7	13.4	12.65	12.4	13.5	13.45
TIME	1517	1927	0917	1445	1934	0841	1428	1937	0900	1440
WIND-10	1.4 Hg	1.3 Hg	1.4 Hg	1.4 Hg	1.2 Hg	1.3 Hg	1.3 Hg	1.3 Hg	1.4 Hg	1.4 Hg
WIND-15	1518	1928	0917	1445	1935	0842	1429	1937	0900	1441
WIND-20	1.95	1.65	2.75	1.95	1.4	2.15	1.4	1.15	2.35	2.3
TIME	1518	1928	0918	1446	1936	0842	1429	1938	0901	1442
WIND-10	7.25	6.9	8.15	7.3	6.75	7.45	6.65	6.4	7.65	7.55
WIND-15	1519	1929	0918	1447	1936	0843	1430	1939	0902	1442
WIND-20	7.0	6.7	7.85	7.05	6.5	7.2	6.4	6.2	7.4	7.25

PROJECT #89-201

OPERATIONS FIELD LOG 2

S.R.P. SITE

DATE	8/7/90	8/8/90	8/8/90	8/8/90	8/9/90	8/9/90
TIME	1942	0840	1523	1914	0831	1417
MHV-1A	6.25	7.3	6.6	6.8	7.05	6.6
MHV-1B	11.55	12.8	12.1	12.3	12.4	12.2
MHV-1C	0.05	0.05	0.0	0.3	4.95	3.6
TIME	1945	0842	1526	1917	0835	1420
MHV-2A	5.45	6.25	5.8	7.0	7.3	6.9
MHV-2B	7.75	8.8	8.05	8.4	8.5	8.25
MHV-2C	1.4 Hg	1.5 Hg	1.3 Hg	1.5 Hg	1.5 Hg	1.5 Hg
TIME	1947	0844	1528	1920	0836	1423
MHV-3A	5.05	6.05	5.45	5.8	5.95	5.6
MHV-3B	9.3	10.65	9.7	11.05	10.5	9.75
MHV-3C	1.9	2.8	2.2	7.4	6.95	2.2
TIME	1949	0846	1529	1928	0839	1425
MHV-4A	0.1	0.05	0.05	0.4	0.55	0.05
MHV-4B	7.05	8.05	7.35	7.55	7.8	7.45
MHV-4C	1.4 Hg	1.5 Hg	1.4 Hg	1.4 Hg	1.5 Hg	1.5 Hg
TIME	1952	0848	1531	1930	0842	1427
MHV-5A	6.05	7.05	6.3	6.5	6.75	6.4
MHV-5B	11.8	12.75	12.1	12.3	12.5	12.15
MHV-5C	13.25	14.3	13.6	13.75	13.95	13.6
TIME	1954	0850	1534	1932	0844	1429
PZ-1	1.3 Hg	1.4 Hg	1.4 Hg	1.4 Hg	1.5 Hg	1.5 Hg
TIME	1955	0850	1534	1933	0844	1429
PZ-2	2.1	3.1	2.3	2.55	2.75	2.4
TIME	1955	0851	1535	1933	0845	1430
PZ-3	7.35	8.4	7.6	7.85	8.1	7.7
TIME	1956	0852	1536	1934	0846	1431
PZ-4	7.15	8.15	7.3	7.6	7.85	7.45

Unit down
for 40
minutes

PROJECT #89-201

OPERATIONS FIELD LOG 2

S.R.P. SITE

DATE	8/9/90	8/10/90	8/10/90	8/10/90	8/10/90	8/10/90
TIME	1921	0828	0855	1020	1049	1305
MHV-1A	5.2	6.3			5.25	5.80
MHV-1B	10.1	11.8			8.9	11.15
MHV-1C	2.3	4.15			3.3	1.80
TIME	1923	0831			1051	1308
MHV-2A	4.25	5.3			4.25	5.20
MHV-2B	6.45	7.85			5.9	7.30
MHV-2C	1.2 Hg	1.4 Hg			1.0 Hg	1.4 Hg
TIME	1925	0833			1054	1310
MHV-3A	4.4	5.25			4.85	4.80
MHV-3B	7.85	9.3			6.95	8.85
MHV-3C	1.95	2.15			1.45	2.30
TIME	1926	0835			1056	1310
MHV-4A	0.05	0.05			0.0	0.05
MHV-4B	5.85	7.05			5.5	6.55
MHV-4C	1.3 Hg	1.4 Hg			1.0 Hg	1.4 Hg
TIME	1928	0837			1058	1312
MHV-5A	4.95	6.0			4.9	5.6
MHV-5B	10.0	11.75			8.35	11.25
MHV-5C	10.6	13.35			7.9	12.3
TIME	1930	0839			1100	1312
PZ-1	1.2 Hg	1.4 Hg			1.0 Hg	1.3 Hg
TIME	1931	0840			1101	1312
PZ-2	1.7	2.1			1.5	2.25
TIME	1931	0840			1102	1312
PZ-3	6.25	7.4			5.85	6.95
TIME	1932	0841			1103	1313
PZ-4	6.0	7.15			5.7	6.75

DATE	8/10/90	8/10/90	8/11	8/11	8/10/90	8/11/90
TIME	1319	1424	3:00		1801	0847
MHV-1A			4.4		4.95	7.15
MHV-1B			4.3		10.4	12.7
MHV-1C			0.65		1.05	0.05
TIME			3:03	3:59	1813	0851
MHV-2A			3.6	4.05	4.4	6.3
MHV-2B			5.25	5.95	6.5	8.75
MHV-2C			1.0"Hg	1.2"Hg	1.4"Hg	1.5"Hg
TIME			3:05	4:01	1815	0853
MHV-3A			3.45	3.8	3.85	6.1
MHV-3B			6.65	7.7	8.35	10.4
MHV-3C			1.55	2.0	2.15	2.7
TIME			3:07	4:02	1817	0855
MHV-4A			0.0	0.0	0.05	0.3
MHV-4B			4.75	5.25	5.75	8.0
MHV-4C			1.1"Hg	1.2"Hg	1.3"Hg	1.5"Hg
TIME			3:08	4:04	1820	0906
MHV-5A			4.05	4.4	4.8	6.95
MHV-5B			8.0	9.7	10.5	12.7
MHV-5C			7.7	10.2	11.75	14.25
TIME			3:10	4:05	1822	0909
PZ-1			1.0"Hg	1.2"Hg	1.3"Hg	1.5"Hg
TIME					1823	0910
PZ-2			1.7	1.5	1.2	3.0
TIME					1823	0910
PZ-3			5.05	5.55	6.1	8.35
TIME			3:11	4:06	1824	0911
PZ-4			4.9	5.35	5.85	8.1

PROJECT #89-201

OPERATIONS FIELD LOG 2

S.R.P. SITE

DATE	8/11/90	8/11/90	8/11/90	8/11/90	8/11/90	8/12/90
TIME	1024	1204	1415	1617	1816	0832
MHV-1A	7.2	7.15	6.85	6.4	6.3	7.55
MHV-1B	12.75	12.75	12.4	11.95	11.9	13.1
MHV-1C	0.0	0.0	0.05	0.0	0.0	0.05
TIME	1026	1206	1418	1622	1819	0835
MHV-2A	6.35	6.3	5.8	5.6	5.5	6.1
MHV-2B	8.75	8.75	8.4	8.0	7.9	9.15
MHV-2C	1.5 Hg	1.5 Hg	1.5 Hg	1.5 Hg	1.4 Hg	1.5 Hg
TIME	1028	1209	1419	1624	1821	0837
MHV-3A	6.15	4.55	5.75	5.25	5.2	6.4
MHV-3B	9.3	10.15	9.9	9.55	9.15	10.85
MHV-3C	2.4	2.55	2.55	2.45	2.45	3.0
TIME	1029	1211	1422	1626	1823	0839
MHV-4A	0.25	0.85	0.65	0.45	0.4	1.15
MHV-4B	8.1	8.1	7.7	7.25	7.2	8.45
MHV-4C	1.5 Hg	1.5 Hg	1.5 Hg	1.4 Hg	1.4 Hg	1.5 Hg
TIME	1031	1213	1424	1628	1826	0843
MHV-5A	7.05	7.05	6.65	6.2	6.1	3.45
MHV-5B	12.45	12.75	12.4	11.9	11.5	13.15
MHV-5C	14.2	14.25	13.8	13.35	13.2	14.65
TIME	1035	1214	1426	1630	1828	0846
PZ-1	1.5 Hg	1.5 Hg	1.4 Hg	1.4 Hg	1.4 Hg	1.5 Hg
TIME	1033	1215	1427	1630	1829	0846
PZ-2	2.75	2.5	1.85	1.35	1.2	2.45
TIME	1033	1215	1427	1631	1829	0847
PZ-3	8.35	8.35	8.0	7.5	7.5	8.8
TIME	1034	1216	1428	1632	1830	0848
PZ-4	8.1	8.15	7.7	7.3	7.2	8.5

DATE	8/12/90	8/12/90	8/13/90	8/13/90	8/13/90	8/13/90
TIME	1508	1929	0832	1338	1430	1605
MHV-1A	6.7	6.25	6.85	2013.0	2013.0	
MHV-1B	12.2	11.8	12.3			
MHV-1C	0.05	0.0	0.0			
TIME	1510	1931	0834			
MHV-2A	5.85	5.55	5.9			
MHV-2B	8.25	7.8	8.35			
MHV-2C	1.5 Hg	1.4 Hg	1.5 Hg			
TIME	1512	1933	0836			
MHV-3A	5.6	5.2	5.7			
MHV-3B	9.7	9.4	10.05			
MHV-3C	2.55	2.4	2.7			
TIME	1514	1935	0838			
MHV-4A	0.8	0.65	0.85			
MHV-4B	7.55	7.2	7.65			
MHV-4C	1.4 Hg	1.4 Hg	1.5 Hg			
TIME	1516	1937	0840			
MHV-5A	5.5	6.2	6.65			
MHV-5B	12.2	11.8	12.2			
MHV-5C	13.7	13.35	13.8			
TIME	1518	1939	0842			
PZ-1	1.4 Hg	1.3 Hg	1.4 Hg			
TIME	1518	1940	0843			
PZ-2	1.5	1.15	1.55			
TIME	1519	1940	0843			
PZ-3	7.85	7.45	7.95			
TIME	1520	1941	0844			
PZ-4	7.55	7.2	7.75			

DATE	8/13/90	8/13/90	8/14/90	8/14/90	8/14/90	8/15/90
TIME	1637	1919	0828	1356	1818	0833
MHV-1A	4.9	5.1	6.3	6.05	5.4	6.75
MHV-1B	10.95	10.45	11.8	11.45	10.85	12.15
MHV-1C	0.05	0.0	0.0	0.05	0.0	0.05
TIME	1640	1921	0830	1358	1821	0835
MHV-2A	4.5	4.65	5.55	5.35	4.9	6.1
MHV-2B	6.15	6.5	7.75	7.45	6.9	8.2
MHV-2C	1.3 Hg	1.3 Hg	1.4 Hg	1.4 Hg	1.3 Hg	1.5 Hg
TIME	1642	1923	0832	1400	1822	0836
MHV-3A	3.8	3.9	5.1	4.8	4.25	5.6
MHV-3B	8.05	8.95	10.0	9.85	9.4	10.65
MHV-3C	2.25	1.8	2.8	2.5	2.4	2.9
TIME	1644	1925	0834	1402	1824	0838
MHV-4A	0.05	0.05	0.45	0.05	0.05	0.05
MHV-4B	5.6	5.85	7.15	6.8	6.35	7.65
MHV-4C	1.3 Hg	1.3 Hg	1.4 Hg	1.4 Hg	1.3 Hg	1.5 Hg
TIME	1646	1927	0836	1404	1826	0841
MHV-5A	4.65	4.95	6.1	5.8	5.35	6.6
MHV-5B	10.15	10.45	11.75	11.45	10.85	12.05
MHV-5C	11.2	12.0	13.3	12.95	12.5	13.7
TIME	1647	1929	0837	1405	1828	0842
PZ-1	1.2 Hg	1.2 Hg	1.4 Hg	1.3 Hg	1.3 Hg	1.4 Hg
TIME	1648	1929	0838	1405	1829	0843
PZ-2	0.8	0.3	1.15	0.8	0.4	1.65
TIME	1648	1930	0838	1406	1829	0843
PZ-3	5.9	6.25	7.4	7.05	6.65	7.85
TIME	1649	1931	0839	1406	1830	0844
PZ-4	5.8	6.0	7.2	6.8	6.4	7.65

PROJECT #89-201

OPERATIONS FIELD LOG 2

S.R.P. SITE

DATE	8/15/90	8/15/90	8/16/90	8/16/90	8/16/90	8/17/90
TIME	1503	1919	0823	1446	1830	0835
MHV-1A	5.8	5.65	6.35	5.5	5.25	6.65
MHV-1B	11.15	10.95	11.65	10.85	10.6	12.05
MHV-1C	0.0	0.0	0.0	0.0	0.0	0.05
TIME	1505	1921	0825	1448	1832	0837
MHV-2A	5.05	5.05	5.6	4.9	4.65	5.85
MHV-2B	7.2	7.1	7.7	6.9	6.65	8.05
MHV-2C	1.4 Hg	1.4 Hg	1.4 Hg	1.4 Hg	1.3 Hg	1.5 Hg
TIME	1507	1923	0827	1450	1833	0839
MHV-3A	4.6	4.55	5.15	4.25	4.05	5.45
MHV-3B	9.45	9.35	9.75	9.25	8.85	10.0
MHV-3C	2.55	2.55	2.9	2.35	2.5	2.75
TIME	1510	1925	0829	1451	1836	0841
MHV-4A	0.05	0.0	0.05	0.0	0.05	0.0
MHV-4B	6.55	6.5	7.15	6.2	6.0	7.45
MHV-4C	1.4 Hg	1.3 Hg	1.4 Hg	1.3 Hg	1.3 Hg	1.4 Hg
TIME	1512	1926	0831	1453	1838	0843
MHV-5A	5.55	5.5	6.15	5.3	5.05	6.45
MHV-5B	10.9	11.05	11.8	10.75	10.5	11.95
MHV-5C	12.6	12.55	13.3	12.3	12.15	13.5
TIME	1514	1928	0833	1455	1840	0845
PZ-1	1.3 Hg	1.3 Hg	1.3 Hg	1.3 Hg	1.2 Hg	1.4 Hg
TIME	1514	1929	0834	1456	1840	0846
PZ-2	0.5	0.55	1.15	0.3	0.1	1.4
TIME	1515	1929	0834	1456	1841	0846
PZ-3	6.75	6.8	7.45	6.55	6.35	7.75
TIME	1516	1930	0835	1457	1842	0847
PZ-4	6.5	6.6	7.2	6.25	6.05	7.5

