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INTERIM RESPONSE ACTIONS FINAL REPORT

VacAir Alloys Division
Frewsburg, New York

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JULY 1992

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CONESTOGA-ROVERS & ASSOCIATES

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1.0 INTRODUCTION

1.1 GENERAL

The VacAir Alloys Division of the Keywell Corporation (Keywell) owns and operates a high grade scrap metal processing plant site (Site) located on the outskirts of Frewsburg, New York. Keywell and the New York State Department of Environmental Conservation (NYSDEC) entered into an Order on Consent (the Order), Index #B9-0333-90-05, to perform Interim Response Actions (IRA) relative to the presence of chemical contamination detected at and adjacent to the Site.

By letter dated January 21, 1992, the "Interim Response Actions Work Plan" for Keywell's Frewsburg, New York plant site (Site), was submitted to the NYSDEC. The IRA Work Plan was subsequently modified by NYSDEC letter dated February 5, 1992 and Conestoga-Rovers & Associates (CRA) letter dated February 14, 1992. By letter dated February 25, 1992, the NYSDEC approved the IRA Work Plan. Implementation of the IRA Work Plan began in early March 1992 in accordance with the terms and conditions of the Order.

This report has been prepared to describe the activities performed as part of the IRA, to summarize all data and information obtained during implementation of the IRA, and to present an evaluation of the data obtained during the IRA.

1.2 SITE DESCRIPTION AND HISTORY

1.2.1 Site Description

VacAir owns approximately 93 acres (VacAir property) on the outskirts of Frewsburg, New York (see Figure 1.1); of the 93 acres, approximately 15 acres were developed into the present VacAir plant Site. The remaining 78 acres consist of undeveloped low lying and wooded areas. A layout of the Site is shown on Figure 1.2.

The Site is located within an area which is zoned for industrial development. The Site is bounded to the north by the Conewango Creek, to the east by low lying and wooded areas, to the south by residential and industrial development, and to the west by Frewsburg-Falconer Road. The Frewsburg Water District (District) municipal supply wells (Production Wells #1 and #2A) are located approximately 300 feet west of the Site. Also located on this well field is a standpipe/well (T-3) installed into the Frewsburg Aquifer. Production Well #3 is located approximately one-half mile north of the Site and Production Well #4 is located approximately one and one-half miles southwest of the Site. Drawing No. 1 illustrates the locations of the production wells.

Buildings on the Site include a guard house at the plant entrance, a 112,000 square foot building complex (main building) that houses the main process operation and administration offices and an 8,000 square foot metal clad building (metal building) that houses additional process operations. An active septic tank and sandbed are located south of the main building. A partially covered drainage ditch/swale runs through the center of the Site. The ditch collects runoff from lands south of the Site and drains into a low swampy area which discharges to the Conewango Creek. A fresh water pond is located in the southwest corner of the Site.

Operations at the Site consist of grading, sorting, cleaning, blending, and packaging high grade scrap metal. Scrap metal handled consists of stainless steel alloys, titanium alloys and nickel bearing metal. Some scrap metal is cleaned after sorting by either shot blasting or degreasing with trichloroethylene (TCE). Waste produced from the process operations include iron dust, TCE sludge, spent TCE, waste lubricating oil and hydraulic oil.

Surface water runoff from the concrete pads (where scrap metals are stored in bins) is treated on Site by an oil-water separator and discharged to the Conewango Creek under the terms and conditions of the facility's State Pollutant Discharge Elimination System (SPDES) permit.

1.2.2 Site History

VacAir began its metal processing/recycling operations in 1969. Prior to 1969, the Site was used for the manufacturing of wafer board. Keywell purchased the VacAir Site in 1987.

Historically, one or more geotechnical investigations are known to have been performed for structural design as the main building was expanded. Several hydrogeologic studies have also been performed in the vicinity of the Site by VacAir and the District for siting of water production wells. In addition, a Site audit was performed in 1987 prior to Keywell purchasing the VacAir property.

