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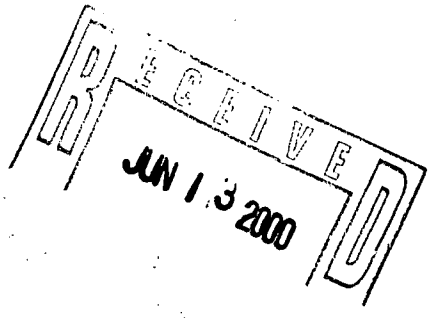

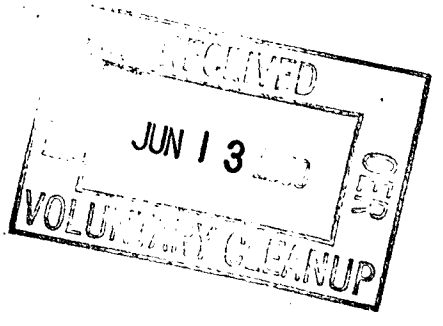

June 9, 2000

Ed Joniskan
Indiana Department of Environmental Management
Voluntary Remediation Program
100 North Senate Avenue
P.O. Box 6015
Indianapolis, Indiana 46206-6015

Subject: VSI Supplemental Investigation Report
Honeywell Industrial Complex, South Bend, Indiana
IDEM Site No. 6980601

Mr. Joniskan:

Enclosed are two copies of the report entitled *VSI Supplemental Investigation, Honeywell Industrial Complex, South Bend, Indiana.* This report is submitted by Harding Lawson Associates, Inc. (HLA) on behalf of Honeywell International, Inc. (Honeywell).

The Supplemental Investigation Report fills data gaps identified by the Indiana Department of Environmental Management (IDEM) during their review of the Voluntary Site Investigation and related documents. At this point, the report is provided for informational purposes only. Results are being incorporated into a site-wide Remediation Work Plan that will be submitted for IDEM's review in July. The Work Plan will present the remedies proposed to address soil and groundwater impacts at the facility.

Please contact Chuck Geadelmann of Honeywell at (612) 951-0571 should you have any questions on this submittal.

Respectfully,

HARDING LAWSON ASSOCIATES, INC.

Donald A. Walsh, CPG
Principal Project Manager

IDEM Office of Land Quality - Fileroom Stamp
VRP Project Name: Honeywell
VRP#: 6980601 File Code: 400
Description: VSI Supplemental Investigation
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Deliberative?
____Yes ✓ No

enclosures

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VSI SUPPLEMENTAL INVESTIGATION

HONEYWELL INDUSTRIAL COMPLEX
SOUTH BEND, INDIANA

PREPARED FOR:

Honeywell

PROJECT NUMBER 49371

JUNE 2000

VSI SUPPLEMENTAL INVESTIGATION

HONEYWELL INDUSTRIAL COMPLEX
SOUTH BEND, INDIANA

IDEM SITE NO. 6980601

PREPARED FOR:

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PROJECT NUMBER 49371

JUNE 2000

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1. EXECUTIVE SUMMARY

In 1995, Honeywell International, Inc. (Honeywell), then AlliedSignal, Inc., began a comprehensive site-wide Voluntary Site Investigation (VSI) to characterize the nature and extent of soil and groundwater impacts resulting from historical manufacturing operations. The VSI incorporated environmental investigations and remedial actions that had conducted proactively and voluntarily since 1978. In January of 1999, after completing the VSI, Honeywell and the Indiana Department of Environmental Management (IDEM) entered into a Voluntary Agreement under Indiana's Voluntary Remediation Program (VRP). The agreement formalized the regulatory framework under which future environmental actions at the site would be addressed.

As one of the first steps in the VRP process, IDEM reviewed the VSI Report and several other related documents. Next, soil and groundwater analytical data collected during the VSI were compared to the IDEM Tier II Cleanup Goals published for the VRP (HLA, 2000a). In the most recent meeting, held on December 7, 1999, it was agreed that the next step in the process involved preparation and submittal of a Remediation Work Plan. The Remediation Work Plan will present the remedial approach to addressing soil and groundwater impacts identified at the Complex.

Prior to submitting the Remediation Work Plan, a limited amount of additional investigation was necessary in order to properly identify actions necessary for: (1) groundwater containment; (2) free product recovery; (3) inorganics in groundwater; and (4) soil sources area remediation. Investigative activities include:

- Additional monitoring well installations, groundwater sampling, and statistical analysis to assess the effectiveness of groundwater containment along Bendix Drive;
- Cone penetrometer testing (CPT) and piezometer installations to evaluate the extent of free product around MW-8 in the Plant 1 area;
- Low-flow sampling of groundwater to more accurately quantify the metals/cyanide concentrations;
- Geoprobe soil sampling to further evaluate elevated total petroleum hydrocarbon (TPH) detections at Areas of Concern (AOCs) where TPH was the only constituent of concern;

- Geoprobe soil sampling to identify a potential soil source area for groundwater impacts downgradient of a former Transportation Area maintenance garage; and,

- Geoprobe soil sampling to further delineate areas of unsaturated soil exceeding the Tier II Cleanup Goals.

Conclusions from the Supplemental Investigation are as follows:

- Extraction wells EW-1 and EW-2, located along Bendix Drive just north of Plant 1, are effectively containing impacted groundwater in the lower portion of the shallow aquifer.

- Groundwater may not be fully contained in the upper portion of the shallow aquifer along Bendix Drive, specifically at the northeast and northwest corners of Plant 1.

- An area of free product, approximately 240-feet long by 140-feet wide, is present in the Former Metal Stamping Area. The free product is 0.2 to 0.6 feet thick. Options to address the free product will be presented in the Remediation Work Plan.

- As presented in the VSI and supported by this Supplemental Investigation, metals do not appear as a concern in groundwater at the site.

- Polynuclear aromatic hydrocarbon (PNA) results for soil samples collected from AOCs where TPH was the only compound of concern were below the IDEM Tier II Cleanup Goals established for the site.

- Soils beneath the Transportation Area Maintenance Garage do not appear to be a significant source for the volatile organic compounds (VOCs) detected in groundwater at downgradient monitoring well MW-10 and nearby Geoprobe groundwater samples. The source appears to be VOC-impacted soil encountered during the Western Carbon Brake Expansion.

- The extent of VOCs in unsaturated soils exceeding the Tier II Cleanup Goals have been delineated at Area 5 – Plant 6/16 and Area 14 – Painting and Degreasing Area, East. The need for remedial action will be addressed in the Remediation Work Plan.

- The extent of metals concentrations in unsaturated soil exceeding the Tier II Cleanup Goal are isolated to shallow soil at a single boring at Area 14 - Former Painting and Degreasing Area, West. The need for remedial action will be addressed in the Remediation Work Plan.

Technical Memorandum Page 1
Date: August 28, 2000

To: Mr. Ed Joniskan

From: Andrew Duwelius, LGP
Jay Erickson

Subject: **Review of Remediation Work Plan Honeywell Industrial Complex South Bend, Indiana (VRP Site # 6980601)**

This technical memorandum presents the findings of Earth Tech's review of the July 2000 Honeywell Remediation Work Plan (RWP) report for the South Bend, Indiana property. The RWP was prepared by Harding Lawson Associates on behalf of Honeywell International, Inc. and was submitted to the Indiana Department of Environmental Management's (IDEMs) Voluntary Remediation Program (VRP).

Earth Tech reviewed the RWP as a stand-alone document with respect to the IDEM VRP guidance, as established in the July 1996 *VRP Resource Guide*. The objective of the review was to determine if the report satisfied the specific requirements of the VRP guidance document. Based on its review, Earth Tech makes the following comments and recommendations regarding the Honeywell RWP.

1. A site map should be included that clearly defines the property boundary. Also, there is no map depicting facilities and land use within one-mile radius of the facility. Please provide this information.
2. No boring logs or well completion diagrams were presented as supportive documentation for the RWP.
3. Table 3-1: It is not clearly stated in the RWP as to whether the constituents listed in Table 3-1 are to be those covered under the covenant. Please clarify.
4. Throughout the RWP, more so in Section 2.0, conclusions are made without supportive data (i.e., there are no analytical summary data tables). Specific constituents have been identified in soil and ground water, but no concentrations are reported. If historical data is available, then contamination trends should be discussed.
5. Figure 2-5: Hatchers should be used to show the areas of a depressed water table.
6. Section 2.2.1.3: There was no discussion concerning the presence or absence of vertical gradients. If this data is available, then it should be presented and discussed.
7. Section 2.2.1.4 second paragraph: It would be helpful to show the location of private water wells on a figure.
8. Section 2.2.8: Unless the VSI Report is included as part of the RWP during the public comment period, the ecological assessment results should be presented and not referenced.
9. Section 2.2.9, Item 2: The statement indicating that no volatile organic vapor emissions where present in the indoor air is misleading. Depending on the sensitivity of the photoionization meter used for screening, VOCs could be present at concentrations undetected by the instrumentation.
10. Section 2.2.1.1: This section indicates surface water run-off either is discharged to the POTW or is routed to one of two retention ponds. It is assumed that the retention pond located north of West Westmoor Street receives storm water run-off from the facility. Please clarify as to which retention pond receives run-off.
11. Section 2.2.7: The reference to Figure 2-12 in this section is incorrect. The correct reference should be Figure 2-14. Please correct.

In addition, exposure to ground water is not an incomplete pathway. The potential for dermal exposure by workers to ground water could occur during routine ground water sampling or during routine and scheduled O&M on ground water remediation equipment.

12. Section 4.3 and Section 4.4: The Health and Safety Plan and Quality Assurance Project Plan

were not submitted as part of the RWP. These documents should be included as part of a complete RWP, because they should be made available during the public comment period. Also, any amendments made to the HASP or QAPP should be available for public comment and approval from IDEM.

13. Figure 2-9: This figure shows the extent of dissolved chlorinated compounds in the shallow ground water aquifer. It would appear that the horizontal extent of the dissolved pump is not fully delineated. The figure suggests that the plume may extend north across West Westmoor Street near monitoring well S22. The figure also suggests that the plume may extent onto adjacent railroad property to the southwest near wells RWB21 and 86-6, geoprobe location 08GP009, and cone penetrometer location 01CPT007. It should also be noted that the extent of the plume has been delineated by ground water screening results.

14. Section 5.1: How are the areas around S23 and S24 going to be remediated? These two wells had increasing trends and are presently outside any capture zones.

15. Section 5.2.1: Following excavation, are monitoring wells to be installed to make sure that product outside of the excavated area do not migrate back into the excavated/backfilled area?

16. Section 5.2.3: This section discusses product found in MW-8. Actions proposed to remediate the area reference the 1999 Construction Report for the Naphtha Recovery System Enhancement. However, that report discusses installing and operating recovery wells about 1,400 feet northwest of MW-8, which would not cleanup MW-8. Figure 2-5 shows flow from MW-8 going towards EW-2. Is it the intent to just let EW-2 handle contamination in MW-8?

17 Section 5.4: This section indicates that an Area-Specific Remediation Work Plan that addresses preliminary design, monitoring/confirmation sampling plan, and an O&M plan for the various remedial actives proposed for the various areas-of-concern. It should be noted that this documentation would be subject to IDEM approval and public comment.

18. Section 6.0, first bulleted item: It is understood that additional documentation in conjunction with the RWP will be submitted during the public comment period. Please provide a list of the additional documentation that will be included in the repository at the South Bend Library.

19. Section 7.0: This section indicates that a Sampling and Analysis Plan for soil confirmation sampling and a Post-System Shutdown Groundwater Monitoring Plan Closure will be prepared and submitted to IDEM. It should be noted that these documents would be subject to IDEM review and public comment.

2. INTRODUCTION

The Honeywell Industrial Complex (IDEM Site No. 6980601) is located at 717 North Bendix Drive, South Bend, Indiana (Figure 1). The Complex includes 26 primary buildings on 110 acres used for the manufacture of automotive and aircraft components. Manufacturing processes at the facility which are of potential environmental importance include metal stamping, grinding, drilling and machining; metal cleaning and degreasing; heat treating; electroplating; coating and painting; and materials storage. Through the years, the fundamental manufacturing processes have remained unchanged, although products have been manufactured at different locations throughout the Complex.

Since 1978, Honeywell International, Inc. (Honeywell), formerly AlliedSignal, Inc., has been proactively conducting environmental investigations and remedial actions at the Honeywell Industrial Complex, all performed on a voluntary basis. In 1995, Honeywell began a comprehensive site-wide Voluntary Site Investigation to characterize the nature and extent of soil and groundwater impacts resulting from historical manufacturing operations (ABB, 1998). In January of 1999, Honeywell and IDEM entered into a Voluntary Remediation Agreement (VRA) under Indiana's VRP.

As one of the first steps in the VRP process, IDEM reviewed the VSI Report and several other related documents. Next, soil and groundwater analytical data collected during the VSI was compared to the IDEM Tier II Cleanup Goals published for the VRP (HLA, 2000a). In the most recent meeting, held on December 7, 1999, it was agreed that the next step in the process involved preparation and submittal of a Remediation Work Plan. The Remediation Work Plan will present the remedial approach to addressing soil and groundwater impacts identified at the Complex.

Prior to submitting the Remediation Work Plan, a Supplemental Investigation was necessary to properly identify actions necessary for: (1) groundwater containment; (2) free product recovery; and, (3) soil sources area remediation. This report presents findings of the Supplemental Investigation, including a comparison of additional soil and groundwater analytical data to the IDEM Tier II Cleanup Goals (IDEM, 1996 and HLA, 2000a).

The Supplemental Investigation Report is organized as follows:

- Section 1- Introduction
- Section 2 - Project Goals and Objectives
- Section 3 - Project Activities/Results
- Section 4 - Conclusions
- Section 5 - References

3. PROJECT GOALS AND OBJECTIVES

Prior to submitting the Remediation Work Plan, a limited amount of additional investigation was necessary in order to properly identify actions necessary for: (1) groundwater containment; (2) free product recovery; (3) inorganics in groundwater; and (4) soil source area remediation. Supplemental investigative activities therefore involved:

- Monitoring well installations, groundwater sampling, and statistical analysis to assess the effectiveness of groundwater containment along Bendix Drive;
- Cone penetrometer testing (CPT) and piezometer installations to evaluate the extent of free product around MW-8 in the Plant 1 area;
- Low-flow sampling of groundwater to more accurately quantify the metals/cyanide concentrations in areas where previous sampling indicated that these constituents may be of concern;
- Geoprobe soil sampling to compare elevated total petroleum hydrocarbon (TPH) concentrations in soils to polynuclear aromatic hydrocarbon (PNA) concentrations from a similar soil interval to assess whether the elevated TPH concentrations warranted further action;
- Geoprobe soil sampling to identify a potential soil source area for groundwater impacts downgradient of a former Transportation Area maintenance garage; and,
- Geoprobe soil sampling to further delineate volatile organic compound (VOC) concentrations in soil at Area 5 – Plant 6/16 and Area 14 – Painting/Degreasing Area, East.
- Geoprobe soil sampling to delineate reported metals concentrations in soils at Area 14 - Former Painting and Degreasing Area, West.

4. PROJECT ACTIVITIES/RESULTS

This section details methods and results of the Supplemental Investigation. Sampling locations during the Supplemental Investigation are shown on Figure 2. Specific task procedures (geoprobe soil sampling, low flow groundwater sampling, and monitoring well installations) were performed in compliance with standard operation procedures detailed in the VSI Quality Assurance Project Plan (ABB, 1997). In accordance with the QAPP, TriMatrix Laboratories Inc. of Grand Rapids, Michigan, provided analytical services.

4.1 GROUNDWATER CONTAINMENT ALONG PLANT 1

The effectiveness of the existing Naphtha and VOC Recovery well systems to contain impacted groundwater on-site required further evaluation. The evaluation focused on the ability of VOC Recovery wells EW-1, EW-2 and EW-3 to contain groundwater north of the existing and demolished portions of Plant 1 and Plant 9 (see Figure 2). The evaluation involved:

- Abandonment of former recovery wells RW-3 and RW-4;
- Installation of two new monitoring wells MW-14 and MW-15;
- Groundwater level measurements and groundwater sampling from monitoring wells MW-14, MW-15, D8, S21, S24, and S26; and,
- Mann-Kendal Trend statistical analysis of off-site plume stability.

The methods and results of these activities are described below.

4.1.1 Recovery Well Abandonment

As part of the Supplemental Investigation, two former recovery wells, RW-3 and RW-4, were abandoned and replaced with two monitoring wells (designated MW-14 and MW-15). Historically, groundwater level measurements were obtained from wells RW-3 and RW-4 to assist in the evaluation of groundwater containment. The groundwater water level measurements suggest that recovery wells EW-1 and EW-2 were having minimal influence on groundwater levels at the water table. Given the flow rate of the recovery wells, the water level measurements obtained from RW-3 and RW-4 were suspect.

Wells RW-3 and RW-4 were formerly part of the previous VOC Recovery System. Operational practices during their use as recovery wells suggested that the wells may have become biofouled in recent time and have poor hydraulic communication with the aquifer. Also, a discontinuous, 2- to 5-foot thick, silty clay lense is present at a depth of 25 feet in this area. A review of subsurface soils information in this area suggests that the well screens for RW-3 and RW-4 may have be installed in the silty clay lense. It is also possible that this silty clay lense inhibits the ability of recovery wells EW-1 and EW-2 to capture shallow groundwater above the lense. If this is the case, intermediate wells 7D, 8D and D8 may be more representative of the influence from EW-1 and EW-2. Monitoring wells MW-14 and MW-15 were installed to provide a more reliable measure of the influence from recovery wells EW-1 and EW-2 on the portion of groundwater above the silty clay lense (i.e., the water table).

On February 25, 2000, Stearns Drilling Company, Dutton, Michigan, a licensed water well driller abandoned wells RW-3 and RW-4. The wells were abandoned by cutting off the upper 2 feet of casing then filling the well with a bentonite slurry. Native soil was placed from 2 feet below ground surface (bgs) to grade. Well Abandonment Forms are presented in Appendix A.

4.1.2 Monitoring Well Installations

Two new shallow monitoring wells, designated MW-14 and MW-15, were installed to replace the abandoned wells. These wells were installed to straddle the water table. The wells were positioned approximately 120 feet to the east and west of EW-2 to evaluate the radius of influence of VOC Recovery System (see Figure 2).

The new monitoring wells were installed by hollow stem auger drilling techniques. During drilling, split-spoon soil samples were collected at 10-foot bgs, 20-foot bgs, and then continuously to 30 feet bgs in order to assess the presence of the silty clay lense. A 2-inch diameter, 10-foot-long stainless steel well screen was installed at each location. The annular space between the well screen and the borehole wall was backfilled with filter pack sand to 2-foot above the top of the screen. A 2-foot thick bentonite pellet seal was placed above the filter pack and then the remainder of the annular space backfilled with bentonite slurry to 2 feet bgs. A locking well cap was placed on the casing and flush-mounted cover was cemented into place. The wells were developed by surging and pumping for until free of fine-grained sediments or for a maximum of one hour. Monitoring well construction logs are provided in Appendix B.

4.1.3 Groundwater Level Measurements

Groundwater level measurements from all wells included in the quarterly monitoring program (HLA, 2000b) and newly installed wells MW-14 and MW-15 were collected on March 6, 2000. After opening the well and allowing the water level to equilibrate, the depth-to-groundwater was measured at each location to the nearest 0.01 foot using an electronic water level indicator. Water level measurements were referenced to the top of the well casing. Groundwater level measurements are presented on Table 1. Groundwater elevations were calculated by subtracting the depth-to-groundwater at each well from the top-of-well casing elevation.

Figure 3 is a potentiometric surface map generated from the groundwater elevation measurements in March. Groundwater elevations demonstrate the groundwater flow conditions when the two VOC and four Naphtha recovery wells are fully operational. VOC Recovery Well EW-3, located north of Plant 9, was off-line during site visit. Only groundwater elevations from monitoring wells that have screens installed at the top of the shallow aquifer were included in the map. To provide a conservative evaluation of containment, groundwater elevations from recovery wells that were actively pumping were excluded. This was done because the water elevation in recovery wells are typically lower than the groundwater elevation in the water-bearing unit due to well losses.

Considering that groundwater movement is generally perpendicular to the contour lines, the containment of shallow groundwater at the north east corner of Plant 1 remain questionable, even after the installation of monitoring wells MW-14 and MW-15. Also, groundwater containment at the northwest corner of Plant 1 (at well S4a) is of concern. Of note, the groundwater contours are consistent with previous measurements when EW-3 was on-line (HLA, 2000b).

4.1.4 Groundwater Sampling

On May 1, 2000, HLA collected groundwater samples for VOC analysis from monitoring wells MW-14, MW-15, D8, S21, S24, and S26 (see Figure 2). The groundwater samples were collected to provide information additional information on the vertical extent of VOCs along the north side of Plant 1. The analytical results were used to further evaluate the area of groundwater along Bendix Drive that required containment.

The monitoring wells were purged of stagnant groundwater prior to sample collection. During purging, the pH, specific conductivity and temperature of the groundwater was measured in the field with a

Horiba U10 Water Checker. Groundwater was purged from the monitoring wells until a minimum of three well volumes was evacuated and the pH, specific conductivity, and temperature were stabilized (within 10 percent between the final two readings). Once purging was completed, a groundwater sample was collected using disposable bailers. Samples were submitted for VOC analysis following the Project QAPP. Groundwater Sampling Records are provided in Appendix C. Analytical results are provided on Table 2.

Figure 4, a geologic cross-section illustrating the groundwater levels and the distribution of VOCs in groundwater, was prepared using the newly obtained groundwater results and historical groundwater results. As illustrated on the cross-section, VOCs are present in the lower portion of the shallow aquifer (beneath the clay lense) primarily at or west of well 7D. At well 7D, only TCE was detected at a concentration exceeding the Tier II Residential Cleanup Goal (7.2 ug/L versus a goal of 5 ug/L). All detected compounds were below the Tier II Non-Residential Cleanup Goal. The VOC distribution illustrated on the cross-section indicates that containment in the lower portion of the shallow aquifer is necessary from approximately well 8D westerly. A review of the groundwater contours on Figure 3 and the slope of the water table on Figure 4 indicates that the pumping from extraction wells EW-1 and EW-2 are effectively containing groundwater in the lower portion of the shallow aquifer.

The concern, however, is that the portion of shallow groundwater above the clay lense is not being contained by pumping from extraction wells EW-1 and EW-2. The presence of the clay lense, which "pinches out" in a westerly direction, appears to inhibit the ability of EW-1 and EW-2 to collect groundwater above the clay lense.

4.1.5 Statistical Analysis of Plume Stability

Because the evaluation of groundwater levels and VOC distribution described above indicated that extraction wells EW-1 and EW-2 may not effectively contain groundwater above the clay lense, a statistical analysis of the stability of VOCs in the off-site portion of the shallow aquifer was conducted. The concept was that, although extraction wells EW-1 and EW-2 may not be fully inhibiting further off-site migration of the plume, additional actions to enhance containment were not necessary if VOC concentrations in the off-site portion of the plume were stable or decreasing.

Using groundwater analytical data from the monitoring well sampling events that have occurred since the rehabilitation of the VOC Recovery System (i.e., since Spring 1997), HLA conducted a Mann-Kendall Trend Test (USEPA, 1998) to evaluated whether VOC concentrations in off-site groundwater are

increasing, decreasing, or stable. The statistical analysis was completed on chemicals that were consistently detected at each well location.

The results of the test are shown graphically on Figure 5. Data matrices and computations of S (the Mann-Kendall Statistic) are included in Appendix D. As shown on Figure 5, individual VOC concentrations at each well location appear to be either stable or exhibiting a decreasing trend, excluding the following:

Wells	Compound
S9	cis-1,2-DCE increasing
S14	TCE increasing cis-1,2-DCE increasing trans-1,2-DCE increasing 1,2-DCA increasing
S23	TCE increasing
S24	TCE increasing
S27	1,1-DCA increasing 1,1-DCE increasing

The results of the groundwater levels, VOC distribution, and plume stability evaluation indicate that groundwater may not be fully contained in the upper portion of the shallow aquifer along Bendix Drive at the northeast corner of Plant 1 (upgradient of S23, S24, and S27), and at the northwest corner of Plant 1 (upgradient of S9 and S14). Actions to address the VOC increases in off-site groundwater will be presented in the Remediation Work Plan.

4.2 FREE PRODUCT DELINEATION (MW-8)

Free-product was observed in monitoring well MW-8 located in the demolished area of Plant 1 (see Figure 2). No free-product was observed during drilling of the well in December 1996, or during sampling of the well in December 1996, February 1997 or June 1997. The free-product was first observed in the well during the September 1997 3rd Quarter groundwater monitoring event. Measurements in the well indicated a free-product thickness of approximately 0.85 feet. By March 1999, the measured product thickness in the well increased to 2.77 feet.

In the spring of 1997, the VOC Recovery System was rehabilitated and recovery wells EW-1, EW-2, and EW-3 were placed on-line (see Figure 2). These wells substantially increased the horizontal gradient in the Plant 1 area, and it is likely that the increased gradient moved product towards well MW-8.

In April 1999, a vacuum truck was used to remove groundwater and product from MW-8 so that the potential recharge free product into the well could be monitored (HLA, 1999). Two months after the removal event, the measured free-product thickness in the well had returned to 1.63 feet, an indication that a significant amount of free product was present in this area.

As part of the Supplemental Investigation, HLA contracted Stratigraphics, Glen Ellyn, Illinois to perform CPT testing to evaluate the horizontal extent of the free phase product in this area. The work was performed during the week of February 18, 2000. The CPT was equipped with traditional cone end bearing resistance, friction resistance, and electrical conductivity instrumentation to evaluate soil stratigraphy. To evaluate if petroleum hydrocarbons are present on the water table, induced ultraviolet (UV) fluorescence measurements were also recorded. A total of eight (8) CPT soundings were perform to a depth of approximately 25 feet below grade at the locations shown on Figure 6. The CPT logs are presented in Appendix E.

The CPT was calibrated by advancing a sounding adjacent to MW-8, where free product could be directly measured and compared to the CPT log (CPT-E). The resulting signature of the free phase product on the water table was an elevated induced UV fluorescence of 600 mV to 800mV combined with a low electrical conductivity. A similar signature was observed on the sounding at CPT-B location. Minimal response to induced UV fluorescence was observed at the remaining six CPT locations. Temporary piezometers, designated PZ-1 and PZ-2, were installed at two of these locations CPT-D and CPT-H to confirm no free product exists were UV fluorescence readings were at background levels (-20mV to 10mV). An additional piezometer, PZ-3, was installed on May 1, 2000, using a Geoprobe. The piezometers consisted of 1.25-inch diameter, 5-foot-long, polyvinyl chloride (PVC) well screens and riser pipe installed so that the well screen intersected the water table. Liquid level measurements were taken from the piezometers after installation and approximately one month later. To date, no free product has been reported accumulating in these piezometers.

As shown on Figure 6, an area of free product approximately 240 feet by 140 feet is present. The CPT logs from CPT-B and CPT-E indicate the thickness of free phase product in soils above the water table is 0.2 feet to 0.6 feet, respectively. The differences are likely due to the capillary effect from the fine

grained, poorly graded sands, which exist at and above the water table. Groundwater level measurements indicate that groundwater initially flows easterly, and then moves northeasterly under the influence of VOC Recovery well EW-2. This raises concern that free product may be migrating towards the property line. Further evaluation of recoverability of this product will be presented in the Remediation Work Plan.

4.3 METALS IN GROUNDWATER

As part of the Supplemental Investigation, low-flow sampling of groundwater for metals and/or cyanide was conducted in areas where previous sampling indicated that metals/cyanide may be of concern. With the exception of the locations described below, all analytical results for dissolved metals in groundwater were below the IDEM Tier II Residential Cleanup Goal. The residential cleanup goals are very conservative for this site because they are based upon groundwater ingestion, which is an incomplete pathway at the site. Complete exposure pathways for the site (e.g., excavation worker direct contact) would result in orders-of-magnitude higher cleanup goals. The conservative nature of the cleanup goals "offsets" the potentially biased low results due to field filtering.

Comparison of analytical data to the very conservative residential cleanup goals indicated that metals in groundwater are not of major concern at the Complex. Metals results exceeded the residential criteria at the following locations:

- Well MW-7, adjacent to Area 14 - Former Painting and Degreasing Operation at the west end of Plant 1. At this location, lead was detected in groundwater at 85 µg/L (versus a criteria of 15 µg/L) and nickel was detected in groundwater at 100 µg/L (versus a criteria of 110 µg/L).

- Dissolved nickel was detected in groundwater at well MW-8 at 150 µg/L (versus a criteria of 100 µg/L). This well is located in the Area 15 - Former Metal Stamping Area.

- Monitoring wells 86-9, 86-12, 86-13, and 86-19, located at a Former Electroplating Area on the south side of Plant 1 and adjacent to a former cyanide tank in Plant 10. At location 13GP006 (adjacent to well 86-9), cyanide was detected at 5,200 µg/L (versus a criteria of 200 µg/L). Also, dissolved cadmium (6.8 µg/L versus a criteria of 5 µg/L at 13GP005) and dissolved nickel (570 µg/L versus a criteria of 100 µg/L at 13GP006) were detected in Geoprobe groundwater samples collected from this area.