DATE	8/17/90	8/17/90	8/20/90	8/20/90	8/20/90	8/20/90
TIME	1417	1815	0824	1358	1858	1915
MHV-1A	6.4	6.0	6.65	6.6	5.2	
MHV-1B	11.8	11.4	11.85	11.9	10.65	
MHV-1C	0.0	0.0	0.05	0.05	0.0	
TIME	1419	1817	0826	1401	1900	
MHV-2A	5.7	5.4	5.9	5.8	5.0	
MHV-2B	7.8	7.45	8.0	8.0	6.75	
MHV-2C	1.4 Hg	1.4 Hg	1.4 Hg	1.5 Hg	1.4 Hg	
TIME	1421	1819	0828	1402	1902	
MHV-3A	5.25	4.85	5.55	5.55	3.3	
MHV-3B	10.0	9.7	10.15	10.2	9.2	
MHV-3C	2.45	2.7	2.55	3.2	2.55	
TIME	1422	1821	0830	1405	1905	
MHV-4A	0.0	0.05	0.0	0.55	0.05	
MHV-4B	7.2	6.8	7.45	7.4	6.15	
MHV-4C	1.4 Hg	1.4 Hg	1.4 Hg	1.4 Hg	1.3 Hg	
TIME	1424	1823	0832	1407	1907	
MHV-5A	6.2	5.85	6.45	6.4	5.25	
MHV-5B	11.75	11.45	11.95	11.9	10.65	
MHV-5C	13.2	12.95	13.4	13.3	12.1	
TIME	1426	1825	0834	1409	1909	
PZ-1	1.3 Hg	1.3 Hg	1.4 Hg	1.4 Hg	1.3 Hg	
TIME	1427	1826	0835	1410	1910	
PZ-2	1.25	0.95	1.6	1.55	0.35	
TIME	1427	1826	0835	1410	1910	
PZ-3	7.45	7.15	7.8	7.65	6.5	
TIME	1428	1827	0836	1411	1911	
PZ-4	7.2	6.95	7.45	7.45	6.25	

DATE	8/20/90	8/21/90	8/21/90	8/21/90	8/22/90	8/22/90
TIME	1945	0835	1433	1920	1041	1444 14
MHV-1A		6.5	5.7	5.0	5.65	2228.8
MHV-1B		12.1	11.4	10.6	11.4	11.25
MHV-1C		0.0	0.05	0.0	0.05	0.0
TIME		0837	1435	1923	1044	1456
MHV-2A		6.1	5.5	4.8	5.4	5.4
MHV-2B		8.1	7.3	6.6	7.3	7.2
MHV-2C		1.5 Hg	1.4 Hg	1.4 Hg	1.4 Hg	1.4 Hg
TIME		0839	1437	1925	1046	1458
MHV-3A		4.35	3.8	3.15	3.95	4.1
MHV-3B		10.7	9.85	9.3	10.25	10.1
MHV-3C		5.2	3.15	3.05	3.9	4.0
TIME		0841	1439	1927	1049	1501
MHV-4A		0.0	0.0	0.0	0.0	⊕0.35
MHV-4B		7.55	6.75	6.0	6.7	6.6
MHV-4C		1.4 Hg	1.4 Hg	1.3 Hg	1.4 Hg	1.4 Hg
TIME		0843	1441	1929	1051	1503
MHV-5A		6.6	5.75	5.1	5.7	5.6
MHV-5B		12.1	11.25	10.65	11.5	11.15
MHV-5C		13.75	12.85	12.2	12.9	12.7
TIME		0845	1443	1931	1053	1504
PZ-1		1.4 Hg	1.4 Hg	1.3 Hg	1.4 Hg	1.3 Hg
TIME		0846	1444	1932	1054	1505
PZ-2		1.6	0.75	0.05	0.65	0.45
TIME		0846	1444	1932	1054	1505
PZ-3		7.9	7.05	6.35	7.1	6.85
TIME		0847	1445	1933	1055	1506
PZ-4		7.7	6.75	6.1	6.85	6.6

DATE	8/22/90	8/23/90	8/23/90	8/23/90	8/23/90	8/24/90
TIME	1918	0831	1657	1715	1835	0822
MHV-1A	4.65	5.35	4.7			6.6
MHV-1B	10.3	11.0	10.4			12.15
MHV-1C	0.0	⊕0.05	0.0			0.0
TIME	1920	0833	1659			0825
MHV-2A	4.6	5.1	4.65			6.2
MHV-2B	6.3	7.05	6.4			8.2
MHV-2C	1.3 Hg	1.4 Hg	1.3 Hg			1.5 Hg
TIME	1922	0835	1700			0826
MHV-3A	0.9 2.9	3.65	3.0			4.7
MHV-3B	9.1	10.0	9.25			11.0
MHV-3C	3.05	3.95	3.2			4.15
TIME	1925	0838	1702			0827
MHV-4A	⊕ 1.35	0.0	0.0			0.05
MHV-4B	5.65	6.45	5.8			7.65
MHV-4C	0.7 Hg	1.3 Hg	1.3 Hg			1.4 Hg
TIME	1927	0840	1703			0829
MHV-5A	4.7	5.45	4.8			6.65
MHV-5B	10.25	11.0	10.3			12.35
MHV-5C	11.95	12.6	12.0			13.8
TIME	1933	0842	1705			1.4 Hg
PZ-1	0.6 Hg	1.3 Hg	1.3 Hg			1.40 Hg
TIME	1930	0843	1705			0832
PZ-2	⊕ 0.4	0.35	+ 0.2			2.65
TIME	1931	0843	1705			0832
PZ-3	5.95	6.75	6.15			8.0
TIME	1932	0844	1706			0833
PZ-4	5.75	6.5	5.85			7.75

DATE	8/24/90	8/24/90	8/24/90	8/24/90	8/24/90	8/24/90
TIME	0910	1030	1352	1415	1513	1555
MHV-1A			6.05		6.0	5.75
MHV-1B			11.5		11.4	11.25
MHV-1C			0.0		0.0	0.0
TIME			1354		1516	1557
MHV-2A			5.8		5.55	5.65
MHV-2B			7.5		7.45	7.35
MHV-2C			1.4 Hg		1.4 Hg	1.4 Hg
TIME			1356		1517	1559
MHV-3A			4.3		4.15	4.05
MHV-3B			10.15		10.0	10.05
MHV-3C			3.7		3.8	3.6
TIME			1359		1519	1601
MHV-4A			0.05		0.0	0.05
MHV-4B			7.0		6.9	6.85
MHV-4C			1.4 Hg		1.4 Hg	1.4 Hg
TIME		1401	6.0		1521	1603
MHV-5A		6.0 →	11.6		5.9	5.85
MHV-5B		16.6 →	12.85		11.5	11.55
MHV-5C		12.85 →	14.03		12.9	12.85
TIME			1403		1523	1605
PZ-1			1.4 Hg		1.3 Hg	1.3 Hg
TIME			1404		1523	1606
PZ-2			2.4		0.55	+0.55
TIME			1405		1524	1606
PZ-3			7.3		7.2	7.1
TIME			1406		1525	1607
PZ-4			7.0		6.95	6.85

Unit down for electrical connection of compressor.

DATE	8/24/90	8/24/90	8/25/90	8/25/90	8/25/90	8/25/90
TIME	1703	1856	0933	1414	1700	1937
MHV-1A	5.65	5.6	6.55	6.2	5.85	5.8
MHV-1B	11.25	11.3	12.4	12.05	11.7	11.7
MHV-1C	0.0	0.05	0.05	0.0	0.0	0.0
TIME	1705	1858	0935	1416	1702	1939
MHV-2A	5.5	5.6	6.45	6.2	5.85	5.85
MHV-2B	7.3	7.35	8.5	8.1	7.75	7.75
MHV-2C	1.4 Hg	1.4 Hg	1.5 Hg	1.5 Hg	1.4 Hg	1.4 Hg
TIME	1707	1901	0937	1418	1704	1941
MHV-3A	3.9	3.85	4.85	4.4	4.15	4.1
MHV-3B	10.0	10.1	11.5	10.75	10.4	10.3
MHV-3C	3.6	3.75	4.8	4.0	3.95	3.95
TIME	1709	1903	0940	1420	1706	1943
MHV-4A	0.05	0.05	0.05	0.05	0.0	0.05
MHV-4B	6.75	6.8	8.0	7.55	7.25	7.15
MHV-4C	1.35 Hg	1.4 Hg	1.5 Hg	1.4 Hg	1.4 Hg	1.4 Hg
TIME	1711	1905	0943	1422	1708	1945
MHV-5A	5.8	5.85	7.05	6.6	6.35	6.25
MHV-5B	11.5	11.5	12.7	12.0	12.0	11.75
MHV-5C	12.8	13.0	14.2	13.7	13.45	13.35
TIME	1713	1907	0945	1424	1710	1947
PZ-1	1.3 Hg	1.3 Hg	1.4 Hg	1.4 Hg	1.3 Hg	1.3 Hg
TIME	1714	1908	0946	1424	1710	1948
PZ-2	⊕ 1.45	⊕ 1.95	⊕ 1.4	⊕ 1.85	⊕ 2.15	⊕ 2.2
TIME	1714	1908	0946	1425	1711	1948
PZ-3	7.0	7.1	8.25	7.75	7.5	7.4
TIME	1715	1909	0947	1425	1712	1949
PZ-4	6.75	6.85	8.0	7.55	7.3	7.2

compressor
went
down

PROJECT #89-201	OPERATIONS FIELD LOG 2					S.R.P. SITE
DATE	8/25/90	8/26/90	8/26/90	8/27/90	8/27/90	8/28/90
TIME	0841	1456	1926	0840	1827	1900
MHV-1A	6.0	5.1	4.85	5.0	4.05	
MHV-1B	11.9	10.9	10.65	10.9	9.55	
MHV-1C	0.05	0.0	⊕ 0.1	0.15	0.0	
TIME	0843	1458	1929	0843	1829	
MHV-2A	6.1	5.3	5.8	6.05	4.55	
MHV-2B	7.9	7.0	6.8	7.0	5.65	
MHV-2C	1.4 Hg	1.4 Hg	1.3 Hg	1.4 Hg	1.3 Hg	
TIME	0845	1500	1931	0845	1831	
MHV-3A	4.35	3.5	3.95	4.15	2.0	
MHV-3B	10.9	9.9	10.45	10.35	9.05	
MHV-3C	4.55	4.2	9.15	9.7	3.15	
TIME	0847	1502	1933	0847	1833	
MHV-4A	0.05	0.05	0.25	0.45	0.0	
MHV-4B	7.35	6.4	6.15	6.4	5.2	
MHV-4C	1.4 Hg	1.4 Hg	1.3 Hg	1.3 Hg	1.3 Hg	
TIME	0849	1504	1935	0850	1834	
MHV-5A	6.5	5.55	5.25	5.5	4.35	
MHV-5B	12.1	11.1	11.05	11.2	9.9	
MHV-5C	13.6	12.55	12.45	12.75	11.45	
TIME	0853	1506	1937	0852	1836	
PZ-1	1.4 Hg	1.3 Hg	1.2 Hg	1.3 Hg	1.2 Hg	
TIME	0853	1507	1938	0853	1837	
PZ-2	⊕ 1.75	⊕ 2.95	⊕ 1.75	⊕ 3.0	⊕ 4.1	
TIME	0854	1507	1938	0853	1837	
PZ-3	7.65	6.65	6.4	6.65	5.45	
TIME	0854	1508	1939	0854	1838	
PZ-4	7.4	6.4	6.2	6.45	7.25	

Compressor on

x

PROJECT #89-201	OPERATIONS FIELD LOG 2				S.R.P. SITE	
DATE	8/28/90	8/28/90	8/29/90	8/29/90	8/30/90	8/30/90
TIME	1300	1608	0825	1755	0835	1432
MHV-1A		2.1	5.2	6.2 3.7	5.1	5.2
MHV-1B		7.4	10.7	9.3	10.9	10.7
MHV-1C		⊕ 0.05	0.0	0.0	0.0	0.0
TIME		1610	0830	1800	0837	1435
MHV-2A		2.4	5.0	4.0	4.9	5.3
MHV-2B		3.6	6.7	5.3	6.9	6.9
MHV-2C		1.0 Hg	1.4 Hg	1.3 Hg	1.4 Hg	1.4 Hg
TIME		1612	0832	1800	0838	1437
MHV-3A		0.95	3.6	2.3	4.0	4.5
MHV-3B		7.1	10.0	8.8	10.2	10.1
MHV-3C		2.9	3.9	3.6	3.5	3.2
TIME		1614	0835	1802	0840	1442
MHV-4A		0.0	0.05	0.00	0.0	0.0
MHV-4B		3.1	6.2	4.8	6.5	6.3
MHV-4C		1.1 Hg	1.3 Hg	1.3 Hg	1.3 Hg	1.4 Hg
TIME		1616	0838	1803	0842	1444
MHV-5A		1.25	5.2	3.9	5.6	5.3
MHV-5B		7.8	10.9	9.0	11.0	10.7
MHV-5C		8.9	12.3	11.0	12.5	12.3
TIME		1621	0842	1806	0844	1446
PZ-1		1.0 Hg	1.3 Hg	1.2 Hg	1.2 Hg	1.2 Hg
TIME		1622	0842	1806	0844	1447
PZ-2		⊕ 0.25	⊕ 0.10	⊕ 3.5	⊕ 2.3	⊕ 2.5
TIME		1622	0843	1807	0845	1448
PZ-3		0.05	0.20	5.0	6.8	6.5
TIME		1623	0845	1808	0846	1449
PZ-4		0.1	6.25	4.9	6.6	6.4

PROJECT #89-201

OPERATIONS FIELD LOG 2

S.R.P. SITE

un
Filter
change

DATE	8/31/90	8/31/90	9/1/90	9/2/90	9/3/90	9/4/90
TIME	0917	1512	1028	1607	1158	0825
MHV-1A	6.9	6.4	7.5	5.1	5.7	6.1
MHV-1B	12.5	11.9	13.0	10.9	11.5	12.8
MHV-1C	0.05	0.025	⊕0.10	0.05	0.00	⊕0.05
TIME	0920	1515	1034	1612	1159	0827
MHV-2A	6.8	6.4	7.3	5.3	5.8	6.9
MHV-2B	8.6	8.1	9.1	6.9	7.5	8.8
MHV-2C	1.4 Hg	1.5 Hg	1.5 Hg	1.3 Hg	1.5 Hg	1.5 Hg
TIME	0922	1517	1036	1613	1203	0829
MHV-3A	5.3	4.7	5.7	3.7	4.2	5.4 4.9
MHV-3B	11.8	11.3	12.4	10.2	10.8	12.1
MHV-3C	4.3	4.0	4.2	4.1	3.25	4.5
TIME	0925	1518	1037	1614	1207	0836
MHV-4A	0.05	0.025	0.05	0.05	0.025	0.00
MHV-4B	7.1	7.6	8.7	6.4	7.0	8.3
MHV-4C	1.4 Hg	1.4 Hg	1.6 Hg	1.4 Hg	1.4 Hg	1.5 Hg
TIME	0930	1522	1039	1616	1208	0838
MHV-5A	7.2	6.7	7.8	5.5	6.05	7.4
MHV-5B	12.6	12.2	13.2	11.1	11.7	14.1
MHV-5C	14.6	13.7	14.9	12.7	13.2	14.5
TIME	0830	1508	1041	1618	1211	0841
PZ-1	1.4 Hg	1.4 Hg	1.5 Hg	1.3 Hg	1.4 Hg	1.5 Hg
TIME	0933	1523	1042	1619	1212	0842
PZ-2	⊕0.8	⊕1.3	⊕0.3	⊕2.6	⊕2.0	⊕0.7
TIME	0934	1524	1043	1620	1213	0843
PZ-3	8.4	7.9	9.0	6.7	8.2	8.7
TIME	0935	1525	1044	1621	1214	0844
PZ-4	8.2	7.7	8.8	6.5	7.1	8.5