In 1990, the NYSDEC initiated an investigation of possible environmental contamination at the Site and decided that a field investigation was warranted. In December 1990, a Site Investigation (SI) was implemented at the VacAir property by Keywell to investigate areas of potential contamination. The SI was conducted in accordance with SI Work Plan documents approved by the NYSDEC and under the terms and conditions of an Order on Consent (Index #B9-0333-90-05).

The results of the activities conducted during the SI indicated the presence of volatile organic compounds (VOCs), metals and total petroleum hydrocarbons in the groundwater (Water Table Aquifer) and soil beneath the Site and in surface water and sediment at the Site. The primary contaminants of concern were TCE and its degradation products. Groundwater samples collected from District Production Well #1 during the SI did not contain contaminants above drinking water quality standards. The results of the SI were presented in the "Site Investigation Report, VacAir Alloys Division, Frewsburg, New York", dated October 1, 1991 and approved by NYSDEC.

The NYSDEC requested, by letter dated August 1, 1991, that Keywell implement additional investigative activities regarding the District water supply. These actions included:

i) the collection of groundwater samples for analyses of VOCs from the District's water supply Production Well #1 and #2A on a monthly basis; and

ii) the installation and sampling (for VOCs) of a groundwater monitoring well between the District well field and the plant Site.

By letter dated August 9, 1991, Keywell agreed to implement the NYSDEC's requested actions. In September 1991, one additional monitoring well (MW-7) was installed at the District well field (see Figure 1.2) into the Water Table Aquifer and groundwater water samples were collected from the District's two active production wells (Well #1 and #2A) under the observation of the NYSDEC. The details and procedures used during implementation of these actions were confirmed in a letter to the NYSDEC, dated September 4, 1991 and were consistent with the procedures presented in the approved SI work plan document.

On September 5, 1991, water supply Production Wells #1 and #2A were sampled for VOC analyses. These samples indicated the presence of TCE in both wells above drinking water standards. Based upon this finding, Production Wells #1 and #2A were immediately shut down and the District's Production Well #4 was put into service. The water supply sampling program was expanded to include all four District wells and several locations within the District's water supply distribution system. The water supply sampling frequency was also increased to an approximate weekly basis. The District's water supply production wells are currently being sampled once every 30 days as part of the IRA program.

Monitoring well MW-7 was installed near the northeast corner of the District property as shown on Figure 1.2 on September 23, 1991 to determine if TCE was present in the shallow groundwater regime (Water Table Aquifer) in the vicinity of Production Wells #1 and #2A. None of the Target Compound List (TCL) VOCs were detected in the groundwater sample from MW-7. The NYSDEC resampled well MW-7 in November 1991 to confirm the September 1991 results. Appendix A contains the stratigraphic log for MW-7, the analytical report, as provided by the laboratory, and the data validation report for the sample collected in September 1991. The NYSDEC's sample results also showed that TCE was not present in well MW-7.

Based on the results of the District water supply sampling program, the NYSDEC requested that Keywell develop and implement certain additional investigations and related interim activities concerning the District water supply. A meeting was held on October 11, 1991 with representatives from Keywell, the NYSDEC, the New York State Department of Health (NYSDOH), the Chautauqua County Health Department (CCHD) and the Frewsburg Water Department to discuss the proposed scope of work. A final scope of work for the IRA was agreed upon, and an Order on Consent (Index #B9-0333-90-05) for implementation was entered into by NYSDEC and Keywell. The effective date of the order was January 13, 1992.

As required by the Order, the "Interim Response Actions Work Plan" was submitted to NYSDEC by letter dated January 21, 1992. The IRA Work Plan was subsequently modified by letter dated February 25, 1992 and February 14, 1992 and was approved by NYSDEC letter dated

February 25, 1992. Implementation of the IRA Work Plan began in March 1992.

1.3 IRA PROGRAM DESCRIPTION

The general objectives of the interim response actions are to monitor the District water supply quality and to investigate the source of contamination detected in Production Wells #1 and #2A. In order to accomplish these objectives, the following tasks, as identified in the Scope of Work Outline (Attachment 1 to the Order), were performed:

i) Task A - Water Supply Monitoring;
ii) Task B - Production Well #3 Evaluation;
iii) Task C - Alternative Water Supply Data Review; and
iv) Task D - Contaminant Source Study.