Dissolved nickel and cyanide were detected during vertical groundwater profiling of CPT borings advanced along the northern boundary of Plant 1 and Plant 9 (within the capture zone of the VOC Recovery System). Dissolved nickel was detected above criteria in CPT borings 01CPT011 (110 µg/L), 01CPT012 (220 µg/L), and 01CPT013 (450 µg/L) at depths ranging from 30 feet bgs to 37 feet bgs. Also, at location 01CPT011, cyanide was reported at a concentration of 220 µg/L at a depth of 37 feet. Deeper samples from these locations and downgradient shallow monitoring wells were below the residential criteria.

Considering the above comparison, low-flow groundwater sampling was conducted at the Former Painting/Degreasing Operation at the west end of Plant 1 (well MW-7), Former Metal Stamping Area (the two newly installed wells MW-14 and MW-15 immediately downgradient of this area), and the Former Electroplating Area wells (86-9, 86-12, 86-13, and 86-19). This approach addresses the concern for these compounds at source areas.

The low flow groundwater sampling was conducted by HLA during the week of February 18, 2000 and March 10, 2000. Groundwater samples were collected from select wells, detailed above, using low flow sampling techniques. Details of individual well sampling are presented on Groundwater Sample Record Sheets presented in Appendix C. The groundwater samples were analyzed for the cadmium, lead, nickel, and cyanide. Analytical results for the groundwater samples are summarized on Table 3.

On March 29, 2000, additional low-flow groundwater sample for inorganics was conducted by Dames & Moore, Rolling Meadows, Illinois, for Bosch Braking Systems, South Bend, Indiana as part of due diligence for a possible property transfer. Dames & Moore samples all monitoring wells located in eastern portion of Plant 1. Result for this sampling event are also provided on Table 3.

None of the reported concentrations for the low flow, unfiltered samples were above the Tier II Non-Residential Cleanup Goal for the site. Only groundwater from wells 86-9, 86-12, and 86-19 had inorganics above the Tier II Residential Cleanup Goals. These exceedances were at the south end/upgradient side of Plant 1. As presented in the VSI and supported by this additional sampling performed during the supplemental investigation, metals do not appear as a concern in groundwater at the site.

4.4 GEOPROBE SOIL SAMPLING

During the week of February 25, 2000 and on May 1, 2000, soil borings were performed with a Geoprobe. Environmental Quality Laboratory of Sterling Heights, Michigan, provided Geoprobe services for the sampling activities. Sampling locations are shown on Figure 2. Soil boring logs are presented in Appendix B. Each of these areas is discussed below.

4.4.1 TPH in Soils

TPH screening data collected during the VSI showed concentrations in excess of risk-based screening level of 6,000 mg/kg at three AOCs. Analytical results for VOCs in soils at these areas showed no concentrations above the Tier II Cleanup goals. However, additional data was needed to assess whether PNAs were present in the soil.

The TPH analysis measures the total amount of hydrocarbons present in the sample as a single number. While the TPH analysis is useful in assessing whether a release has occurred and the overall magnitude of the release, it is of limited use in assessing the risk posed by the hydrocarbons. This is because petroleum hydrocarbons consist of varying quantities of different hydrocarbons each with differing degrees of toxicity. For the three AOCs described below, the constituents of concern within the petroleum oil is PNAs. Detection and quantification of individual PNAs provides the information necessary to assess risk.

4.4.1.1 Area 4/16 – Former I-Beam Building

Soil samples collected from two soil boring locations exhibited TPH concentrations above the risk-based screening level of 6,000 mg/kg. Geoprobe borings were advanced at approximately one foot offset from the original locations 04GP001 and 16GP005 (see Figure 2). Soil samples were collected from the same intervals of the TPH, and analyzed for PNAs. A comparison of the TPH result to the PNA result is presented in Table 4. PNAs were detected in one of the soil samples 04GP001 (9-11 feet). Benzo(a)anthracene, naphthalene, and phenanthrene were reported at concentrations of 5.7 mg/kg, 8.1 mg/kg, and 6.0 mg/kg, respectively. These concentrations are all below the Tier II Cleanup Goals for the PNAs

4.4.1.2 Area 8 - Former I-Beam Building Stormwater Drainage System

The Area 8 – Former I-Beam Building Storm Water Drainage System, was not accessible for sampling due to ponding of snow melt-water and several rain events. Attempts to sample this area were made on three separate occasions. Considering the TPH versus PNA comparison provided on Table 4, it is likely that PNAs are not present at actionable levels. PNA concentrations in this area can be further evaluated during site-wide confirmatory soil sampling conducted in support of a Certificate-of-Completion.

4.4.1.3 Area 15 – Former Metal Stamping Operation

As shown on Figure 2, three Geoprobe borings were performed at the Area 15 – Former Metal Stamping Operation (15GP004, 15GP014, and 15 GP015). The first boring was advanced at an offset location to original 15GP004 location. A soil sample collected during the VSI at this location 15GP004 (2-4') had concentrations of TPH above the risk-based screening level of 6,000 mg/kg. A soil sample was collected from the same interval (2-4') and analyzed for PNAs. As shown on Table 4, no detectable concentrations of PNAs were reported.

Geoprobe soil borings were also advanced at two step-out locations (approximately 40 feet south and 60 feet south west of 15GP004 locations). These borings were advanced through the concrete to the depth of the water table. Soil samples were collected continuously. Based on visual observation and headspace screening with the photoionization detector (PID), three samples were submitted for laboratory analysis for PNAs from each boring. Only one soil sample [15GP014 (2-4')] had detectable concentration of a PNA compound - naphthalene was detected at 1.2 mg/kg. This concentration is below the Tier II Cleanup Goal.

4.4.2 Area 3/20 – Transportation Maintenance Area

Historically, 1,1-dichloroethane, 1,2-dichloroethene, 1,1,1-trichloroethane, and TCE have been detected in groundwater samples collected from monitoring well MW-10, located immediately downgradient of the Transportation Maintenance Building. A total of six (6) Geoprobe soil borings were advanced in the Maintenance Building to evaluate whether unsaturated soils beneath the building were the source area for the groundwater detections.

Soil samples locations are present on Figure 2. Four (4) Geoprobe borings (designated 03GP084 through 03GP087) were advance around a dry well located in the wash area of the Maintenance Building. Two

(2) Geoprobe borings (03GP088 and 03GP089) were advanced at the location of a former oil changing pit, which as been backfilled and sealed with concrete.

Soil samples were collected continuously from just beneath the concrete floor to the water table. Based on visual observation and headspace screening with the PID, two samples were submitted for laboratory analysis for VOCs from each boring.

Analytical results for soil samples are summarized on Table 5. VOCs were detected in four of the soil samples collected from this area. The duplicate sample of 03GP085 (2-4') had tetrachloroethene (PCE) reported at 0.086 mg/kg, however, PCE was not detected in the primary sample from this interval. The reported concentration of PCE is below the Tier II Cleanup Goal of 8.01 mg/kg. Naphthalene was detected in soil samples 03GP086 (12-14'), 03GP087 (8-10'), and 03GP088 at concentrations of 0.80 mg/kg, 4.4 mg/kg, and 0.050 mg/kg respectively. The naphthalene detections are below the Tier II Cleanup Goals for the site. The results indicate that the soils adjacent to the dry well and the former pit are not a major source for the VOCs detected in groundwater at monitoring well MW-10.

The source for the VOCs detected in monitoring well MW-10 is likely VOCs in unsaturated soil located east of the Maintenance Garage, between the Maintenance Garage and the southwest corner of Plant 4A. Soil management during the construction of Plant 4A in 1998 revealed the presence of VOC-impacted soil in this area (Area A as indicated in HLA, 1998). The types of VOCs detected in excavated soils were similar to those detected in groundwater from well MW-10.

4.4.3 Delineation of Tier II Exceedances in Soil

Geoprobe soil borings were advanced to further define the horizontal extent of Tier II Cleanup Goal exceedances at the Area 5 – Plant 6/16 Former USTs, Area 14 – Former Painting and Degreasing Operations, East (northeast corner of Plant 1), and Area 14 - Former Painting and Degreasing Operations, West (west end of Plant 1). The findings of the soil sampling activities are presented in the following subsections.

4.4.3.1 Area 5 – Plant 6/16 Former USTs

Four additional Geoprobe soil borings were performed in this area (05GP073 through 05GP076). The purpose of these borings was to better define the northern and eastern extent of VOC impacts to soils related to the former USTs located south of Plant 6/16.

Soil samples were collected continuously from just below the concrete floor to the water table. Based on visual observation and headspace screening with the PID, two soil samples were submitted for laboratory analysis for VOCs from each boring.

Analytical results from soil samples submitted for VOC analysis are summarized on Table 5. Volatile (fuel constituents) were detected in all of the soil samples submitted for laboratory analysis for VOCs. Detected concentrations range from the low part per billion to low part per million. All detected constituents were reported at concentrations below the Tier II Cleanup Goals for soils at the site.

All of the data on VOCs in soils collected during the VSI and the Supplemental Investigation in this area is presented on Figure 7. As shown on the figure, areas of unsaturated soil exceeding the Tier II Cleanup Goal are of limited extent and do appear to extend beneath the southern portion of Plant 6/16.

4.4.3.2 Area 14 – Former Painting and Degreasing Operations, East

One Geoprobe soil boring was performed in this area to supplement information on VOCs in soils adjacent to the former painting and degreasing operation in the northeast corner of Plant 1. This boring (14GP033) was positioned approximately 50 feet southwest of 14GP016 location (see Figure 8).

Soil samples were collected continuously from just below the concrete floor to the water table. Based on visual observation and headspace screening with the PID, three soil samples were submitted for laboratory analysis for VOCs from the boring.

Analytical results from soil samples submitted for VOC analysis are summarized on Table 5. TCE was detected in all three soil samples at concentrations ranging from 0.76 mg/kg at 14GP033 (8-10') to 2.6 mg/kg 14GP033 (14-16'). Naphthalene was also detected in one soil sample 14GP033 (14-16') at a concentration of 0.66 mg/kg. The duplicate sample for this interval had only TCE reported at a concentration of 1.2 mg/kg.

All of the data on VOCs in soils collected during the VSI and the Supplemental Investigation in this area is presented on Figure 8. The Tier II Cleanup Goal for TCE was exceeded in one soil sample the duplicate for 14GP016 (13-15'). The primary sample from this interval was reported at a concentration below the Tier II Cleanup Goal for TCE, 25.73 mg/kg. The need for remedial action in this area will be addressed in the Remediation Work Plan.

4.4.3.3 Area 14 - Painting and Degreasing Area, West

During the VSI, metals in soils were found at concentrations above the Tier II Cleanup Goal for the site in one soil sample from Geoprobe soil boring 14GP026. This boring was located at a painting/degreasing area at the west end of Plant 1. Four (4) Geoprobe soil borings were perform evaluate the horizontal extent of metals impacts to soils. One Geoprobe was advanced adjacent to 14GP026 to confirm the exceedance.

Soil samples were collected continuously from just below the concrete floor to the water table. Two soil samples from each boring were submitted for laboratory analysis of cadmium, lead and nickel. One of the sample depths corresponded to the (2-4'), interval which exceeded the Tier II Cleanup Goal at 14GP026. The second sample for laboratory analysis was below this depth, to provide information on the vertical extent of any Tier II Cleanup Goal exceedances.

Analytical results from soil samples submitted for metals analysis are summarized on Table 6. Only lead in the confirmatory sample collected adjacent to 14GP026 exceeded the Tier II Cleanup Goals. The results, illustrated on Figure 9, indicate that the elevated metals impacts reported in soil sample 14GP026 (2-4') appear to be isolated to shallow soils near this boring. The need for remedial action in this area will be addressed in the Remediation Work Plan.

5. CONCLUSIONS

Conclusions from the Supplemental Investigation are as follows:

- Extraction wells EW-1 and EW-2, located along Bendix Drive just north of Plant 1, are effectively containing groundwater in the lower portion of the shallow aquifer where necessary.

- Groundwater may not be fully contained in the upper portion of the shallow aquifer along Bendix Drive, specifically at the northeast and northwest corners of Plant 1.

- An area of free product, approximately 240-feet long by 140-feet wide, is present in Area 15 - Former Metal Stamping. The free product is 0.2 to 0.6 feet thick. Free-product recovery of this area will be addressed in the Remediation Work Plan.

- As presented in the VSI and supported by this Supplemental Investigation, metals do not appear as a concern in groundwater at the site.

- PNA results for soil samples collected from AOCs where TPH was the only compound of concern were below the IDEM Tier II Cleanup Goals established for the site.

- Soils beneath the Transportation Area Maintenance Garage do not appear to be a significant source for the chemical constituents detected in groundwater at downgradient monitoring well MW-10 and nearby Geoprobe groundwater samples. The source appears to be VOC-impacted soil encountered during the Western Carbon Brake Expansion.

- The extent of VOCs in unsaturated soils exceeding the Tier II Cleanup Goals have been delineated at Area 5 – Plant 6/16 and Area 14 – Painting and Degreasing Area, East. The need for remedial actions in these areas will be addressed in the Remediation Work Plan.

- The extent of metals in unsaturated soil exceeding the Tier II Cleanup Goal at Area 14 - Former Painting and Degreasing Area in the west end of Plant 1 are isolated to shallow soils near a single boring location. Further evaluation of the need for remediation in this area will be presented in the Remediation Work Plan.

6. REFERENCES

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Table 1

Groundwater Elevations - March 2000

VSI Supplemental Investigation

Honeywell Industrial Complex, South Bend, Indiana

PERIOD: From 03/06/2000 thru 03/07/2000 - Inclusive

SITE	DATE	MP ELEVATION (feet)	TIME	DEPTH TO WATER (feet)	FLOATING PRODUCT THICKNESS (feet)	WATER ELEV. (feet)
Shallow Monitoring Wells:						
86-2	3/6/2000	714.98	19:17	18.22	0.00	696.76
86-4	3/6/2000	715.09	19:30	18.10	0.00	696.99
86-5	3/6/2000	715.04	19:21	18.09	0.00	696.95
86-7	3/6/2000	714.15	16:57	16.33	0.00	697.82
86-8	3/6/2000	714.62	16:58	16.75	0.00	697.87
86-9	3/7/2000	715.25	08:18	17.42	0.00	697.83
86-10	3/7/2000	715.06	08:10	17.40	0.00	697.66
86-11	3/7/2000	715.14	08:02	17.57	0.00	697.57
86-12	3/7/2000	715.71	08:04	18.13	0.00	697.58
86-13	3/7/2000	714.75	08:08	17.04	0.00	697.71
86-15	3/7/2000	715.06	07:57	17.68	0.00	697.38
86-19	3/7/2000	714.33	08:14	17.49	0.00	696.84
7-25	3/6/2000	720.47	10:13	20.87	0.00	699.60
9-33	3/6/2000	716.20	13:13	19.31	0.00	696.89
MW-1	3/6/2000	720.88	18:59	18.59	0.00	702.29
MW-2	3/6/2000	713.93	17:59	12.57	0.00	701.36
MW-3	3/6/2000	713.10	18:10	14.14	0.00	698.96
MW-4	3/6/2000	712.66	19:32	16.24	0.00	696.42
MW-5	3/6/2000	713.21	19:37	16.67	0.00	696.54
MW-6	3/6/2000	709.44	19:10	15.65	1.75	693.79
MW-7	3/6/2000	712.59	19:30	15.60	0.00	696.99
MW-8	3/6/2000	712.79	17:10	16.72	1.58	696.07
MW-9	3/6/2000	710.90	13:16	16.34	0.00	694.56
MW-11	3/6/2000	717.74	17:54	13.24	0.00	704.50
MW-12	3/6/2000	711.58	18:02	11.17	0.00	700.41
MW-13	3/6/2000	712.55	13:12	15.71	0.00	696.84
MW-14	3/6/2000	712.63	17:20	15.65	0.00	696.98
MW-15	3/6/2000	712.72	17:25	15.96	0.00	696.76
OW1	3/6/2000	711.48	16:50	14.69	0.00	696.79
OW2	3/6/2000	711.45	16:55	14.74	0.00	696.71
S3	3/6/2000	716.65	13:14	21.26	0.00	695.39
S4A	3/6/2000	711.37	16:45	14.71	0.00	696.66
S5	3/6/2000	712.83	17:30	14.25	0.00	698.58
S8	3/6/2000	714.65	13:35	18.67	0.00	695.98
S9	3/6/2000	714.17	13:52	18.34	0.00	695.83
S12	3/6/2000	721.45	18:14	20.16	0.00	701.29
S14	3/6/2000	711.86	13:40	16.57	0.00	695.29
S15	3/6/2000	714.37	13:19	19.78	0.00	694.59
S16	3/6/2000	716.18	15:45	19.12	0.00	697.06
S17	3/6/2000	716.97	14:58	19.84	0.00	697.13
S18	3/6/2000	715.41	17:40	17.20	0.00	698.21
S19	3/6/2000	723.38	12:40	20.47	0.00	702.91
S20	3/6/2000	709.97	14:32	16.24	0.00	693.73
S21	3/6/2000	711.33	14:40	16.96	0.00	694.37
S22	3/6/2000	709.33	14:23	15.90	0.00	693.43
S23	3/6/2000	710.24	14:20	19.89	0.00	690.35
S24	3/6/2000	713.03	14:44	17.47	0.00	695.56
S25	3/6/2000	710.60	14:28	16.83	0.00	693.77
S26	3/6/2000	714.50	15:50	18.95	0.00	695.55
S27	3/6/2000	715.40	14:48	20.02	0.00	695.38
S28	3/6/2000	714.48	15:32	17.47	0.00	697.01

Table 1

Groundwater Elevations - March 2000

VSI Supplemental Investigation

Honeywell Industrial Complex, South Bend, Indiana

PERIOD: From 03/06/2000 thru 03/07/2000 - Inclusive

SITE	DATE	MP ELEVATION (feet)	TIME	DEPTH TO WATER (feet)	FLOATING PRODUCT THICKNESS (feet)	WATER ELEV. (feet)
Intermediate Monitoring Wells (50 - 75 feet)						
7-50	3/6/2000	719.84	10:15	20.38	0.00	699.46
8D	3/6/2000	714.56	15:28	18.17	0.00	696.39
D8	3/6/2000	717.07	15:40	20.49	0.00	696.58
I1	3/6/2000	711.58	14:02	19.50	0.00	692.08
Deep Monitoring Wells (75 - 210 feet)						
D3	3/6/2000	714.45	13:30	18.68	0.00	695.77
D4	3/6/2000	717.85	13:49	21.42	0.00	696.43
D5	3/6/2000	712.07	13:42	15.88	0.00	696.19
D7	3/6/2000	713.83	13:45	16.86	0.00	696.97
D9	3/6/2000	717.00	18:08	18.08	0.00	698.92
D12	3/6/2000	710.35	14:10	24.60	0.00	685.75
1D	3/6/2000	714.17	16:56	16.84	0.00	697.33
2D	3/6/2000	715.36	16:10	18.47	0.00	696.89
3D	3/6/2000	712.91	13:15	19.21	0.00	693.70
4D	3/6/2000	711.68	17:35	23.94	0.00	687.74
5D	3/6/2000	712.01	14:36	24.22	0.00	687.79
7D	3/6/2000	714.85	15:25	18.76	0.00	696.09
Recovery Wells						
Former VOC System:						
RW-7	3/6/2000	710.73	16:30	14.05	0.00	696.68
RW-14	3/6/2000	712.63	15:20	15.76	0.00	696.87
RW-16	3/6/2000	712.51	15:15	15.83	0.00	696.68
RW-17	3/6/2000	712.78	15:10	16.22	0.00	696.56
Naphtha System:						
E3	3/6/2000	714.50	18:30	22.42	1.72	692.08
RWB6	3/6/2000	715.80	18:22	19.89	0.00	695.91
RWB16	3/6/2000	715.30	18:39	19.72	0.00	695.58
RWB21	3/6/2000	717.62	18:20	20.93	0.00	696.69
RWB22	3/6/2000	715.11	18:27	19.85	0.38	695.26
RWB23	3/6/2000	713.01	18:50	18.68	0.00	694.33
VOC System:						
EW-1	3/6/2000	712.26	20:20	20.20	0.00	692.06
EW-2	3/6/2000	711.58	16:35	19.92	0.00	691.66
EW-3	3/6/2000	712.59	15:00	17.53	0.00	695.06

Groundwater Elevations Relative to Mean Sea Level

Measurements taken with an electronic water level indicator

Table 1

Groundwater Elevations - March 2000

VSI Supplemental Investigation

Honeywell Industrial Complex, South Bend, Indiana

PERIOD: From 03/06/2000 thru 03/07/2000 - Inclusive

SITE	DATE	MP ELEVATION (feet)	TIME	DEPTH TO WATER (feet)	FLOATING PRODUCT THICKNESS (feet)	WATER ELEV. (feet)
Intermediate Monitoring Wells (50 - 75 feet)						
7-50	3/6/2000	719.84	10:15	20.38	0.00	699.46
8D	3/6/2000	714.56	15:28	18.17	0.00	696.39
D8	3/6/2000	717.07	15:40	20.49	0.00	696.58
I1	3/6/2000	711.58	14:02	19.50	0.00	692.08
Deep Monitoring Wells (75 - 210 feet)						
D3	3/6/2000	714.45	13:30	18.68	0.00	695.77
D4	3/6/2000	717.85	13:49	21.42	0.00	696.43
D5	3/6/2000	712.07	13:42	15.88	0.00	696.19
D7	3/6/2000	713.83	13:45	16.86	0.00	696.97
D9	3/6/2000	717.00	18:08	18.08	0.00	698.92
D12	3/6/2000	710.35	14:10	24.60	0.00	685.75
1D	3/6/2000	714.17	16:56	16.84	0.00	697.33
2D	3/6/2000	715.36	16:10	18.47	0.00	696.89
3D	3/6/2000	712.91	13:15	19.21	0.00	693.70
4D	3/6/2000	711.68	17:35	23.94	0.00	687.74
5D	3/6/2000	712.01	14:36	24.22	0.00	687.79
7D	3/6/2000	714.85	15:25	18.76	0.00	696.09
Recovery Wells						
Former VOC System:						
RW-7	3/6/2000	710.73	16:30	14.05	0.00	696.68
RW-14	3/6/2000	712.63	15:20	15.76	0.00	696.87
RW-16	3/6/2000	712.51	15:15	15.83	0.00	696.68
RW-17	3/6/2000	712.78	15:10	16.22	0.00	696.56
Naphtha System:						
E3	3/6/2000	714.50	18:30	22.42	1.72	692.08
RWB6	3/6/2000	715.80	18:22	19.89	0.00	695.91
RWB16	3/6/2000	715.30	18:39	19.72	0.00	695.58
RWB21	3/6/2000	717.62	18:20	20.93	0.00	696.69
RWB22	3/6/2000	715.11	18:27	19.85	0.38	695.26
RWB23	3/6/2000	713.01	18:50	18.68	0.00	694.33
VOC System:						
EW-1	3/6/2000	712.26	20:20	20.20	0.00	692.06
EW-2	3/6/2000	711.58	16:35	19.92	0.00	691.66
EW-3	3/6/2000	712.59	15:00	17.53	0.00	695.06

Groundwater Elevations Relative to Mean Sea Level

Measurements taken with an electronic water level indicator

Table 2
Analytical Summary - VOCs in Groundwater
VSI Supplemental Investigation
Honeywell Industrial Complex
South Bend, Indiana

PERIOD: From 04/15/2000 thru 05/01/2000 - Inclusive
SAMPLE TYPE Water

CONSTITUENT	SITE DATE	1996 VRP Tier II Non-Residential	1996 VRP Tier II Residential	D8 04/15/2000	MW-10 05/01/2000	MW-14 04/15/2000	MW-15 04/15/2000	S21 04/15/2000	S24 04/15/2000
1,1-Dichloroethane	(ug/l)	10220	640	<5	**44**	<5	**51**	<5	<5
1,1-Dichloroethene	(ug/l)	7	7	<5	<5	**[24]**	**[8.8]**	<5	<5
trans-1,2-Dichloroethene	(ug/l)	2040	100	**8**	**15**	<5	**5.2**	**17**	**170**
cis-1,2-Dichloroethene	(ug/l)	1022	70	**51**	**360**	**92**	**91**	**23**	**110**
1,1,1-Trichloroethane	(ug/l)	9198	200	<5	**150**	**24**	**56**	<5	<5
Trichloroethene	(ug/l)	260	5	<5	**[410]**	**200**	**220**	**33**	**26**

Only Constituents Detected are Shown.
Criteria Comparison 1996 VRP Tier II Criteria

--- = Not analyzed

Table 2
Analytical Summary - VOCs in Groundwater
VSI Supplemental Investigation
Honeywell Industrial Complex
South Bend, Indiana

PERIOD: From 04/15/2000 thru 05/01/2000 - Inclusive
SAMPLE TYPE Water

CONSTITUENT	SITE DATE	1996 VRP Tier II Non-Residential	1996 VRP Tier II Residential	S26 04/15/2000
1,1-Dichloroethane	(ug/l)	10220	640	<5
1,1-Dichloroethene	(ug/l)	7	7	<5
trans-1,2-Dichloroethene	(ug/l)	2040	100	<5
cis-1,2-Dichloroethene	(ug/l)	1022	70	**12**
1,1,1-Trichloroethane	(ug/l)	9198	200	<5
Trichloroethene	(ug/l)	260	5	**41**

Only Constituents Detected are Shown.
Criteria Comparison 1996 VRP Tier II Criteria

--- = Not analyzed

TABLE 3
ANALYTICAL SUMMARY - INORGANICS IN GROUNDWATER
VSI SUPPLEMENTAL INVESTIGATION
HONEYWELL INDUSTRIAL COMPLEX, SOUTH BEND, INDIANA

			Sampled by HLA for Honeywell								
		Well Location:	86-9 (µg/L)	86-12 (µg/L)	86-13 (µg/L)	86-19 (µg/L)	MW-7 (µg/L)	MW-7 (µg/L) (Dup)	MW-14 (µg/L)	MW-15 (µg/L)	MW-15 (µg/L) (Dup)
		Date Sampled:	2/16/00	2/16/00	2/16/00	2/17/00	2/17/00	2/16/00	3/7/00	3/7/00	3/7/00
Constituents	Tier II Non-Residential (µg/L)	Tier II Residential (µg/L)									
Cyanide, total	2,044	200	200	< 50	70	< 50	< 50	< 50	< 50	< 50	< 50
Cadmium, total	51.1	50	< 0.2	1.1	0.3	22	2.1	1.2	< 0.2	0.4	0.3
Lead, total	15	15	1.5	3.9	2.9	2.0	6.6	4.0	2.2	2.0	1.5
Nickel, total	2,044	100	< 20	22	< 20	247	< 20	22	22	< 20	< 20

			Sampled by Dames & Moore for Bosch												
		Well Location:	86-7 (µg/L)	86-7 (µg/L) (Blank)[2]	86-8 (µg/L)	86-8 (µg/L) (Blank)	86-9 (µg/L)	86-9 (µg/L) (Blank)	86-10 (µg/L)	86-11 (µg/L)	86-12 (µg/L)	86-13 (µg/L)	86-15 (µg/L)	86-19 (µg/L)	MW-7 (µg/L)
		Date Sampled:	3/29/00	3/29/00	3/29/00	3/29/00	3/29/00	3/29/00	3/29/00	3/29/00	3/29/00	3/29/00	3/29/00	3/29/00	3/29/00
Constituents	Tier II Non-Residential (µg/L)	Tier II Residential (µg/L)													
Arsenic, total	50	50	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	4	5	14	< 2.0	< 2.0	< 2.0	< 2.0
Barium, total	7,154	2,000	73	12	98	82	60	23	144	243	91	58	129	103	46
Cadmium, total	51.1	5	< 1.0	< 1.0	30	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium[1], total	511	100	< 1.0	< 1.0	4.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	189	3.0	< 1.0	< 1.0	1.0
Copper, total	3,800	1,300	< 1.0	30	8.0	30	< 1.0	22	< 1.0	< 1.0	16	< 1.0	1.0	2.0	2.0
Cyanide, total	2,044	200	< 5.0	< 5.0	9.0	< 5.0	336	< 5.0	< 5.0	< 5.0	19	125	< 5.0	260	< 5.0
Lead, total	15	15	< 2.0	< 2.0	< 2.0	4.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Mercury	6.1	2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel, total	2,044	100	4.0	< 1.0	8.0	1.0	2.0	< 1.0	< 1.0	< 1.0	15	2.0	3.0	41	5.0
Selenium	511	50	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Silver	511	152	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Notes: Unfiltered samples collected by low-flow techniques.

[1] Clean Up Goal shown is the lower of Chromium III or Chromium VI

[2] Decontaminated tubing and collected blank prior to sampling denoted well.

Denotes exceedance of Tier II Residential Cleanup Goal; no constituents exceeded the Tier II Non-Residential Cleanup Goals.