System
down

PROJECT #89-201

OPERATIONS FIELD LOG 2

S R.P. SITE

DATE	9/5/90	9/6/90	9/6/90	9/7/90	9/7/90	9/8/90
TIME	0840	0820	1625	0905	1620	1524
MHV-1A	5.7	4.6	3.5	4.7	3.7	0.2
MHV-1B	11.5	10.5	9.4	10.6	9.5	0.2
MHV-1C	0.00	0.10	0.05	0.05	0.00	0.0
TIME	0842	0827	1622	0908	1622	1525
MHV-2A	5.7	4.8	1.8	4.9	2.2	0.15
MHV-2B	7.5	6.4	5.4	6.6	5.8	0.15
MHV-2C	1.5 Hg	1.3 Hg	1.3 Hg	1.3 Hg	1.3 Hg	0.15
TIME	0845	0828	1620	0910	1625	1526
MHV-3A	4.2	3.2	2.3	3.4	2.4	0.15
MHV-3B	10.8	9.8	8.9	10.0	9.0	0.15
MHV-3C	4.6	4.6	4.5	4.9	4.5	0.00
TIME	0847	0830	1615	0915	1628	1527
MHV-4A	0.025	0.05	0.05	0.05	0.00	0.10
MHV-4B	7.0	6.0	4.9	6.1	5.2	0.15
MHV-4C	1.4 Hg	1.4 Hg	1.3 Hg	1.3 Hg	1.3 Hg	0.10
TIME	0850	0839	1610	0917	1630	1528
MHV-5A	7.1	5.1	3.9	5.1	4.0	0.10
MHV-5B	12.7	10.8	9.7	10.9	9.9	0.10
MHV-5C	13.3	12.3	11.2	12.4	11.5	0.10
TIME	0852	0842	1605	0918	1632	1529
PZ-1	1.4 Hg	1.2 Hg	1.2 Hg	1.3 Hg	1.3 Hg	0.15
TIME	0853	0843	1606	0919	1633	1529
PZ-2	2.0	2.9	3.9	2.6	3.2	0.15
TIME	0854	0844	1607	0919	1634	1529
PZ-3	7.4	6.2	5.1	6.3	5.3	0.15
TIME	0855	0845	1608	0920	1635	1530
PZ-4	7.2	6.0	5.1	6.1	5.1	0.15

System
down

PROJECT #89-201

OPERATIONS FIELD LOG 2

S.R.P. SITE

DATE	9/8/90	9/9/90	9/10/90	9/10/90	9/11/90	9/11/90
TIME	1653	1318	0851	1937	0831	1757
MHV-1A	1.1	1.7	5.8	4.75	5.9	4.6
MHV-1B	5.8	5.8	11.8	10.95	13.05	10.6
MHV-1C	0.0	0.0	0.0	0.0	0.0	0.05
TIME	1655	1322	0853	1939	0833	1759
MHV-2A	1.4	1.6	5.9	5.35	6.25	4.8
MHV-2B	2.2	2.7	7.75	6.85	8.0	6.65
MHV-2C	0.8 Hg	0.5 Hg	1.4 Hg	1.4 Hg	1.5 Hg	1.4 Hg
TIME	1658	1323	0855	1940	0835	1801
MHV-3A	0.5	1.2	4.55	3.85	3.25	3.0
MHV-3B	5.7	6.0	11.35	10.45	11.3	10.0
MHV-3C	2.0	2.6	6.55	3.75	5.0	4.4
TIME	1700	1325	0857	1942	0837	1803
MHV-4A	0.25	0.00	0.05	0.05	0.05	0.05
MHV-4B	2.1	2.4	7.25	6.4	7.5	6.2
MHV-4C	1.0 Hg	0.9 Hg	1.4 Hg	1.3 Hg	1.4 Hg	1.3 Hg
TIME	1701	1327	0859	1944	0839	1805
MHV-5A	1.3	1.9	6.35	5.5	6.55	5.3
MHV-5B	5.9	6.0	12.2	11.35	12.25	10.95
MHV-5C	5.7	5.2	13.55	12.75	13.75	12.4
TIME	1702	1328	0901	1946	0841	1807
PZ-1	0.9 Hg	0.8 Hg	1.3 Hg	1.3 Hg	1.4 Hg	1.3 Hg
TIME	1703	1329	0902	1946	0842	1808
PZ-2	⊕1.1	⊕0.6	⊕1.35	⊕2.25	⊕1.25	⊕2.35
TIME	1704	1330	0902	1947	0842	1808
PZ-3	2.3	2.7	7.6	6.75	7.75	6.45
TIME	1705	1331	0903	1948	0843	1809
PZ-4	2.2	2.6	7.35	6.55	7.55	6.25

Heated
Air Inj.

PROJECT #89-201

OPERATIONS FIELD LOG 2

S.R.P. SITE

DATE	9/12/90	9/12/90	9/13/90	9/13/90	9/14/90	9/14/90
TIME	0838	1626	0832	1526	0844	1516
MHV-1A	6.05	4.5	5.45	4.6	5.0	4.2
MHV-1B	12.05	10.5	11.45	10.6	10.95	10.15
MHV-1C	0.05	0.05	0.0	0.05	0.0	④ 0.1
TIME	0840	1632	0841	1529	0847	1520
MHV-2A	6.35	5.1	5.95	5.05	5.45	4.75
MHV-2B	8.1	6.55	7.45	6.65	7.0	6.15
MHV-2C	1.4 Hg	1.3 Hg	1.3 Hg	1.2 Hg	1.3 Hg	1.2 Hg
TIME	0842	1634	0834	1531	0850	1522
MHV-3A	4.1	2.95	3.7	3.05	3.35	2.65
MHV-3B	11.45	9.95	11.0	10.0	10.5	9.65
MHV-3C	5.15	4.7	5.3	4.75	5.05	4.85
TIME	0844	1636	0843	1532	0853	1525
MHV-4A	0.05	0.05	0.0	0.0	0.05	0.0
MHV-4B	7.55	6.05	6.95	6.1	6.5	5.55
MHV-4C	1.4 Hg	1.2 Hg	1.3 Hg	1.2 Hg	1.2 Hg	1.2 Hg
TIME	0846	1638	0846	1534	0855	1527
MHV-5A	6.7	5.1	6.1	5.2	5.6	4.65
MHV-5B	12.4	10.8	11.8	10.85	11.3	10.25
MHV-5C	13.75	12.2	13.2	12.25	12.7	11.75
TIME	0848	1640	0848	1536	0857	1530
PZ-1	1.4 Hg	1.2 Hg	1.2 Hg	1.2 Hg	1.2 Hg	1.2 Hg
TIME	0849	1641	0848	1537	0858	1530
PZ-2	④ 1.05	④ 2.55	④ 1.65	④ 2.30	④ 1.6	④ 2.55
TIME	0850	1641	0849	1537	0859	1531
PZ-3	7.85	6.25	7.25	6.35	6.85	5.85
TIME	0850	1642	0849	1538	0900	1532
PZ-4	7.65	6.0	7.05	6.15	6.55	5.6

Unc
Filter change

PROJECT #89-201

OPERATIONS FIELD LOG 2

S.R.P. SITE

DATE	9/15/90	9/15/90	9/16/90	9/16/90	9/17/90	9/17/90
TIME	0833	1628	0834	1649	0829	1605
MHV-1A	3.35	2.55	4.45	4.2	7.55	6.95
MHV-1B	9.3	8.5	10.25	10.0	13.45	12.8
MHV-1C	0.0	0.05	(4) 0.05	0.0	0.05	0.05
TIME	0837	1630	0836	1651	0831	1607
MHV-2A	3.95	3.4	4.85	4.75	7.8	7.05
MHV-2B	5.4	4.6	6.4	6.15	9.5	8.85
MHV-2C	1.2 Hg	1.1 Hg	1.2 Hg	1.2 Hg	1.4 Hg	1.5 Hg
TIME	0839	1632	0837	1653	0833	1608
MHV-3A	2.0	1.45	2.9	2.75	5.3	4.9
MHV-3B	9.05	8.05	9.8	9.45	12.75	12.0
MHV-3C	5.3	4.8	5.6	5.3	7.2	5.15
TIME	0841	1634	0839	1655	0835	1610
MHV-4A	0.0	0.05	0.0	0.05	0.35	0.0
MHV-4B	4.9	4.05	5.9	5.6	9.05	8.35
MHV-4C	1.1 Hg	1.1 Hg	1.2 Hg	1.1 Hg	1.4 Hg	1.4 Hg
TIME	0844	1636	0841	1657	0837	1612
MHV-5A	3.95	3.15	5.0	4.7	8.1	7.4
MHV-5B	9.5	8.55	10.45	10.25	13.65	13.0
MHV-5C	11.05	10.15	12.0	11.65	15.1	14.5
TIME	0846	1638	0842	1659	0847	1620
PZ-1	1.1 Hg	1.0 Hg	1.1 Hg	1.1 Hg	1.4 Hg	1.3 Hg
TIME	0847	1638	0843	1659	0839	1614
PZ-2	(+) 3.1	(+) 3.8	(+) 1.95	(+) 2.2	(+) 0.55	(+) 0.2
TIME	0847	1639	0843	1700	0840	1614
PZ-3	5.15	4.35	6.2	5.9	9.35	8.65
TIME	1148	1640	0844	1701	0841	1615
PZ-4	4.95	4.1	6.0	5.75	9.15	8.45

compressor down / reservoir

PROJECT #89-201	OPERATIONS FIELD LOG 2				S.R.P. SITE	
DATE	9/18/90	9/18/90	9/19/90	9/19/90	9/20/90	9/20/90
TIME	0742	1639	0834	1616	0833	1524
MHV-1A	7.6	5.85	5.0	3.45	5.15	5.8
MHV-1B	13.55	11.75	10.95	9.35	10.85	9.75
MHV-1C	0.0	0.0	0.0	⊕ 0.05	0.05	0.0
TIME	0744	1641	0836	1618	0836	1520
MHV-2A	7.55	6.3	5.4	4.1	5.25	4.5
MHV-2B	9.55	7.85	7.0	5.4	6.85	5.9
MHV-2C	1.4 Hg	1.4 Hg	1.2 Hg	1.1 Hg	1.2 Hg	1.2 Hg
TIME	0746	1643	0838	1619	0837	1522
MHV-3A	5.35	4.1	3.4	2.2	3.45	2.55
MHV-3B	12.7	11.1	10.5	8.85	10.2	9.0
MHV-3C	6.35	6.0	6.2	5.55	7.25	7.3
TIME	0747	1645	0839	1621	0839	1526
MHV-4A	0.4	0.0	0.05	0.0	0.0	0.0
MHV-4B	9.15	7.4	6.55	4.95	6.35	5.35
MHV-4C	1.4 Hg	1.3 Hg	1.2 Hg	1.1 Hg	1.2 Hg	1.2 Hg
TIME	0749	1647	0841	1622	0840	1528
MHV-5A	8.15	6.5	5.7	4.05	5.35	4.45
MHV-5B	13.8	11.9	11.3	9.45	10.95	10.0
MHV-5C	15.25	13.55	12.7	11.05	12.4	11.45
TIME	0802	1649	0849	1629	0849	1530
PZ-1	1.3 Hg	1.3 Hg	1.1 Hg	1.0 Hg	1.1 Hg	1.1 Hg
TIME	0751	1649	0843	1624	0843	1531
PZ-2	⊕ 0.4	⊕ 1.25	⊕ 1.9	⊕ 3.25	⊕ 1.05	⊕ 3.3
TIME	0752	1650	0843	1625	0843	1531
PZ-3	9.4	7.65	6.85	5.2	6.65	5.65
TIME	0753	1651	0844	1626	0844	1532
PZ-4	9.2	7.45	6.65	5.0	6.4	5.35

Unit maintenance

PROJECT #89-201

OPERATIONS FIELD LOG 2

S.R.P

DATE	9/21/90	9/21/90	9/24/90	9/24/90	9/25/90	9/25/90
TIME	0838	1518	0836	1629	0829	1515
MHV-1A	4.95	4.25	7.35	5.7	5.4	3.1
MHV-1B	10.9	10.1	13.3	11.65	11.5	9.1
MHV-1C	0.0	0.0	0.0	0.0	0.05	0.0
TIME	0840	1520	0838	1632	0831	1515
MHV-2A	5.45	4.8	7.6	6.25	6.0	4.1
MHV-2B	7.0	6.25	9.4	7.7	7.55	5.1
MHV-2C	1.2 Hg	1.2 Hg	1.4 Hg	1.3 Hg	1.2 Hg	1.1
TIME	0841	1522	0839	1633	0832	1515
MHV-3A	2.5	2.85	5.2	3.95	3.8	2.1
MHV-3B	10.45	9.55	12.65	11.05	11.15	9.1
MHV-3C	7.8	7.15	8.95	8.75	9.4	5.1
TIME	0843	1524	0841	1635	0835	1515
MHV-4A	0.0	0.05	0.95	0.3	0.0	0.0
MHV-4B	6.5	5.75	8.95	7.2	7.1	5.1
MHV-4C	1.2 Hg	1.2 Hg	1.3 Hg	1.3 Hg	1.2 Hg	1.1
TIME	0845	1526	0843	1637	0837	1515
MHV-5A	5.65	4.85	8.0	6.3	6.2	4.1
MHV-5B	11.0	10.25	13.55	11.8	11.8	10.1
MHV-5C	12.55	11.75	15.0	13.35	13.3	11.6
TIME	0852	1528	0855	1639	0847	1515
PZ-1	1.15 Hg	1.1 Hg	1.3 Hg	1.2 Hg	1.1 Hg	1.1
TIME	0847	1528	0846	1639	0840	1515
PZ-2	2.35	3.0	0.35	1.15	2.25	3.8
TIME	0847	1529	0846	1640	0841	1515
PZ-3	6.8	6.0	9.25	7.45	7.35	5.6
TIME	0848	1529	0847	1640	0842	1515
PZ-4	6.6	5.8	9.05	7.25	7.2	5.4