As part of the IRA tasks, the following activities were performed:

i) collection and analyses of drinking water samples from the District water supply production wells;

ii) inspection, evaluation and disinfection of Production Well #3;

iii) review of available and pertinent information for the location of alternative water supply wells;

iv) the installation of groundwater monitoring wells and/or boreholes into the Frewsburg Aquifer;

v) the performance of a pumping test at Production Wells #1/2A;

vi) the collection and analyses of groundwater samples during the pumping test of Production Wells #1/#2A, from the newly installed monitoring well and from selected existing monitoring wells; and

vii) the collection and analyses of soil samples for physical characterization of the geologic units.

The IRA tasks were performed in accordance with the procedures and protocols used during the 1990-91 SI program, as presented in the Site Investigation Work Plan, Volume I; Volume II, Quality Assurance Project Plan (QAPP); and Volume III, Health and Safety Plan (HASP), all dated December 7, 1990 and in subsequent letter submittals dated January 8, 1991 and April 5, 1991, except as noted in the IRA Work Plan.

2.0 TASK A - WATER SUPPLY MONITORING

As part of the IRA Work Plan, a "sentry well" was to be installed into the Frewsburg Aquifer between Production Well #2A and Production Well #3. The purpose of this monitoring well was to provided advance warning of the migration, if any, of the contaminant plume towards Production Well #3. As such the "sentry well" was to be included in the Water Supply Monitoring Task. However, as discussed in Section 4.0 of this report, two attempts were made to install the "sentry well", but no aquifer was encountered. Accordingly, sampling of the sentry well could not be performed.

IRA Task A, Water Supply Monitoring, provides for the continued monitoring of the District water supply wells. As provided in the IRA Work Plan, the District Production Wells #3 and #4 have been sampled for analysis of the drinking water VOCs at 30-day intervals. Although not required in the IRA Work Plan, Production Wells #1 and #2A have also been sampled at 30-day intervals.

All water supply well samples were collected by Microbac Laboratories, Inc. (Microbac) personnel from a sampling port near each of the production wells. Samples were collected by opening the sampling port and allowing water to flow for approximately 10 minutes. The samples were then collected directly into precleaned laboratory provided sample containers. The samples were labelled and hand delivered to the laboratory by Microbac personnel.

All water samples collected from the District Production Wells were analyzed for the drinking water VOCs by EPA Method 502.1. The drinking water samples, were collected as part of the IRA on the following sampling dates:

i) December 30, 1991;
ii) January 29, 1992;
iii) February 27, 1992;
iv) March 26, 1992;
v) April 23, 1992;
vi) May 21, 1992; and
vii) June 18, 1992.

Copies of all Microbac sampling and laboratory reports are included in Appendix B. All laboratory analytical reports except those for the sampling dates of June 18, 1992 were previously submitted by Keywell to the NYSDEC. A summary of the analytical results for detected VOCs is presented on Table 2.1. Examination of this table shows that no VOCs were detected in any samples from Production Wells #1 and #2A since December 1991 and that no VOCs were detected in Production Wells #3 and #4.

Based on the results of the Water Supply Monitoring program, continued use of Production Wells #3 and #4 for the District's water supply is appropriate.

3.0 TASK B - PRODUCTION WELL #3 EVALUATION

IRA Task B, Production Well #3 Evaluation, involved the implementation of activities to ensure Production Well #3 is an adequate standby water supply well for use in the District's water supply system. These activities were performed by the Frewsburg Water District and/or its contractors (Hydro Group, Inc. of the Layne Well Pump Division of Pittsford, New York) during the month of February 1992. A copy of Hydro Group's report which summarizes the results of the evaluation are provided in Appendix C.

The mechanical and physical components of Production Well #3 were inspected and evaluated by the District and Hydro Group. The pump was found to be in good working condition and only minor servicing was performed. Production Well #3 was cleaned and sanitized using muriatic acid and chlorine by Hydro Group in accordance with acceptable industry standards. Hydro Group performed a short-term pumping test on Production Well #3 to determine if a sufficient well yield could be maintained. Based on the results of this short-term (approximately three hour) pumping test, Hydro Group concluded that Well #3 is capable of sustaining a long-term pumping rate of approximately 200 gallons per minute (GPM) and that the well was currently as efficient as when the well and pump were originally installed (see Appendix C).