Table 4
Analytical Summary - TPH/DRO & PNA Comparison
Area 4/16 and Area 15
VSI Supplemental Investigation
Honeywell Industrial Complex
South Bend, Indiana

PERIOD: From 10/14/1996 thru 02/23/2000 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT	SITE DATE DEPTH (ft) RESULT TYPE	1996 VRP Tier II Non-Residential	04GP001 10/22/1996 11.00 Primary	04GP001 02/22/2000 11.00 Primary	16GP005 10/14/1996 16.00 Primary	16GP005 02/22/2000 16.00 Primary	15GP004 11/04/1996 4.00 Primary	15GP004 02/23/2000 4.00 Primary	15GP004 02/23/2000 4.00 Duplicate 1
TPH/DRO	(mg/kg)	6000	[7900]	---	[6400]	---	[7000]PI	---	---
Benzo (a) anthracene	(mg/kg)	103.8	---	5.7	---	<0.33	---	<0.33	<0.33
Fluoranthene	(mg/kg)	10000	---	8.1	---	<0.33	---	<0.33	<0.33
Naphthalene	(mg/kg)	10000	---	<12	---	<1.3	---	<0.33	<3.5
Phenanthrene	(mg/kg)	10000	---	6.0	---	<0.33	---	<0.33	<0.33

Only Constituents Detected are Shown.
Criteria Comparison 1996 VRP Tier II Non-Residential

---=Not analyzed

Table 4
Analytical Summary - TPH/DRO & PNA Comparison
Area 4/16 and Area 15
VSI Supplemental Investigation
Honeywell Industrial Complex
South Bend, Indiana

PERIOD: From 10/14/1996 thru 02/23/2000 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT	SITE DATE DEPTH (ft) RESULT TYPE	1996 VRP Tier II Non-Residential	15GP014 02/23/2000 4.00 Primary	15GP014 02/23/2000 12.00 Primary	15GP014 02/23/2000 16.00 Primary	15GP015 02/23/2000 4.00 Primary	15GP015 02/23/2000 12.00 Primary	15GP015 02/23/2000 16.00 Primary
TPH/DRO	(mg/kg)	6000	—	—	—	—	—	—
Benzo (a) anthracene	(mg/kg)	103.8	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Fluoranthene	(mg/kg)	10000	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Naphthalene	(mg/kg)	10000	1.2	<0.33	<0.33	<0.79	<0.33	<0.33
Phenanthrene	(mg/kg)	10000	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33

Only Constituents Detected are Shown.
Criteria Comparison 1996 VRP Tier II Non-Residential

—=Not analyzed

Table 5
Analytical Summary - VOCs in Soil
Area 3/20, Area 5, and Area 14
VSI Supplemental Investigation
Honeywell Industrial Complex
South Bend, Indiana

PERIOD: From 02/23/1900 thru 02/23/2000 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT	SITE DATE DEPTH (ft) RESULT TYPE	1996 VRP Tier II Non-Residential	03GP084 02/22/2000 2.00 Primary	03GP084 02/22/2000 6.00 Primary	03GP085 02/22/2000 4.00 Primary	03GP085 02/22/2000 4.00 Duplicate 1	03GP085 02/22/2000 6.00 Primary	03GP086 02/22/2000 6.00 Primary	03GP086 02/22/2000 14.00 Primary
Toluene	(mg/kg)	1000	<0.05	<0.05	<0.05	<0.05	<0.05	<0.3	<0.3
Ethyl benzene	(mg/kg)	1000	<0.01	<0.01	<0.01	<0.01	<0.01	<0.06	<0.06
Xylene (total)	(mg/kg)	1000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.6	<0.6
Isopropylbenzene	(mg/kg)	1000	<0.01	<0.01	<0.01	<0.01	<0.01	<0.06	<0.06
n-Propylbenzene	(mg/kg)	1000	<0.01	<0.01	<0.01	<0.01	<0.01	<0.06	<0.06
1,3,5-Trimethylbenzene	(mg/kg)	1000	<0.01	<0.01	<0.01	<0.01	<0.01	<0.06	<0.06
1,2,4-Trimethylbenzene	(mg/kg)	1000	<0.01	<0.01	<0.01	<0.01	<0.01	<0.06	<0.06
Naphthalene	(mg/kg)	10000	<0.05	<0.05	<0.05	<0.05	<0.05	<0.3	**0.80**
2-Methylnaphthalene	(mg/kg)	10000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.6	<0.6
Tetrachloroethene	(mg/kg)	8.01	<0.05	<0.05	<0.05UJ	**0.086J**	<0.05	<0.3	<0.3
Trichloroethene	(mg/kg)	25.73	<0.05	<0.05	<0.05	<0.05	<0.05	<0.3	<0.3

Only Constituents Detected are Shown.
Criteria Comparison 1996 VRP Tier II Non-Residential

— = Not analyzed

Table 5
Analytical Summary - VOCs in Soil
Area 3/20, Area 5, and Area 14
VSI Supplemental Investigation
Honeywell Industrial Complex
South Bend, Indiana

PERIOD: From 02/23/1900 thru 02/23/2000 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT	SITE DATE DEPTH (ft) RESULT TYPE	1996 VRP Tier II Non-Residential	03GP087 02/22/2000 4.00 Primary	03GP087 02/22/2000 10.00 Primary	03GP088 05/1/2000 4.00 Primary	03GP088 05/1/2000 12.00 Primary	03GP088 05/1/2000 12.00 Duplicate	03GP089 05/1/2000 2.00 Primary	03GP089 05/1/2000 14.00 Primary
Toluene	(mg/kg)	1000	<0.4	<0.3	<0.050	<0.050	<0.050	<0.050	<0.050
Ethyl benzene	(mg/kg)	1000	<0.07	<0.06	<0.010	<0.010	<0.010	<0.010	<0.010
Xylene (total)	(mg/kg)	1000	<0.7	<0.6	<0.100	<0.100	<0.100	<0.100	<0.100
Isopropylbenzene	(mg/kg)	1000	<0.07	<0.06	<0.010	<0.010	<0.010	<0.010	<0.010
n-Propylbenzene	(mg/kg)	1000	<0.07	<0.06	<0.010	<0.010	<0.010	<0.010	<0.010
1,3,5-Trimethylbenzene	(mg/kg)	1000	<0.07	<0.06	<0.010	<0.010	<0.010	<0.010	<0.010
1,2,4-Trimethylbenzene	(mg/kg)	1000	<0.07	<0.06	<0.010	<0.010	<0.010	<0.010	<0.010
Naphthalene	(mg/kg)	10000	<0.4	4.4	<0.050	<0.050	<0.050	<0.050	<0.050
2-Methylnaphthalene	(mg/kg)	10000	<0.7	<0.6	<0.100	<0.100	<0.100	<0.100	<0.100
Tetrachloroethene	(mg/kg)	8.01	<0.4	<0.3	<0.050	<0.050	<0.050	<0.050	0.05
Trichloroethene	(mg/kg)	25.73	<0.4	<0.3	<0.050	<0.050	<0.050	<0.050	<0.050

Only Constituents Detected are Shown.
--- = Not analyzed
Criteria Comparison 1996 VRP Tier II Non-Residential

Table 5
Analytical Summary - VOCs in Soil
Area 3/20, Area 5, and Area 14
VSI Supplemental Investigation
Honeywell Industrial Complex
South Bend, Indiana

PERIOD: From 02/23/1900 thru 02/23/2000 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT	SITE DATE DEPTH (ft) RESULT TYPE	1996 VRP Tier II Non-Residential	05GP073 02/22/2000 12.00 Primary	05GP073 02/22/2000 4.00 Primary	05GP073 02/22/2000 16.00 Primary	05GP074 02/22/2000 8.00 Primary	05GP075 02/23/2000 12.00 Primary	14GP033 02/23/2000 16.00 Primary	14GP033 02/23/2000 14.00 Primary
Toluene	(mg/kg)	1000	<0.3	<0.6	<0.3	<0.05	<0.3	**0.58**	<0.05
Ethyl benzene	(mg/kg)	1000	**0.65**	**4.6**	**2.9**	<0.01	<0.06	**0.91**	**0.024**
Xylene (total)	(mg/kg)	1000	**5.2**	**28**	**8.1**	<0.1	<0.6	**3.5**	<0.1
Isopropylbenzene	(mg/kg)	1000	<0.06	**1.9**	**1.1**	<0.01	<0.06	**0.66**	<0.01
n-Propylbenzene	(mg/kg)	1000	<0.06	**2.6**	**1.8**	<0.01	<0.06	**1.9**	**0.013**
1,3,5-Trimethylbenzene	(mg/kg)	1000	**2.2**	**6.3**	**2.7**	<0.01	**0.099**	**6.0**	**0.077**
1,2,4-Trimethylbenzene	(mg/kg)	1000	**3.2**	**9.0**	**5.5**	0.015	**0.29**	**17**	**0.027**
Naphthalene	(mg/kg)	10000	<0.3	<0.6	<0.3	<0.05	**0.49**	**1.5**	<0.05
2-Methylnaphthalene	(mg/kg)	10000	<0.6	<1	<0.6	<0.1	<0.6	**1.2**	<0.1
Tetrachloroethene	(mg/kg)	8.01	<0.3	<0.6	<0.3	<0.05	<0.3	<0.3	<0.05
Trichloroethene	(mg/kg)	25.73	<0.3	<0.6	<0.3	<0.05	**<0.3**	<0.3	<0.05

Only Constituents Detected are Shown.
--- = Not analyzed
Criteria Comparison 1996 VRP Tier II Non-Residential

Table 6
Analytical Summary - Inorganics in Soils
Plant 1 - Former Painting/Degreasing Operations
VSI Supplemental Investigation
Honeywell Industrial Complex
South Bend, Indiana

PERIOD: From 12/12/1996 thru 05/07/2000 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT	SITE DATE DEPTH (ft) RESULT TYPE	1996 VRP Tier II Non-Residential	14GP026 05/01/00 4.00 Primary	14GP026 05/01/00 4.00 Duplicate	14GP034 02/21/2000 4.00 Primary	14GP034 02/21/2000 14.00 Primary	14GP035 02/21/2000 12.00 Primary	14GP035 02/22/2000 4.00 Primary	14GP036 02/21/2000 4.00 Primary
Cadmium, Total	(mg/kg)	730.0	**372**	**369**	<1	<1	**1.6**	**27**	<1
Lead, Total	(mg/kg)	400	**1410**	**1120**	<5	<5	**19**	**229**	**34**
Nickel, Total	(mg/kg)	10000	**20**	**5.2**	**3.6**	**5.2**	**5.7**	**15**	**3.4**
Cyande	(mg/kg)	10000	**7.1**	**7.8**	- - -	- - -	- - -	- - -	- - -

Only Constituents Detected are Shown.
Criteria Comparison 1996 VRP Tier II Non-Residential

The following qualifier(s) exist: J, U ---=Not analyzed

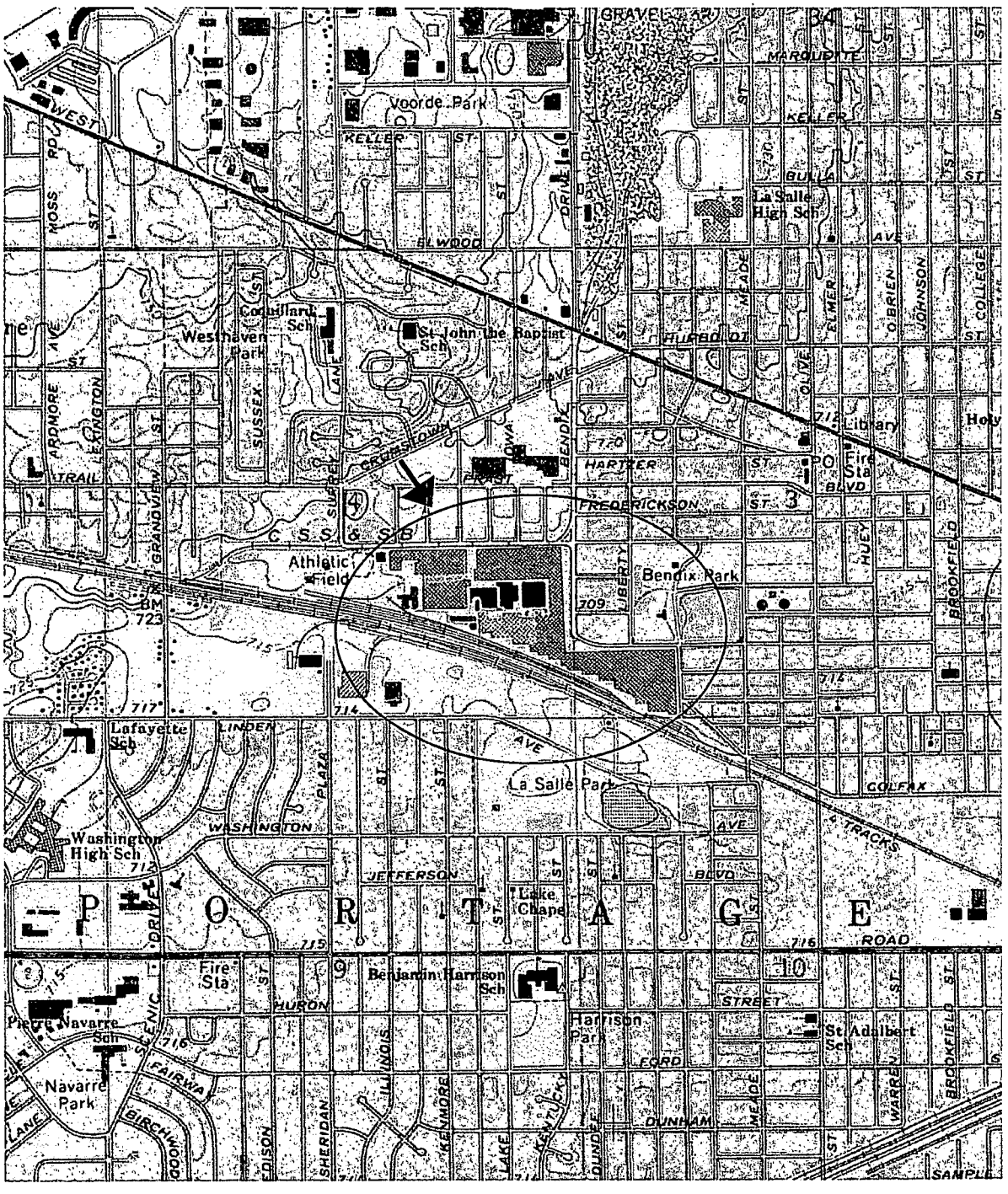
Table 6
Analytical Summary - Inorganics in Soils
Plant 1 - Former Painting/Degreasing Operations
VSI Supplemental Investigation
Honeywell Industrial Complex
South Bend, Indiana

PERIOD: From 12/12/1996 thru 05/07/2000 - Inclusive
SAMPLE TYPE: Soil

CONSTITUENT	SITE DATE DEPTH (ft) RESULT TYPE	1996 VRP Tier II Non-Residential	14GP036 02/21/2000 8.00 Primary	14GP037 02/22/2000 4.00 Primary	14GP037 02/22/2000 10.00 Primary	14GP037 02/22/2000 10.00 Duplicate 1
Cadmium, Total	(mg/kg)	730.0	<1	**6.3**	**1.3J**	<1UJ
Lead, Total	(mg/kg)	400	<5	**144**	**41J**	<5UJ
Nickel, Total	(mg/kg)	10000	**3.8**	**6.6**	**6.7J**	**3.7J**
Cyande	(mg/kg)	10000	---	---	---	---

Only Constituents Detected are Shown.
Criteria Comparison 1996 VRP Tier II Non-Residential

The following qualifier(s) exist: J, U —=Not analyzed



Taken from the South Bend, Indiana 7.5 Series U.S.G.S. Topographic Quadrangle Map

Figure 1
Site Location Map
VSI Supplemental Investigation
Honeywell Industrial Complex
South Bend, Indiana

Harding Lawson Associates

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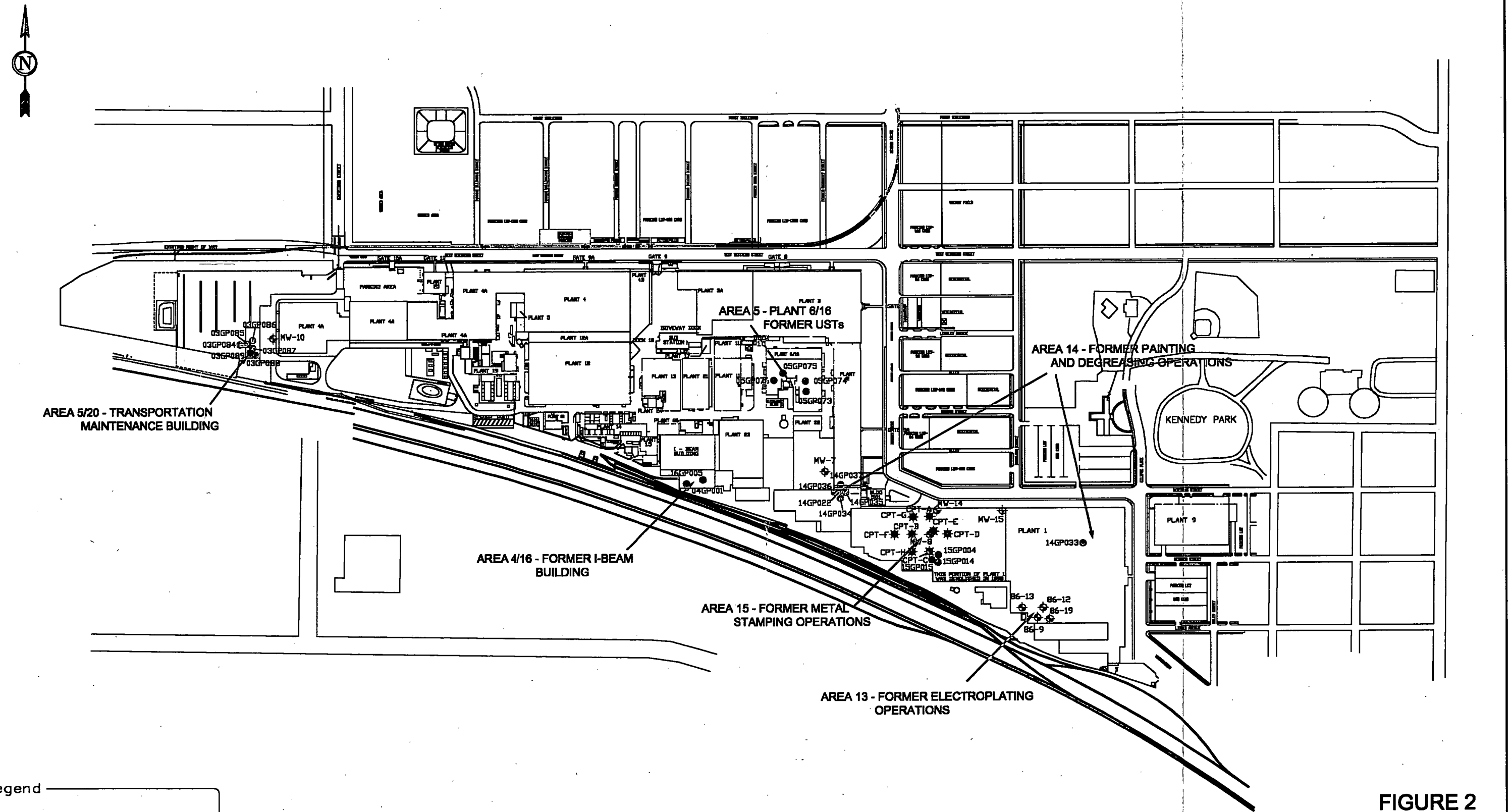


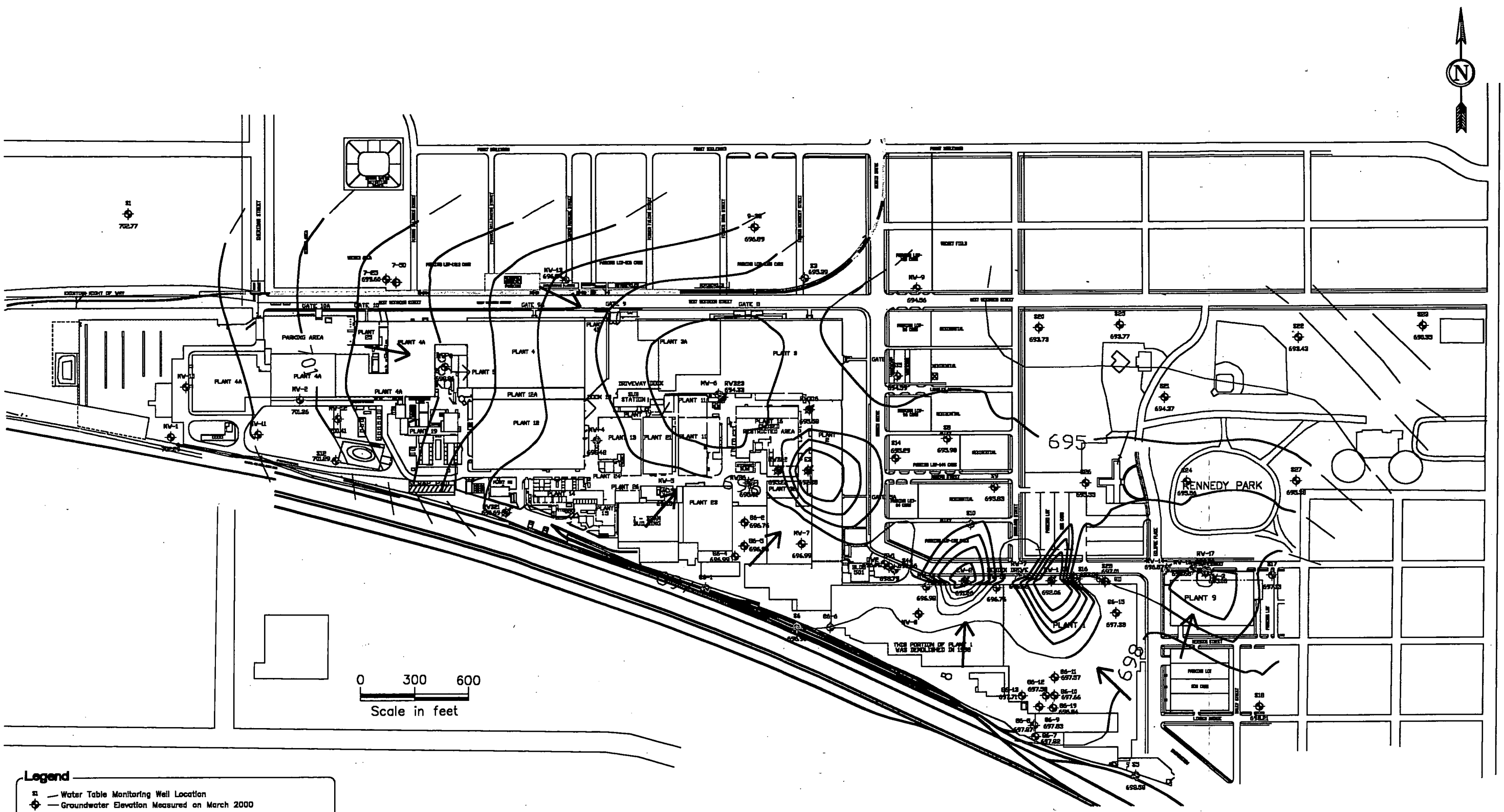
Legend

- Geoprobe Soil Sampling Location
- Cone Penetrometer Testing Location
- Water Table Monitoring Well Location

0 300 600
Scale in feet

FIGURE 2
SAMPLING LOCATION MAP
VSI SUPPLEMENTAL INVESTIGATION
HONEYWELL INDUSTRIAL COMPLEX
SOUTH BEND, INDIANA

Harding Lawson Associates



Legend

- S1 — Water Table Monitoring Well Location
- 702.72 — Groundwater Elevation Measured on March 2000
- RV216 — Recovery Wells
- 693.24 — Groundwater Elevation Measured on March 2000
- 696 — Groundwater Potentiometric Contour, feet above Mean Sea Level
- Groundwater Flow Direction

FIGURE 3
POTENTIOMETRIC SURFACE MAP, SHALLOW WELLS, MARCH 2000
VSI SUPPLEMENTAL INVESTIGATION
HONEYWELL INDUSTRIAL COMPLEX
SOUTH BEND, INDIANA

Harding Lawson Associates

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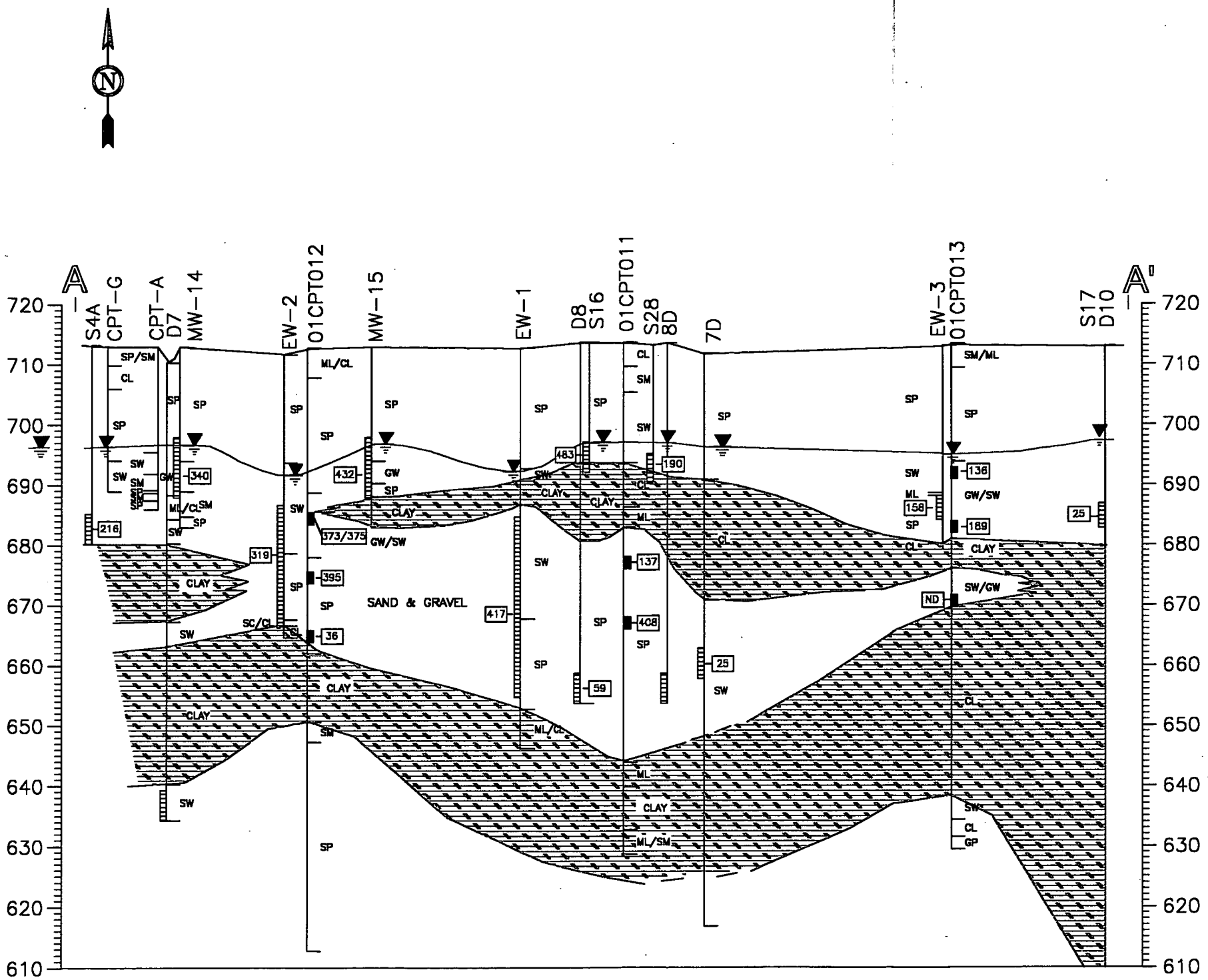
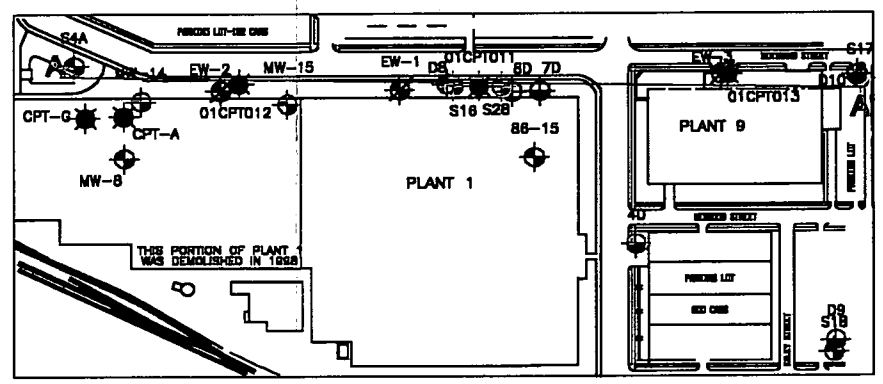


0 100 200

Scale in feet
12 x Vertical Ex.