System

PROJECT # 9-201

OPERATIONS FIELD LOG 2

S.R.P. SIT

DATE	9/26/90	9/26/90	9/27/90	9/27/90	9/28/90	9/28/90
TIME	1350	1736	0831	1655	0834	1653
MHV-1A	1.55	2.25	5.35	4.5	6.2	4.95
MHV-1B	7.0	8.3	11.35	10.55	12.2	10.9
MHV-1C	0.0	0.0	⊕ 0.05	0.0	0.0	0.05
TIME	1352	1738	0833	1658	0836	1655
MHV-2A	2.35	3.25	5.95	5.25	6.7	5.5
MHV-2B	3.25	4.45	7.5	6.7	8.3	7.05
MHV-2C	0.9 Hg	1.0 Hg	1.2 Hg	1.2 Hg	1.3 Hg	1.2 Hg
TIME	1354	1740	0834	1700	0840	1658
MHV-3A	0.9	1.35	3.75	3.15	4.6	3.55
MHV-3B	6.75	8.0	11.0	10.2	11.8	10.5
MHV-3C	4.75	5.8	7.5	7.3	9.05	8.65
TIME	1355	1741	0837	1702	0842	1700
MHV-4A	0.0	0.05	0.05	0.05	0.6	0.0
MHV-4B	2.9	3.95	7.0	6.25	7.9	6.55
MHV-4C	0.9 Hg	1.0 Hg	1.2 Hg	1.2 Hg	1.3 Hg	1.2 Hg
TIME	1357	1743	0838	1703	0844	1702
MHV-5A	2.1	3.15	6.15	5.35	7.0	5.7
MHV-5B	7.05	8.7	11.6	10.85	12.5	11.1
MHV-5C	7.85	10.05	13.1	12.35	13.95	12.65
TIME	1405	1752	0847	1712	0853	1710
PZ-1	0.9 Hg	1.0 Hg	1.1 Hg	1.2 Hg	1.2 Hg	1.1 Hg
TIME	1359	1745	0840	1706	0846	1703
PZ-2	⊕ 3.15	⊕ 4.4	⊕ 2.2	⊕ 2.95	⊕ 1.25	⊕ 2.55
TIME	1400	1746	0841	1706	0847	1704
PZ-3	3.2	4.25	7.3	6.45	8.15	6.85
TIME	1400	1747	0842	1707	0848	1705
PZ-4	3.0	4.05	7.15	6.25	8.0	6.65

filter
change

DATE	9/29/90	9/30/90	10/1/90	10/1/90	10/2/90	10/3/90
TIME	0920	0938	0848	1556	0845	1137
MHV-1A	5.15	4.6	4.85	3.95	5.4	3.4
MHV-1B	11.2	10.55	10.75	9.5	10.95	8.6
MHV-1C	0.05	0.0	0.0	0.0	0.0	ⓐ0.05
TIME	0923	0940	0851	1554	0847	1139
MHV-2A	5.85	5.4	5.55	4.85	5.6	3.85
MHV-2B	7.3	6.75	6.95	5.9	7.25	4.95
MHV-2C	1.3 Hg	1.2 Hg	1.2 Hg	1.1 Hg	1.2 Hg	1.0 Hg
TIME	0925	0942	0853	1558	0849	1141
MHV-3A	3.7	3.3	3.55	2.65	3.9	2.35
MHV-3B	10.7	10.3	10.4	9.2	10.65	8.25
MHV-3C	8.95	9.15	9.65	8.65	9.45	6.4
TIME	0927	0944	0855	1600	0852	1143
MHV-4A	0.0	0.05	0.05	0.0	0.55	0.0
MHV-4B	6.75	6.75	6.5	5.35	6.85	4.6
MHV-4C	1.2 Hg	1.2 Hg	1.2 Hg	1.1 Hg	1.1 Hg	1.1 Hg
TIME	0929	0946	0856	1601	0854	1145
MHV-5A	5.9	5.4	5.65	4.5	6.05	3.8
MHV-5B	11.5	10.9	11.05	9.9	11.25	8.95
MHV-5C	12.85	12.3	12.45	11.25	12.5	9.5
TIME	0938	0955	0905	1609	0903	1147
PZ-1	1.2 Hg	1.1 Hg	1.1 Hg	1.1 Hg	1.1 Hg	1.0 Hg
TIME	0931	0950	0858	1603	0858	1148
PZ-2	ⓐ2.3	ⓐ2.75	ⓐ2.25	ⓐ3.3	ⓐ1.6	ⓐ0.6
TIME	0932	0950	0859	1604	0858	1148
PZ-3	7.05	6.55	6.65	5.6	7.15	4.9
TIME	0933	0951	0900	1604	0859	1149
PZ-4	6.9	6.35	6.55	5.4	6.95	4.75

PROJECT #89-201

OPERATIONS FIELD LOG 2

S.R.P. SITE

DATE	10/3/90	10/3/90	10/3/90	10/4/90	10/4/90	10/4/90
TIME	1648	1707	~1825	0815	0850	1551
MHV-1A	3.45				5.4	2.9
MHV-1B	9.45				11.05	9.1
MHV-1C	0.05				0.05	0.05
TIME	1650				0852	1553
MHV-2A	4.35				5.8	4.1
MHV-2B	5.55				7.15	5.3
MHV-2C	1.2 Hg				1.3 Hg	1.1 Hg
TIME	1651				0854	1555
MHV-3A	2.35				3.95	2.0
MHV-3B	8.95				10.6	8.7
MHV-3C	7.8				9.6	8.85
TIME	1654				0856	1557
MHV-4A	0.05				0.0	0.05
MHV-4B	5.1				6.6	4.85
MHV-4C	1.1 Hg				1.2 Hg	1.1 Hg
TIME	1656				0858	1600
MHV-5A	4.25				5.7	4.05
MHV-5B	9.85				11.25	9.6
MHV-5C	11.25				12.65	11.1
TIME	1704				0908	1605
PZ-1	1.1 Hg				1.1 Hg	1.1 Hg
TIME	1658				0900	1558
PZ-2	⊕ 2.95				⊕ 0.4	⊕ 6.8
TIME	1659				0901	1558
PZ-3	5.4				6.9	5.15
TIME	1659				0901	1559
PZ-4	5.2				6.65	4.95

DATE	10/4/90	10/5/90	10/5/90	10/5/90	10/5/90	10/5/90
TIME	~2055	0930	1113	~1322	1520	1625
MHV-1A			2.65			3.4
MHV-1B			7.7			9.35
MHV-1C			0.05			0.0
TIME			1115			1627
MHV-2A			3.2			4.25
MHV-2B			4.15			5.5
MHV-2C			0.9 Hg			1.1 Hg
TIME			1116			1628
MHV-3A			2.0			2.3
MHV-3B			7.4			8.85
MHV-3C			7.55			8.55
TIME			1118			1630
MHV-4A			0.05			0.0
MHV-4B			3.85			4.95
MHV-4C			1.0 Hg			1.1 Hg
TIME			1119			1632
MHV-5A			3.15			4.15
MHV-5B			7.9			9.55
MHV-5C			8.15			11.0
TIME			1126			1639
PZ-1			0.9 Hg			1.0 Hg
TIME			1121			1634
PZ-2			④ 2.3			④ 3.7
TIME			1121			1634
PZ-3			4.15			5.25
TIME			1122			1635
PZ-4			4.0			5.05

ST #89-201

OPERATIONS FIELD LOG 2

S.R.P. SITE

	10/6/90	10/7/90	10/8/90	10/8/90	10/8/90	10/8/90
TIME	0726	1048	~0230	0900	1032	1605
MHV-1A	4.0	4.85			2.45	2.55
MHV-1B	10.3	11.05			7.45	8.55
MHV-1C	0.05	0.05			0.0	0.0
TIME	0728	1050			1034	1607
MHV-2A	5.0	5.8			3.1	3.65
MHV-2B	6.4	7.2			3.9	4.75
MHV-2C	1.1 Hg	1.3 Hg			0.9 Hg	1.1 Hg
TIME	0729	1052			1035	1608
MHV-3A	2.75	3.5			1.75	1.55
MHV-3B	9.85	10.5			7.1	8.2
MHV-3C	9.05	10.25			7.9	9.55
TIME	0731	1054			1037	1610
MHV-4A	0.05	0.05			0.0	0.0
MHV-4B	5.9	6.75			3.6	4.2
MHV-4C	1.1 Hg	1.2 Hg			1.0 Hg	1.1 Hg
TIME	0732	1055			1038	1611
MHV-5A	5.1	5.95			2.9	3.55
MHV-5B	10.6	11.4			7.65	8.75
MHV-5C	12.15	12.85			7.85	10.3
TIME	0740	1102			1046	1618
PZ-1	1.0 Hg	1.2 Hg			0.9 Hg	1.1 Hg
TIME	0734	1057			1040	1613
PZ-2	⊕5.65	⊕4.8			⊕2.65	⊕6.35
TIME	0735	1058			1041	1614
PZ-3	6.2	7.0			3.95	4.5
TIME	0736	1058			1042	1614
PZ-4	6.05	6.85			3.8	4.35

DATE	10/9/90	10/9/90	10/9/90	10/9/90	10/10/90	
TIME	0830	0925	1030	1513	0831	
MHV-1A	3.2	✓		1.9	1.75	
MHV-1B	9.4	✓	✓	8.05	7.95	
MHV-1C	0.0	✓	✓	0.0	0.05	
TIME	0832			1515	0833	
MHV-2A	4.3			3.05	3.05	
MHV-2B	5.6			4.2	4.2	
MHV-2C	1.1 Hg			1.0 Hg	1.0 Hg	
TIME	0834			1517	0835	
MHV-3A	2.2			1.15	1.0	
MHV-3B	9.15			7.55	7.7	
MHV-3C	9.95			7.55	8.65	
TIME	0836			1519	0838	
MHV-4A	0.0			0.05	0.05	
MHV-4B	5.1			3.75	3.7	
MHV-4C	1.1 Hg			1.0 Hg	1.0 Hg	
TIME	0837			1521	0840	
MHV-5A	4.3			3.0	2.9	
MHV-5B	9.85			8.35	8.35	
MHV-5C	11.25			9.8	9.8	
TIME	0845			1523	0843	
PZ-1	1.0 Hg			0.9 Hg	0.9 Hg	
TIME	0840			1524	0843	
PZ-2	⊕ 6.2			⊕ 7.0	⊕ 7.7	
TIME	0840			1524	0844	
PZ-3	5.35			4.05	3.95	
TIME	0841			1525	0844	
PZ-4	5.2			3.85	3.75	

DATE	10/9/90	10/9/90	10/9/90	10/9/90	10/10/90	10/10/90
TIME	0830	0925	1030	1513	0831	1639
MHV-1A	3.2	✓	✓	1.9	1.75	0.85
MHV-1B	9.4	✓	✓	8.05	7.95	7.2
MHV-1C	0.0	✓	✓	0.0	0.05	0.05
TIME	0832	1035	1035	1515	0833	1653
MHV-2A	4.3	✓	✓	3.05	3.05	2.45
MHV-2B	5.6	✓	✓	4.2	4.2	3.55
MHV-2C	1.1 Hg	✓	✓	1.0 Hg	1.0 Hg	1.0 Hg
TIME	0834	1035	1035	1517	0835	1655
MHV-3A	2.2	✓	✓	1.15	1.0	0.4
MHV-3B	9.15	✓	✓	7.55	7.7	7.3
MHV-3C	9.95	✓	✓	7.55	8.65	8.4
TIME	0836	1035	1035	1519	0838	1658
MHV-4A	0.0	✓	✓	0.05	0.05	0.0
MHV-4B	5.1	✓	✓	3.75	3.7	2.9
MHV-4C	1.1 Hg	✓	✓	1.0 Hg	1.0 Hg	0.9 Hg
TIME	0837	1035	1035	1521	0840	1700
MHV-5A	4.3	✓	✓	3.0	2.9	2.15
MHV-5B	9.85	✓	✓	8.35	8.35	7.3
MHV-5C	11.25	✓	✓	9.8	9.8	9.1
TIME	0845	1035	1035	1523	0843	1650
PZ-1	1.0 Hg	✓	✓	0.9 Hg	0.9 Hg	0.9 Hg
TIME	0840	1035	1035	1524	0843	1704
PZ-2	⊕ 6.2	✓	✓	⊕ 7.0	⊕ 7.7	⊕ 8.6
TIME	0840	1035	1035	1524	0844	1704
PZ-3	5.35	✓	✓	4.05	3.95	3.1
TIME	0841	1035	1035	1525	0844	1705
PZ-4	5.2	✓	✓	3.85	3.75	2.95

DATE	10/10/90	10/11/90	10/11/90	10/11/90	10/12/90	10/12/90
TIME	~2030	0820	1039	1525	1035	1534
MHV-1A			2.15	3.05	2.45	1.75
MHV-1B			7.5	9.1	8.7	8.1
MHV-1C			0.0	0.3	0.75	1.4
TIME			1041	1527	1037	1536
MHV-2A			3.0	4.3	4.2	3.55
MHV-2B			3.95	5.4	4.95	4.3
MHV-2C			0.9 Hg	1.1 Hg	1.1 Hg	1.1 Hg
TIME			1042	1528	1039	1538
MHV-3A			1.75	2.6	1.95	1.3
MHV-3B			7.75	9.15	8.6	8.25
MHV-3C			8.1	11.7	14.35	5.75
TIME			1044	1530	1041	1542
MHV-4A			1.55	1.4	0.1	0.8
MHV-4B			3.55	4.85	4.35	3.7
MHV-4C			1.0 Hg	1.1 Hg	1.1 Hg	1.1 Hg
TIME			1047	1531	1042	1544
MHV-5A			2.8	4.1	3.55	1.95
MHV-5B			7.8	9.5	9.05	8.5
MHV-5C			8.55	10.8	10.5	10.0
TIME			1048	1540	1050	1552
PZ-1			0.9 Hg	1.1 Hg	1.1 Hg	1.0 Hg
TIME			1049	1533	1044	1546
PZ-2			4.05	5.8	7.25	7.8
TIME			1049	1534	1045	1546
PZ-3			3.85	5.15	4.6	4.0
TIME			1050	1535	1046	1547
PZ-4			3.7	4.95	4.45	3.75

DATE	10/13/90	10/13/90	10/13/90	10/14/90	10/15/90	10/15/90
TIME	0809	1005	1040	0821	0832	1538
MHV-1A	3.25			5.05	6.1	5.4
MHV-1B	9.6			11.4	12.5	11.75
MHV-1C	(6.15)			(8.6)	(5.95)	0.05
TIME	0811			0823	0834	1540
MHV-2A	4.85			6.2	7.1	6.35
MHV-2B	5.8			7.55	8.6	7.85
MHV-2C				1.3 Hg	1.4 Hg	1.4 Hg
TIME	0813			0825	0836	1542
MHV-3A	2.8			4.5	4.65	4.0
MHV-3B	9.2			10.95	12.0	11.2
MHV-3C	7.4			8.9	9.0	9.2
TIME	0815			0827	0838	1544
MHV-4A	0.05			(0.6)	(1.8)	(1.65)
MHV-4B	5.25			6.95	8.1	7.3
MHV-4C				1.3 Hg	1.3 Hg	1.3 Hg
TIME	0817			0829	0840	1546
MHV-5A	4.5			6.2	7.3	6.55
MHV-5B	10.1			11.85	13.05	12.25
MHV-5C	11.7			13.45	14.6	13.85
TIME				0846	0849	1531
PZ-1				1.2 Hg	1.3 Hg	1.3 Hg
TIME	0819			0831	0843	1548
PZ-2	(+) 6.4			(+) 4.85	(+) 3.95	(+) 4.55
TIME	0820			0832	0844	1549
PZ-3	5.5			7.3	8.4	7.6
TIME	0820			0833	0845	1550
PZ-4	5.25			7.0	8.15	7.35