Water samples were collected from Well #3 on February 10, 1992 and March 3, 1992, for analysis of bacteria. The analyses were performed by the Environmental Health Water Bacteriology Laboratory of the CCHD. The results (see Appendix B) indicated that Well #3 complies with the New York State bacterial maximum contaminant levels. Well #3 was also sampled on February 27, 1992 for analysis of total iron and on March 26, 1992 for analyses of total iron and odor. Sampling and analyses were performed by Microbac. The iron levels detected in the February 27, 1992 and March 26, 1992 samples were 0.81 mg/L and 0.93 mg/L, respectively. The March 26, 1992 sample was found to have a threshold odor number of 2 units and a manganese concentration of 0.06 mg/L. These results are included in Appendix B of this report. In addition, Well #3 had been sampled, as described in Section 2.0 of this report, for the drinking water VOCs, but none were detected.

Based upon the results of the well evaluation activities performed by the District, the CCHD granted the Frewsburg Water District permission to use Well #3 as a drinking water supply source. The Frewsburg Water District placed Well #3 into active service in early April 1992.

Since District Well #3 is presently in service and meets the requirements of Task B of the IRA program, no further work is required under Task B. Continued monitoring of the water quality under Task A will be conducted.

4.0 TASK D - CONTAMINANT MIGRATION STUDY

4.1 FIELD ACTIVITIES

The Contaminant Migration Study (IRA Task D) was performed to obtain additional information of the Frewsburg Aquifer in the immediate vicinity of the Site and to determine if the Site was the source of VOC contaminants found in the District's Production Wells #1 and #2A and/or a potential source of contamination of Production Well #3. This task involved the following activities:

i) installation of boreholes and a monitoring well into the Frewsburg Aquifer;

ii) collection of soil samples from the Frewsburg Aquifer and the confining clay layers for analysis of physical and chemical properties;

iii) collection of groundwater samples from the newly installed Frewsburg Aquifer monitoring well for chemical analysis; and

iv) performance of pumping tests on Production Wells #1 and/or #2A.

The details of the field activities are presented in the following sections of this report and associated appendices noted herein.

4.1.1 Monitoring Well/Borehole Installations

In the IRA Work Plan, it was proposed that four monitoring wells would be installed into the Frewsburg Aquifer. Three of the locations, (MW-1D, MW-6D, and MW-5D) were distributed around the perimeter of the Site adjacent to existing upper aquifer (Water Table Aquifer) monitoring wells (MW-1, MW-6, MW-5). The purpose of these Frewsburg Aquifer monitoring wells was to determine the presence or absence of the Frewsburg Aquifer beneath the Site and if present, allow the collection of hydrogeologic and water quality data. The fourth proposed well location (MW-8D), located north of the Conewango River between Production Wells #1/2A and #3, was selected to provide a "sentry well" to monitor for potential migration of contaminants from the Site toward Production Well #3.

The Frewsburg Aquifer was not encountered at three of the four proposed monitoring well locations (MW-1D, MW-6D, MW-8D). Drilling continued to a depth of 69 feet below ground surface (BGS) at location MW-1D, 63 feet BGS at location MW-6D; and 62 feet BGS at location MW-8D. These three boreholes were grouted up to ground surface and the casings were cut off at the ground surface. These three boreholes are now designated as BH-1D, BH-6D, and BH-8D.

A monitoring well (well MW-5D) was installed into the Frewsburg Aquifer adjacent to existing upper aquifer monitoring well MW-5. The Frewsburg Aquifer was encountered at 34.2 feet BGS and was found to be 10.5 feet thick. The monitoring well was installed and screened from

35 feet BGS to 40 feet BGS. Flowing artesian conditions were not encountered at this location.