Legend

- Cone Penetrometer Sampling Location
- Monitoring Well Screened Interval
- Groundwater Elevation measured in March 2000
- 136 — Total VOC concentrations in groundwater most recent sampling results (ug/l).
- NOTE: Extraction Well (EW-3) was temporarily off-line when water level measurements were recorded.
- 86-15 — Shallow Monitoring Well Location
- 7D — Deep Monitoring Well Location
- CPT-A — Cone Penetrometer Testing Location
- EW-1 — VOC Extraction Well Location



NOT TO SCALE

FIGURE 4
VOC DISTRIBUTION IN SHALLOW FLOW SYSTEM
VSI SUPPLEMENTAL INVESTIGATION
HONEYWELL INDUSTRIAL COMPLEX
SOUTH BEND, INDIANA

Harding Lawson Associates

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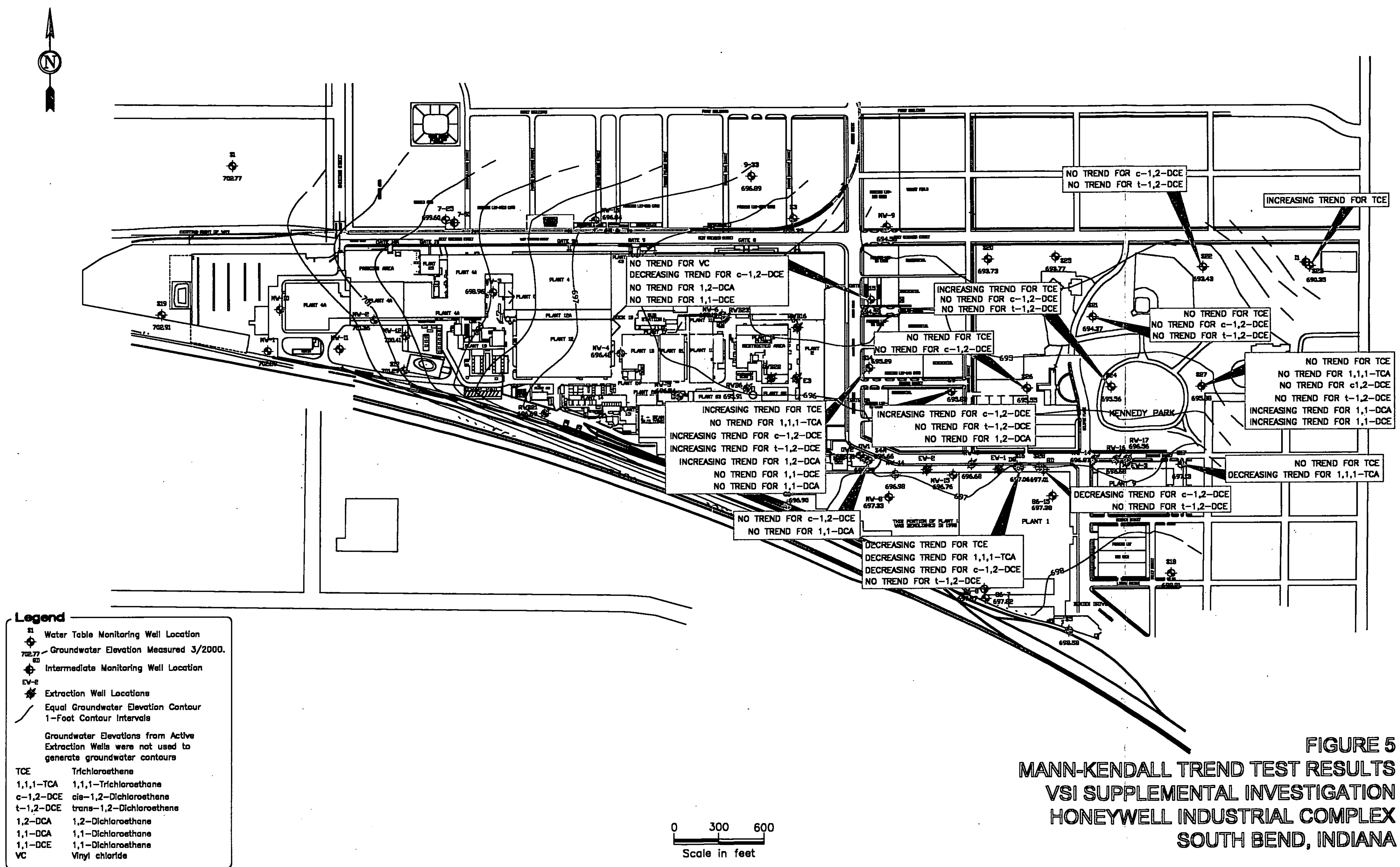

FIGURE 5
MANN-KENDALL TREND TEST RESULTS
VSI SUPPLEMENTAL INVESTIGATION
HONEYWELL INDUSTRIAL COMPLEX
SOUTH BEND, INDIANA

Harding Lawson Associates

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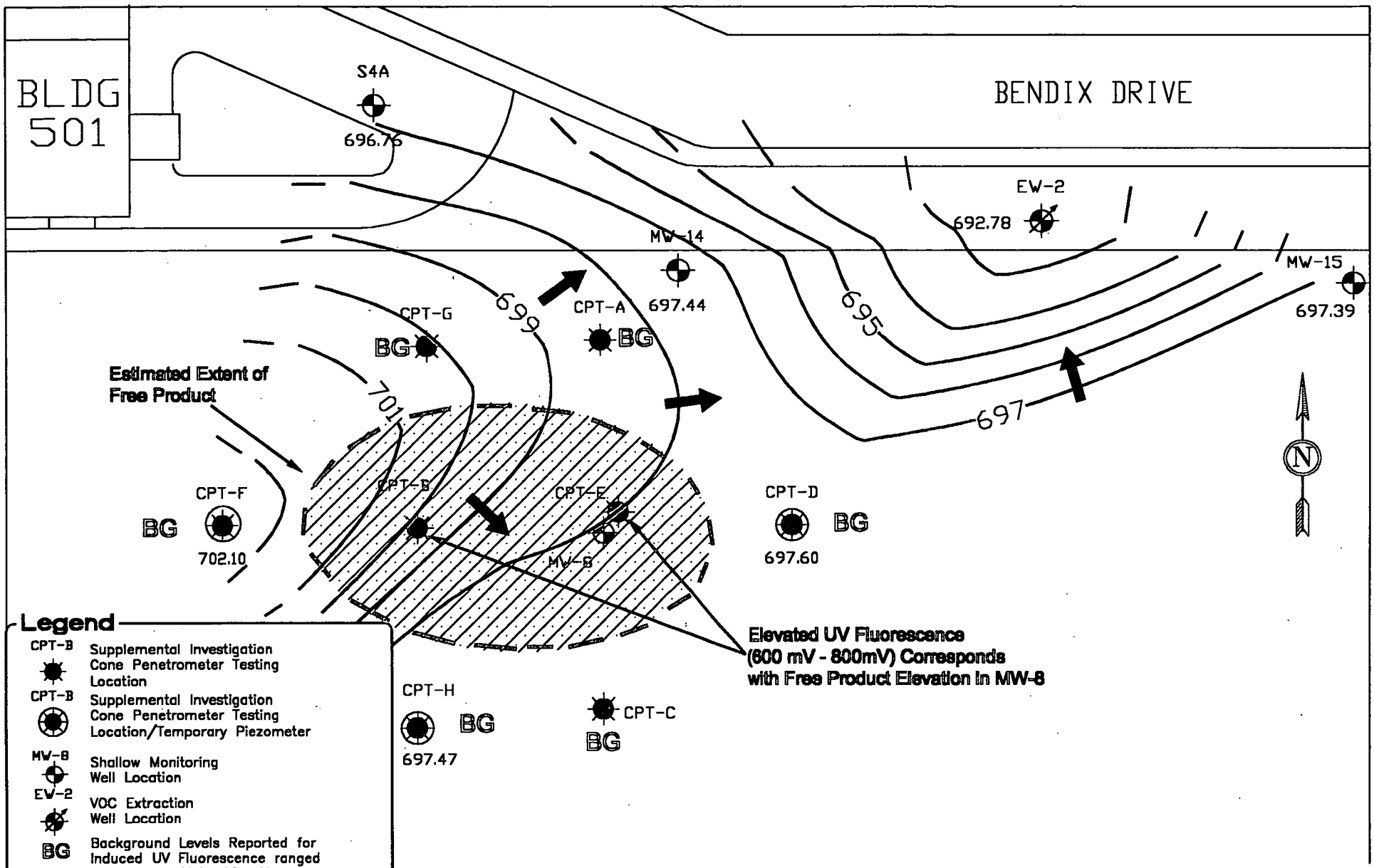

FIGURE 6

AREA 15 - ESTIMATED EXTENT OF FREE PRODUCT
VSI SUPPLEMENTAL INVESTIGAION
HONEYWELL INDUSTRIAL COMPLEX
SOUTH BEND, INDIANA

Harding Lawson Associate

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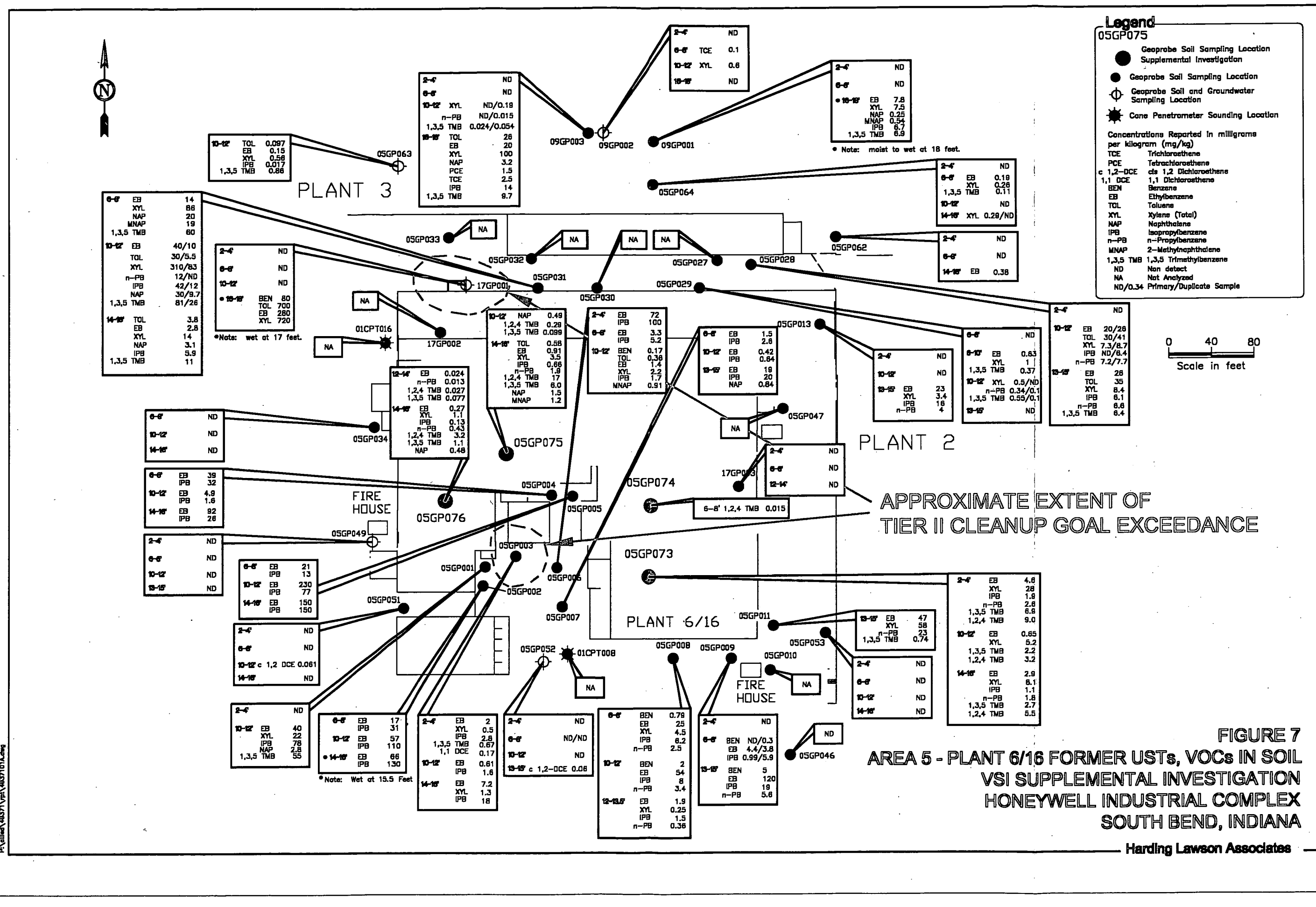
Legend
05GP075
Geoprobe Soil Sampling Location Supplemental Investigation
Geoprobe Soil Sampling Location
Geoprobe Soil and Groundwater Sampling Location
Cone Penetrometer Sounding Location
Concentrations Reported in milligrams per kilogram (mg/kg)
TCE Trichloroethene
PCE Tetrachloroethene
c 1,2-DCE cis 1,2 Dichloroethene
1,1 DCE 1,1 Dichloroethene
BEN Benzene
EB Ethylbenzene
TOL Toluene
XYL Xylene (Total)
NAP Naphthalene
IPB Isopropylbenzene
n-PB n-Propylbenzene
MNAP 2-Methylnaphthalene
1,3,5 TMB 1,3,5 Trimethylbenzene
ND Non detect
NA Not Analyzed
ND/0.34 Primary/Duplicate Sample
0 40 80
Scale in feet
PLANT 3
PLANT 2
PLANT 6/16
FIRE HOUSE
FIRE HOUSE
05GP063
09GP003
09GP002
09GP001
05GP064
05GP033
05GP032
05GP031
05GP030
05GP027
05GP028
05GP062
05GP029
17GP001
01CPT016
17GP002
05GP013
05GP075
05GP034
05GP047
05GP004
05GP005
05GP074
05GP076
05GP049
05GP003
05GP001
05GP002
05GP006
05GP007
05GP073
05GP051
05GP011
05GP053
05GP052
01CPT008
05GP008
05GP009
05GP010
05GP046
APPROXIMATE EXTENT OF TIER II CLEANUP GOAL EXCEEDANCE
• Note: moist to wet at 18 feet.
•Note: wet at 17 feet.
•Note: Wet at 15.5 Feet
6-8' 1,2,4 TMB 0.015
FIGURE 7
AREA 5 - PLANT 6/16 FORMER USTs, VOCs IN SOIL
VSI SUPPLEMENTAL INVESTIGATION
HONEYWELL INDUSTRIAL COMPLEX
SOUTH BEND, INDIANA
Harding Lawson Associates
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PLANT 1

APPROXIMATE EXTENT OF
TIER II CLEANUP GOAL EXCEEDANCE

86-11 NA

86-15

05GP071

8–10' TCE	0.76
12–14'TCE	1.6
NAP	0.63
14–16'TCE	2.6/1.2
NAP	0.66/ND

6–8' TCE	0.26
10–12'TCE	0.23
14–16'TCE	0.26

6–8' TCE	5.4
10–12'TCE	1.3

6–8' TCE	1.8
10–12'TCE	7.7
13–15'TCE	4.3

14GP033

14GP013

14GP014

14GP012

14GP015

2–4' TCE	5.5
6–8' TCE	3.4
10–12'TCE	8.4

2–4' TCE	0.49
8–10' TCE	0.88
13–15'TCE	4.3/[58]

14GP016

14GP020

14GP021

2–4' TCE	5.5
6–8' TCE	3.4
10–12'TCE	8.4

2–4'	ND
10–12'TCE	0.15
12–14'TCE	0.16

14GP022

2–4' TCE	0.31
8–10' TCE	0.48
13–15'TCE	0.28

2–4' TCE	0.55
c 1,2 DCE	0.12
6–8' TCE	0.68
c 1,2 DCE	0.16
10–12'TCE	0.51
c 1,2 DCE	0.14

2–4'	ND
6–8'	ND
10–12'	ND

05GP072

N

Legend

14GP033 Geoprobe Soil Sampling Location Supplimental Investigation

Geoprobe Soil Sampling Location

Geoprobe Soil and Groundwater Sampling Location

Water Table Monitoring Well Location

Concentrations Reported in milligrams per kilogram (mg/kg)

[56] Reported Concentrations Exceeds Tier II Industrial Criteria

TCE Trichloroethene
c 1,2 DCE cis 1,2 Dichloroethene
NAP Naphthalene

ND Non detect
NA Not Analyzed
ND/0.34 Primary/Duplicate Sample

0 20 40 80 FEET

SCALE: 1"=40'

FIGURE 8
AREA14 - FORMER PAINTING/ DEGREASING OPERATIONS
VOCs IN SOILS
VSI SUPLEMENTAL INVESTIGATION
HONEYWELL INDUSTRIAL COMPLEX
SOUTH BEND, INDIANA

Harding Lawson Associates

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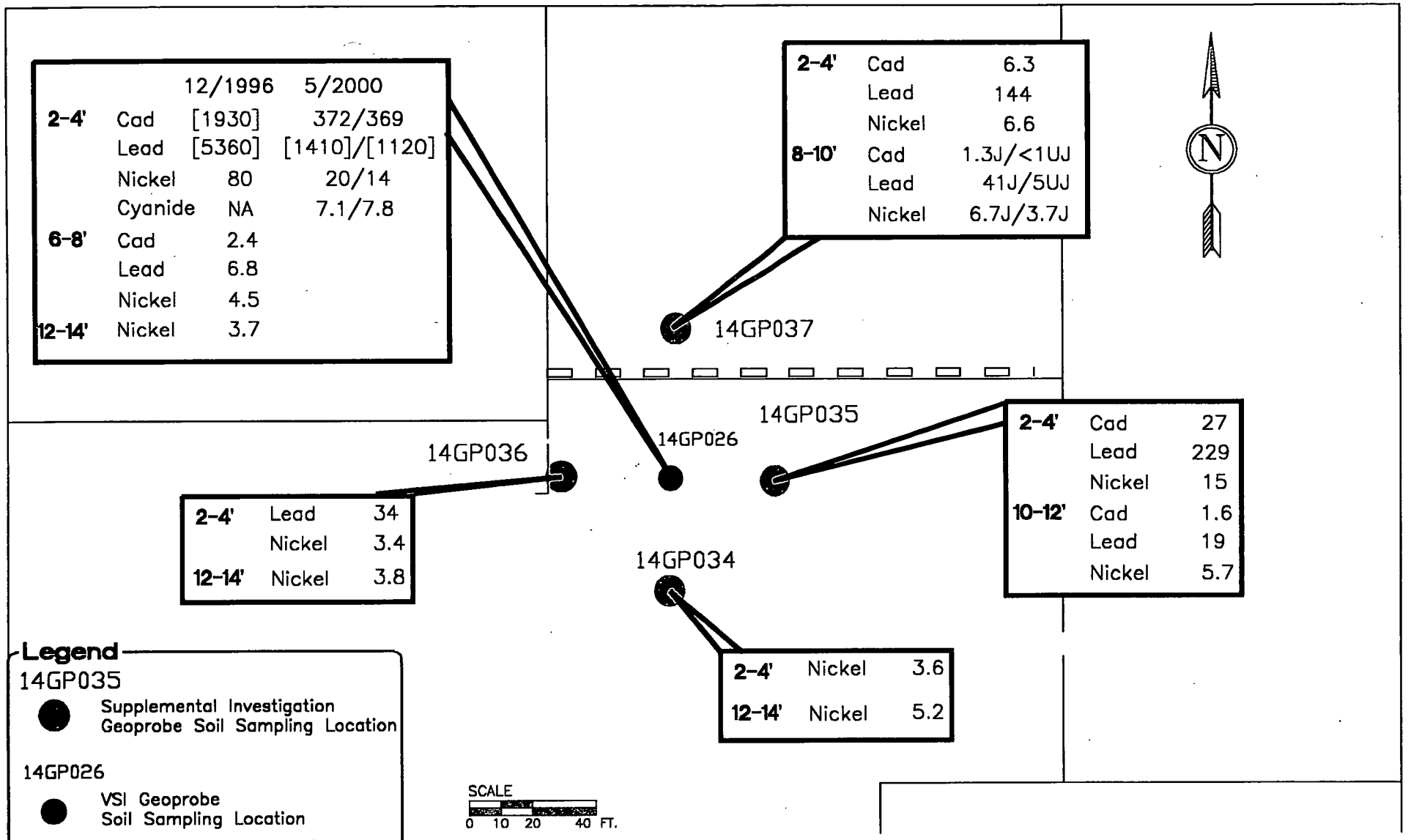

FIGURE 9

AREA 14 - PAINTING/DEGREASING OPERATIONS WEST

INORGANICS IN SOIL

VSI SUPPLEMENTAL INVESTIGATION

HONEYWELL INDUSTRIAL COMPLEX

SOUTH BEND, INDIANA

Harding Lawson Associate

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APPENDIX A

WELL ABANDONEDMENT FORMS

STEARNS DRILLING

March 8, 2000

Indiana Department of Natural Resources
Division of Water
402 W. Washington Street #W264
Indianapolis, IN 46204-2743

Re: Monitor Well Logs

To Whom It May Concern:

Enclosed please find the logs for the above referenced project at Honeywell International (Allied Signal), 717 N. Bendix Drive, South Bend, Indiana. We performed this work for Harding Lawson Associates., 39255 Country Club Drive, Suite B-25, Farmington Hills, Michigan. Mr. Adam Gouda was our contact. He can be reached at (248) 489-8040.

If you have questions or require additional information, please contact us at your convenience.

Very truly yours,

STEARNS DRILLING

Joseph W. Stearns

JWS/mbm

Enclosures

g:\indiana\letters\indydnr.doc

6974 Hammond SE • Dutton, Michigan 49316-9116 • (616) 698-7770 / FAX 698-9886

RECORD OF WATER WELL

State Form 35680 (R4 . 4-92)

Mail complete record within 30 days to:
INDIANA DEPARTMENT OF NATURAL RESOURCES
Division of Water
402 W.Washington St., Rm. W264
Indianapolis, IN 46204
(317) 232-4160

Fill in completely

WELL LOCATION

County where drilled	Civil township	Township	Range	Section
St. Joseph	Within city of South Bend			

Driving directions to the well location (*include county road names, number, subdivision lot number with consideration to intersecting road and trip origination*). There is space for a map on reverse side.

MW-14 Northwest corner of former plant 1 at Honeywell Int'l. - South Bend complex - 85 feet south of Bendix Dr.

MW-15 Northeast corner of former plant 1 at Honeywell Int'l. - South Bend complex - 85 feet south of Bendix Dr.

OWNER - CONTRACTOR

Name of well owner: Honeywell International - South Bend complex (Raywhite)

Telephone number: 219-231-3412

Address (*number and street, city, state, ZIP code*): 717 N. Bendix Dr., South Bend, IN 46620

Name of building contractor:

Telephone number:

Address (*number and street, city, state, ZIP code*):

Name of drilling contractor: Stearns Drilling Company

Telephone number: 616-698-7770

Address (*number and street, city, state, ZIP code*): 6974 Hammond Avenue, SE, Dutton, MI 49316-9116

Name of equipment operator	License number	Date of completion
Richard Herron	1581	February 25, 2000

CONSTRUCTION DETAILS

Use of well:
☐ Home ☐ Industry ☐ Test ☐ Irrigation
☐ Public supply ☐ Stock ☐ Other (*specify*):

Method of drilling
☐ Rotary ☐ Jet ☐ Bucket rig
☐ Cable tool ☐ Rev. rotary ☐ Other

Casing length	Material	Diameter
feet		inches

Screen length	Material	Diameter
feet		inches

Screen slot size	Total depth of well

Depth of pump setting	Water quality (*clear, cloudy, odor, etc.*)

Type of pump ☐ Shallow-well jet ☐ Other (*specify*):
☐ Submersible ☐ Deep-well jet

WELL CAPACITY TEST

Check one ☐ Air
☐ Bailing ☐ Pumping

Test rate ___________ gpm ___________ hrs.

Drawdown feet

Static level (*depth of water*) feet

GROUTING INFORMATION

Grout material	Depth of grout From to
Method of installation	Number of bags used

WELL ABANDONMENT

Sealing material	Depth filled From To
Method of installation	Number of bags used

WELL LOG

FORMATIONS: Type of material	From (*feet*)	To (*feet*)

(*Additional space for well log on reverse side*)

I hereby swear or affirm, under the penalties for perjury that the information submitted herewith is to the best of my knowledge and belief, true, accurate and complete

Signature of owner or authorized representative

Date

STEARNS DRILLING COMPANY

6974 Hammond SE
Dutton, Michigan 49316-9116
616/698-7770
FAX 616/698-9886

Job No. 00-8392-2

LOG OF TEST BORING NO. MW-14

Sheet: 1 of 1

Project: Honeywell

Location: 717 N. Bendix Drive, South Bend, Indiana

Date Completed: February 24, 2000

Crew Chief: Herron, Dick
Drill Rig: D-120
Boring Method: 4 1/4" H.S.A.

Hole Plugged With:

GROUNDWATER:

Encountered @	16.50	ft.
After completion		ft.
After hrs.		ft.
Seepage:		ft.
Boring Caved at:		ft.

MONITOR WELL DATA:
Pipe/Type: 2" galvanized
Length: 15.0'
Above Ground: Ground level
Cap: J-plug manhole

Screen/Type: Johnson stainless steel
Size: 2"
Slot: .010"
Set @ 25.0' - 15.0'
Backfilled: #7 sand

Bentonite Seal: 2.0'
Grout/Type: Quik-grout
Depth: 11.0' to surface
Protective Casing: Manhole
Materials Cleaned:
Development:

REMARKS:

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS-2" Split Spoon Sampler
LS-Brass Liner Sample
ST-Shelby Tube Sample
SNR-Sample not recovered
LB-Large Bore

Sample Type	REC	Blow Count	Depth Feet	SOIL DESCRIPTION	TW
			0.5	Concrete	
			1.5	Gray fine sand	
				Brown sand, few cobbles	
			5		
		5			
SS		7	10		
		10			
		16			
			15		
			19.0		
		3		Fine sand mixed with small gravel	
SS		5	20		
		10			
		10			
		9			
SS		18			
		11			
		10	23.0		
		7		Fine sand	
SS		11	24.0		
		15		Very fine sand and silt	
		16	25		
		3			
SS		9			
		13			
		21			
		6			
SS		16			
		11			
		15			
			30	E.O.B. @ 29.0'	

STEARNS DRILLING COMPANY

6974 Hammond SE
Dutton, Michigan 49316-9116
616/698-7770
FAX 616/698-9886

Job No. 00-8392-2

LOG OF TEST BORING NO. MW-15

Sheet: 1 of 1

Project: Honeywell

Location: 717 N. Bendix Drive, South Bend, Indiana

Date Completed: February 24, 2000

Crew Chief: Herron, Dick
Drill Rig: D-120
Boring Method: 4 1/4" H.S.A.

Hole Plugged With:

GROUNDWATER:

Encountered @	16.50 ft.
After completion	16.50 ft.
After hrs.	ft.
Seepage:	ft.
Boring Caved at:	ft.

MONITOR WELL DATA:
Pipe/Type: 2" flush joint galvanized
Length: 15.0'
Above Ground:
Cap:

Screen/Type: Johnson
Size: 2" x 10'
Slot: .010"
Set @ 25.0' - 15.0'
Backfilled: #7 sand

Bentonite Seal: 2.0' chips
Grout/Type: Quik-grout
Depth: 11.0' to surface
Protective Casing: 9" water tight manhole
Materials Cleaned: Yes
Development: Until clear and no sand

REMARKS:

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS-2" Split Spoon Sampler
LS-Brass Liner Sample
ST-Shelby Tube Sample
SNR-Sample not recovered
LB-Large Bore

Sample Type	REC	Blow Count	Depth Feet	SOIL DESCRIPTION
			0.5	Concrete - augered
				Black sandy soil
			2.5	
				Brown sand, some cobbles
			5	
		8		
SS		12	10	
		16		
		16		
			15	
			19.0	
		10		Fine to medium sand, some small gravel
SS		18	20	
		22		
		23	21.0	
		7		Fine to medium sand, some small gravel,
SS		10		gray silty clay
		14		
		18		
		8		
SS		10		
		11		
		8	25	
		3		Gray silty clay
SS		5		
		6		
		8		
		3		
SS		5		
		8		
		11		
			30	E.O.B. @ 29.0'

STEARNS DRILLING COMPANY

6974 Hammond SE
Dutton, Michigan 49316-9116
616/698-7770
FAX 616/698-9886

Job No. 00-8392-2

ABANDONMENT OF WELL NO. RW-4

Sheet: 1 of 1

Project: Honeywell/Allied Signal

Location: 717 N. Dexter, South Bend, Indiana

Date Completed: February 25, 2000

Crew Chief: Herron, Dick
Drill Rig: D-120
Boring Method:

Hole Plugged With: Quik-grout from 32.0' to top of casing

GROUNDWATER:

Encountered @	16.50	ft.
After completion		ft.
After hrs.		ft.
Seepage:		ft.
Boring Caved at:		ft.