DATE	10/16/90	10/16/90	10/16/90	10/16/90	10/17/90	10/17/90
TIME	0856	0900	1155	1611	0833	1529
MHV-1A	7.3			5.25	6.15	4.75
MHV-1B	13.65			11.4	12.55	11.1
MHV-1C	0.0			0.0	0.1	⊕ 0.05
TIME	0859			1613	0835	1531
MHV-2A	8.15			6.1	7.1	5.8
MHV-2B	9.7			7.55	8.7	7.25
MHV-2C	0.8 Hg			1.3 Hg	1.4 Hg	1.3 Hg
TIME	0900			1615	0836	1532
MHV-3A	5.6			3.25	4.75	3.55
MHV-3B	13.2			10.9	12.1	10.7
MHV-3C	10.8			8.0	10.2	9.5
TIME	0915			1617	0838	1534
MHV-4A	3.2			1.1	2.15	1.7
MHV-4B	9.2			7.15	8.25	6.85
MHV-4C	0.5 Hg			1.3 Hg	1.3 Hg	1.3 Hg
TIME	0917			1619	0840	1536
MHV-5A	8.5			6.35	7.5	6.05
MHV-5B	13.15			12.0	13.25	11.75
MHV-5C	15.5			13.45	14.9	13.5
TIME	0925			1627	0849	1544
PZ-1	0.4 Hg			1.2 Hg	1.3 Hg	1.2 Hg
TIME	0918			1621	0842	1538
PZ-2	⊕ 2.35			⊕ 3.65	⊕ 3.85	⊕ 5.2
TIME	0919			1621	0843	1539
PZ-3	9.25			7.45	8.6	7.1
TIME	0920			1622	0844	1539
PZ-4	9.1			7.15	8.35	6.8

System down

DATE	10/18/90	10/18/90	10/19/90	10/19/90	10/20/90	10/21/90
TIME	0840	1520	0823	1513	0840	0837
MHV-1A	2.6	1.35	4.8	4.5	6.15	5.05
MHV-1B	9.0	7.75	11.3	10.95	12.6	11.5
MHV-1C	⊕ 0.05	⊕ 0.05	0.0	0.05	0.05	0.1
TIME	0842	1522	0826	1515	0843	0839
MHV-2A	4.0	2.8	5.65	5.7	7.1	6.1
MHV-2B	5.15	3.95	7.35	7.05	8.7	7.6
MHV-2C	1.1 Hg	1.0 Hg	1.2 Hg	1.3 Hg	1.3 Hg	1.3 Hg
TIME	0843	1523	0828	1517	0845	0840
MHV-3A	1.7	0.7	3.55	3.3	4.65	3.75
MHV-3B	8.65	7.5	10.8	10.5	12.1	11.0
MHV-3C	9.0	9.45	11.35	11.0	11.8	11.55
TIME	0846	1525	0830	1519	0847	0843
MHV-4A	0.05	0.0	1.8	1.95	3.4	2.65
MHV-4B	4.6	3.35	6.9	6.6	8.25	7.2
MHV-4C	1.1 Hg	1.0 Hg	1.1 Hg	1.2 Hg	1.3 Hg	1.2 Hg
TIME	0847	1527	0832	1521	0849	0845
MHV-5A	3.9	2.6	6.1	5.75	7.45	6.4
MHV-5B	9.55	8.15	17.75	11.5	13.3	12.1
MHV-5C	11.3	10.05	13.55	13.25	14.95	13.9
TIME	0855	1534	0842	1529	0900	0853
PZ-1	1.0 Hg	0.9 Hg	1.1 Hg	1.2 Hg	1.2 Hg	1.2 Hg
TIME	0849	1528	0836	1523	0853	0847
PZ-2	⊕ 7.2	⊕ 8.4	⊕ 5.2	⊕ 5.55	⊕ 4.05	⊕ 5.0
TIME	0850	1529	0836	1523	0853	0847
PZ-3	4.9	3.6	7.15	6.85	8.55	7.45
TIME	0850	1530	0837	1524	0855	0848
PZ-4	4.65	3.35	6.9	6.6	8.3	7.2

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PROJECT #89-201

OPERATIONS FIELD LOG 2

S.R.P. SITE

DATE	10/18/90	10/18/90	10/19/90	10/19/90	10/20/90	10/21/90
TIME	0840	1520	0823	1513	0840	0837
MHV-1A	2.6	1.35	4.8	4.5	6.15	5.05
MHV-1B	9.0	7.75	11.3	10.95	12.6	11.5
MHV-1C	⊕ 0.05	⊕ 0.05	0.0	0.05	0.05	0.1
TIME	0842	1522	0826	1515	0843	0839
MHV-2A	4.0	2.8	5.65	5.7	7.1	6.1
MHV-2B	5.15	3.95	7.35	7.05	8.7	7.6
MHV-2C	1.1 Hg	1.0 Hg	1.2 Hg	1.3 Hg	1.3 Hg	1.3 Hg
TIME	0843	1523	0828	1517	0845	0840
MHV-3A	1.7	0.7	3.55	3.3	4.65	3.75
MHV-3B	8.65	7.5	10.8	10.5	12.1	11.0
MHV-3C	9.0	9.45	11.35	11.0	11.8	11.55
TIME	0846	1525	0830	1519	0847	0843
MHV-4A	0.05	0.0	1.8	1.95	3.4	2.65
MHV-4B	4.6	3.35	6.9	6.6	8.25	7.2
MHV-4C	1.1 Hg	1.0 Hg	1.1 Hg	1.2 Hg	1.3 Hg	1.2 Hg
TIME	0847	1527	0832	1521	0849	0845
MHV-5A	3.9	2.6	6.1	5.75	7.45	6.4
MHV-5B	9.55	8.15	12.75	11.5	13.3	12.1
MHV-5C	11.3	10.05	13.55	13.25	14.95	13.9
TIME	0855	1534	0842	1529	0900	0853
PZ-1	1.0 Hg	0.9 Hg	1.1 Hg	1.2 Hg	1.2 Hg	1.2 Hg
TIME	0849	1528	0836	1523	0853	0847
PZ-2	⊕ 7.2	⊕ 8.4	⊕ 5.2	⊕ 5.55	⊕ 4.05	⊕ 5.0
TIME	0850	1529	0836	1523	0853	0847
PZ-3	4.9	3.6	7.15	6.85	8.55	7.45
TIME	0850	1530	0837	1524	0855	0848
PZ-4	4.65	3.35	6.9	6.6	8.3	7.2

DATE	10/22/90	10/22/90	10/23/90	10/23/90	10/23/90	10/23/90
TIME	0821	1519	~0500	1400	1530	1738
MHV-1A	2.85	1.55			0.15	1.2
MHV-1B	9.15	7.9			5.35	7.4
MHV-1C	0.05	0.0			0.0	0.05
TIME	0823	1521			1532	1741
MHV-2A	4.2	3.3			1.1	2.7
MHV-2B	5.45	4.1			1.7	3.45
MHV-2C	1.2 Hg	1.1 Hg			0.7 Hg	0.9 Hg
TIME	0824	1522			1534	1742
MHV-3A	2.0	0.85			④ 0.2	0.6
MHV-3B	8.95	7.75			5.25	7.2
MHV-3C	11.05	10.85			7.4	9.25
TIME	0827	1524			1536	1744
MHV-4A	0.85	0.05			0.0	0.0
MHV-4B	4.95	3.5			1.25	2.95
MHV-4C	1.1 Hg	1.0 Hg			0.8 Hg	1.0 Hg
TIME	0829	1526			1537	1745
MHV-5A	4.2	2.7			0.55	2.15
MHV-5B	9.8	8.4			5.5	7.8
MHV-5C	11.7	10.2			5.95	9.35
TIME	0838	1535			1546	1755
PZ-1	1.0 Hg	1.0 Hg			0.7 Hg	0.9 Hg
TIME	0831	1528			1539	1748
PZ-2	④ 6.9	④ 8.3			④ 5.05	④ 6.35
TIME	0832	1529			1540	1749
PZ-3	5.25	3.75			1.6	3.3
TIME	0832	1529			1541	1750
PZ-4	5.0	3.5			1.35	3.05

DATE	10/24/90	10/24/90	10/25/90	10/25/90	10/26/90	10/26/90
TIME	0828	1545	0832	1619	0846	1617
MHV-1A	3.65	2.5	1.1	2.4	5.3	5.1
MHV-1B	10.2	9.15	7.7	8.9	11.8	11.65
MHV-1C	0.0	0.0	0.0	0.0	0.0	0.0
TIME	0829	1547	0834	1621	0848	1619
MHV-2A	5.45	4.0	2.7	3.8	6.35	6.15
MHV-2B	6.3	5.2	3.8	5.05	7.9	7.7
MHV-2C	1.2 Hg	1.1 Hg	1.0 Hg	1.1 Hg	1.3 Hg	1.3 Hg
TIME	0831	1548	0836	1622	0851	1620
MHV-3A	2.65	1.75	0.6	1.6	4.0	3.7
MHV-3B	10.05	8.85	7.5	8.7	11.55	11.2
MHV-3C	12.2	9.2	9.05	9.5	11.75	11.35
TIME	0833	1550	0838	1624	0853	1622
MHV-4A	1.35	0.0	0.05	0.05	0.55	1.8
MHV-4B	5.7	4.65	3.2	4.45	7.35	7.2
MHV-4C	1.2 Hg	1.1 Hg	1.0 Hg	1.0 Hg	1.2 Hg	1.2 Hg
TIME	0835	1552	0840	1626	0856	1624
MHV-5A	4.9	3.8	2.45	3.7	6.5	6.4
MHV-5B	10.7	9.65	8.25	9.45	12.4	12.2
MHV-5C	12.7	11.6	10.1	11.3	14.15	14.0
TIME	0845	1600	0848	1635	0905	1633
PZ-1	1.1 Hg	1.1 Hg	0.9 Hg	1.0 Hg	1.2 Hg	1.2 Hg
TIME	0838	1554	0842	1627	0858	1626
PZ-2	⊕6.05	⊕7.1	⊕8.45	⊕7.15	⊕4.55	⊕4.5
TIME	0838	1555	0842	1628	0859	1627
PZ-3	6.0	4.9	3.5	4.8	7.85	7.5
TIME	0839	1555	0843	1629	0900	1628
PZ-4	5.75	4.6	3.2	4.5	7.4	7.2

JECT #89-201

OPERATIONS FIELD LOG 2

S.R.P. SITE

DATE	10/27/90	10/28/90	10/29/90	10/29/90	10/29/90	10/29/90
TIME	1118	1158	0829	1543	1610	1645
1-1A	8.6	4.7	6.35	5.4	Unif down	Wys down
1-1B	15.05	11.2	12.7	11.55		
1-1C	0.05	⊕ 0.05	0.05	0.05		
ME	1120	1200	0831	1545		
1-2A	9.4	5.9	7.35	6.2	down	down
1-2B	11.1	7.3	8.85	7.75		
1-2C	1.6 Hg	1.3 Hg	1.3 Hg	1.3 Hg		
ME	1122	1201	0833	1546		
1-3A	6.8	3.55	4.9	4.0	down	down
1-3B	14.4	10.8	12.2	11.1		
1-3C	13.3	11.7	12.25	12.1		
ME	1124	1203	0835	1548		
1-4A	5.65	2.75	4.1	3.4	down	down
1-4B	10.65	6.85	8.45	7.3		
1-4C	1.5 Hg	1.2 Hg	1.3 Hg	1.2 Hg		
ME	1126	1205	0837	1550		
1-5A	9.8	6.1	7.6	6.5	change	
1-5B	15.65	11.85	13.25	12.1		
1-5C	1.2 Hg	13.7	15.05	13.95		
ME	1139	1213	0847	1558		
1-1	1.5 Hg	1.2 Hg	1.3 Hg	1.2 Hg		
ME	1129	1207	0840	1552		
1-2	⊕ 1.5	⊕ 5.15	⊕ 3.5	⊕ 4.55		
ME	1130	1208	0840	1553		
1-3	10.95	7.1	8.7	7.6		
ME	1131	1208	0841	1554		
1-4	10.7	6.85	8.5	7.35		

	10/30/90	10/30/90	10/30/90	10/30/90	10/31/90	10/31/90
	0830	~1530	1610	1722	0806	~0905
A	6.75			4.45	4.95	
B	12.95			10.0	11.2	
C	0.0			0.0	0.0	
	0832			1724	0809	
A	7.45			5.1	5.7	
B	9.05			6.35	7.3	
C	1.4 Hg			1.1 Hg	1.2 Hg	
	0834			1725	0810	
A	5.35			3.25	3.65	
B	12.75			9.6	11.05	
C	14.15			10.1	12.55	
	0837			1727	0813	
A	4.45			1.8	2.55	
B	8.65			6.0	6.9	
C	1.3 Hg			1.0 Hg	1.2 Hg	
	0838			1728	0815	
A	7.85			5.35	6.2	
B	13.65			10.3	11.9	
C	15.4			11.45	13.7	
	0847			1735	0824	
	1.3 Hg			1.0 Hg	1.1 Hg	
	0841			1730	0818	
	④ 3.45			④ 4.15	④ 5.05	
	0842			1730	0818	
	8.95			6.3	7.25	
	0843			1731	0819	
	8.7			6.1	7.0	

DATE	11/3/90	11/3/90	11/3/90	11/4/90	11/4/90	11/5/90
TIME	1530	1809		1320	1515	0833
HV-1A		0.65			2.7	1.3
HV-1B	✓	6.0	⊖		8.35	7.4
HV-1C	✓	0.0	⊖	⊖	⊕ 0.05	⊕ 0.05
TIME		1811			1517	0835
HV-2A	✓	1.65	⊖	⊖	3.5	2.65
HV-2B	✓	1.45	⊖	⊖	4.6	3.7
HV-2C	✓	0.7 Hg	⊖	⊖	1.0 Hg	0.9 Hg
TIME		1812			1518	0837
HV-3A	✓	0.15	⊖	⊖	1.85	0.7
HV-3B	✓	5.95	⊖	⊖	8.1	7.3
HV-3C	✓	8.15	⊖	⊖	10.85	11.2
TIME		1814			1520	0839
HV-4A	✓	0.0	⊖	⊖	0.95	0.0
HV-4B	✓	2.0	⊖	⊖	4.05	3.15
HV-4C	✓	0.8 Hg	⊖	⊖	1.0 Hg	0.9 Hg
TIME		1815			1525	0841
HV-5A	✓	1.35	⊖	⊖	3.2	2.45
HV-5B	✓	6.5	⊖	⊖	8.65	7.8
HV-5C	✓	7.5	⊖	⊖	10.3	9.5
TIME		1824			1528	0849
-1		0.7 Hg	⊖	⊖	0.9 Hg	0.8 Hg
ME		1818			1523	0843
-2		⊕ 5.55	⊖	⊖	⊕ 4.9	⊕ 7.75
ME		1819			1523	0843
-3		2.35	⊖	⊖	4.3	3.4
ME		1820			1524	0844
-4		2.1	⊖	⊖	4.0	3.15

DATE	11/5/90	11/5/90	11/6/90	11/7/90	11/7/90	11/8/90	system down 11/8/90
TIME	0930	1614	0823	1115	1530	1427	
MHV-1A		⊕ 1.05	3.3	4.1	4.3	2.45	
MHV-1B		4.4	8.7	9.0	9.1	5.9	
MHV-1C		0.0	0.0	0.0	0.0	⊕ 0.05	
TIME		1616	0825	1123	1532	1428	
MHV-2A		0.45	4.05	4.7	4.8	2.5	
MHV-2B		1.2	5.45	5.9	6.1	3.0	
MHV-2C		10.6 #g	14.9	14.3	14.5	8.25	
TIME		1618	0827	1125	1534	1430	
MHV-3A		⊕ 1.15	2.45	3.0	3.1	1.8	
MHV-3B		4.5	8.55	8.7	8.9	6.0	
MHV-3C		8.95	11.85	9.55	9.6	6.2	
TIME		1621	0829	1127	1536	1432 1540	
MHV-4A		0.0	1.2	1.5	1.5	0.00	
MHV-4B		0.7	5.0	5.6	5.7	3.2	
MHV-4C		10.1 #g	14.35	14.0	14.3	10.85	
TIME		1623	0831	1129	1538	1438	
MHV-5A		0.1	4.3	4.9	5.0	2.55	
MHV-5B		4.95	9.1	9.3	9.3	5.9	
MHV-5C		6.45	10.7	10.6	10.6	5.85	
TIME		1625	0833	1131	1540	1441	
PZ-1		9.6 #g	13.9	13.5	13.8	10.4	
TIME		1626	0834	1132	1541	1442	
PZ-2		⊕ 9.65	⊕ 5.4	⊕ 4.4	⊕ 4.5	⊕ 1.3	
TIME		1626	0835	1133	1542	1443	
PZ-3		0.9	5.25	5.8	5.8	3.3	
TIME		1627	0836	1134	1543	1444	
PZ-4		0.7	4.85	5.7	5.8	2.2	

**FULL SCALE FIELD TEST OF THE IN SITU AIR STRIPPING PROCESS AT THE
SAVANNAH RIVER INTEGRATED DEMONSTRATION TEST SITE (U)**

Appendix C Groundwater Well VOC Concentration Data.