Since the Frewsburg Aquifer was not encountered at location BH-8D, Keywell proposed to attempt to install a "sentry well" in another location (BH-9D) between Production Wells #1/#2A and #3. The NYSDEC agreed with the proposal and a drilling location (on a farm field between Production Wells #1/#2A and #3 and west of Falconer Road) was selected. Drilling at this location was performed on May 20 to 21, 1992, immediately upon receipt of a signed access agreement from the property owner. The borehole (BH-9D) was advanced to a depth of 70 feet BGS. The Frewsburg Aquifer was not encountered at this location and the borehole was grouted up to ground surface and the casing was cut off at the ground surface. Accordingly, a "sentry well" could not be installed between the Site and Production Well #3.

A detailed description of the borehole/monitoring well installation and soil sampling procedures is provided in Appendix D. Stratigraphic and instrumentation logs for the deep monitoring well and the boreholes are included in Appendix E. The locations of the boreholes/monitoring well are shown on Figure 4.1. Table 4.1 presents a sample summary key. Table 4.2 summarizes the overburden stratigraphy. Table 4.3 presents a summary of the monitoring well installation details.

4.1.2 Geotechnical Analyses of Soil Samples

During the course of the IRA drilling program selected soil samples were collected for laboratory analysis. The analyses included the following: grain-size distribution of aquifer and aquitard (upper and lower confining layers) materials; moisture content; fractional organic carbon (FOC); and, vertical hydraulic conductivity of aquitard samples. The details of the soil sample collection and handling are presented in Appendix D. The results of the analyses are presented on Table 4.4 and are discussed in the following section.

Grain-Size Distribution

A composite sample of the Frewsburg Aquifer material was collected from MW-5D at a depth of 36 to 44 feet BGS and was submitted to Huntingdon Analytical Services (HAS) of Middleport, New York for grain-size distribution analyses. In addition, three Shelby tube samples from the aquitard units (confining clay units above and below the Frewsburg Aquifer) were also evaluated for grain-size distribution. Table 4.1 presents a sample summary key.

The results of the grain-size analyses are presented on Table 4.4. The Frewsburg Aquifer sample consisted primarily of gravel (44.9 percent) and sand (31.9 percent), with a relatively large percentage of silt and clay size particles (23.2 percent). The samples from the Upper Aquitard Unit (BH-1D at 29 to 31 feet and BH-8D at 44 to 46 feet) were predominantly fine-grained materials with silt and clay content varying from approximately

95 to 99 percent. The one sample collected from the Lower Aquitard Unit (MW-5D at 48 to 50 feet BGS) exhibited a clay and silt content of 100 percent.

The main findings of the grain-size distribution analyses is that the aquitard units, in particular the Upper Aquitard Unit, have a very high silt and clay content making them important units in restricting groundwater flow and contaminant transport.

<u>Moisture Content</u>

The moisture of content of the samples submitted for grain-size analyses was also performed by HAS. The moisture content of the Frewsburg Aquifer sample was 8.8 percent. As this sample was taken in the saturated portion of the aquifer, the porosity of the sample can be estimated using the following relationships:

$$e = \frac{W \bullet Gs}{Sr} \text{ and}$$

$$n = \frac{e}{1+e}$$

where:

W = moisture content (0.088)

Gs = specific gravity (assumed to be 2.6)

Sr = degree of saturation (assumed to 1)

e = void ratio, and

n = porosity.

Based on these results the porosity of the sand and gravel sample was estimated to be approximately 18 percent. This value is on the low range for a sand and gravel aquifer (Freeze and Cherry, 1979).

The moisture content for the Aquitard Unit samples was determined both prior to and after the permeability testing. The close relationship between the pre- and post-test results indicate all clay samples were saturated at the time of collection. The moisture contents ranged from 24 to 35 percent. Using the above equations, it was determined that the total porosity of the clay samples was on the order of 38 to 48 percent. These values are typical of clay material.

Vertical Hydraulic Conductivity

The vertical hydraulic conductivity of the Shelby tube samples from the aquitard units were determined in the laboratory by HAS. The samples were analyzed using the the Flexible Wall Permeability Test (ASTM D 5084). The results of the testing are presented on Table 4.4.

The results for the Upper Aquitard Unit indicate a very low hydraulic conductivity on the order of 1.8×10^{-8} to 3.0×10^{-8} cm/sec. Similarly the lower Aquitard Unit exhibited a very low hydraulic conductivity of 2.4×10^{-8} cm/sec.