MONITOR WELL DATA:

Pipe/Type:
Length:
Above Ground:
Cap:

Screen/Type:
Size:
Slot:
Set @
Backfilled:

Bentonite Seal:
Grout/Type:
Depth:
Protective Casing:
Materials Cleaned:
Development:

REMARKS:

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS-2" Split Spoon Sampler
LS-Brass Liner Sample
ST-Shelby Tube Sample
SNR-Sample not recovered
LB-Large Bore

Sample Type	REC	Blow Count	Depth Feet		ABANDONMENT DESCRIPTION	T W
					Well grouted in place. Tremie grouted from 32.0' to surface with bentonite slurry.	
			5			
			10			
			15			
			20			
			25			
			30			
					Well Abandoned @ 32.0'	

STEARNS DRILLING COMPANY

6974 Hammond SE
Dutton, Michigan 49316-9116
616/698-7770
FAX 616/698-9886

Job No. 00-8392-2

ABANDONMENT OF WELL NO. RW-5

Sheet: 1 of 1

Project: Honeywell/Allied Signal

Location: 717 N. Dexter, South Bend, Indiana

Date Completed: February 25, 2000

Crew Chief: Herron, Dick
Drill Rig: D-120
Boring Method:

Hole Plugged With: Quik-grout from 25.0' to top of casing

GROUNDWATER:

Encountered @	16.50	ft.
After completion		ft.
After hrs.		ft.
Seepage:		ft.
Boring Caved at:		ft.

MONITOR WELL DATA:

Pipe/Type:
Length:
Above Ground:
Cap:

Screen/Type:
Size:
Slot:
Set @
Backfilled:

Bentonite Seal:
Grout/Type:
Depth:
Protective Casing:
Materials Cleaned:
Development:

REMARKS:

LEGEND:
BlowCount/Blows per 6"
w/140# hammer x 30" drop
SS-2" Split Spoon Sampler
LS-Brass Liner Sample
ST-Shelby Tube Sample
SNR-Sample not recovered
LB-Large Bore

Sample Type	REC	Blow Count	Depth Feet	ABANDONMENT DESCRIPTION
				Well grouted in place. Tremie grouted from 25.0' to surface with bentonite slurry.
			5	
			10	
			15	
			20	
			25	
				Well Abandoned @ 25.0'
			30	

APPENDIX B

SOIL BORINGS/MONITORING WELL CONSTRUCTION LOGS

HLA Harding Lawson Associates 39255 County Club Dr., B-25 Farmington Hills, MI 48331	**Project No.** 49371 **Boring No.** 03GP084 **Contractor:** EQL		**Page** 1 **Drilling Rig:** Gator Probe **Drilling Method:** GEOPROBE
Project Name and Location: Honeywell VRP South Bend Complex	**Drill Crew:** ROB **Date Started:** 2/22/00		**Sampling Method:** VOC 8260 **Date Finished:** 2/22/00
Surface Elevation: **Borehole Backfill Method & Interval:** Cuttings placed back in hole	**Logged by:** ADAM GOUDA		**First water during drilling (feet bgs):** 15.7

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		2000		0-.6 Concrete
					.6-3.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4	Y	700	SW	
					3.0-4.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	4-6		1470		4.0-8.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
5				SW	
	6-8	Y	1150		
	8-10		232		8-10 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
10	10-12		350	SW	10-12 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	12-14		106		12-14 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	14-16		50	GW	14-16 Gravel: (f-c), with trace sand (m-c) well graded, saturated at 15.7, brown/tan, loose
15					
20					

HLA Harding Lawson Associates 39255 County Club Dr., B-25 Farmington Hills, MI 48331	**Project No.** 49371 **Boring No.** 03GP085 **Contractor:** EQL		**Page** 1 **Drilling Rig:** Gator Probe **Drilling Method:** GEOPROBE
Project Name and Location: Honeywell VRP South Bend Complex	**Drill Crew:** ROB **Date Started:** 2/22/00		**Sampling Method:** VOC 8260 **Date Finished:** 2/22/00
Surface Elevation: **Borehole Backfill Method & Interval:** Cuttings placed back in hole	**Logged by:** ADAM GOUDA		**First water during drilling (feet bgs):** 15.7

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		100		0-.6 Concrete
					.6-3.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4	Y	119	SW	
					3.0-4.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	4-6		88		
5					4.0-8.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
				SW	
	6-8	Y	60		
					8-10 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	8-10		53		
10	10-12		37		10-12 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	12-14			SP	12-14 No recovery, due to cobble obstruction
	14-16				14-16 No recovery, due to cobble obstruction, saturated at 15.7.
15					
20					

HLA Harding Lawson Associates 39255 County Club Dr., B-25 Farmington Hills, MI 48331	**Project No.** 49371 **Boring No.** 03GP086 **Contractor:** EQL	**Page** 1 **Drilling Rig:** Gator Probe **Drilling Method:** GEOPROBE	
Project Name and Location: **Honeywell VRP** **South Bend Complex**	**Drill Crew:** ROB **Date Started:** 2/22/00	**Sampling Method:** VOC 8260 **Date Finished:** 2/22/00	
Surface Elevation: **Borehole Backfill Method & Interval:** Cuttings placed back in hole	**Logged by:** ADAM GOUDA	**First water during drilling (feet bgs):** 15.7	

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		52		0-.5 Concrete
				SM	.5-3.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4		55		
					3.0-4.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	4-6	Y	61		
5					4.0-8.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
				SM	5.7-5.9 Silty sand: sand (vf-f), medium plastic, soft, damp
	6-8		71		
					8-10 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	8-10		55		
10	10-12		50	SP	10-12 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	12-14	Y	82		12-14 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	14-16		32		14-16 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose. saturated 15.7.
15					
20					

HLA Harding Lawson Associates 39255 County Club Dr., B-25 Farmington Hills, MI 48331	**Project No.** 49371	**Page** 1	
	Boring No. 03GP087	**Drilling Rig:** Gator Probe	
	Contractor: EQL	**Drilling Method:** GEOPROBE	
	Drill Crew: ROB	**Sampling Method:**	
Project Name and Location: Honeywell VRP South Bend Complex	**Date Started:** 2/22/00	**Date Finished:** 2/22/00	
Surface Elevation:	**Logged by:** ADAM GOUDA	**First water during drilling (feet bgs):** 15.7	
Borehole Backfill Method & Interval: Cuttings placed back in hole			

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		45		0-.5 Concrete .5-3.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4		50		
					3.0-4.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	4-6	Y	37		
5					4.0-8.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	6-8		34	SW	
	8-10		60		8-10 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
10	10-12		42		10-12 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	12-14	Y	39		12-14 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	14-16		25		14-16 Sand: (f-c), with trace gravel (f), moderately graded, brown/tan, loose. saturated 15.7.
15					
20					

HLA Harding Lawson Associates 39255 County Club Dr., B-25 Farmington Hills, MI 48331	**Project No.** 49371		**Page** 1
	Boring No. 03GP088		**Drilling Rig:** Gator Probe
	Contractor: EQL		**Drilling Method:** GEOPROBE
Project Name and Location: **Honeywell VRP** **South Bend Complex**	**Drill Crew:** ROB		**Sampling Method:**
	Date Started:	5/1/00	**Date Finished:** 5/1/00
Surface Elevation:	**Logged by:**	ADAM GOUDA	**First water during drilling (feet bgs):** 16
Borehole Backfill Method & Interval:	Cuttings placed back in hole		

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		2.8		0-.5 Concrete
				SP	.5-3.0 Sand (f-c), with trace gravel (f), moderately graded, dry, black/brown with some red medium density.
	2-4	Y	3.7		
					4.0-13.0 Sand (f-c), with some gravel (f-m), well graded, dry, brown/tan medium density.
	4-6		1.8		
5					
	6-8		9.0		
				SW	8.0 trace gravel
	8-10		19.0		
10	10-12	Y	28.0		
	12-14		15		
					13-16 Sand: (f-c), with trace gravel (f), moderately graded, brown/tan, loose. saturated 15.7.
	14-16		15		
15					
20					

HLA Harding Lawson Associates 39255 County Club Dr., B-25 Farmington Hills, MI 48331	**Project No.** 49371		**Page** 1
	Boring No. 03GP089		**Drilling Rig:** Gator Probe
	Contractor: EQL		**Drilling Method:** GEOPROBE
Project Name and Location: **Honeywell VRP** **South Bend Complex**	**Drill Crew:** ROB		**Sampling Method:**
	Date Started: 5/1/00		**Date Finished:** 5/1/00
Surface Elevation:	**Logged by:** ADAM GOUDA		**First water during drilling (feet bgs):** 16
Borehole Backfill Method & Interval: Cuttings placed back in hole			

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2	Y	108.0		0-.5 Concrete
					.5-6.5.0 Sand (f-c), with trace gravel (f), moderately graded, dry, black/brown with some red medium density.
	2-4		31.0	SW	
					3.0-4.0 black staining noted
	4-6		21.0		
5					6.5-16.0 Sand (f-m), with some gravel (f-m), poorly graded, dry, brown/tan medium density.
	6-8		16.4		
					8.0 trace gravel
	8-10		22.0	SP	
10	10-12		17.2		
	12-14	Y	28.0		
					13-16 Sand: (f-c), with trace gravel (f), moderately graded, brown/tan, loose. saturated 15.7.
	14-16		6.0		
15					
20					

HLA Harding Lawson Associates 39255 County Club Dr., B-25 Farmington Hills, MI 48331	**Project No.** 49371		**Page** 1
	Boring No. 05GP073		**Drilling Rig:** Gator Probe
	Contractor: EQL		**Drilling Method:** GEOPROBE
Project Name and Location: **Honeywell VRP** **South Bend Complex**	**Drill Crew:** ROB		**Sampling Method:** VOC 8260
	Date Started: 2/22/00		**Date Finished:** 2/22/00
Surface Elevation:	**Logged by:** ADAM GOUDA		**First water during drilling (feet bgs):** 15.9
Borehole Backfill Method & Interval: Cuttings placed back in hole			

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		130		0-.5 Concrete
					.5-3.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4	Y	900	SW	
					3.0-4.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	4-6		780		4.9-8.0 Sand: (f-c), poorly graded, gray/black, dry, medium density
5					
	6-8		500	SP	
					8-10 Sand (f-c), poorly graded, dry, black/brown, medium density.
	8-10		900		
10	10-12	Y	1300		10-12 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	12-14		1300	SP	12-14 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	14-16		1250		14-16 Sand: (f-c), with trace gravel (f), moderately graded, brown/tan, loose. saturated 15.9.
15					
20					

HLA Harding Lawson Associates 39255 County Club Dr., B-25 Farmington Hills, MI 48331	**Project No.** 49371		**Page** 1
	Boring No. 05GP074		**Drilling Rig:** Gator Probe
	Contractor: EQL		**Drilling Method:** GEOPROBE
Project Name and Location: Honeywell VRP South Bend Complex	**Drill Crew:** ROB		**Sampling Method:** VOC 8260
	Date Started:	2/22/00	**Date Finished:** 2/22/00
Surface Elevation:	**Logged by:**	ADAM GOUDA	**First water during drilling (feet bgs):** 15.9
Borehole Backfill Method & Interval:	Cuttings placed back in hole		

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		40		0-.5 Concrete
					.5-3.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4		52	SW	
					3.0-4.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	4-6		1300		4.9-8.0 Sand: (f-c), poorly graded, gray/black, dry, medium density
5					
	6-8	Y	1690		
				SP	8-10 Sand (f-c), poorly graded, dry, black/brown, medium density.
	8-10		454		
10	10-12		1604		10-12 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	12-14		810		12-14 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	14-16	Y	1694	SP	14-16 Sand: (f-c), with trace gravel (f), moderately graded, brown/tan, loose. saturated 15.9.
15					
20					

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Harding Lawson Associates
39255 County Club Dr., B-25
Farmington Hills, MI 48331

Project No.	49371	**Page**	1
Boring No.	05GP075	**Drilling Rig:**	Gator Probe
Contractor:	EQL	**Drilling Method:**	GEOPROBE
Drill Crew:	ROB	**Sampling Method:**	VOC 8260
Project Name and Location: Honeywell VRP South Bend Complex			
Date Started:	2/23/00	**Date Finished:**	2/23/00
Surface Elevation:		**Logged by:**	ADAM GOUDA
Borehole Backfill Method & Interval:	Cuttings placed back in hole	**First water during drilling (feet bgs):**	15.9

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		71		0-.4 Concrete
				SW	.4-1.5 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4		104		
				SM	1.5-4.0 Sand: (vf-f), with some silt, moderately graded loose, damp, black/brown
	4-6		85.2		
5					
	6-8		97.4		
				SP	4.0-10 Sand (f-c), poorly graded, dry, black/brown, medium density.
	8-10		184.6		
10	10-12	Y	250.2		10-12 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
				SP	
	12-14		197		12-14 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	14-16	Y	672	SP	14-16 Sand: (f-c), with trace gravel (f), moderately graded, brown/tan, loose. saturated 15.7.
15					
20					

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Farmington Hills, MI 48331

Project No. 49371		**Page** 1
Boring No. 05GP076		**Drilling Rig:** GEOPROBE
Contractor: Environmental Quality Labs		**Drilling Method:** GEOPROBE
Drill Crew: ROB		**Sampling Method:** VOC 8260
Project Name and Location: Honeywell VRP South Bend Complex	**Date Started:** 2/23/00	**Date Finished:** 2/23/00
Surface Elevation:	**Logged by:** ADAM GOUDA	**First water during drilling (feet bgs):** 15.7
Borehole Backfill Method & Interval: Cuttings placed back in hole		

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		28.8		0-.6 Concrete
				SW	.6-1.5 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4		1.9		
				SM	1.5-4.0 Sand: (vf-f), with some silt, moderately graded loose, damp, black/brown
	4-6		2.0		
5					
				SP	5.7 to 6.0 black/red staining
	6-8		1.8		
					7.1-7.5 black/red staining
					4.0-10 Sand (f-c), poorly graded, dry, black/brown, medium density.
	8-10		1.6		
10	10-12		1.4		10-12 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
				SP	
	12-14	Y	51		12-14 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	14-16	Y	672		14-16 Sand: (f-c), with trace gravel (f), moderately graded, brown/tan, loose. saturated 15.7.
15					
20					

HLA Harding Lawson Associates 39255 County Club Dr., B-25 Farmington Hills, MI 48331	**Project No.** 49371 **Boring No.** 14GP034 **Contractor:** EQL	**Page** 1 **Drilling Rig:** Gator Probe **Drilling Method:** GEOPROBE	
Project Name and Location: **Honeywell VRP** **South Bend Complex**	**Drill Crew:** ROB **Date Started:** 2/21/00	**Sampling Method:** NI, PB, CD **Date Finished:** 2/21/00	
Surface Elevation:	**Logged by:** ADAM GOUDA	**First water during drilling (feet bgs):** 15.7	
Borehole Backfill Method & Interval: Cuttings placed back in hole			

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		0		0-.4 Concrete .4-3.5 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4	Y	0	SP	
				GW	3.5-.37 Gravel: (f-c) with trace sand (f-c), mod graded, dry, black/brown
	4-6		0		3.7-4.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density. 4.0-7.8 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
5				SP	
	6-8		2.1		
				SC	7.8-8.0 Silty Clay: with some sand (f-m), non-plastic, firm, dry, brown/tan,
	8-10		0		8-10 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
10	10-12		0		10-12 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	12-14	Y	4.1	SP	12-14 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	14-16		5.7		14-16 Sand: (f-c), with trace gravel (f), moderately graded, saturated 15.7, gray/tan, loose.
15					
20					

HLA Harding Lawson Associates 39255 County Club Dr., B-25 Farmington Hills, MI 48331	**Project No.** 49371 **Boring No.** 14GP035 **Contractor:** EQL		**Page** 1 **Drilling Rig:** Gator Probe **Drilling Method:** GEOPROBE
Project Name and Location: Honeywell VRP South Bend Complex	**Drill Crew:** ROB		**Sampling Method:** NI, PB, CD
	Date Started: 2/21/00		**Date Finished:** 2/21/00
Surface Elevation:	**Logged by:** ADAM GOUDA		**First water during drilling (feet bgs):** 15.7
Borehole Backfill Method & Interval: Cuttings placed back in hole			

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		0		0-.4 Concrete
				SW	.4-3.5 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4	Y	0		
				GW	3.5-.37 Gravel: (f-c) with trace sand (f-c), mod graded, dry, black/brown
					3.7-4.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	4-6		0	SW	4.0-7.8 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
5					
	6-8		0	SM	6.0-8.0 Sand: (vf-f), with some silt and trace clay, non-plastic, firm, dry
				SW	8-10 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	8-10	Y	0		
10	10-12		0		10-12 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	12-14		0	SP	12-14 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	14-16		0		14-16 Sand: (f-c), with trace gravel (f), moderately graded, saturated 15.7, gray/tan, loose.
15					
20					

HLA Harding Lawson Associates 39255 County Club Dr., B-25 Farmington Hills, MI 48331	**Project No.** 49371 **Boring No.** 14GP036 **Contractor:** EQL	**Page** 1 **Drilling Rig:** Gator Probe **Drilling Method:** GEOPROBE	
Project Name and Location: Honeywell VRP South Bend Complex	**Drill Crew:** ROB **Date Started:** 2/21/00	**Sampling Method:** NI, PB, CD **Date Finished:** 2/21/00	
Surface Elevation:	**Logged by:** ADAM GOUDA	**First water during drilling (feet bgs):** 15.7	
Borehole Backfill Method & Interval: Cuttings placed back in hole			

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		0		0-.4 Concrete
				SW	.4-3.5 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4	Y	50		
				GW	3.5-.37 Gravel: (f-c) with trace sand (f-c), mod graded, dry, black/brown
	4-6		8.5		3.7-4.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
5					4.0-8.0 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
				SW	
	6-8	Y	28		
	8-10		33.0		8-10 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
10	10-12		305		10-12 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	12-14		250	SP	12-14 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	14-16		290		14-16 Sand: (f-c), with trace gravel (f), moderately graded, saturated 15.7, gray/tan, loose.
15					
20					

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Farmington Hills, MI 48331

Project No.	49371	**Page**	1
Boring No.	15GP014	**Drilling Rig:**	Gator Probe
Contractor:	EQL	**Drilling Method:**	GEOPROBE
Drill Crew:	ROB	**Sampling Method:**	PNA 8270
Date Started:	2/23/00	**Date Finished:**	2/23/00
Logged by:	ADAM GOUDA	**First water during drilling (feet bgs):**	16.1

Project Name and Location:
Honeywell VRP
South Bend Complex

Surface Elevation:

Borehole Backfill Method & Interval: Cuttings placed back in hole

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		1.5		0-.3 Concrete
				SW	.3-1.5 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4	Y	1.2		1.5-7.7 Sand: (vf-f), with some silt, moderately graded loose, damp, brown
	4-6		2.3	SM	
5					
	6-8		3.7		
	8-10	Y	6.8		7.7-10 Sand (f-c), poorly graded, dry, black/brown, medium density.
10	10-12		71.0		10-12 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	12-14		20.4		12-14 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	14-16	Y	68.4	SP	14-16 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
15					
					16-18 Sand: (f-c), with trace gravel (f), moderately graded, brown/tan, loose. saturated 16.1.
20					

HLA Harding Lawson Associates 39255 County Club Dr., B-25 Farmington Hills, MI 48331	**Project No.** 49371	**Page** 1
	Boring No. 15GP015	**Drilling Rig:** Gator Probe
	Contractor: EQL	**Drilling Method:** GEOPROBE
Project Name and Location: Honeywell VRP South Bend Complex	**Drill Crew:** ROB	**Sampling Method:** PNA 8270
	Date Started: 2/23/00	**Date Finished:** 2/23/00
Surface Elevation:	**Logged by:** ADAM GOUDA	**First water during drilling (feet bgs):** 15.8
Borehole Backfill Method & Interval: Cuttings placed back in hole		

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		1.5		0-.3 Concrete
				SW	.3-1.5 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4	Y	1.2		1.5-7.7 Sand: (vf-f), with some silt, moderately graded loose, damp, brown
	4-6		1.0	SM	
5					
	6-8		1.0		
					7.7-10 Sand (f-c), poorly graded, dry, black/brown, medium density.
	8-10		4.5		
10	10-12	Y	6.0		10-12 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
				SP	
	12-14		5.0		12-14 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	14-16	Y	8.8		14-16 Sand: (f-c), with trace gravel (f), moderately graded, brown/tan, loose. saturated 15.8.
15					
20					

HLA Harding Lawson Associates 39255 County Club Dr., B-25 Farmington Hills, MI 48331	**Project No.** 49371	**Page** 1
	Boring No. 14GP033	**Drilling Rig:** Gator Probe
	Contractor: EQL	**Drilling Method:** GEOPROBE
Project Name and Location: Honeywell VRP South Bend Complex	**Drill Crew:** ROB	**Sampling Method:** VOC 8260
	Date Started: 2/23/00	**Date Finished:** 2/23/00
Surface Elevation:	**Logged by:** ADAM GOUDA	**First water during drilling (feet bgs):** 15.9
Borehole Backfill Method & Interval: Cuttings placed back in hole		

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0-2		450		0-.4 Concrete
				SW	.4-1.5 Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4		62		
				SM	1.5-4.0 Sand: (vf-f), with some silt, moderately graded loose, damp, brown
	4-6		27.2		
5					
	6-8		46		
				SP	4.0-10 Sand (f-c), poorly graded, dry, black/brown, medium density.
	8-10	Y	105		
10	10-12		61.4		10-12 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
	12-14	Y	114		12-14 Sand: (f-c), with trace gravel (f), moderately graded, damp, brown/tan, loose.
				SP	
	14-16	Y	80.6		14-16 Sand: (f-c), with trace gravel (f), moderately graded, brown/tan, loose. saturated 15.7.
15					
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HLA Harding Lawson Associates 39255 County Club Dr., B-25 Farmington Hills, MI 48331	**Project No.** 49371 **Boring No.** 14GP037 **Contractor:** EQL		**Page** 1 **Drilling Rig:** Gator Probe **Drilling Method:** GEOPROBE
Project Name and Location: **Honeywell VRP** **South Bend Complex**	**Drill Crew:** ROB **Date Started:** 2/22/00		**Sampling Method:** NI, PB, CD **Date Finished:** 2/22/00
Surface Elevation: **Borehole Backfill Method & Interval:** Cuttings placed back in hole	**Logged by:** ADAM GOUDA		**First water during drilling (feet bgs):** 15.7

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	LAB SUBMIT	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION	
0	0-2		10.4		0-.4	Concrete
					.4-2.5	Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	2-4	Y	14.2	SW		
					2.5-6.0	Sand (f-c), with some gravel (f-m), well graded, dry, black/brown with some red medium density.
	4-6		10.2	SP		
5						
	6-8		9.7		6.0-8.0	Sand: (f-c), poorly graded, gray/black, dry, medium density.
	8-10	Y	18.2		8-10	Sand: (f-c), poorly graded, gray/black, dry, medium density medium density.
10	10-12		8.2		10-12	Sand: (f-c), poorly graded, gray/black, dry, medium density.
				SP		
	12-14		250		12-14	Sand: (f-c), poorly graded, gray/black, dry, medium density.
	14-16		290		14-16	Sand: (f-c), with trace gravel (f), moderately graded, saturated 15.7 gray/tan, loose.
15						
20						

APPENDIX C

GROUNDWATER SAMPLING RECORDS

HARDING LAWSON ASSOCIATES
GROUNDWATER SAMPLE RECORD

Sample No.: MW-7
Sample Date: ~~2/16~~/2/17/00
Sample Time: 1710

SITE/SAMPLE LOCATION

Site Name: Honeywell International- Bend Complex
Project No.: 49371
Personnel Present: Adam gouda
Activity Start: 1640
Activity End: 1720
Weather: Cold 24°
Well Type and Location: 2" PVC flush in tower Plant 34.

WATER LEVEL/WELL DATA

Well Depth: 18.53 feet using Solinst (measuring device) (from top of well casing)
Water Depth: 15.92 feet using Solinst (measuring device) (from top of well casing)
Historical Well Depth: Same feet (from ground surface)
Protective Casing Stickup: ____ feet (for above-ground surface)
Protect. Casing Well Casing Difference: ____ feet
Floating Product Thickness: NONE feet using — (measuring device)
Well Condition (see Note 1): Ok
Measuring Device Decontamination Procedure:
PI Meter ID: ____ Ambient Air: ____ ppm Well Mouth: 0.0 ppm

PURGING PROCEDURES

Height of Water Column feet
( ) .041 gal/ft (1 in)
(X) .16 gal/ft (2 in)
( ) .65 gal/ft (4 in)
( ) ____ gal/ft (___ in)
X 3 casing volumes = 440 ~~gallons~~ mL to purge
Purge Method (see Note 2): Low Flow sampling with perastaltic pump

Purge Vol. (gal)	440	740	1040	1340
Time (Min.)	1651	1654	1657	1700
Temperature (C°) /turb	9.06 /350	9.01 /234	9.04 /240	9.05 /230
pH (Units) /DO	6.52 /.13	6.40 /.14	6.41 /.12	6.44 /.16
Conductivity at 25°C (mS/cm) /ORP	1.27 /-3	1.29 /-5	1.34 /-4	1.36 /-2

Total Volume Purged ____ gallons
Water Appearance (describe color, clarity odor:) Slightly brn

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): same as above
Sample Water Appearance (color, clarity, odor): slightly brn to clear

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?		Cool to 4°C?	
Metals	6000/7000	500ml poly	1	nitric acid	Y	(N)	(Y)	N
Cyanide	9012	500ml poly	1		Y	(N)	(Y)	N
					Y	N	Y	N
					Y	N	Y	N
					Y	N	Y	N

OTHER OBSERVATIONS
(.154)(.17)(17.00) = 440mL = 1volume
establish loop/row of grad cylinder & stopwatch

NAME (Print): Adam Gouda
SIGNATURE:

Notes: (1) Described whether well was locked and the condition of the protective casing and concrete collar.
(2) Describe sequence of purging/sampling including equipment type and decontamination method.

HARDING LAWSON ASSOCIATES
GROUNDWATER SAMPLE RECORD

Sample No.: B6-19
Sample Date: 2/17/00
Sample Time: 940

SITE/SAMPLE LOCATION

Site Name: Honeywell International- Bend Complex Project No.: 49371
Personnel Present: Adam gouda
Activity Start: 820 AM Activity End: 950
Weather: Cold Sunny 18°
Well Type and Location: 2" .092 PVC stickup w/ Dedicated bailer + steel protector / south side of plant

WATER LEVEL/WELL DATA

Well Depth: 28.1 feet using Solinst (from top of well casing) (measuring device)
Water Depth: 16.88 feet using Solinst (from top of well casing) (measuring device)
Historical Well Depth: Same feet (from ground surface)
Protective Casing Stickup: ____ feet (for above-ground surface)
Protect. Casing Well Casing Difference: ____ feet
Floating Product Thickness: None feet using — (measuring device)
Well Condition (see Note 1): Ok.
Measuring Device Decontamination Procedure: L-nox - DI water.
PI Meter ID: ____ Ambient Air: ____ ppm Well Mouth: 0.0 ppm

PURGING PROCEDURES

Height of Water Column feet
( ) .041 gal/ft (1 in)
(X) .16 gal/ft (2 in)
( ) .65 gal/ft (4 in)
( ) ____ gal/ft (___ in)
X 3 casing volumes = 690 ~~gallons~~ mL to purge
Purge Method (see Note 2): Low Flow sampling with perastaltic pump

Purge Vol. (gal)	690mL	990	1290	1590
Time (Min.)	9:25	928	931	934
Temperature (C°) / Turb	5.22 / 11.4	5.56 / 10.7	5.75 / 10.6	5.81 / 11.1
pH (Units) / DO	6.32 / 3.91	6.36 / 3.17	6.57 / 3.40	6.59 / 3.12
Conductivity at 25°C (mS/cm) / ORP	1.06 / 173	1.05 / 170	1.04 / 169	1.04 / 168

Total Volume Purged ____ gallons
Water Appearance (describe color, clarity odor:) slightly black but translucent.

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): same as above
Sample Water Appearance (color, clarity, odor): going to sl. translucent & clear

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
Metals	6000/7000	500ml poly	1	nitric acid	Y (N)	N
Cyanide	9012	500ml poly	1		Y (N)	N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS

(.154)(.17)(26.5) = 690mL for 1 volume

NAME (Print): Adam Gouda
SIGNATURE:

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

HARDING LAWSON ASSOCIATES
GROUNDWATER SAMPLE RECORD

Sample No.: BG-9
Sample Date: 2/16/00
Sample Time: 1402

SITE/SAMPLE LOCATION

Site Name: Honeywell International- Bend Complex
Project No.: 49371
Personnel Present: Adam gouda
Activity Start: 1244
Activity End: 1410
Weather: Snow cold 20°
Well Type and Location: .092 PVC stickup w/ Protect cover.