DATE	Elapsed Time Days	MHT-1C TCE	MHT-1C PCE	MHT-2C TCE	MHT-2C PCE	MHT-2D TCE	MHT-2D PCE
27-Jul-90	0						
7-Aug-90	11	546	127	839	80	494	49
7-Aug-90	11	540	129	877	89	505	53
8-Aug-90	12						
8-Aug-90	12						
24-Aug-90	28			811	84	364	36
24-Aug-90	28			822	83	382	41
28-Aug-90	32	269	66	353	47	704	49
28-Aug-90	32	340	87	372	53	704	50
29-Aug-90	33						
29-Aug-90	33						
4-Sep-90	39	453	129	490	84	459	23
4-Sep-90	39	392	117	416	72	585	28
5-Sep-90	40						
5-Sep-90	40						
18-Sep-90	53	365	86	384	64	623	39
18-Sep-90	53	406	105	437	75	612	38
19-Sep-90	54						
19-Sep-90	54						
2-Oct-90	67	387	108	382	64	551	27
2-Oct-90	67	384	105	423	72	588	28
3-Oct-90	68						
3-Oct-90	68						
9-Oct-90	74	283	63	355	54	528	20
9-Oct-90	74	295	61	371	58	469	19
11-Oct-90	76						
11-Oct-90	76						
16-Oct-90	81	353	95	363	55	376	17
16-Oct-90	81	372	107	372	58	394	14
17-Oct-90	82						
17-Oct-90	82						
23-Oct-90	88	316	85				
23-Oct-90	88	358	104				
24-Oct-90	89	320	65	378	59	739	22
24-Oct-90	89	278	55	348	49	647	19
30-Oct-90	95	296	56	355	43	463	13
30-Oct-90	95	319	59	394	58	502	14
31-Oct-90	96						
31-Oct-90	96						
6-Nov-90	102	392	91	415	62	929	27
6-Nov-90	102	427	94	373	51	945	28
7-Nov-90	103						
7-Nov-90	103						
13-Nov-90	109	387	95	194	26	775	18
13-Nov-90	109	383	92	271	36	844	20
14-Nov-90	110						
14-Nov-90	110						
20-Nov-90	116	277	41	285	31		
20-Nov-90	116	367	90	276	29		
21-Nov-90	117					489	13
21-Nov-90	117					542	14

DATE	Elapsed Time Days	MHT-1C TCE	MHT-1C PCE	MHT-2C TCE	MHT-2C PCE	MHT-2D TCE	MHT-2D PCE
27-Nov-90	123	414	110	327	32	578	14
27-Nov-90	123	417	108	335	34	601	15
29-Nov-90	125						
29-Nov-90	125						
4-Dec-90	130	427	110	332	30	430	13
4-Dec-90	130	410	104	336	29	443	14
11-Dec-90	137	381	95	348	32	382	14
11-Dec-90	137	430	114	373	35	383	15
12-Dec-90	138						
12-Dec-90	138						
18-Dec-90	144	519	125	382	32	188	7
18-Dec-90	144	502	122	391	33	213	8
26-Dec-90	152	265	54	153	9	106	3
26-Dec-90	152	331	72	145	9	106	3
27-Dec-90	153						
27-Dec-90	153						
2-Jan-91	159	400	87	347	22	225	10
2-Jan-91	159	427	92	345	21	218	10
8-Jan-91	165	473	116	329	27	200	11
8-Jan-91	165	502	121	345	29	206	12
9-Jan-91	166						
9-Jan-91	166						
22-Jan-91	179	987	60	297	31		
22-Jan-91	179	501	119	376	37		
23-Jan-91	180						
23-Jan-91	180						
7-Feb-91	195						
7-Feb-91	195						
19-Feb-91	207	68	11	360	31	199	11
19-Feb-91	207	376	74	331	27	209	12
20-Feb-91	208						
20-Feb-91	208						

DATE	Elapsed Time Days	MHT-3C TCE	MHT-3C PCE	MHT-4C TCE	MHT-4C PCE	MHT-5C TCE	MHT-5C PCE
27-Jul-90	0						
7-Aug-90	11						
7-Aug-90	11						
8-Aug-90	12					780	124
8-Aug-90	12					794	126
24-Aug-90	28	441	67	1464	71	668	99
24-Aug-90	28	524	79	1687	80	710	108
28-Aug-90	32						
28-Aug-90	32						
29-Aug-90	33						
29-Aug-90	33						
4-Sep-90	39	401	60			345	72
4-Sep-90	39	481	69			358	46
5-Sep-90	40			570	23		
5-Sep-90	40			600	24		
18-Sep-90	53	712	105	316	13	225	25
18-Sep-90	53	689	101	328	14	201	23
19-Sep-90	54						
19-Sep-90	54						
2-Oct-90	67	794	123			190	26
2-Oct-90	67	758	114			184	25
3-Oct-90	68			152	10		
3-Oct-90	68			183	12		
9-Oct-90	74	791	121	75	7	55	8
9-Oct-90	74	735	106	79	4	54	7
11-Oct-90	76						
11-Oct-90	76						
16-Oct-90	81						
16-Oct-90	81						
17-Oct-90	82	391	54	27	2	111	17
17-Oct-90	82	532	71	29	4	120	18
23-Oct-90	88						
23-Oct-90	88						
24-Oct-90	89	702	90	22	2	295	40
24-Oct-90	89	781	106	22	2	277	35
30-Oct-90	95	778	100	24	2	322	40
30-Oct-90	95	814	111	24	2	317	39
31-Oct-90	96						
31-Oct-90	96						
6-Nov-90	102	387	43	11	1	299	31
6-Nov-90	102	476	50	14	1	301	32
7-Nov-90	103						
7-Nov-90	103						
13-Nov-90	109	666	80			329	35
13-Nov-90	109	712	86			363	43
14-Nov-90	110			12	1		
14-Nov-90	110			13	1		
20-Nov-90	116	821	98	25	2	532	64
20-Nov-90	116	867	113	27	3	548	68
21-Nov-90	117						
21-Nov-90	117						

DATE	Elapsed Time Days	MHT-3C	MHT-3C	MHT-4C	MHT-4C	MHT-5C	MHT-5C
		TCE	PCE	TCE	PCE	TCE	PCE
27-Nov-90	123	821	101	44	3	545	65
27-Nov-90	123	745	87	47	4	466	56
29-Nov-90	125						
29-Nov-90	125						
4-Dec-90	130	755	89			389	47
4-Dec-90	130	765	84			456	54
11-Dec-90	137	834	111	22	2	324	33
11-Dec-90	137	830	108	27	2	353	39
12-Dec-90	138						
12-Dec-90	138						
18-Dec-90	144	561	61	37	3	357	43
18-Dec-90	144	594	68	39	3	383	51
26-Dec-90	152	343	22	43	3	379	53
26-Dec-90	152	350	22	45	3	397	59
27-Dec-90	153						
27-Dec-90	153						
2-Jan-91	159	752	86	49	4	36	5
2-Jan-91	159	787	92	49	4	34	5
8-Jan-91	165	768	90	49	4	382	57
8-Jan-91	165	745	86	50	4	374	55
9-Jan-91	166						
9-Jan-91	166						
22-Jan-91	179	167	13	795	92	43	3
22-Jan-91	179	176	12	478	45	56	5
23-Jan-91	180						
23-Jan-91	180						
7-Feb-91	195						
7-Feb-91	195						
19-Feb-91	207	628	61	62	5	162	19
19-Feb-91	207	516	49	55	4	105	13
20-Feb-91	208						
20-Feb-91	208						

DATE	Elapsed Time Days	MHT-5D TCE	MHT-5D PCE	MHT-6C TCE	MHT-6C PCE	MHT-7C TCE	MHT-7C PCE
27-Jul-90	0						
7-Aug-90	11						
7-Aug-90	11						
8-Aug-90	12			1696	181		
8-Aug-90	12			1917	187		
24-Aug-90	28	778	65	1304	165	111	63
24-Aug-90	28	759	62	1363	164	117	67
28-Aug-90	32					88	27
28-Aug-90	32					96	33
29-Aug-90	33						
29-Aug-90	33						
4-Sep-90	39	356	30				
4-Sep-90	39	416	36				
5-Sep-90	40			287	64	86	39
5-Sep-90	40			290	65	92	43
18-Sep-90	53	410	36	382	39		
18-Sep-90	53	318	24	367	35		
19-Sep-90	54						
19-Sep-90	54						
2-Oct-90	67	357	31				
2-Oct-90	67	372	34				
3-Oct-90	68			109	36	63	24
3-Oct-90	68			114	41	68	25
9-Oct-90	74	278	22				
9-Oct-90	74	238	21				
11-Oct-90	76			32	16	51	17
11-Oct-90	76			43	20	54	18
16-Oct-90	81						
16-Oct-90	81						
17-Oct-90	82	137	12	41	32	37	12
17-Oct-90	82	129	11	38	31	40	13
23-Oct-90	88						
23-Oct-90	88						
24-Oct-90	89	103	10	15	7	15	10
24-Oct-90	89	121	12	15	8	16	11
30-Oct-90	95	103	9				
30-Oct-90	95	105	9				
31-Oct-90	96					14	9
31-Oct-90	96					14	9
6-Nov-90	102	119	10	10	4	25	11
6-Nov-90	102	113	9	11	5	25	12
7-Nov-90	103						
7-Nov-90	103						
13-Nov-90	109	131	12				
13-Nov-90	109	148	13				
14-Nov-90	110			21	12	13	7
14-Nov-90	110			22	13	13	7
20-Nov-90	116	167	15				
20-Nov-90	116	176	16				
21-Nov-90	117			14	2	46	22
21-Nov-90	117			15	2	48	22

DATE	Elapsed Time Days	MHT-5D	MHT-5D	MHT-6C	MHT-6C	MHT-7C	MHT-7C
		TCE	PCE	TCE	PCE	TCE	PCE
27-Nov-90	123	140	13	15	5		
27-Nov-90	123	172	16	15	5		
29-Nov-90	125					36	19
29-Nov-90	125					43	22
4-Dec-90	130	234	22	14	2	53	25
4-Dec-90	130	230	21	12	2	70	32
11-Dec-90	137	150	14				
11-Dec-90	137	157	15				
12-Dec-90	138			10	7	110	41
12-Dec-90	138			10	5	112	41
18-Dec-90	144	198	18	11	3	130	53
18-Dec-90	144	221	21	9	3	124	51
26-Dec-90	152	150	14	10	3		
26-Dec-90	152	178	16	10	3		
27-Dec-90	153					153	51
27-Dec-90	153					128	38
2-Jan-91	159	216	20	8	2	168	87
2-Jan-91	159	201	19	8	2	154	77
8-Jan-91	165	233	21	9	3		
8-Jan-91	165	228	21	10	4		
9-Jan-91	166					189	107
9-Jan-91	166					192	106
22-Jan-91	179	173	20				
22-Jan-91	179	333	39				
23-Jan-91	180			211	17	6	2
23-Jan-91	180			273	21	6	2
7-Feb-91	195	30	4	2	0	252	76
7-Feb-91	195			3	1	247	72
19-Feb-91	207	232	18	9	4		
19-Feb-91	207	152	11	0	0		
20-Feb-91	208					243	99
20-Feb-91	208					240	102

DATE	Elapsed Time Days	MHT-8C TCE	MHT-8C PCE	MHT-9C TCE	MHT-9C PCE	MHT-9D TCE	MHT-9D PCE
27-Jul-90	0						
7-Aug-90	11						
7-Aug-90	11						
8-Aug-90	12					1795	195
8-Aug-90	12					1757	191
24-Aug-90	28	380	15	104	19	1807	168
24-Aug-90	28	410	60	112	20	1886	175
28-Aug-90	32	157	21				
28-Aug-90	32	155	20				
29-Aug-90	33			61	48	1556	161
29-Aug-90	33			61	47	1684	151
4-Sep-90	39						
4-Sep-90	39						
5-Sep-90	40	167	18	150	47	1730	180
5-Sep-90	40	174	19	133	42	1886	173
18-Sep-90	53	293	20	1319	110		
18-Sep-90	53	296	19	1224	90		
19-Sep-90	54					1588	114
19-Sep-90	54					1611	121
2-Oct-90	67						
2-Oct-90	67						
3-Oct-90	68	266	22	1505	124	1667	119
3-Oct-90	68	268	22	1504	124	1739	127
9-Oct-90	74						
9-Oct-90	74						
11-Oct-90	76	236	26	1441	93	1461	93
11-Oct-90	76	233	25	1582	113	1418	88
16-Oct-90	81						
16-Oct-90	81						
17-Oct-90	82	321	33	1516	104	1641	122
17-Oct-90	82	309	31	1342	108	1674	124
23-Oct-90	88						
23-Oct-90	88						
24-Oct-90	89	215	25	1060	49	1136	49
24-Oct-90	89	235	27	1109	52	1477	90
30-Oct-90	95						
30-Oct-90	95						
31-Oct-90	96						
31-Oct-90	96						
6-Nov-90	102						
6-Nov-90	102						
7-Nov-90	103	356	24	1172	56	1356	72
7-Nov-90	103	350	23	1182	58	1300	64
13-Nov-90	109						
13-Nov-90	109						
14-Nov-90	110	314	27	1100	52	1149	49
14-Nov-90	110	330	30	985	40	755	26
20-Nov-90	116						
20-Nov-90	116						
21-Nov-90	117	318	33	666	24	548	22
21-Nov-90	117	314	33	827	31	633	24