Fraction of Organic Carbon

Samples collected from the the Frewsburg Aquifer and the Aquitard Units were submitted to H2M for the determination of total organic carbon (TOC). This parameter provides a measure of the mobility of organic compounds in the geologic media, and was determined for use in any future fate and transport calculations.

The FOC results are presented on Table 4.4. Examination of this table indicates that the FOC values for the confining beds (aquitards) varied from 0.095% (upper aquitard) to 0.41% (lower aquitard). This wide variation may be due to different depositional environments of the clay. The FOC of the Frewsburg Aquifer was 0.16%, which is relatively high for a sand and gravel aquifer. However, at this location (MW-SD) the Frewsburg Aquifer had a silt and clay content of 23.2%.

4.1.3 Collection of Groundwater Samples

Following completion of well installation activities, groundwater samples were collected from the newly installed Frewsburg Aquifer monitoring well MW-5D and the existing standpipe T-3. The groundwater samples were analyzed for the TCL VOCs.

MW-5D was purged and sampled on April 15, 1992 according to protocols established for the SI. Although stabilization based on pH, conductivity and temperature had occurred after purging three well volumes, a full five volumes were purged prior to sample collection. Purging was performed with a peristaltic pump using dedicated tubing. The well was sampled using a precleaned stainless steel bottom loading bailer. Samples were poured gently from the bailer into laboratory supplied sample containers.

Existing standpipe T-3 was also purged and sampled on April 15, 1992 in accordance with the SI protocols. Well T-3 was purged of five well volumes prior to sampling by using a peristaltic pump equipped with dedicated silicone and teflon tubing. Immediately following purging the well was sampled using a precleaned stainless steel bottom loading bailer. Samples were poured directly from the bailer into the laboratory supplied glassware. Purge water from wells T-3 and MW-5D was drummed and staged at the Site for disposal in accordance with the appropriate and applicable regulations. Table 4.5 summarizes the well purging data.

In addition to the investigative samples described above the following field quality control/quality assurance (QA/QC) samples were collected: one rinse blank and one field duplicate. The rinse blank was collected from the precleaned stainless steel bailer prior to use in sampling well MW-5D. The field duplicate was collected from MW-5D. A trip blank was also submitted for analysis.

Immediately following sample collection, the samples were labelled and placed into a cooler with ice. The samples were packed and shipped via overnight courier under chain of custody to H2M of Melville, New York. A summary of the groundwater samples collected is presented on Table 4.1.

4.1.4 Aquifer Testing

It was proposed in the IRA Work Plan to perform aquifer tests on Production Wells #2A and #3 as part of the interim program. The purpose of the aquifer testing was to determine well yield, aquifer hydraulic parameters and, for Production Well #2A, the hydraulic relationship between the Frewsburg Aquifer and the Upper Aquifer along with pumped groundwater quality. The testing of Production Well #3 was undertaken by the District's contractor (Hydro Group) and was previously presented in Section 3.0. CRA, on behalf of Keywell, performed the required aquifer testing on Production Well #2A.

The aquifer testing of Production Well #2A was performed during the week of June 1, 1992 and consisted of pre-test hydraulic monitoring, a step-drawdown test and a 24-hour constant-rate pumping test. On May 29 and June 4, 1992, Telog pressure transducers and data loggers were installed in eight deep aquifer wells and seven upper aquifer wells. A summary of the observation well network is presented on Table 4.6, while the locations of the wells which were monitored during the aquifer testing program are shown on Figure 4.1. Included in the observation well network, are two private water supply wells, Monarch Plastics #1 and Junk Yard Well, located at Monarch Plastics (southwest of the Site) and at a property owned by a junk yard northeast of Production Well #3 (see Figure 4.1), respectively.

Appendix F presents the procedures followed during performance of the aquifer tests.

The step-drawdown test was performed on Production Wells 1/#2A on June 2, 1992. The well was pumped at rates up to 250 gpm. Based on the results of the step-drawdown test presented in Appendix F, it was decided to conduct the constant-rate pumping test on Production Well #1 at a flow rate of 230 GPM.