WATER LEVEL/WELL DATA

Well Depth: 26.8 feet using Solinst (from top of well casing) (measuring device)
Water Depth: _____ feet using Solinst (from top of well casing) (measuring device)
Historical Well Depth: _____ feet (from ground surface)
Protective Casing Stickup: _____ feet (for above-ground surface)
Protect. Casing Well Casing Difference: _____ feet
Floating Product Thickness: None feet using _____ (measuring device)
Well Condition (see Note 1): OK
Measuring Device Decontamination Procedure: _____
PI Meter ID: _____ Ambient Air: _____ ppm Well Mouth: _____ ppm

PURGING PROCEDURES

Height of Water Column feet
( ) .041 gal/ft (1 in)
(X) .16 gal/ft (2 in)
( ) .65 gal/ft (4 in)
( ) _____ gal/ft (___ in)
X 3 casing volumes = 670mL ~~gallons to purge~~
Purge Method (see Note 2): Low Flow sampling with perastaltic pump

Purge Vol. (gal)	670mL	970mL	1270mL	1570
Time (Min.)	1340	1355	1358	1401
Temperature (C°) DO	9.11 / 2.22	9.01 / 1.90	9.02 / 1.66	9.01 / 1.69
pH (Units) Turb	6.83	6.65 / 4.0	6.69 / 4.1	6.71 / 3.8
Conductivity at 25°C (mS/cm) ORP	1.27 / 46	1.27 / 20	1.29 / 18	1.28 / 14
Total Volume Purged	_____ gallons			
Water Appearance (describe color, clarity odor:)	clear			

over

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): same as above
Sample Water Appearance (color, clarity, odor): clear

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?		Cool to 4°C?	
Metals	6000/7000	500ml poly	1	nitric acid	Y	(N)	(Y)	N
Cyanide	9012	500ml poly	1		Y	(N)	(Y)	N
					Y	N	Y	N
					Y	N	Y	N
					Y	N	Y	N

OTHER OBSERVATIONS

(.154)(.17)(25.6) = 670mL = 1 volume

~~Temp~~ turbidity sensor not work correctly after 1st

NAME (Print): Adam Gouda
SIGNATURE:

Notes: (1) Described whether well was locked and the condition of the protective casing and concrete collar.
(2) Describe sequence of purging/sampling including equipment type and decontamination method.

Reading / Re autocalibrate.

HARDING LAWSON ASSOCIATES
GROUNDWATER SAMPLE RECORD

Sample No.: MW-13
Sample Date: 2/16/00
Sample Time: 1149

SITE/SAMPLE LOCATION

Site Name: Honeywell International- Bend Complex Project No.: 49371
Personnel Present: Adam gouda
Activity Start: 1055 Activity End: 1200
Weather: Snow, cold 22°
Well Type and Location: .092 stickup PVC, w/ steel protector

WATER LEVEL/WELL DATA

Well Depth: 26.8 feet using Sounder (from top of well casing; measuring device)
Water Depth: 17.44 feet using Sounder (from top of well casing; measuring device)
Historical Well Depth: _____ feet (from ground surface)
Protective Casing Stickup: _____ feet (for above-ground surface)
Protect. Casing Well Casing Difference: _____ feet
Floating Product Thickness: NONE feet using _____ (measuring device)
Well Condition (see Note 1): Ok.
Measuring Device Decontamination Procedure: _____
PI Meter ID: _____ Ambient Air: _____ ppm Well Mouth: _____ ppm

PURGING PROCEDURES

Height of Water Column ____ feet
( ) .041 gal/ft (1 in)
(X) .16 gal/ft (2 in)
( ) .65 gal/ft (4 in)
( ) ____ gal/ft (___ in)
X 3 casing volumes = 670 mL ~~gallons to purge~~
Purge Method (see Note 2): Low Flow sampling with perastaltic pump

Purge Vol. (gal)	670mL	970mL	1270mL	1570mL
Time (Min.)	1120	1123	1126	1129
Temperature (C°) 100	11.20 / .27	11.23 / .18	11.28 / .17	11.28 / .13
pH (Units) Lvrb	6.75 / -85	6.80 / -6.9	6.78 / -8.8	6.79 / -96
Conductivity at 25°C (mS/cm) ORP	.860 / -47	.946 / -60	.890 / -62	.910 / -70
Total Volume Purged	_____ gallons			
Water Appearance (describe color, clarity odor:)	clear slightly black cloudy.			

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): same as above
Sample Water Appearance (color, clarity, odor): clear.

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
Metals	6000/7000	500ml poly	1	nitric acid	Y (N)	(Y) N
Cyanide	9012	500ml poly	1		Y (N)	(Y) N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS

(.154)(.17)(25.8) = .67L or 670mL for 1st Volume.

NAME (Print): Adam Gouda
SIGNATURE: _____

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

HARDING LAWSON ASSOCIATES
GROUNDWATER SAMPLE RECORD

Sample No.: B6-12
Sample Date: 2/16/00
Sample Time: 1040

SITE/SAMPLE LOCATION

Site Name: **Honeywell International- Bend Complex** Project No.: 49371

Personnel Present: **Adam gouda**

Activity Start: 925 Activity End: 1050

Weather: Cold Snow 22°

Well Type and Location: 2" .020 Stick up PVC w/ steel protector in plant

WATER LEVEL/WELL DATA

Well Depth: 25.4 feet using Solinst (from top of well casing) (measuring device)

Water Depth: 18.64 feet using Solinst (from top of well casing) (measuring device)

Historical Well Depth: _____ feet (from ground surface)

Protective Casing Stickup: _____ feet (for above-ground surface)

Protect. Casing Well Casing Difference: _____ feet

Floating Product Thickness: none - feet using _____ (measuring device)

Well Condition (see Note 1): ok

Measuring Device Decontamination Procedure: _____

PI Meter ID: _____ Ambient Air: _____ ppm Well Mouth: _____ ppm

PURGING PROCEDURES

Height of Water Column feet
( ) .041 gal/ft (1 in)
(X) .16 gal/ft (2 in)
( ) .65 gal/ft (4 in)
( ) _____ gal/ft (___ in)

X 3 casing volumes = 610 ~~gallons~~ mL to purge

Purge Method (see Note 2): **Low Flow sampling with perastaltic pump**

Purge Vol. (gal)	610mL	920mL	1230mL	
Time (Min.)	1025	1028	1031	
Temperature (C°) / turb	10.0 / 30.0	9.28 / 29.9	10.2 / 27.7	
pH (Units) / DO	6.51 / 1.43	6.51 / 1.48	6.32 / 1.40	
Conductivity at 25°C (mS/cm) / ORP	1.25 / ~~[illegible]~~ 167	1.25 / 175	1.21 / 165	
Total Volume Purged	← ~~gallons~~ 1400mL			
Water Appearance (describe color, clarity odor:)	clear to slightly orange.			

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): **same as above**

Sample Water Appearance (color, clarity, odor): clear.

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
Metals	**6000/7000**	**500ml poly**	**1**	**nitric acid**	Y (N)	(Y) N
Cyanide	**9012**	**500ml poly**	**1**	**H_2SO_4**	Y (N)	(Y) N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS

(.154)(.17)(23.5) = 1.61L or 610mL = Volume

NAME (Print): **Adam Gouda**

SIGNATURE: _____

Notes: (1) Described whether well was locked and the condition of the protective casing and concrete collar.
(2) Describe sequence of purging/sampling including equipment type and decontamination method.

HARDING LAWSON ASSOCIATES
GROUNDWATER SAMPLE RECORD

Sample No.: MW-100
Sample Date: 2-17-00
Sample Time: —

SITE/SAMPLE LOCATION

Site Name: **Honeywell International- Bend Complex** Project No.: 49371
Personnel Present: **Adam gouda**
Activity Start: — Activity End:
Weather: —
Well Type and Location: —

WATER LEVEL/WELL DATA

Well Depth: — feet using (from top of well casing) (measuring device) Water Depth: — feet using (from top of well casing) (measuring device)
Historical Well Depth: feet (from ground surface) Protective Casing Stickup: feet (for above-ground surface) Protect. Casing Well Casing Difference: feet
Floating Product Thickness: — feet using — (measuring device)
Well Condition (see Note 1): —
Measuring Device Decontamination Procedure:
PI Meter ID: Ambient Air: ppm Well Mouth: ppm

PURGING PROCEDURES

Height of Water Column feet
( ) .041 gal/ft (1 in)
(X) .16 gal/ft (2 in)
( ) .65 gal/ft (4 in)
( ) gal/ft (in)
X 3 casing volumes = gallons ~~gallons~~ mL to purge
Purge Method (see Note 2): **Low Flow sampling with perastaltic pump**

Purge Vol. (gal)				
Time (Min.)	Same as MW-7			
Temperature (C°)				
pH (Units)				
Conductivity at 25°C (mS/cm)				

Total Volume Purged gallons
Water Appearance (describe color, clarity odor:) Same as MW-7

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): **same as above**
Sample Water Appearance (color, clarity, odor): Same as MW-7

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?		Cool to 4°C?	
Metals	**6000/7000**	**500ml poly**	**1**	**nitric acid**	Y	(N)	(Y)	N
Cyanide	**9012**	**500ml poly**	**1**		Y	(N)	(Y)	N
					Y	N	Y	N
					Y	N	Y	N
					Y	N	Y	N

OTHER OBSERVATIONS
See MW-7 for water Quality Results

NAME (Print) **Adam Gouda**
SIGNATURE:

Notes: *(1) Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) Describe sequence of purging/sampling including equipment type and decontamination method.

HARDING LAWSON ASSOCIATES
GROUNDWATER SAMPLE RECORD

Sample No.: ~~MW-14~~ D-8
Sample Date: ~~4/14/94~~
Sample Time: 1155

SITE/SAMPLE LOCATION

Site Name: HONEYWELL SOUTHBEND COMPLEX
Project No.: 49791
Personnel Present: ADAM GOUDA
Activity Start: 1000
Activity End: 1206
Weather: Sunny 45°
Well Type and Location: 4" steel stickup N. of plant 1

WATER LEVEL/WELL DATA

Well Depth: 61.9 feet using _____ Water Depth: 19.90 feet using SOLINST
(from top of well casing) (measuring device) (from top of well casing) (measuring device)

Historical Well Depth: _____ feet (from ground surface)
Protective Casing Stickup: _____ feet (for above-ground surface)
Protect. Casing Well Casing Difference: _____ feet

Floating Product Thickness: _____ feet using _____ (measuring device)

Well Condition (see Note 1): oh.
Measuring Device Decontamination Procedure: DI water + L-nox
PI Meter ID: — Ambient Air: — ppm Well Mouth: 0.0 ppm

PURGING PROCEDURES

Height of Water Column: 42.0 feet
( ) .041 gal/ft (1 in)
(~~X~~ .16 gal/ft (2 in))
(X) .65 gal/ft (4 in)
( ) ____ gal/ft (___ in)

X 3 casing volumes = 82.0 gallons to purge

Purge Method (see Note 2): whale pump w/ PVC tubing.

Purge Vol. (gal)	27.3	54.6	81.9	
Time (Min.)	1140	X	X	
Temperature (C°)	13.4			
pH (Units)	8.67			
Conductivity at 25°C (mS/cm)	1.03			

Total Volume Purged _____ gallons
Water Appearance (describe color, clarity odor:) translucent w/ black particles

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): Disposable bailer
Sample Water Appearance (color, clarity, odor): translucent w/ black particles

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
VOC	8260	2			Y (N)	(Y) N
					Y N	Y N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS
well went Dry after 30 gallons purged
Significant drawdown throughout purging

NAME (Print)
SIGNATURE:

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

HARDING LAWSON ASSOCIATES
GROUNDWATER SAMPLE RECORD

Sample No.: [redacted] S-21
Sample Date: 4/4/00
Sample Time: 1600

SITE/SAMPLE LOCATION

Site Name: HONEYWELL SOUTHBEND COMPLEX Project No.: 49791
Personnel Present: ADAM GOUDA
Activity Start: 1528 Activity End: 1605
Weather: cloudy 30°
Well Type and Location: FL mount w/ manhole 4" w/ dedicated bladder installed.

WATER LEVEL/WELL DATA

Well Depth: 23.71 feet using ____ (from top of well casing) (measuring device) Water Depth: 16.86. feet using SOLINST (from top of well casing) (measuring device)

Historical Well Depth: ____ feet (from ground surface) Protective Casing Stickup: ____ feet (for above-ground surface) Protect. Casing Well Casing Difference: ____ feet

Floating Product Thickness: — feet using — (measuring device)

Well Condition (see Note 1): ok.
Measuring Device Decontamination Procedure: L-nox DI water
PI Meter ID: ____ Ambient Air: ____ ppm Well Mouth: 0.0 ppm

PURGING PROCEDURES

Height of Water Column: 6.85 feet
( ) .041 gal/ft (1 in)
~~( ) .16 gal/ft (2 in)~~
(✓) .65 gal/ft (4 in)
~~( ) .917 gal/ft ( ) in~~
X 3 casing volumes = 13.3 gallons to purge

Purge Method (see Note 2): Disposable bailer

Purge Vol. (gal)	4.45	8.90	13.3	
Time (Min.)	1535	1542	~~1610~~ 1550	
Temperature (C°)	10.4	10.6	10.7	
pH (Units)	7.37	7.24	7.28	
Conductivity at 25°C (mS/cm)	2.08	2.04	2.02	

Total Volume Purged ____ gallons
Water Appearance (describe color, clarity odor:) clear w/ fine particate matter

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): Same.
Sample Water Appearance (color, clarity, odor): Same

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
VOC	8260	2			Y (N)	(Y) N
					Y N	Y N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS
Note: enough water in hole but pump only submerged 1.5 inches into water. Bladder pump cannot be used. Need pump to be 3.5 ft longer to get enough of pump submerged.

NAME (Print) ____
SIGNATURE: ____

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

HARDING LAWSON ASSOCIATES
GROUNDWATER SAMPLE RECORD

Sample No.: ~~MW-14~~ S-24
Sample Date: 4/11/00
Sample Time: 1510

SITE/SAMPLE LOCATION

Site Name: HONEYWELL SOUTHBEND COMPLEX
Project No.: 49791
Personnel Present: ADAM GOUDA
Activity Start: 1454
Activity End: 1514
Weather: cloudy 32°
Well Type and Location: .092 flmount w/ aluminum pro cover in park

WATER LEVEL/WELL DATA

Well Depth: 21.70 feet using _____ (measuring device) (from top of well casing)
Water Depth: 17.40 feet using SOLINST (measuring device) (from top of well casing)
Historical Well Depth: _____ feet (from ground surface)
Protective Casing Stickup: _____ feet (for above-ground surface)
Protect. Casing Well Casing Difference: _____ feet
Floating Product Thickness: — feet using _____ (measuring device)
Well Condition (see Note 1): ok
Measuring Device Decontamination Procedure: L-nox DI water
PI Meter ID: _____ Ambient Air: _____ ppm Well Mouth: 0.0 ppm

PURGING PROCEDURES

Height of Water Column: 4.3 feet
( ) .041 gal/ft (1 in)
~~(X .16 gal/ft (2 in))~~
( ) .65 gal/ft (4 in)
(X) .092 gal/ft (1.5 in)
X 3 casing volumes = 1.18 gallons to purge
Purge Method (see Note 2): Dedicated bladder pump.

Purge Vol. (gal)	.40	.80	1.18	
Time (Min.)	1458	1502	1505	
Temperature (C°)	10.1	10.1	10.1	
pH (Units)	6.66	6.69	6.71	
Conductivity at 25°C (mS/cm)	1.72	1.75	1.74	
Total Volume Purged	_____ gallons			
Water Appearance (describe color, clarity odor:)	clear w/ slight eggy odor			

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): Same as above.
Sample Water Appearance (color, clarity, odor): Same.

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
VOC	8260	2			Y (N)	(Y) N
					Y N	Y N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS

NAME (Print) _____
SIGNATURE: _____

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

HARDING LAWSON ASSOCIATES
GROUNDWATER SAMPLE RECORD

Sample No.: [redacted] S-26
Sample Date: 4/11/00
Sample Time: 1630

SITE/SAMPLE LOCATION

Site Name: HONEYWELL SOUTHBEND COMPLEX
Project No.: 49791
Personnel Present: ADAM GOUDA
Activity Start: 1615
Activity End: 1634
Weather: cloudy 36°
Well Type and Location: .092 flmount w/ black procover North of plant

WATER LEVEL/WELL DATA

Well Depth: 27.0 feet using ____ (from top of well casing) (measuring device)
Water Depth: 18.24 feet using SOLINST (from top of well casing) (measuring device)
Historical Well Depth: 27.0 feet (from ground surface)
Protective Casing Stickup: ____ feet (for above-ground surface)
Protect. Casing Well Casing Difference: ____ feet
Floating Product Thickness: — feet using — (measuring device)
Well Condition (see Note 1): ok.
Measuring Device Decontamination Procedure: L-nox DI water
PI Meter ID: —
Ambient Air: — ppm
Well Mouth: 0.0 ppm

PURGING PROCEDURES

Height of Water Column 8.76 feet
( ) .041 gal/ft (1 in)
~~(X .16 gal/ft (2 in))~~
( ) .65 gal/ft (4 in)
(X) .092 gal/ft (___ in)
X 3 casing volumes = 2.4 gallons to purge
Purge Method (see Note 2): Dedicated bladder pump

Purge Vol. (gal)	.80	1.6	2.4	
Time (Min.)	1618	1623	1628	
Temperature (C°)	12.3	12.5	12.4	
pH (Units)	7.24	7.18	7.22	
Conductivity at 25°C (mS/cm)	1.92	1.91	1.93	

Total Volume Purged ____ gallons
Water Appearance (describe color, clarity odor:) clear / eggy odor.

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): same as above
Sample Water Appearance (color, clarity, odor): Same.

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?		Cool to 4°C?	
VOC	8260	2		1-1 HCL	Y	(N)	(Y)	N
					Y	N	Y	N
					Y	N	Y	N
					Y	N	Y	N
					Y	N	Y	N

OTHER OBSERVATIONS

take mw-100 @ this well

NAME (Print)
SIGNATURE:

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

HARDING LAWSON ASSOCIATES
GROUNDWATER SAMPLE RECORD

Sample No.: MW-14
Sample Date: 4/12/00
Sample Time: 830

SITE/SAMPLE LOCATION

Site Name: HONEYWELL SOUTHBEND COMPLEX
Project No.: 49791
Personnel Present: ADAM GOUDA
Activity Start: 807
Activity End: 834
Weather: Sunny 30°
Well Type and Location:

WATER LEVEL/WELL DATA

Well Depth: 25.05 feet using _____ (from top of well casing) (measuring device)
Water Depth: 15.58 feet using SOLINST (from top of well casing) (measuring device)
Historical Well Depth: _____ feet (from ground surface)
Protective Casing Stickup: _____ feet (for above-ground surface)
Protect. Casing Well Casing Difference: _____ feet
Floating Product Thickness: — feet using _____ (measuring device)
Well Condition (see Note 1): Ok
Measuring Device Decontamination Procedure: L-nox DI water.
PI Meter ID: _____ Ambient Air: _____ ppm Well Mouth: 0.0 ppm

PURGING PROCEDURES

Height of Water Column: 9.47 feet
( ) .041 gal/ft (1 in)
(X .16 gal/ft (2 in)
( ) .65 gal/ft (4 in)
( ) ____ gal/ft (___ in)
X 3 casing volumes = 4.5 gallons to purge
Purge Method (see Note 2): Disposable bailer.

Purge Vol. (gal)	1.5	3.0	4.5	
Time (Min.)	813	818	822	
Temperature (C°)	9.6	9.5	9.7	
pH (Units)	✱ 11.96	✱ 11.85	✱ 11.80	
Conductivity at 25°C (mS/cm)	1.43	1.48	1.50	

Total Volume Purged _____ gallons
Water Appearance (describe color, clarity odor:) Silty brown

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): Same as above
Sample Water Appearance (color, clarity, odor): Silty brown

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
VOC	8260	2		1-1 HCL	Y (N)	(Y) N
					Y N	Y N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS
✱ - Ph very high, Horiba giving error message for Ph, calibrated 3 times, still getting message

NAME (Print)
SIGNATURE:

Notes: (1) Described whether well was locked and the condition of the protective casing and concrete collar.
(2) Describe sequence of purging/sampling including equipment type and decontamination method.

HARDING LAWSON ASSOCIATES
GROUNDWATER SAMPLE RECORD

Sample No.: [redacted] MW-15
Sample Date: 4/12/00
Sample Time: 900

SITE/SAMPLE LOCATION

Site Name: HONEYWELL SOUTHBEND COMPLEX
Project No.: 49791
Personnel Present: ADAM GOUDA
Activity Start: 840
Activity End: 905
Weather: Sunny 32°
Well Type and Location: 2" flush w/ concreted pro cover.

WATER LEVEL/WELL DATA

Well Depth: 25.06 feet using ____ (from top of well casing) (measuring device)
Water Depth: 15.73 feet using SOLINST (from top of well casing) (measuring device)
Historical Well Depth: ---- feet (from ground surface)
Protective Casing Stickup: ____ feet (for above-ground surface)
Protect. Casing Well Casing Difference: ____ feet
Floating Product Thickness: ---- feet using ____ (measuring device)
Well Condition (see Note 1): ok.
Measuring Device Decontamination Procedure: Lnox DI water
PI Meter ID: ---- Ambient Air: ---- ppm Well Mouth: ---- 0.0 ppm

PURGING PROCEDURES

Height of Water Column: 9.33 feet
( ) .041 gal/ft (1 in)
(X .16 gal/ft (2 in)
( ) .65 gal/ft (4 in)
( ) ____ gal/ft (___ in)
X 3 casing volumes = 4.5 gallons to purge
Purge Method (see Note 2): Disposable bailer

Purge Vol. (gal)	1.5	3.0	4.5	
Time (Min.)	844	851	856	
Temperature (C°)	10.5	10.7	10.8	
pH (Units)	~~11.40~~	~~11.46~~	~~11.55~~	
Conductivity at 25°C (mS/cm)	1.42	1.42	1.43	

Total Volume Purged: 4.5 gallons
Water Appearance (describe color, clarity odor:) Silty brown

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): Same as above.
Sample Water Appearance (color, clarity, odor): Silty brown

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
VOC	8260	2		1-1 HCL	Y (N)	Y (N)
					Y N	Y N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS

pH not working correctly on Horiba readings not accurate.

NAME (Print)
SIGNATURE:

Notes: (1) Described whether well was locked and the condition of the protective casing and concrete collar.
(2) Describe sequence of purging/sampling including equipment type and decontamination method.

APPENDIX D

MANN-KENDALL TREND TEST CALCULATIONS

8D - Mann Kendall Trend Test

trans-1,2-Dichloroethene											
Sampling Dates		03/21/1997	06/03/1997	09/24/1997	12/08/1997	06/11/1998	12/12/1998	06/23/1999	12/15/1999	04/15/2000	
Concentrations (µg/l)		27	35	23	21	29	32	28	23	8	Summation
03/21/1997	27	0	1	-1	-1	1	1	1	-1	-1	0
06/03/1997	35		0	-1	-1	-1	-1	-1	-1	-1	-7
09/24/1997	23			0	-1	1	1	1	0	-1	1
12/08/1997	21				0	1	1	1	1	-1	3
06/11/1998	29					0	1	-1	-1	-1	-2
12/12/1998	32						0	-1	-1	-1	-3
06/23/1999	28							0	-1	-1	-2
12/15/1999	23								0	-1	-1
04/15/2000	8									0	0
											-11

S= **-11** **No Trend for trans-1,2-Dichloroethene**

P= **0.154**

P **>0.05**

cis-1,2-Dichloroethene											
Sampling Dates		03/21/1997	06/03/1997	09/24/1997	12/08/1997	06/11/1998	12/12/1998	06/23/1999	12/15/1999	04/15/2000	
Concentrations (µg/l)		230	310	240	220	260	220	240	200	51	Summation
03/21/1997	230	0	1	1	-1	1	-1	1	-1	-1	0
06/03/1997	310		0	-1	-1	-1	-1	-1	-1	-1	-7
09/24/1997	240			0	-1	1	-1	0	-1	-1	-3
12/08/1997	220				0	1	0	1	-1	-1	0
06/11/1998	260					0	-1	-1	-1	-1	-4
12/12/1998	220						0	1	-1	-1	-1
06/23/1999	240							0	-1	-1	-2
12/15/1999	200								0	-1	-1
04/15/2000	51									0	0
											-18

S= **-18** **Decreasing Trend for cis-1,2-Dichloroethene**

P= **0.038**

P **<0.05**

S4A - Mann Kendall Trend Test

1,1-Dichloroethane

Sampling Dates		03/21/1997	06/03/1997	09/23/1997	12/09/1997	06/10/1998	12/14/1998	06/22/1999	12/14/1999		Summation
Concentrations (µg/l)		14	31	24	23	33	33	40	26		
03/21/1997	14	0	1	1	1	1	1	1	1		7
06/03/1997	31		0	-1	-1	1	1	1	-1		0
09/23/1997	24			0	-1	1	1	1	1		3
12/09/1997	23				0	1	1	1	1		4
06/10/1998	33					0	0	1	-1		0
12/14/1998	33						0	1	-1		0
06/22/1999	40							0	-1		-1
12/14/1999	26								0		0
											0
											13

S= **13** **No Trend for 1,1-Dichloroethane**

P= **0.071**

P **>0.05**

cis-1,2-Dichloroethene

Sampling Dates		03/21/1997	06/03/1997	09/23/1997	12/09/1997	06/10/1998	12/14/1998	06/22/1999	12/14/1999		Summation
Concentrations (µg/l)		210	300	220	210	280	260	260	190		
03/21/1997	210	0	1	1	0	1	1	1	-1		4
06/03/1997	300		0	-1	-1	-1	-1	-1	-1		-6
09/23/1997	220			0	-1	1	1	1	-1		1
12/09/1997	210				0	1	1	1	-1		2
06/10/1998	280					0	-1	-1	-1		-3
12/14/1998	260						0	0	-1		-1
06/22/1999	260							0	-1		-1
12/14/1999	190								0		0
											0
											-4

S= **-4** **No Trend for cis-1,2-Dichloroethene**

P= **0.36**

P **>0.05**

S9 - Mann Kendall Trend Test

1,2-Dichloroethane											
Sampling Dates		03/19/1997	06/04/1997	09/25/1997	12/11/1997	06/11/1998	12/14/1998	06/23/1999	12/14/1999		
Concentrations (µg/l)		220	250	190	240	170	240	<5.0	160		Summation
03/19/1997	220	0	1	-1	1	-1	1	-1	-1		-1
06/04/1997	250		0	-1	-1	-1	-1	-1	-1		-6
09/25/1997	190			0	1	-1	1	-1	-1		-1
12/11/1997	240				0	-1	0	-1	-1		-3
06/11/1998	170					0	1	-1	-1		-1
12/14/1998	240						0	-1	-1		-2
06/23/1999	<5.0							0	1		1
12/14/1999	160								0		0
											0
											-13

S= -13 No Trend for 1,2-Dichloroethane

P= 0.072

P >0.05

trans-1,2 Dichloroethene											
Sampling Dates		03/19/1997	06/04/1997	09/25/1997	12/11/1997	06/11/1998	12/14/1998	06/23/1999	12/14/1999		
Concentrations (µg/l)		5.8	<5	5.8	<5.0	7.3	<5.0	12	8.3		Summation
03/19/1997	5.8	0	-1	0	-1	1	-1	1	1		0
06/04/1997	<5		0	1	0	1	0	1	1		4
09/25/1997	5.8			0	-1	1	-1	1	1		1
12/11/1997	<5.0				0	1	0	1	1		3
06/11/1998	7.3					0	-1	1	1		1
12/14/1998	<5.0						0	1	1		2
06/23/1999	12							0	-1		-1
12/14/1999	8.3								0		0
											0
											10

S= 10 No Trend for trans-1,2-Dichloroethene

P= 0.138

P >0.05

S9 - Mann Kendall Trend Test

cis-1,2-Dichloroethene											
Sampling Dates		03/19/1997	06/04/1997	09/25/1997	12/11/1997	06/11/1998	12/14/1998	06/23/1999	12/14/1999		
Concentrations (µg/l)		45	54	54	62	61	92	91	70		Summation
03/19/1997	45	0	1	1	1	1	1	1	1		7
06/04/1997	54		0	0	1	1	1	1	1		5
09/25/1997	54			0	1	1	1	1	1		5
12/11/1997	62				0	-1	1	1	1		2
06/11/1998	61					0	1	1	1		3
12/14/1998	92						0	-1	-1		-2
06/23/1999	91							0	-1		-1
12/14/1999	70								0		0
											0
											19

S= **19**

P= **0.012**

P **<0.05**

Increasing Trend for cis-1,2-Dichloroethene

S14 - Mann Kendall Trend Test

Trichloroethene											
Sampling Dates		03/19/1997	06/05/1997	09/24/1997	12/11/1997						
Concentrations (µg/l)		40	44	64	77						Summation
03/19/1997	40	0	1	1	1						3
06/05/1997	44		0	1	1						2
09/24/1997	64			0	1						1
12/11/1997	77				0						0
											0
											0
											0
											0
											6