DATE	Elapsed Time Days	MHT-8C TCE	MHT-8C PCE	MHT-9C TCE	MHT-9C PCE	MHT-9D TCE	MHT-9D PCE
27-Nov-90	123						
27-Nov-90	123						
29-Nov-90	125	234	25	837	33	739	28
29-Nov-90	125	241	25			703	27
4-Dec-90	130	223	28	824	32	860	31
4-Dec-90	130	241	31	863	33	880	32
11-Dec-90	137						
11-Dec-90	137						
12-Dec-90	138	310	31	1027	50	525	20
12-Dec-90	138	273	28	1011	50	804	29
18-Dec-90	144	326	34	985	48	903	33
18-Dec-90	144	309	33	1077	59	985	33
26-Dec-90	152						
26-Dec-90	152						
27-Dec-90	153	304	29	837	40	821	28
27-Dec-90	153	299	28	880	44	824	26
2-Jan-91	159	353	31	716	32	1057	42
2-Jan-91	159	176	18	789	35	1077	43
8-Jan-91	165						
8-Jan-91	165						
9-Jan-91	166	327	24	965	53	1008	41
9-Jan-91	166	350	26	935	50	1086	48
22-Jan-91	179						
22-Jan-91	179						
23-Jan-91	180	268	89				
23-Jan-91	180						
7-Feb-91	195	1	0	907	34	913	30
7-Feb-91	195	141	9	922	38	32	3
19-Feb-91	207						
19-Feb-91	207						
20-Feb-91	208	425	27	1042	49	1103	54
20-Feb-91	208	464	28	999	45	1069	50

DATE	Elapsed Time Days	MHT-10C TCE	MHT-10C PCE
27-Jul-90	0		
7-Aug-90	11		
7-Aug-90	11		
8-Aug-90	12		
8-Aug-90	12		
24-Aug-90	28	456	52
24-Aug-90	28	398	47
28-Aug-90	32		
28-Aug-90	32		
29-Aug-90	33	96	46
29-Aug-90	33	100	50
4-Sep-90	39		
4-Sep-90	39		
5-Sep-90	40	70	25
5-Sep-90	40	89	31
18-Sep-90	53		
18-Sep-90	53		
19-Sep-90	54	236	33
19-Sep-90	54	284	36
2-Oct-90	67		
2-Oct-90	67		
3-Oct-90	68	711	58
3-Oct-90	68	769	67
9-Oct-90	74		
9-Oct-90	74		
11-Oct-90	76	1320	120
11-Oct-90	76	1287	107
16-Oct-90	81		
16-Oct-90	81		
17-Oct-90	82	1352	83
17-Oct-90	82	1356	107
23-Oct-90	88		
23-Oct-90	88		
24-Oct-90	89	1280	73
24-Oct-90	89	1260	72
30-Oct-90	95		
30-Oct-90	95		
31-Oct-90	96		
31-Oct-90	96		
6-Nov-90	102		
6-Nov-90	102		
7-Nov-90	103	1224	50
7-Nov-90	103	1241	52
13-Nov-90	109		
13-Nov-90	109		
14-Nov-90	110	804	23
14-Nov-90	110	840	23
20-Nov-90	116		
20-Nov-90	116		
21-Nov-90	117	906	40
21-Nov-90	117	975	44

DATE	Elapsed Time Days	MHT-10C TCE	MHT-10C PCE
27-Nov-90	123		
27-Nov-90	123		
29-Nov-90	125	975	34
29-Nov-90	125	972	39
4-Dec-90	130	1031	67
4-Dec-90	130	1024	65
11-Dec-90	137		
11-Dec-90	137		
12-Dec-90	138	1100	63
12-Dec-90	138	1047	54
18-Dec-90	144	995	60
18-Dec-90	144	1067	68
26-Dec-90	152		
26-Dec-90	152		
27-Dec-90	153	909	37
27-Dec-90	153	932	39
2-Jan-91	159	962	49
2-Jan-91	159	988	51
8-Jan-91	165		
8-Jan-91	165		
9-Jan-91	166	975	53
9-Jan-91	166	1001	56
22-Jan-91	179		
22-Jan-91	179		
23-Jan-91	180		
23-Jan-91	180		
7-Feb-91	195	1011	28
7-Feb-91	195	895	23
19-Feb-91	207		
19-Feb-91	207		
20-Feb-91	208	1205	42
20-Feb-91	208	1171	40

**FULL SCALE FIELD TEST OF THE IN SITU AIR STRIPPING PROCESS AT THE
SAVANNAH RIVER INTEGRATED DEMONSTRATION TEST SITE (U)**

Appendix D Helium Tracer Test Results for All Monitoring Points.

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated -

DATE TIME
19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
AIR	AIR	18-Oct-90	4:29 PM	5	-0.7	n/a	n/a
AIR	AIR	18-Oct-90	5:16 PM	5	-0.6	n/a	n/a
AIR	AIR	19-Oct-90	11:15 AM	5	0.1	n/a	n/a
AIR	AIR	19-Oct-90	11:17 AM	5	0.1	n/a	n/a
AIR	AIR	19-Oct-90	2:40 PM	5	0.2	n/a	n/a
AIR	AIR	19-Oct-90	2:42 PM	5	0.2	n/a	n/a
AIR	AIR	19-Oct-90	6:44 PM	6	0.4	n/a	n/a
AIR	AIR	19-Oct-90	6:47 PM	5	0.4	n/a	n/a
AIR	AIR	20-Oct-90	11:02 AM	6	1.1	n/a	n/a
AIR	AIR	20-Oct-90	11:12 AM	7	1.1	n/a	n/a
AIR	AIR	21-Oct-90	11:23 AM	4	2.1	n/a	n/a
AIR	AIR	22-Oct-90	10:26 AM	5	3.1	n/a	n/a
AIR	AIR	22-Oct-90	10:29 AM	5	3.1	n/a	n/a
AIR	AIR	23-Oct-90	4:30 PM	4	3.9	n/a	n/a
AIR	AIR	23-Oct-90	4:30 PM	4	3.9	n/a	n/a
AIR	AIR	25-Oct-90	8:32 AM	5	5.6	n/a	n/a
AIR	AIR	25-Oct-90	8:33 AM	5	5.6	n/a	n/a
AIR	AIR	26-Oct-90	9:37 AM	6	6.7	n/a	n/a
AIR	AIR	28-Oct-90	1:30 PM	7	8.8	n/a	n/a
AIR	AIR	29-Oct-90	2:30 PM	6	9.9	n/a	n/a

Results of Helium Tracer Test - Point Sampling Test #1

DATE TIME
Helium injection initiated - 19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
AMH	2	18-Oct-90	4:30 PM	7	-0.7	flow rate (cfm) =	580
AMH	2	18-Oct-90	4:57 PM	5	-0.7		
AMH	2	19-Oct-90	10:30 AM	7	0.1	0.0	0.0
AMH	2	19-Oct-90	2:02 PM	6	0.2	0.2	0.0
AMH	2	19-Oct-90	5:33 PM	7	0.4	0.4	0.0
AMH	2	20-Oct-90	2:57 AM	13	0.8	2.0	0.2
AMH	2	20-Oct-90	10:03 AM	22	1.1	5.1	0.6
AMH	2	20-Oct-90	5:50 PM	25	1.4	10.1	1.2
AMH	2	20-Oct-90	9:40 PM	28	1.5	13.0	1.5
AMH	2	21-Oct-90	10:34 AM	19	2.1	21.3	2.5
AMH	2	21-Oct-90	7:10 PM	23	2.4	26.1	3.0
AMH	2	22-Oct-90	9:56 AM	18	3.0	34.0	4.0
AMH	2	22-Oct-90	9:56 AM	19	3.0	34.0	4.0
AMH	2	22-Oct-90	9:56 AM	19	3.0	34.0	4.0
AMH	2	22-Oct-90	4:25 PM	17	3.3	37.0	4.3
AMH	2	23-Oct-90	4:10 PM	15	3.9	42.6	5.0
AMH	2	25-Oct-90	8:17 AM	15	5.6	56.6	6.6
AMH	2	26-Oct-90	9:40 AM	18	6.7	66.7	7.8
AMH	2	28-Oct-90	1:33 PM	15	8.8	87.5	10.2
AMH	2	29-Oct-90	2:30 PM	13	9.9	95.3	11.1
AMH	2	30-Oct-90	2:30 PM	14	10.9	102.4	12.0
AMH	2	6-Nov-90	11:40 AM	16	14.7	134.1	15.7
AMH	2	7-Nov-90	2:30 PM	16	15.9	144.0	16.8
AMH	2	21-Nov-90	2:30 PM	17	23.9	219.2	25.6
AMH	2	6-Dec-90	2:00 PM	12	38.8	338.0	39.5
AMH	2	13-Dec-90	12:00 PM	14	45.8	384.2	44.9

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated - DATE TIME
19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHM	1	18-Oct-90	5:05 PM	5	-0.7	n/a	n/a
MHM	1	19-Oct-90	11:13 AM	5	0.1	no flow	no flow
MHM	1	19-Oct-90	2:36 PM	5	0.2	no flow	no flow
MHM	1	19-Oct-90	6:41 PM	6	0.4	no flow	no flow
MHM	1	20-Oct-90	10:56 AM	7	1.1	no flow	no flow
MHM	1	20-Oct-90	6:35 PM	7	1.4	no flow	no flow
MHM	1	21-Oct-90	11:21 AM	5	2.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated -

DATE	TIME
19-Oct-90	8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHM	2	18-Oct-90	5:07 PM	5	-0.7	n/a	n/a
MHM	2	19-Oct-90	11:03 AM	4	0.1	no flow	no flow
MHM	2	19-Oct-90	2:29 PM	5	0.2	no flow	no flow
MHM	2	19-Oct-90	6:28 PM	6	0.4	no flow	no flow
MHM	2	20-Oct-90	10:46 AM	7	1.1	no flow	no flow
MHM	2	20-Oct-90	6:27 PM	7	1.4	no flow	no flow
MHM	2	21-Oct-90	11:11 AM	5	2.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

DATE TIME
Helium Injection Initiated - 19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHM	3	18-Oct-90	5:08 PM	5	-0.7	n/a	n/a
MHM	3	19-Oct-90	11:13 AM	3	0.1	no flow	no flow
MHM	3	19-Oct-90	2:35 PM	5	0.2	no flow	no flow
MHM	3	19-Oct-90	6:39 PM	5	0.4	no flow	no flow
MHM	3	20-Oct-90	10:58 AM	7	1.1	no flow	no flow
MHM	3	20-Oct-90	6:36 PM	5	1.4	no flow	no flow
MHM	3	21-Oct-90	11:22 AM	5	2.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated -

DATE	TIME
19-Oct-90	8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHM	4	18-Oct-90	5:10 PM	5	-0.6	n/a	n/a
MHM	4	19-Oct-90	11:10 AM	4	0.1	no flow	no flow
MHM	4	19-Oct-90	2:31 PM	5	0.2	no flow	no flow
MHM	4	19-Oct-90	6:34 PM	5	0.4	no flow	no flow
MHM	4	20-Oct-90	10:53 AM	7	1.1	no flow	no flow
MHM	4	20-Oct-90	6:30 PM	5	1.4	no flow	no flow
MHM	4	21-Oct-90	11:16 AM	5	2.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

DATE TIME
Helium Injection Initiated - 19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHM	5	18-Oct-90	5:12 PM	5	-0.6	n/a	n/a
MHM	5	19-Oct-90	11:05 AM	4	0.1	no flow	no flow
MHM	5	19-Oct-90	2:31 PM	5	0.2	no flow	no flow
MHM	5	19-Oct-90	6:30 PM	6	0.4	no flow	no flow
MHM	5	20-Oct-90	10:48 AM	7	1.1	no flow	no flow
MHM	5	20-Oct-90	6:28 PM	5	1.4	no flow	no flow
MHM	5	21-Oct-90	11:13 AM	5	2.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

DATE TIME
Helium Injection Initiated - 19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHM	6	18-Oct-90	5:13 PM	5	-0.6	n/a	n/a
MHM	6	19-Oct-90	11:08 AM	4	0.1	no flow	no flow
MHM	6	19-Oct-90	2:33 PM	5	0.2	no flow	no flow
MHM	6	19-Oct-90	6:37 PM	6	0.4	no flow	no flow
MHM	6	20-Oct-90	10:55 AM	7	1.1	no flow	no flow
MHM	6	20-Oct-90	6:32 PM	5	1.4	no flow	no flow
MHM	6	21-Oct-90	11:17 AM	5	2.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated -

DATE	TIME
19-Oct-90	8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHM	7	18-Oct-90	5:15 PM	5	-0.6	n/a	n/a
MHM	7	19-Oct-90	11:10 AM	4	0.1	no flow	no flow
MHM	7	19-Oct-90	2:33 PM	5	0.2	no flow	no flow
MHM	7	19-Oct-90	6:36 PM	5	0.4	no flow	no flow
MHM	7	20-Oct-90	11:00 AM	7	1.1	no flow	no flow
MHM	7	20-Oct-90	6:33 PM	6	1.4	no flow	no flow
MHM	7	21-Oct-90	11:20 AM	4	2.1	no flow	no flow

	DATE	TIME
Helium Injection Initiated -	19-Oct-90	8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHM	8	18-Oct-90	5:17 PM	5	-0.6	n/a	n/a
MHM	8	19-Oct-90	11:08 AM	5	0.1	no flow	no flow
MHM	8	19-Oct-90	2:29 PM	6	0.2	no flow	no flow
MHM	8	19-Oct-90	6:32 PM	5	0.4	no flow	no flow
MHM	8	20-Oct-90	10:50 AM	7	1.1	no flow	no flow
MHM	8	20-Oct-90	6:29 PM	7	1.4	no flow	no flow
MHM	8	21-Oct-90	11:15 AM	5	2.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated - **DATE TIME**
 19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	1C	18-Oct-90	4:34 PM	6	-0.7	n/a	n/a
MHT	1C	19-Oct-90	2:04 PM	5	0.2	no flow	no flow
MHT	1C	19-Oct-90	5:36 PM	6	0.4	no flow	no flow
MHT	1C	20-Oct-90	10:05 AM	15	1.1	no flow	no flow
MHT	1C	20-Oct-90	5:52 PM	26	1.4	no flow	no flow
MHT	1C	21-Oct-90	10:35 AM	4	2.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

DATE TIME
Helium injection initiated - 19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	1D	18-Oct-90	4:36 PM	6	-0.7	flow rate (cfm) =	0.17
MHT	1D	19-Oct-90	9:00 AM	6	0.0		
MHT	1D	19-Oct-90	9:15 AM	242	0.0	3.03E-04	3.55E-05
MHT	1D	19-Oct-90	9:33 AM	633	0.0	1.63E-03	1.90E-04
MHT	1D	19-Oct-90	10:00 AM	1793	0.1	7.17E-03	8.39E-04
MHT	1D	19-Oct-90	10:34 AM	1793	0.1	1.75E-02	2.05E-03
MHT	1D	19-Oct-90	11:45 AM	1701	0.1	3.85E-02	4.51E-03
MHT	1D	19-Oct-90	2:05 PM	1732	0.2	7.93E-02	9.27E-03
MHT	1D	19-Oct-90	5:38 PM	1671	0.4	1.41E-01	1.65E-02
MHT	1D	20-Oct-90	10:07 AM	973	1.1	3.62E-01	4.24E-02
MHT	1D	20-Oct-90	5:53 PM	15	1.4	4.01E-01	4.69E-02
MHT	1D	21-Oct-90	10:37 AM	4	2.1	4.02E-01	4.70E-02