The constant-rate pumping test was initiated on June 4, 1992 at a rate of 230 gpm. However, after approximately 5 hours of pumping cavitation occurred in the well. In order to continue the test, it was decided to pump both Production Wells #1 and #2A to allow the highest pumping rate possible. The average pumping rate maintained during the 24-hour test period was 228 gpm. During the course of the test, the pumping rate varied considerably. Because of this, it was not possible to evaluate the aquifer test data to determine hydraulic parameters (transmissivity and storativity).

During the course of the constant-rate pumping test, groundwater samples were collected in accordance with the IRA Work Plan. A summary of the samples collected is presented on Table 4.1. All pumped groundwater samples were submitted to H2M for analyses of the TCL VOCs.

The details of the aquifer testing program are described in Appendix F, along with the resulting water level hydrographs. The significance of the results will be discussed in the Section 4.2.1.

4.2 RESULTS OF THE CONTAMINANT MIGRATION STUDY

4.2.1 Geology/Hydrogeology

The stratigraphic units encountered at the Site during the SI and IRA programs were as follows:

i) surface overburden consisting of native and fill materials;

ii) shallow layer of sand, gravel and silt (Water Table Aquifer);

iii) upper clay and silt layer (Upper Aquitard);

iv) sand and gravel layer (Frewsburg Aquifer);

v) lower clay and silt layer (Lower Aquitard);

vi) glacial deposits of clay, gravel and sand; and

vii) bedrock consisting of shales and sandstones of the Upper Devonian Conewango Group.

Of most importance in the contaminant migration study were the properties of the Frewsburg Aquifer and the two aquitard units. The distributions of the stratigraphic units beneath the Site, based on the results of the investigations performed to date, is summarized on a series of cross-sections. The locations of the cross-sections are shown on Figure 4.2 while the individual cross-sections are illustrated on Figures 4.3 to 4.5, inclusive. Table 4.2 summarizes the overburden stratigraphy encountered in boreholes advanced on Site and in the District Production Wells. Table 4.4 summarizes the soil sample results and Appendix G presents the soil sample data reports provided by the laboratory.

Underlying the Water Table Aquifer (upper aquifer) beneath the Site is a layer of clay and silt (Upper Aquitard) which was approximately 18 feet thick at MW-5D (see Appendix E). Because this layer is primarily comprised of clay and silt, the permeability is very low. Shelby tube samples collected at BH-1D (29 to 31 feet BGS) and BH-8D (44 to 46 feet BGS) were tested and found to have permeabilities of 1.8×10^{-8} cm/sec and 3.0×10^{-8} cm/sec, respectively. Grain size analyses on the Shelby tube samples collected at MW-1D and MW-8D confirms that the confining layer is comprised predominantly of fine-grained sediments, namely clay and silt (see Appendix G). The Shelby tube sample from BH-1D (29 to 31 feet BGS) contained 85.6 percent clay, 14.2 percent silt, 0.2 percent sand and zero percent gravel. The Shelby tube sample from BH-8D (44 to 46 feet BGS) contained 52.1 percent clay, 42.5 percent silt, 2.5 percent sand and 2.9 percent gravel.

Underlying the clay/silt unit is a waterbearing zone consisting of a confined strata of gravel, sand and silt Frewsburg Aquifer which exhibits artesian conditions. These coarse deposits are uniform and continuous and produce a sufficient amount of groundwater to be used as a municipal water supply for the Hamlet of Frewsburg.

The Frewsburg Aquifer unit was not observed to be present beneath the eastern portion of the Site (boreholes BH-1D and BH-6D) nor was it present in the area between Production Well #3 and the Conewango River, in the vicinity of Frewsburg Road (at boreholes BH-8D and BH-9D). The Frewsburg Aquifer was only encountered at MW-5D which was expected since its location at the western boundary of the Site is in close proximity to Production Wells #1, 2A and test well T-3 (see Figure 4.1).