S= 6 Increasing Trend for Trichloroethene

P= 0.042

P <0.05

1,1,1-Trichloroethane											
Sampling Dates		03/19/1997	06/05/1997	09/24/1997	12/11/1997						
Concentrations (µg/l)		21	21	35	34						Summation
03/19/1997	21	0	0	1	1						2
06/05/1997	21		0	1	1						2
09/24/1997	35			0	-1						-1
12/11/1997	34				0						0
											0
											0
											0
											0
											0
											3

S= 3 No Trend for 1,1,1-Trichloroethane

P= 0.271

P >0.05

S14 - Mann Kendall Trend Test

cis-1,2-Dichloroethene											
Sampling Dates		03/19/1997	06/05/1997	09/24/1997	12/11/1997						
Concentrations (µg/l)		66	71	110	140						Summation
03/19/1997	66	0	1	1	1						3
06/05/1997	71		0	1	1						2
09/24/1997	110			0	1						1
12/11/1997	140				0						0
											0
											0
											0
											0
											0
											6

S= 6 **Increasing Trend for cis-1,2-Dichloroethene**

P= 0.042

P <0.05

trans-1,2-Dichloroethene											
Sampling Dates		03/19/1997	06/05/1997	09/24/1997	12/11/1997						
Concentrations (µg/l)		5	5.1	7.6	10						Summation
03/19/1997	5	0	1	1	1						3
06/05/1997	5.1		0	1	1						2
09/24/1997	7.6			0	1						1
12/11/1997	10				0						0
											0
											0
											0
											0
											0
											6

S= 6 **Increasing Trend for trans-1,2-Dichloroethene**

P= 0.042

P >0.05

S14 - Mann Kendall Trend Test

1,1-Dichloroethene											
Sampling Dates		03/19/1997	06/05/1997	09/24/1997	12/11/1997						
Concentrations (µg/l)		5.3	<5	6.3	7.8						Summation
03/19/1997	5.3	0	-1	1	1						1
06/05/1997	<5		0	1	1						2
09/24/1997	6.3			0	1						1
12/11/1997	7.8				0						0
											0
											0
											0
											0
											0
											4

S= 4 **No Trend for 1,1-Dichloroethene**

P= 0.167

P >0.05

1,2-Dichloroethane											
Sampling Dates		03/19/1997	06/05/1997	09/24/1997	12/11/1997						
Concentrations (µg/l)		66	71	110	140						Summation
03/19/1997	66	0	1	1	1						3
06/05/1997	71		0	1	1						2
09/24/1997	110			0	1						1
12/11/1997	140				0						0
											0
											0
											0
											0
											0
											6

S= 6 **Increasing Trend for 1,2-Dichloroethane**

P= 0.042

P <0.05

S14 - Mann Kendall Trend Test

1,1-Dichloroethane											
Sampling Dates		03/19/1997	06/05/1997	09/24/1997	12/11/1997						
Concentrations (µg/l)		21	21	44	61						Summation
03/19/1997	21	0	0	1	1						2
06/05/1997	21		0	1	1						2
09/24/1997	44			0	1						1
12/11/1997	61				0						0
											0
											0
											0
											0
											0
											5

S= 5

P= 0.105

P >0.05

No Trend for 1,1-Dichloroethene

S15 - Mann Kendall Trend Test

Vinyl chloride											
Sampling Dates		03/21/1997	06/05/1997	09/24/1997	12/08/1997	06/11/1998	12/14/1998	06/23/1999	12/14/1999		
Concentrations (µg/l)		18	30	31	25	15	29	<10	30		Summation
03/21/1997	18	0	1	1	1	-1	1	-1	1		3
06/05/1997	30		0	1	-1	-1	-1	-1	0		-3
09/24/1997	31			0	-1	-1	-1	-1	-1		-5
12/08/1997	25				0	-1	1	-1	1		0
06/11/1998	15					0	1	-1	1		1
12/14/1998	29						0	-1	1		0
06/23/1999	<10							0	1		1
12/14/1999	30								0		0
											0
											-3

S= **-3** **No Trend for Vinyl chloride**

P= **0.406**

P **>0.05**

cis-1,2-Dichloroethene											
Sampling Dates		03/21/1997	06/05/1997	09/24/1997	12/08/1997	06/11/1998	12/14/1998	06/23/1999	12/14/1999		
Concentrations (µg/l)		18	35	22	<5.0	16	16	14	12		Summation
03/21/1997	18	0	1	1	-1	-1	-1	-1	-1		-3
06/05/1997	35		0	-1	-1	-1	-1	-1	-1		-6
09/24/1997	22			0	-1	-1	-1	-1	-1		-5
12/08/1997	<5.0				0	1	1	1	1		4
06/11/1998	16					0	0	-1	-1		-2
12/14/1998	16						0	-1	-1		-2
06/23/1999	14							0	-1		-1
12/14/1999	12								0		0
											0
											-15

S= **-15** **Decreasing Trend for cis-1,2-Dichloroethene**

P= **0.042**

P= **0.05**

S15 - Mann Kendall Trend Test

1,2-Dichloroethane

Sampling Dates		03/21/1997	06/05/1997	09/24/1997	12/08/1997	06/11/1998	12/14/1998	06/23/1999	12/14/1999		
Concentrations (µg/l)		24	41	<5.0	<5.0	12	<5.0	9.7	<5		Summation
03/21/1997	24	0	1	-1	-1	-1	-1	-1	-1		-5
06/05/1997	41		0	-1	-1	-1	-1	-1	-1		-6
09/24/1997	<5.0			0	0	1	0	1	0		2
12/08/1997	<5.0				0	1	0	1	0		2
06/11/1998	12					0	-1	-1	-1		-3
12/14/1998	<5.0						0	1	0		1
06/23/1999	9.7							0	-1		-1
12/14/1999	<5								0		0
											0
											-10

S= -10 **No Trend for 1,2-Dichloroethane**

P= 0.179

P >0.05

1,1-Dichloroethane

Sampling Dates		03/21/1997	06/05/1997	09/24/1997	12/08/1997	06/11/1998	12/14/1998	06/23/1999	12/14/1999		
Concentrations (µg/l)		<5	14	14	14	8.6	13	8.2	14		Summation
03/21/1997	<5	0	1	1	1	1	1	1	1		7
06/05/1997	14		0	0	0	-1	-1	-1	0		-3
09/24/1997	14			0	0	-1	-1	-1	0		-3
12/08/1997	14				0	-1	-1	-1	0		-3
06/11/1998	8.6					0	1	-1	1		1
12/14/1998	13						0	-1	1		0
06/23/1999	8.2							0	1		1
12/14/1999	14								0		0
											0
											0

S= 0 **No Trend for 1,1-Dichloroethane**

P= 0.54

P >0.05

S16 - Mann Kendall Trend Test

Trichloroethene											
Sampling Dates		03/20/1997	06/03/1997	09/24/1997	12/08/1997	06/11/1998	12/14/1998	06/23/1999	12/14/1999		
Concentrations (µg/l)		380	650	560	470	460	420	390	380		Summation
03/20/1997	380	0	1	1	1	1	1	1	0		6
06/03/1997	650		0	-1	-1	-1	-1	-1	-1		-6
09/24/1997	560			0	-1	-1	-1	-1	-1		-5
12/08/1997	470				0	-1	-1	-1	-1		-4
06/11/1998	460					0	-1	-1	-1		-3
12/14/1998	420						0	-1	-1		-2
06/23/1999	390							0	-1		-1
12/14/1999	380								0		0
											0
											-15

S= **-15** **Decreasing Trend for Trichloroethene**

P= **0.043**

P **<0.05**

1,1,1-Trichloroethane											
Sampling Dates		03/20/1997	06/03/1997	09/24/1997	12/08/1997	06/11/1998	12/14/1998	06/23/1999	12/14/1999		
Concentrations (µg/l)		25	37	27	20	20	20	19	17		Summation
03/20/1997	25	0	1	1	-1	-1	-1	-1	-1		-3
06/03/1997	37		0	-1	-1	-1	-1	-1	-1		-6
09/24/1997	27			0	-1	-1	-1	-1	-1		-5
12/08/1997	20				0	0	0	-1	-1		-2
06/11/1998	20					0	0	-1	-1		-2
12/14/1998	20						0	-1	-1		-2
06/23/1999	19							0	-1		-1
12/14/1999	17								0		0
											0
											-21

S= **-21** **Decreasing Trend for 1,1,1-Trichloroethane**

P= **0.0045**

P **<0.05**

S16 - Mann Kendall Trend Test

cis-1,2-Dichloroethene

Sampling Dates		03/20/1997	06/03/1997	09/24/1997	12/08/1997	06/11/1998	12/14/1998	06/23/1999	12/14/1999		Summation
Concentrations (µg/l)		150	120	91	73	79	54	54	68		
03/20/1997	150	0	-1	-1	-1	-1	-1	-1	-1		-7
06/03/1997	120		0	-1	-1	-1	-1	-1	-1		-6
09/24/1997	91			0	-1	-1	-1	-1	-1		-5
12/08/1997	73				0	1	-1	-1	-1		-2
06/11/1998	79					0	-1	-1	-1		-3
12/14/1998	54						0	0	1		1
06/23/1999	54							0	1		1
12/14/1999	68								0		0
											0
											-21

S= -21 Decreasing Trend for cis-1,2-Dichloroethene

P= 0.0045

P <0.05

trans-1,2-Dichloroethene

Sampling Dates		03/20/1997	06/03/1997	09/24/1997	12/08/1997	06/11/1998	12/14/1998	06/23/1999	12/14/1999		Summation
Concentrations (µg/l)		11	<5	18	19	5.5	26	8.2	18		
03/20/1997	11	0	-1	1	1	-1	1	-1	1		1
06/03/1997	<5		0	1	1	1	1	1	1		6
09/24/1997	18			0	1	-1	1	-1	0		0
12/08/1997	19				0	-1	1	-1	-1		-2
06/11/1998	5.5					0	1	1	1		3
12/14/1998	26						0	-1	-1		-2
06/23/1999	8.2							0	1		1
12/14/1999	18								0		0
											0
											7

S= 7 No Trend for trans-1,2-Dichloroethene

P= 0.237

P >0.05

S17 - Mann Kendall Trend Test

Trichloroethene											
Sampling Dates		03/20/97	06/03/97	09/24/97	12/11/97	06/10/98	12/14/98	06/23/99	12/15/99		
Concentrations (µg/l)		16	25	28	25	19	18	15	17		Summation
03/20/97	16	0	1	1	1	1	1	-1	1		5
06/03/97	25		0	1	0	-1	-1	-1	-1		-3
09/24/97	28			0	-1	-1	-1	-1	-1		-5
12/11/97	25				0	-1	-1	-1	-1		-4
06/10/98	19					0	-1	-1	-1		-3
12/14/98	18						0	-1	-1		-2
06/23/99	15							0	1		1
12/15/99	17								0		0
											0
											-11

S= **-11** **No Trend for Trichloroethene**

P= **0.138**

P **>0.05**

1,1,1-Trichloroethane											
Sampling Dates		03/20/97	06/03/97	09/24/97	12/11/97	06/10/98	12/14/98	06/23/99	12/15/99		
Concentrations (µg/l)		34	40	51	37	26	22	18	16		Summation
03/20/97	34	0	1	1	1	-1	-1	-1	-1		-1
06/03/97	40		0	1	-1	-1	-1	-1	-1		-4
09/24/97	51			0	-1	-1	-1	-1	-1		-5
12/11/97	37				0	-1	-1	-1	-1		-4
06/10/98	26					0	-1	-1	-1		-3
12/14/98	22						0	-1	-1		-2
06/23/99	18							0	-1		-1
12/15/99	16								0		0
											0
											-20

S= **-20** **Decreasing Trend for 1,1,1-Trichloroethane**

P= **0.0071**

P **<0.05**

S21 - Mann Kendall Trend Test

Trichloroethene											
Sampling Dates		03/20/1997	06/04/1997	09/26/1997	12/10/1997	06/10/1998	12/14/1998	06/22/1999	12/15/1999	04/15/2000	
Concentrations (µg/l)		28	31	42	46	38	25	20	26	33	Summation
03/20/1997	28	0	1	1	1	1	-1	-1	-1	1	2
06/04/1997	31		0	1	1	1	-1	-1	-1	1	1
09/26/1997	42			0	1	-1	-1	-1	-1	-1	-4
12/10/1997	46				0	-1	-1	-1	-1	-1	-5
06/10/1998	38					0	-1	-1	-1	-1	-4
12/14/1998	25						0	-1	1	1	1
06/22/1999	20							0	1	1	2
12/15/1999	26								0	1	1
04/15/2000	33									0	0
											-6

S= -6 **No Trend for Trichloroethene**
P= 0.306
P >0.05

cis-1,2-Dichloroethene											
Sampling Dates		03/20/1997	06/04/1997	09/26/1997	12/10/1997	06/10/1998	12/14/1998	06/22/1999	12/15/1999	04/15/2000	
Concentrations (µg/l)		22	36	25	23	33	22	57	36	23	Summation
03/20/1997	22	0	1	1	1	1	0	1	1	1	7
06/04/1997	36		0	-1	-1	-1	-1	1	0	-1	-4
09/26/1997	25			0	-1	1	-1	1	1	-1	0
12/10/1997	23				0	1	-1	1	1	0	2
06/10/1998	33					0	-1	1	1	-1	0
12/14/1998	22						0	1	1	1	3
06/22/1999	57							0	-1	-1	-2
12/15/1999	36								0	-1	-1
04/15/2000	23									0	0
											5

S= 5 **No Trend for cis-1,2-Dichloroethene**
P= 0.344
P >0.05

S21 - Mann Kendall Trend Test

trans-1,2-Dichloroethene											
Sampling Dates		03/20/1997	06/04/1997	09/26/1997	12/10/1997	06/10/1998	12/14/1998	06/22/1999	12/15/1999	04/15/2000	
Concentrations (µg/l)		16	29	20	18	24	13	52	28	17	Summation
03/20/1997	16	0	1	1	1	1	-1	1	1	1	6
06/04/1997	29		0	-1	-1	-1	-1	1	-1	-1	-5
09/26/1997	20			0	-1	1	-1	1	1	-1	0
12/10/1997	18				0	1	-1	1	1	-1	1
06/10/1998	24					0	-1	1	1	-1	0
12/14/1998	13						0	1	1	1	3
06/22/1999	52							0	-1	-1	-2
12/15/1999	28								0	-1	-1
04/15/2000	17									0	0
											2

S= **2**

P= **0.46**

P **>0.05**

No Trend for trans 1,2-Dichloroethene

S22 - Mann Kendall Trend Test

trans-1,2 Dichloroethene											
Sampling Dates		03/22/1997	06/04/1997	09/23/1997	12/10/1997	06/09/1998	12/14/1998	06/22/1999	12/15/1999		
Concentrations (µg/l)		69	91	97	92	71	86	<5.0	67		Summation
03/22/1997	69	0	1	1	1	1	1	-1	-1		3
06/04/1997	91		0	1	1	-1	-1	-1	-1		-2
09/23/1997	97			0	-1	-1	-1	-1	-1		-5
12/10/1997	92				0	-1	-1	-1	-1		-4
06/09/1998	71					0	1	-1	-1		-1
12/14/1998	86						0	-1	-1		-2
06/22/1999	<5.0							0	1		1
12/15/1999	67								0		0
											0
											-10

S= **-10** **No Trend for trans-1,2-Dichloroethene**

P= **0.138**

P **>0.05**

cis-1,2-Dichloroethene											
Sampling Dates		03/22/1997	06/04/1997	09/23/1997	12/10/1997	06/09/1998	12/14/1998	06/22/1999	12/15/1999		
Concentrations (µg/l)		46	66	64	63	53	59	53	53		Summation
03/22/1997	46	0	1	1	1	1	1	1	1		7
06/04/1997	66		0	-1	-1	-1	-1	-1	-1		-6
09/23/1997	64			0	-1	-1	-1	-1	-1		-5
12/10/1997	63				0	-1	-1	-1	-1		-4
06/09/1998	53					0	1	0	0		1
12/14/1998	59						0	-1	-1		-2
06/22/1999	53							0	0		0
12/15/1999	53								0		0
											0
											-9

S= **-9** **No Trend for cis-1,2-Dichloroethene**

P= **0.169**

P **>0.05**

S23 - Mann Kendall Trend Test

Trichloroethene											
Sampling Dates		03/22/1997	06/04/1997	09/23/1997	12/10/1997	06/10/1998	12/14/1998	06/22/1999	12/15/1999		
Concentrations (µg/l)		<5	<5	<5.0	5.1	5.2	9.8	11	18		**Summation**
03/22/1997	<5	0	0	0	1	1	1	1	1		5
06/04/1997	<5		0	0	1	1	1	1	1		5
09/23/1997	<5.0			0	1	1	1	1	1		5
12/10/1997	5.1				0	1	1	1	1		4
06/10/1998	5.2					0	1	1	1		3
12/14/1998	9.8						0	1	1		2
06/22/1999	11							0	1		1
12/15/1999	18								0		0
											0
											25

S= **25**

P= **0.0005**

P= **<0.05**

Increasing Trend for Trichloroethene

S24 - Mann Kendall Trend Test

Trichloroethene

Sampling Dates		03/21/1997	06/05/1997	09/23/1997	12/09/1997	12/14/1998	06/22/1999	12/15/1999	04/15/2000		
Concentrations (µg/l)		<5	9	9.1	9.3	10	22	32	26		Summation
03/21/1997	<5	0	1	1	1	1	1	1	1		7
06/05/1997	9		0	1	1	1	1	1	1		6
09/23/1997	9.1			0	1	1	1	1	1		5
12/09/1997	9.3				0	1	1	1	1		4
12/14/1998	10					0	1	1	1		3
06/22/1999	22						0	1	1		2
12/15/1999	32							0	-1		-1
04/15/2000	26								0		0
											0
											26

S= 26 **Increasing Trend for Trichloroethene**

P= 0

P <0.05

trans-1,2 Dichloroethene

Sampling Dates		03/21/1997	06/05/1997	09/23/1997	12/09/1997	12/14/1998	06/22/1999	12/15/1999	04/15/2000		
Concentrations (µg/l)		85	170	160	180	150	220	170	170		Summation
03/21/1997	85	0	1	1	1	1	1	1	1		7
06/05/1997	170		0	-1	1	-1	1	0	0		0
09/23/1997	160			0	1	-1	1	1	1		3
12/09/1997	180				0	-1	1	-1	-1		-2
12/14/1998	150					0	1	1	1		3
06/22/1999	220						0	-1	-1		-2
12/15/1999	170							0	0		0
04/15/2000	170								0		0
											0
											9

S= 9 **No Trend for trans-1,2-Dichloroethene**

P= 0.169

P >0.05

S24 - Mann Kendall Trend Test

cis-1,2-Dichloroethene											
Sampling Dates		03/21/1997	06/05/1997	09/23/1997	12/09/1997	12/14/1998	06/22/1999	12/15/1999	04/15/2000		
Concentrations (µg/l)		44	100	91	99	100	140	120	110		Summation
03/21/1997	44	0	1	1	1	1	1	1	1		7
06/05/1997	100		0	-1	-1	0	1	1	1		1
09/23/1997	91			0	1	1	1	1	1		5
12/09/1997	99				0	1	1	1	1		4
12/14/1998	100					0	1	1	1		3
06/22/1999	140						0	-1	-1		-2
12/15/1999	120							0	-1		-1
04/15/2000	110								0		0
											0
											17

S= **17**

P= **0.023**

P **<0.05**

Increasing Trend for cis-1,2-Dichloroethene

S26 - Mann Kendall Trend Test

Trichloroethene											
Sampling Dates		03/20/1997	06/03/1997	09/23/1997	12/09/1997	12/14/1999	04/15/2000				
Concentrations (µg/l)		35	51	66	65	28	41				Summation
03/20/1997	35	0	1	1	1	-1	1				3
06/03/1997	51		0	1	1	-1	-1				0
09/23/1997	66			0	-1	-1	-1				-3
12/09/1997	65				0	-1	-1				-2
12/14/1999	28					0	1				1
04/15/2000	41						0				0
											0
											0
											0
											-1

S= **-1** **No Trend for Trichloroethene**

P= **0.5**

P **>0.05**

cis-1,2-Dichloroethene											
Sampling Dates		03/20/1997	06/03/1997	09/23/1997	12/09/1997	12/14/1999	04/15/2000				
Concentrations (µg/l)		12	18	21	22	7.1	12				Summation
03/20/1997	12	0	1	1	1	-1	0				2
06/03/1997	18		0	1	1	-1	-1				0
09/23/1997	21			0	1	-1	-1				-1
12/09/1997	22				0	-1	-1				-2
12/14/1999	7.1					0	-1				-1
04/15/2000	12						0				0
0	0										0
0	0										0
											0
											-2

S= **-2** **No Trend for cis-1,2-Dichloroethene**

P= **0.42**

P **>0.05**

S27 - Mann Kendall Trend Test

Trichloroethene											
Sampling Dates		03/20/97	06/05/97	09/23/97	12/09/97	06/10/98	12/14/98	06/22/99	12/15/99		
Concentrations (µg/l)		23	25	36	36	32	32	31	30		Summation
03/20/97	23	0	1	1	1	1	1	1	1		7
06/05/97	25		0	1	1	1	1	1	1		6
09/23/97	36			0	0	-1	-1	-1	-1		-4
12/09/97	36				0	-1	-1	-1	-1		-4
06/10/98	32					0	0	-1	-1		-2
12/14/98	32						0	-1	-1		-2
06/22/99	31							0	-1		-1
12/15/99	30								0		0
											0
											0

S= **0** **No Trend for Trichloroethene**

P= **0.548**

P **>0.05**

1,1,1-Trichloroethane											
Sampling Dates		03/20/97	06/05/97	09/23/97	12/09/97	06/10/98	12/14/98	06/22/99	12/15/99		
Concentrations (µg/l)		<5	<5	<5	<5	<5	<5	<5	5.2		Summation
03/20/97	<5	0	0	0	0	0	0	0	1		1
06/05/97	<5		0	0	0	0	0	0	1		1
09/23/97	<5			0	0	0	0	0	1		1
12/09/97	<5				0	0	0	0	1		1
06/10/98	<5						0	0	1		1
12/14/98	<5							0	1		1
06/22/99	<5							0	1		1
12/15/99	5.2								0		0
											0
											7

S= **7** **No Trend for 1,1,1-Trichloroethane**

P= **0.245**

P **>0.05**

S27 - Mann Kendall Trend Test

cis-1,2-Dichloroethene											
Sampling Dates		03/20/97	06/05/97	09/23/97	12/09/97	06/10/98	12/14/98	06/22/99	12/15/99		
Concentrations (µg/l)		21	26	31	30	29	29	22	18		Summation
03/20/97	21	0	1	1	1	1	1	1	-1		5
06/05/97	26		0	1	1	1	1	-1	-1		2
09/23/97	31			0	-1	-1	-1	-1	-1		-5
12/09/97	30				0	-1	-1	-1	-1		-4
06/10/98	29					0	0	-1	-1		-2
12/14/98	29						0	-1	-1		-2
06/22/99	22							0	-1		-1
12/15/99	18								0		0
											0
											-7

S= -7 No Trend for cis-1,2-Dichloroethene

P= 0.245

P >0.05

trans-1,2-Dichloroethene											
Sampling Dates		03/20/97	06/05/97	09/23/97	12/09/97	06/10/98	12/14/98	06/22/99	12/15/99		
Concentrations (µg/l)		11	15	18	16	14	16	5.3	<5		Summation
03/20/97	11	0	1	1	1	1	1	-1	-1		3
06/05/97	15		0	1	1	-1	1	-1	-1		0
09/23/97	18			0	-1	-1	-1	-1	-1		-5
12/09/97	16				0	-1	0	-1	-1		-3
06/10/98	14					0	1	-1	-1		-1
12/14/98	16						0	-1	-1		-2
06/22/99	5.3							0	-1		-1
12/15/99	<5								0		0
											0
											-9

S= -9 No Trend for trans-1,2-Dichloroethene

P= 0.118

P >0.05

S27 - Mann Kendall Trend Test

1,1-Dichloroethene											
Sampling Dates		03/20/97	06/05/97	09/23/97	12/09/97	06/10/98	12/14/98	06/22/99	12/15/99		
Concentrations (µg/l)		<5	<5	<5	<5	<5	9.9	14	11		Summation
03/20/97	<5	0	0	0	0	0	1	1	1		3
06/05/97	<5		0	0	0	0	1	1	1		3
09/23/97	<5			0	0	0	1	1	1		3
12/09/97	<5				0	0	1	1	1		3
06/10/98	<5					0	1	1	1		3
12/14/98	9.9						0	1	1		2
06/22/99	14							0	-1		-1
12/15/99	11								0		0
											0
											16

S= 16 Increasing Trend for 1,1-Dichloroethene

P= 0.031

P <0.05

1,1-Dichloroethane											
Sampling Dates		03/20/97	06/05/97	09/23/97	12/09/97	06/10/98	12/14/98	06/22/99	12/15/99		
Concentrations (µg/l)		<5	<5	17	26	44	50	83	65		Summation
03/20/97	<5	0	0	1	1	1	1	1	1		6
06/05/97	<5		0	1	1	1	1	1	1		6
09/23/97	17			0	1	1	1	1	1		5
12/09/97	26				0	1	1	1	1		4
06/10/98	44					0	1	1	1		3
12/14/98	50						0	1	1		2
06/22/99	83							0	-1		-1
12/15/99	65								0		0
											0
											25