Results of Helium Tracer Test - Point Sampling Test #1

DATE TIME
Helium Injection Initiated - 19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	2 C	18-Oct-90	4:38 PM	5	-0.7	n/a	n/a
MHT	2C	19-Oct-90	2:07 PM	939	0.2	no flow	no flow
MHT	2C	19-Oct-90	5:48 PM	1549	0.4	no flow	no flow
MHT	2C	20-Oct-90	10:09 AM	1126	1.1	no flow	no flow
MHT	2C	20-Oct-90	5:55 PM	9	1.4	no flow	no flow
MHT	2C	21-Oct-90	10:39 AM	4	2.1	no flow	no flow

	DATE	TIME
Helium injection initiated -	19-Oct-90	8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	2D	18-Oct-90	4:40 PM	5	-0.7	n/a	n/a
MHT	2D	19-Oct-90	10:38 AM	5	0.1	no flow	no flow
MHT	2D	19-Oct-90	2:07 PM	96	0.2	no flow	no flow
MHT	2D	19-Oct-90	5:42 PM	224	0.4	no flow	no flow
MHT	2D	20-Oct-90	10:11 AM	47	1.1	no flow	no flow
MHT	2D	20-Oct-90	5:57 PM	144	1.4	no flow	no flow
MHT	2D	21-Oct-90	10:40 AM	6	2.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated - DATE TIME
 19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	3C	18-Oct-90	4:42 PM	5	-0.7	n/a	n/a
MHT	3C	19-Oct-90	10:41 AM	5	0.1	no flow	no flow
MHT	3C	19-Oct-90	2:10 PM	6	0.2	no flow	no flow
MHT	3C	19-Oct-90	5:45 PM	5	0.4	no flow	no flow
MHT	3C	20-Oct-90	10:13 AM	5	1.1	no flow	no flow
MHT	3C	20-Oct-90	6:10 PM	6	1.4	no flow	no flow
MHT	3C	21-Oct-90	10:43 AM	5	2.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

DATE TIME
Helium Injection Initiated - 19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	3D	18-Oct-90	4:44 PM	5	-0.7	n/a	n/a
MHT	3D	19-Oct-90	10:41 AM	5	0.1	no flow	no flow
MHT	3D	19-Oct-90	2:10 PM	6	0.2	no flow	no flow
MHT	3D	19-Oct-90	5:45 PM	18	0.4	no flow	no flow
MHT	3D	20-Oct-90	10:15 AM	230	1.1	no flow	no flow
MHT	3D	20-Oct-90	6:00 PM	483	1.4	no flow	no flow
MHT	3D	21-Oct-90	10:45 AM	29	2.1	no flow	no flow
MHT	3D	22-Oct-90	10:01 AM	5	3.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated - DATE TIME
19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	4C	18-Oct-90	4:46 PM	5	-0.7	n/a	n/a
MHT	4C	19-Oct-90	10:47 AM	114	0.1	no flow	no flow
MHT	4C	19-Oct-90	2:14 PM	144	0.2	no flow	no flow
MHT	4C	19-Oct-90	5:52 PM	1488	0.4	no flow	no flow
MHT	4C	19-Oct-90	5:57 PM	1463	0.4	no flow	no flow
MHT	4C	20-Oct-90	10:20 AM	269	1.1	no flow	no flow
MHT	4C	20-Oct-90	6:04 PM	238	1.4	no flow	no flow
MHT	4C	21-Oct-90	10:49 AM	15	2.1	no flow	no flow
MHT	4C	22-Oct-90	10:06 AM	10	3.1	no flow	no flow
MHT	4C	23-Oct-90	4:15 PM	4	3.9	no flow	no flow
MHT	4C	25-Oct-90	8:19 AM	5	5.6	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated - DATE TIME
19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	4D	18-Oct-90	4:47 PM	5	-0.7	n/a	n/a
MHT	4D	19-Oct-90	10:47 AM	5	0.1	no flow	no flow
MHT	4D	19-Oct-90	2:14 PM	5	0.2	no flow	no flow
MHT	4D	19-Oct-90	5:55 PM	5	0.4	no flow	no flow
MHT	4D	20-Oct-90	10:22 AM	299	1.1	no flow	no flow
MHT	4D	20-Oct-90	6:05 PM	483	1.4	no flow	no flow
MHT	4D	21-Oct-90	10:50 AM	667	2.1	no flow	no flow
MHT	4D	22-Oct-90	10:09 AM	114	3.1	no flow	no flow
MHT	4D	23-Oct-90	4:16 PM	24	3.9	no flow	no flow
MHT	4D	25-Oct-90	8:20 AM	8	5.6	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated -

DATE	TIME
19-Oct-90	8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	5C	18-Oct-90	4:49 PM	5	-0.7	n/a	n/a
MHT	5C	19-Oct-90	10:44 AM	5	0.1	no flow	no flow
MHT	5C	19-Oct-90	2:12 PM	5	0.2	no flow	no flow
MHT	5C	19-Oct-90	5:50 PM	5	0.4	no flow	no flow
MHT	5C	20-Oct-90	10:16 AM	42	1.1	no flow	no flow
MHT	5C	20-Oct-90	6:02 PM	23	1.4	no flow	no flow
MHT	5C	21-Oct-90	10:46 AM	4	2.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

Helium injection initiated -

DATE TIME
19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	5D	18-Oct-90	4:50 PM	5	-0.7	n/a	n/a
MHT	5D	19-Oct-90	10:44 AM	4	0.1	no flow	no flow
MHT	5D	19-Oct-90	2:12 PM	5	0.2	no flow	no flow
MHT	5D	19-Oct-90	6:02 PM	6	0.4	no flow	no flow
MHT	5D	20-Oct-90	10:18 AM	18	1.1	no flow	no flow
MHT	5D	20-Oct-90	6:03 PM	65	1.4	no flow	no flow
MHT	5D	21-Oct-90	10:48 AM	30	2.1	no flow	no flow
MHT	5D	22-Oct-90	10:05 AM	5	3.1	no flow	no flow
MHT	5D	23-Oct-90	4:12 PM	4	3.9	no flow	no flow
MHT	5D	25-Oct-90	8:21 AM	5	5.6	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated -

DATE TIME
19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	6C	18-Oct-90	4:52 PM	5	-0.7	n/a	n/a
MHT	6C	19-Oct-90	10:49 AM	5	0.1	no flow	no flow
MHT	6C	19-Oct-90	2:16 PM	157	0.2	no flow	no flow
MHT	6C	19-Oct-90	5:52 PM	392	0.4	no flow	no flow
MHT	6C	20-Oct-90	10:24 AM	77	1.1	no flow	no flow
MHT	6C	20-Oct-90	6:07 PM	45	1.4	no flow	no flow
MHT	6C	21-Oct-90	10:53 AM	4	2.1	no flow	no flow
MHT	6C	22-Oct-90	10:11 AM	5	3.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

DATE TIME
Helium injection initiated - 19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	6D	18-Oct-90	4:54 PM	5	-0.7	flow rate (cfm) =	0.02
MHT	6D	19-Oct-90	9:04 AM	6	0.0		
MHT	6D	19-Oct-90	9:18 AM	6	0.0		
MHT	6D	19-Oct-90	9:35 AM	6	0.0		
MHT	6D	19-Oct-90	10:04 AM	6	0.1		
MHT	6D	19-Oct-90	10:49 AM	6	0.1	9.00E-07	1.05E-07
MHT	6D	19-Oct-90	11:45 AM	27	0.1	1.38E-05	1.61E-06
MHT	6D	19-Oct-90	2:16 PM	633	0.2	9.95E-04	1.16E-04
MHT	6D	19-Oct-90	6:00 PM	939	0.4	4.49E-03	5.26E-04
MHT	6D	20-Oct-90	10:26 AM	1034	1.1	2.38E-02	2.79E-03
MHT	6D	20-Oct-90	6:09 PM	1004	1.4	3.32E-02	3.89E-03
MHT	6D	21-Oct-90	10:55 AM	65	2.1	4.39E-02	5.13E-03
MHT	6D	22-Oct-90	10:12 AM	12	3.1	4.48E-02	5.24E-03
MHT	6D	23-Oct-90	4:20 PM	5	3.9	4.49E-02	5.25E-03
MHT	6D	25-Oct-90	8:23 AM	5	5.6	4.49E-02	5.25E-03

Results of Helium Tracer Test - Point Sampling Test #1

DATE TIME
Helium injection initiated - 19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	7C	18-Oct-90	4:55 PM	5	-0.7	n/a	n/a
MHT	7C	19-Oct-90	10:52 AM	5	0.1	no flow	no flow
MHT	7C	19-Oct-90	2:18 PM	6	0.2	no flow	no flow
MHT	7C	19-Oct-90	6:06 PM	5	0.4	no flow	no flow
MHT	7C	20-Oct-90	10:40 AM	59	1.1	no flow	no flow
MHT	7C	20-Oct-90	6:22 PM	49	1.4	no flow	no flow
MHT	7C	21-Oct-90	10:57 AM	4	2.1	no flow	no flow
MHT	7C	22-Oct-90	10:15 AM	5	3.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated - **DATE TIME**
 19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	7D	18-Oct-90	4:56 PM	5	-0.7	n/a	n/a
MHT	7D	19-Oct-90	10:52 AM	5	0.1	no flow	no flow
MHT	7D	19-Oct-90	2:18 PM	5	0.2	no flow	no flow
MHT	7D	19-Oct-90	6:06 PM	5	0.4	no flow	no flow
MHT	7D	20-Oct-90	10:31 AM	7	1.1	no flow	no flow
MHT	7D	20-Oct-90	6:12 PM	6	1.4	no flow	no flow
MHT	7D	21-Oct-90	10:59 AM	389	2.1	no flow	no flow
MHT	7D	22-Oct-90	10:17 AM	881	3.1	no flow	no flow
MHT	7D	23-Oct-90	4:23 PM	120	3.9	no flow	no flow
MHT	7D	25-Oct-90	8:25 AM	5	5.6	no flow	no flow
MHT	7D	26-Oct-90	9:43 AM	11	6.7	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated - DATE TIME
19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	8C	18-Oct-90	4:59 PM	5	-0.7	n/a	n/a
MHT	8C	19-Oct-90	11:00 AM	5	0.1	no flow	no flow
MHT	8C	19-Oct-90	2:26 PM	5	0.2	no flow	no flow
MHT	8C	19-Oct-90	6:24 PM	5	0.4	no flow	no flow
MHT	8C	20-Oct-90	10:42 AM	7	1.1	no flow	no flow
MHT	8C	20-Oct-90	5:59 PM	7	1.4	no flow	no flow
MHT	8C	21-Oct-90	11:06 AM	5	2.1	no flow	no flow

	DATE	TIME
Helium Injection Initiated -	19-Oct-90	8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	8D	18-Oct-90	5:00 PM	5	-0.7	n/a	n/a
MHT	8D	19-Oct-90	11:00 AM	4	0.1	no flow	no flow
MHT	8D	19-Oct-90	2:26 PM	5	0.2	no flow	no flow
MHT	8D	19-Oct-90	6:26 PM	5	0.4	no flow	no flow
MHT	8D	20-Oct-90	10:44 AM	59	1.1	no flow	no flow
MHT	8D	20-Oct-90	6:25 PM	114	1.4	no flow	no flow
MHT	8D	21-Oct-90	11:09 AM	108	2.1	no flow	no flow
MHT	8D	22-Oct-90	10:25 AM	71	3.1	no flow	no flow
MHT	8D	23-Oct-90	4:28 PM	255	3.9	no flow	no flow
MHT	8D	25-Oct-90	8:30 AM	346	5.6	no flow	no flow
MHT	8D	26-Oct-90	9:45 AM	224	6.7	no flow	no flow
MHT	8D	28-Oct-90	1:35 PM	48	8.8	no flow	no flow
MHT	8D	29-Oct-90	2:35 PM	27	9.9	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated -

DATE	TIME
19-Oct-90	8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	9C	18-Oct-90	5:01 PM	5	-0.7	n/a	n/a
MHT	9C	19-Oct-90	10:55 AM	4	0.1	no flow	no flow
MHT	9C	19-Oct-90	2:21 PM	6	0.2	no flow	no flow
MHT	9C	19-Oct-90	6:12 PM	5	0.4	no flow	no flow
MHT	9C	20-Oct-90	10:33 AM	7	1.1	no flow	no flow
MHT	9C	20-Oct-90	6:14 PM	7	1.4	no flow	no flow
MHT	9C	21-Oct-90	11:00 AM	5	2.1	no flow	no flow

	DATE	TIME
Helium Injection Initiated -	19-Oct-90	8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	9D	18-Oct-90	5:02 PM	5	-0.7	n/a	n/a
MHT	9D	19-Oct-90	10:55 AM	5	0.1	no flow	no flow
MHT	9D	19-Oct-90	2:21 PM	5	0.2	no flow	no flow
MHT	9D	19-Oct-90	6:14 PM	5	0.4	no flow	no flow
MHT	9D	20-Oct-90	10:35 AM	7	1.1	no flow	no flow
MHT	9D	20-Oct-90	6:19 PM	10	1.4	no flow	no flow
MHT	9D	21-Oct-90	11:03 AM	102	2.1	no flow	no flow
MHT	9D	22-Oct-90	10:20 AM	697	3.1	no flow	no flow
MHT	9D	23-Oct-90	4:25 PM	304	3.9	no flow	no flow
MHT	9D	25-Oct-90	8:28 AM	71	5.6	no flow	no flow
MHT	9D	26-Oct-90	9:41 AM	23	6.7	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

Helium Injection Initiated - **DATE TIME**
 19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	10C	18-Oct-90	5:03 PM	5	-0.7	n/a	n/a
MHT	10C	19-Oct-90	10:57 AM	5	0.1	no flow	no flow
MHT	10C	19-Oct-90	2:24 PM	7	0.2	no flow	no flow
MHT	10C	19-Oct-90	6:15 PM	5	0.4	no flow	no flow
MHT	10C	20-Oct-90	10:37 AM	7	1.1	no flow	no flow
MHT	10C	20-Oct-90	6:21 PM	7	1.4	no flow	no flow
MHT	10C	21-Oct-90	11:04 AM	5	2.1	no flow	no flow

Results of Helium Tracer Test - Point Sampling Test #1

DATE TIME
Helium Injection Initiated - 19-Oct-90 8:45 AM

SERIES	WELL	DATE	TIME	helium (ppm)	elapsed time (days)	He Recovered SCFM	He Recovered %
MHT	10D	18-Oct-90	5:04 PM	5	-0.7	n/a	n/a
MHT	10D	19-Oct-90	10:57 AM	6	0.1	no flow	no flow
MHT	10D	19-Oct-90	2:24 PM	5	0.2	no flow	no flow
MHT	10D	19-Oct-90	6:22 PM	6	0.4	no flow	no flow
MHT	10D	20-Oct-90	10:35 AM	10	1.1	no flow	no flow
MHT	10D	20-Oct-90	6:22 PM	7	1.4	no flow	no flow
MHT	10D	21-Oct-90	11:05 AM	4	2.1	no flow	no flow
MHT	10D	22-Oct-90	10:21 AM	5	3.1	no flow	no flow
MHT	10D	26-Oct-90	9:46 AM	6	6.7	no flow	no flow

END

**DATE
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