S= 25 Increasing Trend for 1,1-Dichloroethane

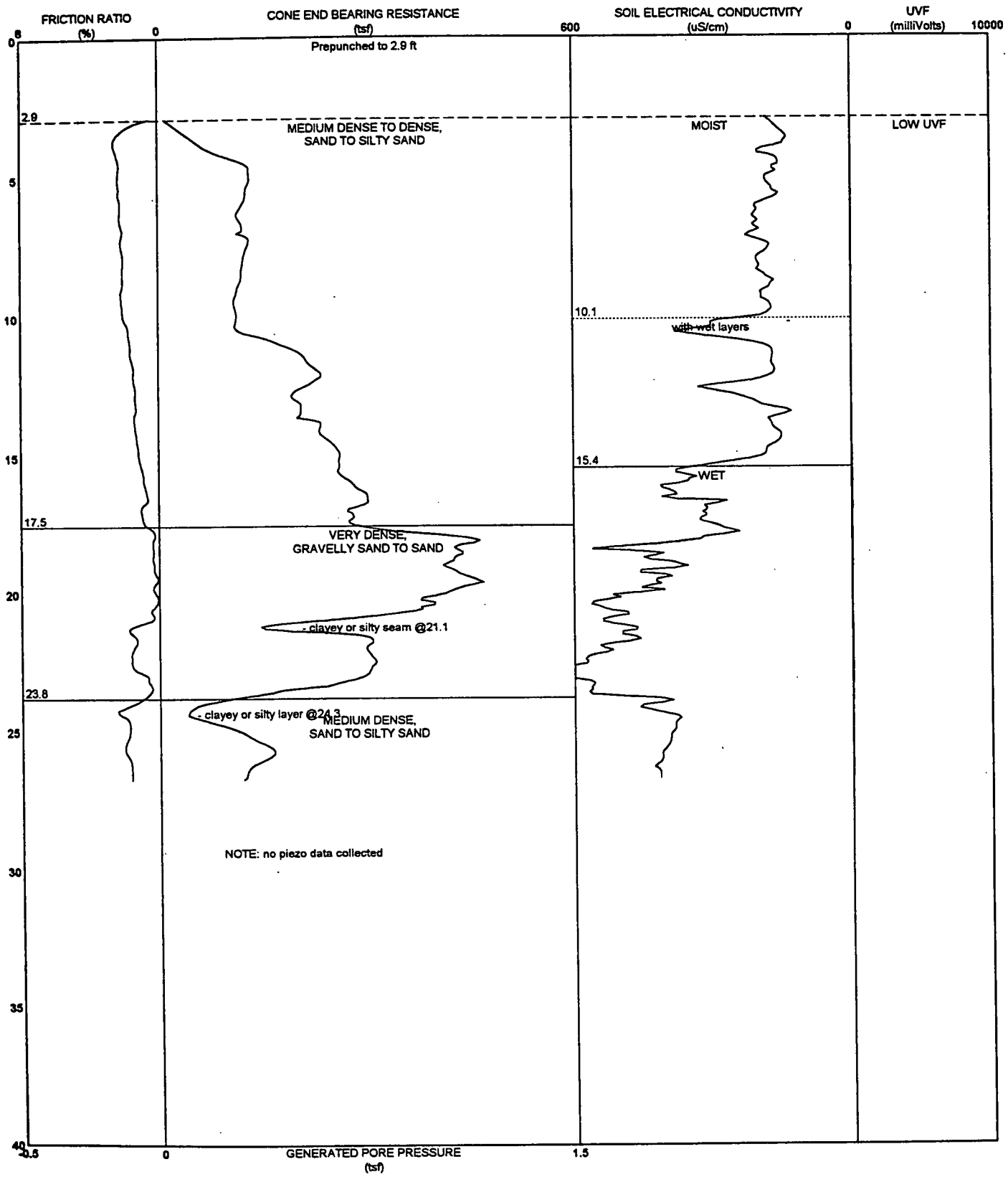
P= 0.00056

P <0.05

APPENDIX E

CONE PENETROMETER LOGS

CPTU-EC-UVIF LOG WITH LITHOLOGIC EVALUATION

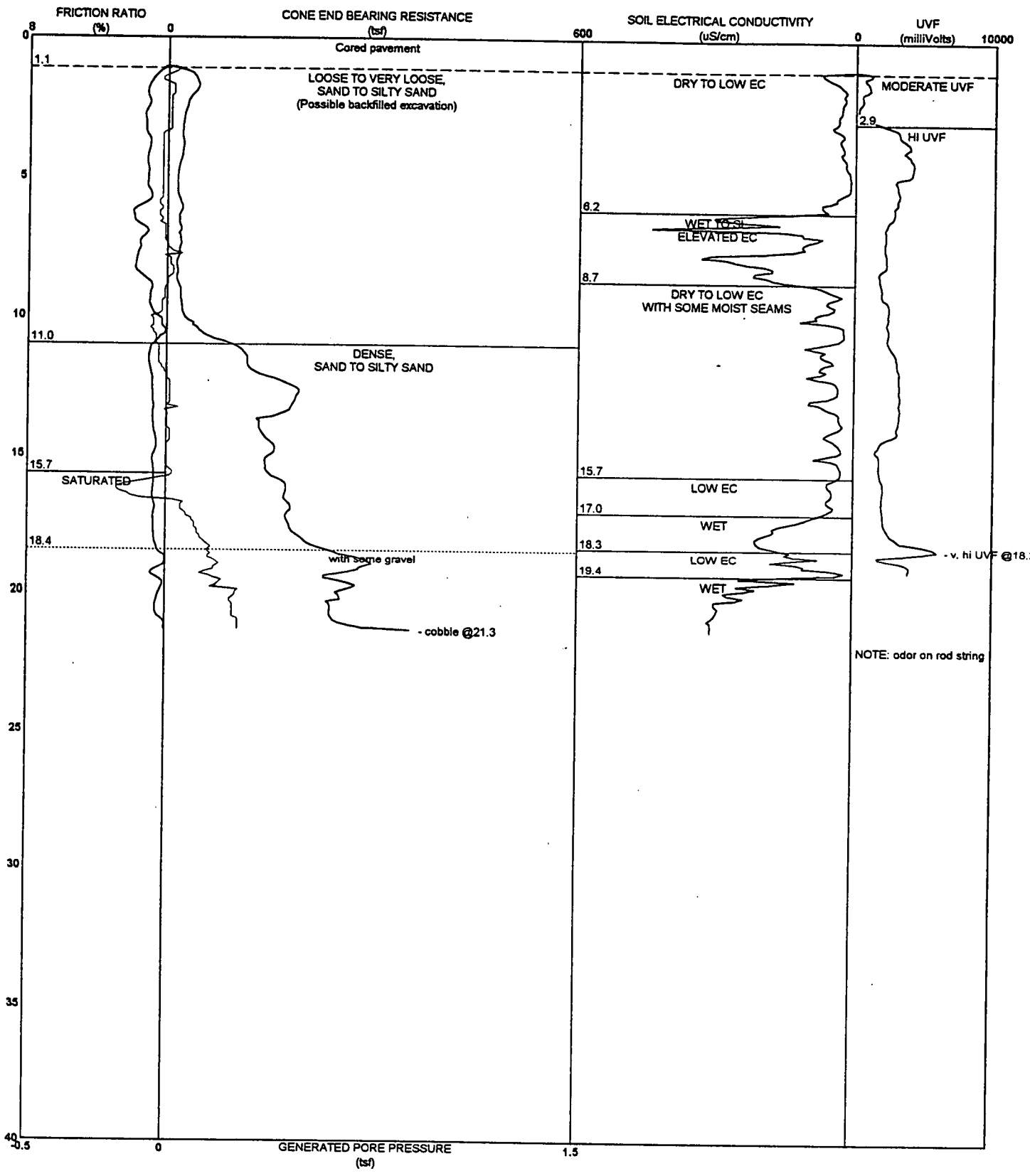


PROJECT NAME:Honeywell Intl. S. Bend Complex
PROJECT NUMBER:00-120-010

STRATIGRAPHICS

DATE: 2-16-2000 TIME:18:05:34.58
SOUNDING NUMBER:CPT-A

CPTU-EC-UVIF LOG WITH LITHOLOGIC EVALUATION

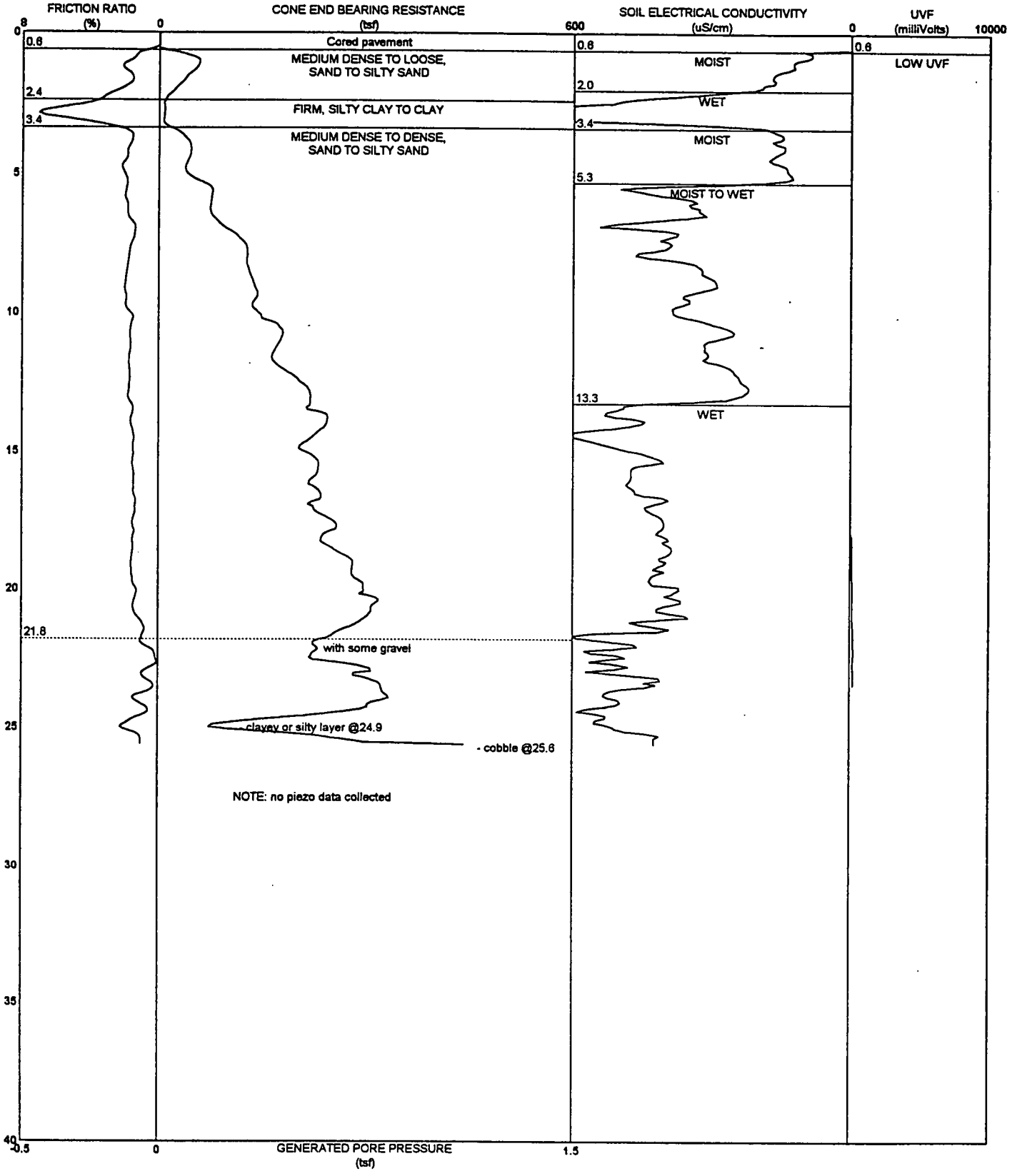


PROJECT NAME:Honeywell Intl. S. Bend Complex
PROJECT NUMBER:00-120-010

STRATIGRAPHICS

DATE: 2-17-2000 TIME:14:14:47.22
SOUNDING NUMBER:CPT-B1

CPTU-EC-UVIF LOG WITH LITHOLOGIC EVALUATION

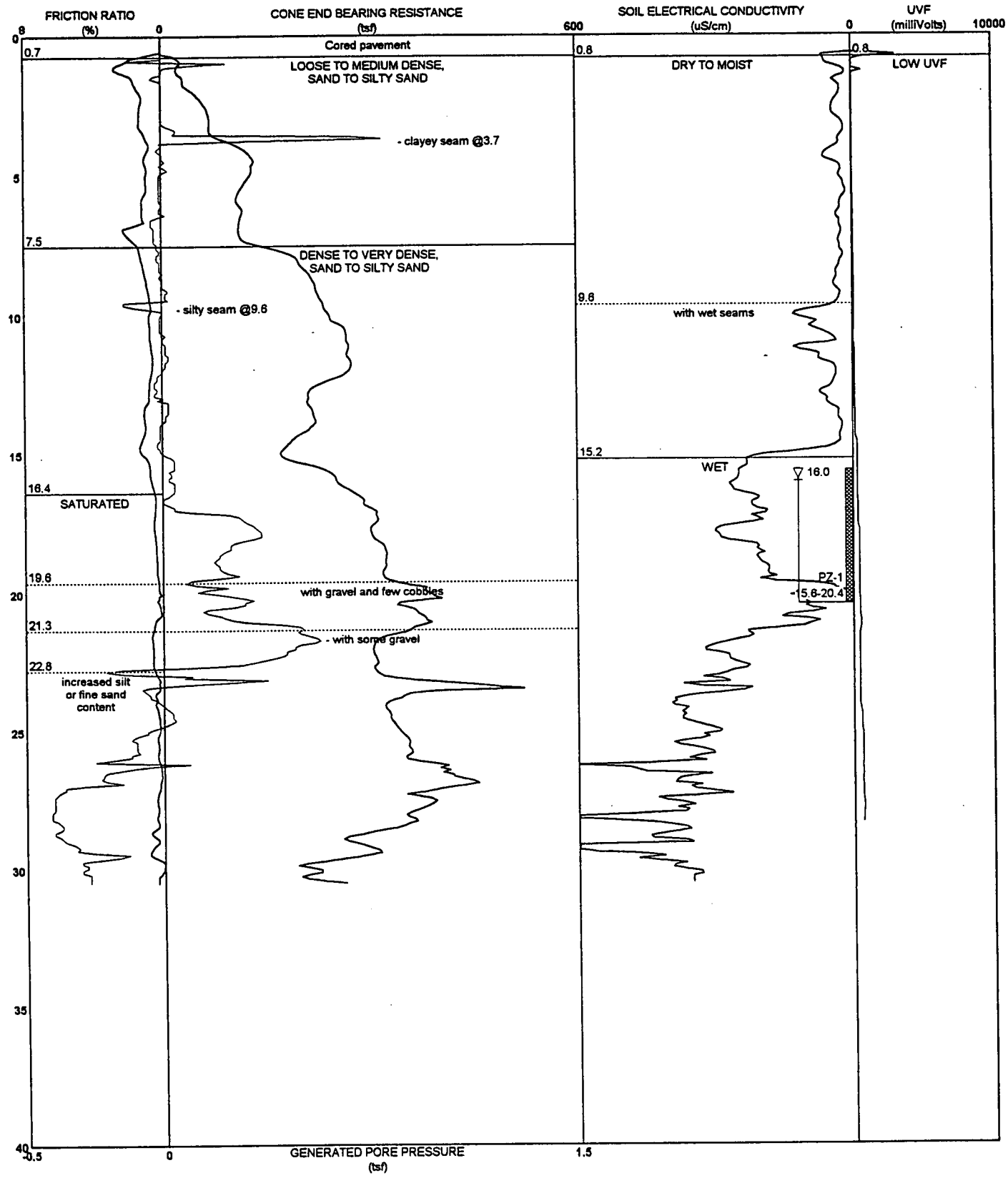


PROJECT NAME:Honeywell Intl. S. Bend Complex
PROJECT NUMBER:00-120-010

STRATIGRAPHICS

DATE: 2-16-2000 TIME:20:23:21.05
SOUNDING NUMBER:CPT-C

CPTU-EC-UVIF LOG WITH LITHOLOGIC EVALUATION

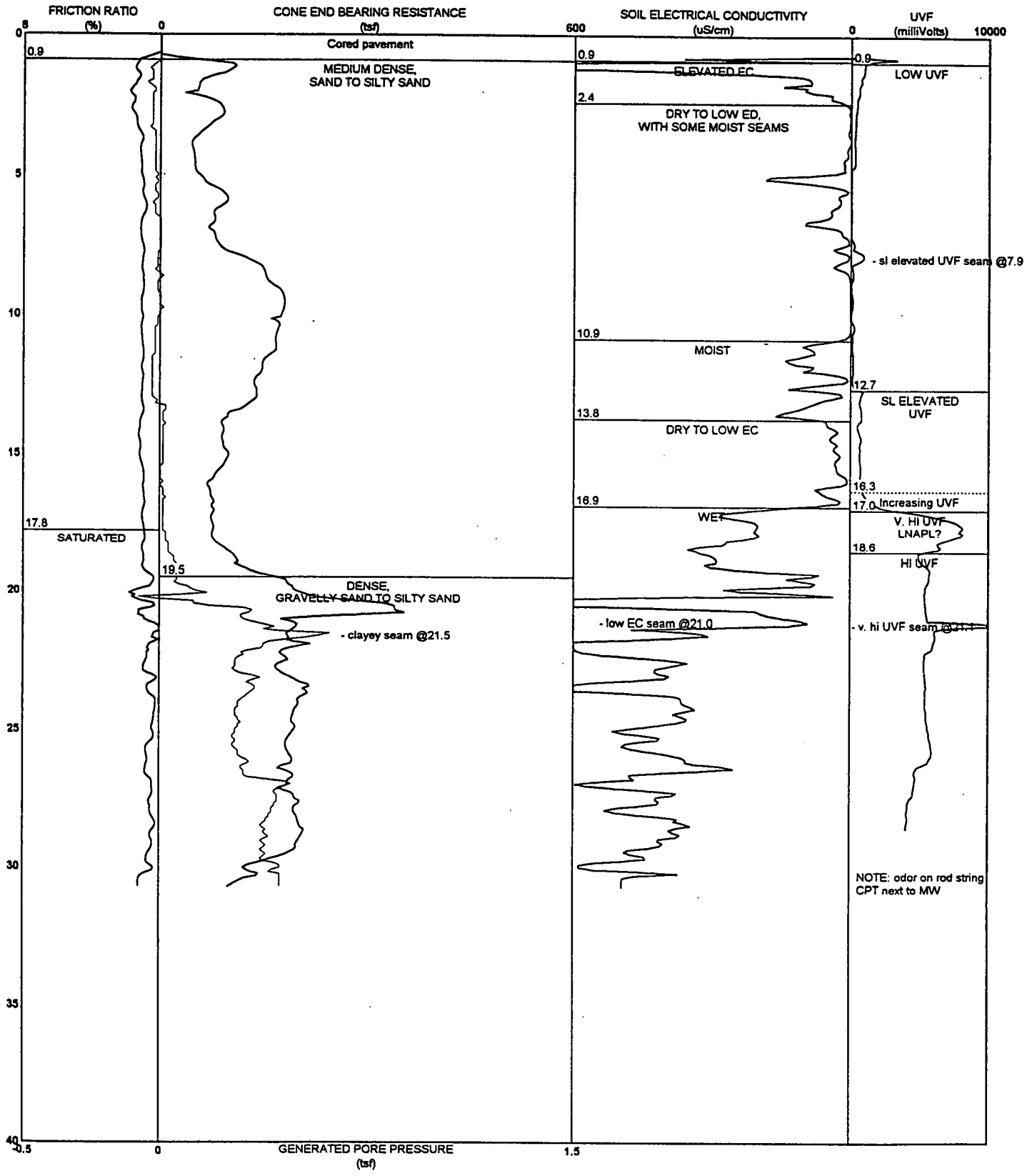


PROJECT NAME:Honeywell Intl. S. Bend Complex
PROJECT NUMBER:00-120-010

STRATIGRAPHICS

DATE: 2-17-2000 TIME:11:26:28.29
SOUNDING NUMBER:CPT-D

CPTU-EC-UVIF LOG WITH LITHOLOGIC EVALUATION

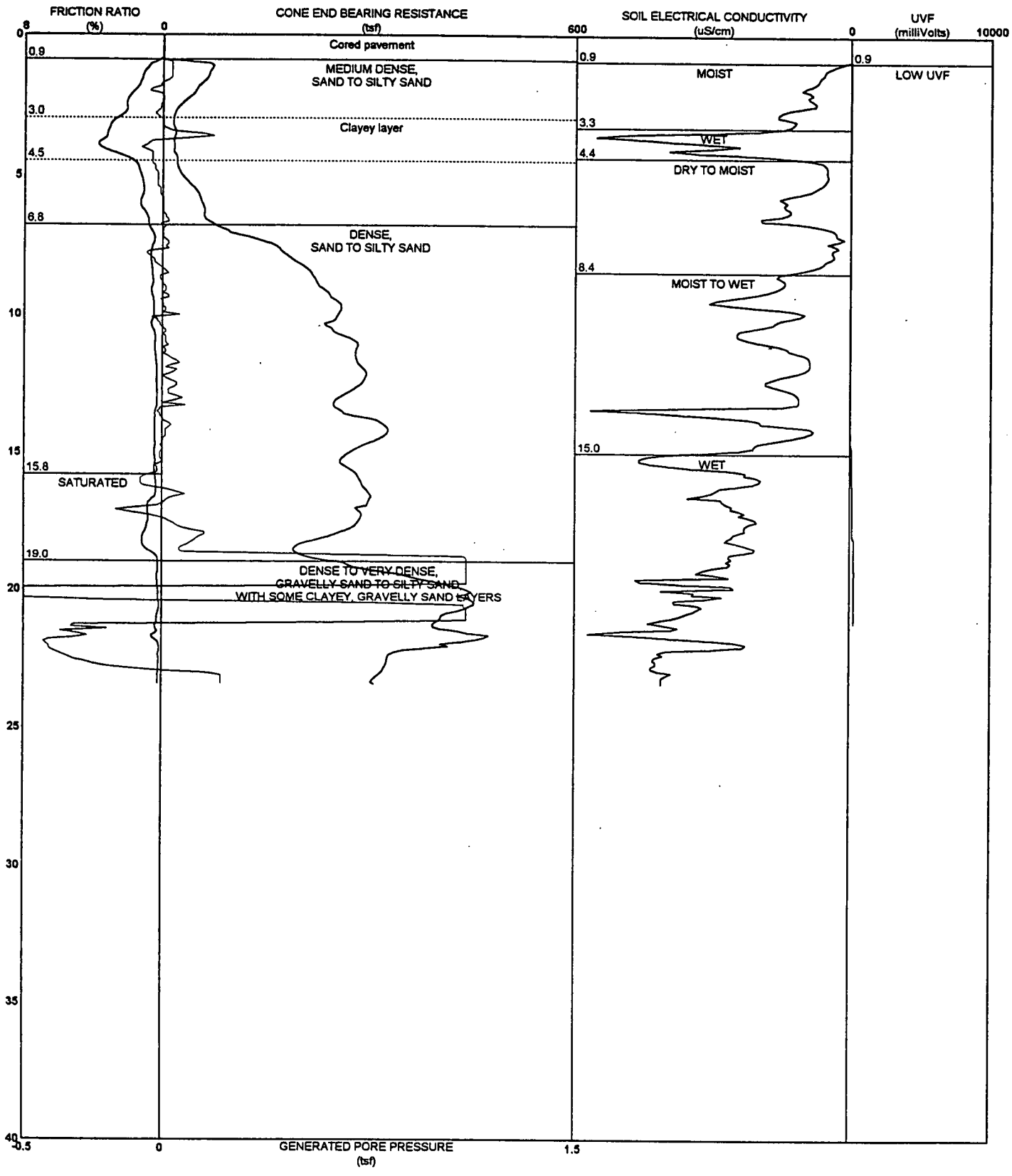


PROJECT NAME:Honeywell Intl. S. Bend Complex
PROJECT NUMBER:00-120-010

STRATIGRAPHICS

DATE: 2-17-2000 TIME:14:50:29.32
SOUNDING NUMBER:CPT-E

CPTU-EC-UVIF LOG WITH LITHOLOGIC EVALUATION

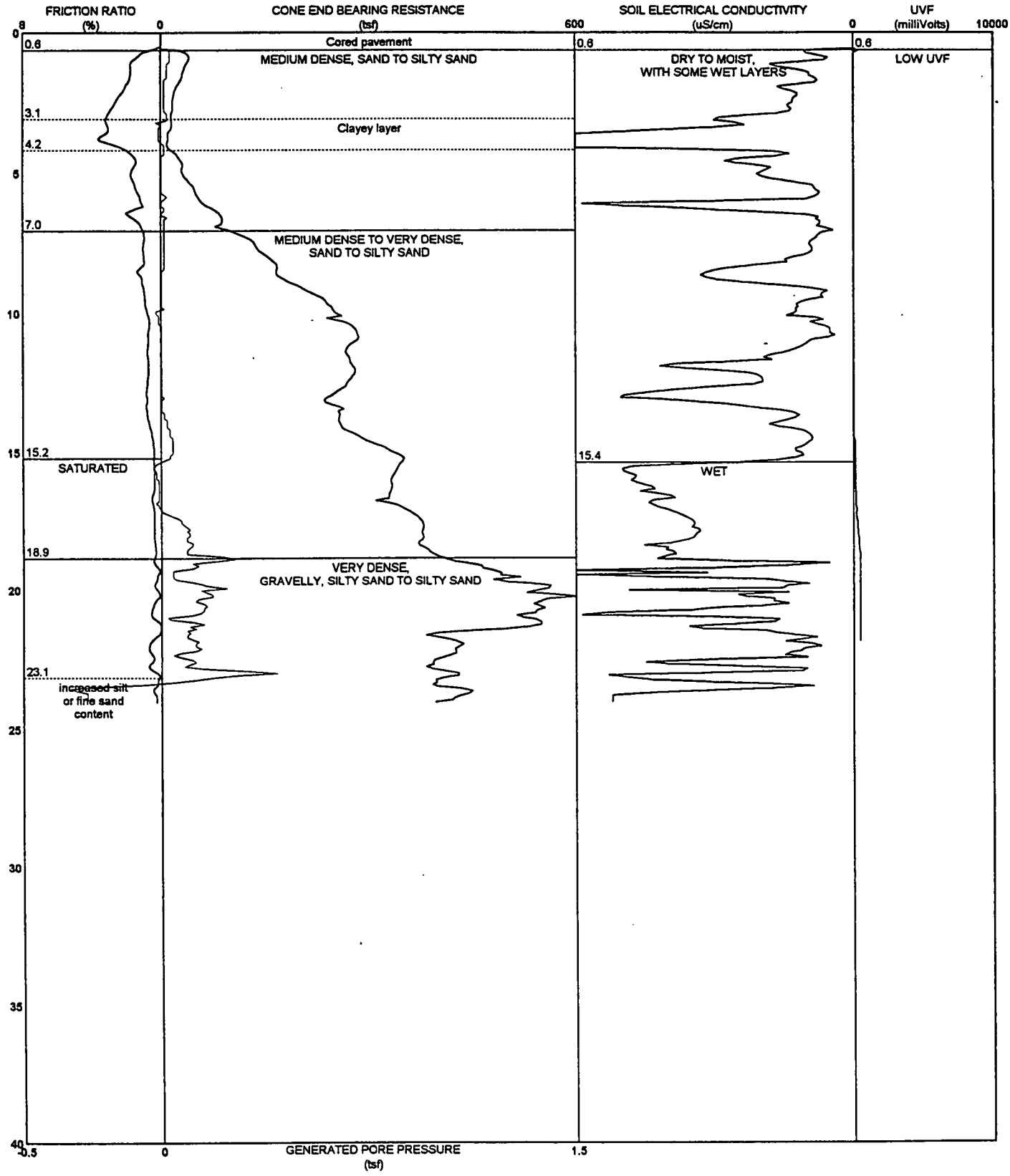


PROJECT NAME:Honeywell Intl. S. Bend Complex
PROJECT NUMBER:00-120-010

STRATIGRAPHICS

DATE: 2-18-2000 TIME:11:37:57.33
SOUNDING NUMBER:CPT-F1

CPTU-EC-UVIF LOG WITH LITHOLOGIC EVALUATION

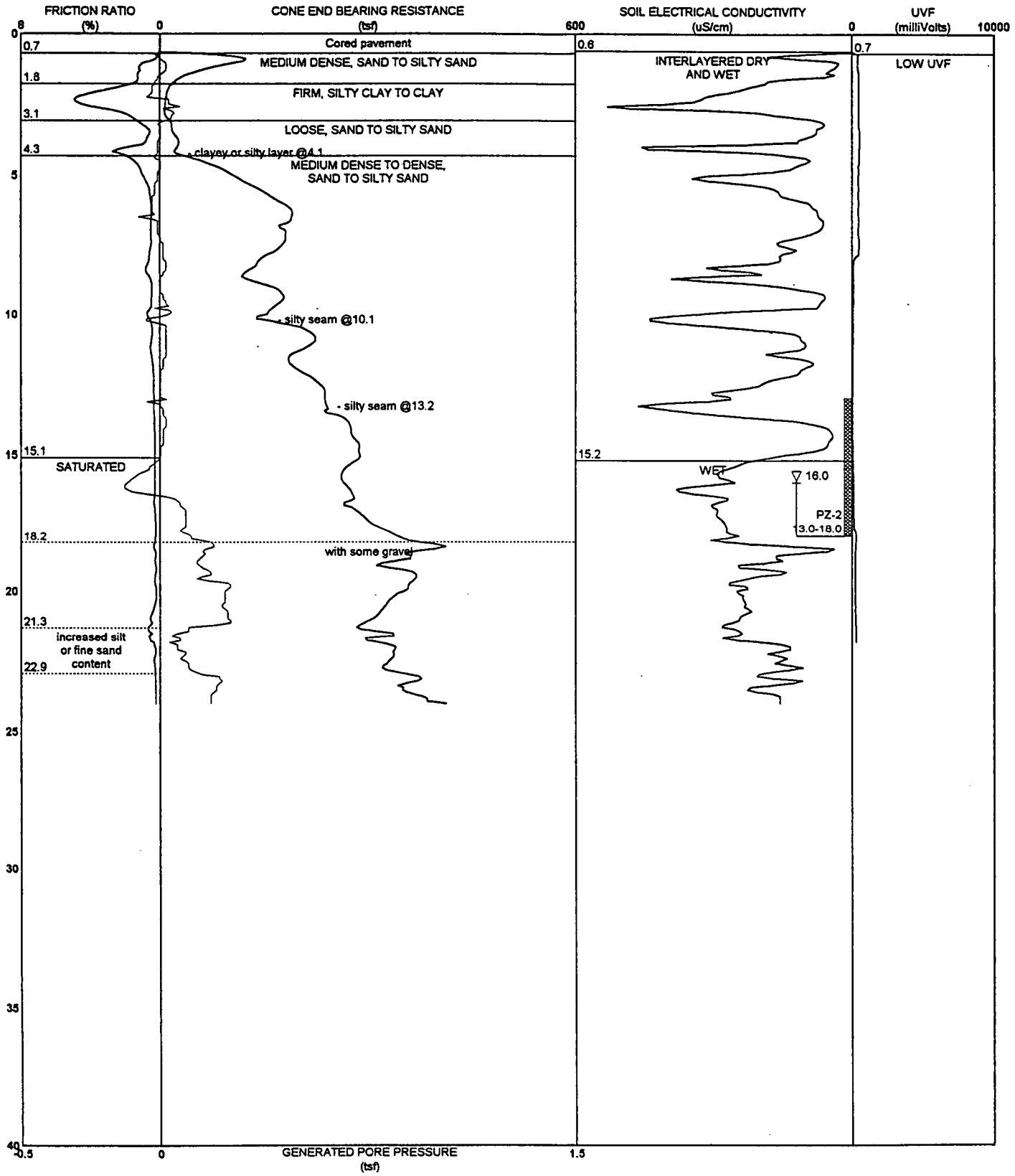


PROJECT NAME:Honeywell Intl. S. Bend Complex
PROJECT NUMBER:00-120-010

STRATIGRAPHICS

DATE: 2-17-2000 TIME:16:39:12.60
SOUNDING NUMBER:CPT-G

CPTU-EC-UVIF LOG WITH LITHOLOGIC EVALUATION



PROJECT NAME:Honeywell Intl. S. Bend Complex
PROJECT NUMBER:00-120-010

STRATIGRAPHICS

DATE: 2-17-2000 TIME:17:52:11.15
SOUNDING NUMBER:CPT-H