Although the Frewsburg Aquifer was not encountered at the eastern portion of the Site it was encountered at MW-5D which indicates that the Frewsburg Aquifer does underlie at least part of the Site. Historical geotechnical information provided by VacAir and the Frewsburg Water District suggest that the Frewsburg Aquifer does exist near the southwest corner of the VacAir property, south of the Site, and in the vicinity of the southeast corner of the main production area, at location TH-3 (see Figure 4.1) (stratigraphic log for TH-3 is provided on a drawing for test hole data for the Flakebord Plant, dated August 1, 1962 and revised July 5, 1967). However, according to VacAir personnel, another borehole drilled (as part of a water supply exploration program performed by VacAir in about 1974 which was later cancelled) near the southwest corner of the main production building did not encounter the Frewsburg Aquifer. Based upon this information the following conclusions can be made:

i) the Frewsburg Aquifer exists beneath part of the Site; and

ii) the areal extent of the Frewsburg Aquifer beneath the Site has not been fully defined.

The depth to the Frewsburg Aquifer, as shown on the stratigraphic log of MW-5D in Appendix E, is 34 to 44.7 feet BGS. The thickness of the Frewsburg Aquifer ranged from about 5 feet to 11 feet (Crain, 1966). A composite sample of the aquifer material collected from split spoon samples from 36 to 44 feet BGS at MW-5D was submitted for grain size analysis. The results indicate that the aquifer is comprised predominantly of gravel (44.9 percent), sand (31.9 percent), and silt/clay (23.2 percent). The origin of the Frewsburg Aquifer is believed to be from glacial outwash (Crain, 1966). If this is true, then this unit would be geologically equivalent to the Jamestown Valley-Fill Aquifer (Crain, 1966).

There is no demonstrated physical connection between Frewsburg Aquifer encountered at the Site and at Production Well #3. The Frewsburg Aquifer was not encountered at BH-8D which is located between the Site and Production Well #3. Furthermore, there does not appear to be a physical connection between the Frewsburg Aquifer at Production Wells #1/#2A and at Production Well #3. This is further supported by the fact that Production Well #3 has historically exhibited concentrations of iron above recommended drinking water standards while Production Wells #1 and #2A have historically and currently contained acceptable concentrations of iron.

A confining clay underlies the Frewsburg Aquifer (see the stratigraphic log in Appendix E). A Shelby tube sample for this lower confining unit (Lower Aquitard) was collected at 48 to 50 feet BGS at MW-5D. This Shelby tube sample was tested for grain size distribution and permeability. The grain size distribution from the Lower Aquitard had a remarkably high clay component (90.9 percent) with silt (9.1 percent) and no sand or gravel. Consequently, the sample demonstrated a very low permeability of 2.4×10^{-8} cm/sec. This lower aquitard is approximately 65 feet thick and extends to a depth of 106 feet BGS (based upon a stratigraphic log for test hole T-3 located 200 to 300 feet west of the Site).

Beneath this clay layer is another 50 feet of varying amounts of sand, gravel and clay. Four waterbearing strata were noted within this zone, however, none of these strata yielded water of sufficient quantities for use as a municipal water supply.

At test boring T-3, bedrock was encountered at approximately 156 feet BGS. The bedrock was described as gray shale and fine grained sandstone. This bedrock unit is believed to be part of the upper Devonian Conewango Group (Crain, 1966).

4.2.2 Aquifer Testing

Aquifer testing was performed consisting of a step-drawdown test and a long-term pumping test. The step-drawdown test was performed on June 2, 1992. The long-term pumping test, which consisted of 24 1/2 hours of continuous pumping, began on June 4 and concluded on

June 5, 1992. Throughout the entire pumping test an average pumping rate of 228 GPM was obtained.

Based upon a review of hydrographs and manual water levels collected during the pumping test it is apparent that a hydraulic connection in the Frewsburg Aquifer exists between the Site and Production Wells #1 and #2A. Following the start of pumping activities, MW-5D showed an immediate drawdown, indicating a strong and direct connection through the Frewsburg Aquifer with Production Wells #1 and #2A. Monarch Plastics' Well #1, south of Production Well #2 and southeast of the Site also showed an almost immediate response to the start of pumping activities at the Production wells. Figure 4.1 presents the location of the Monarch Plastic well.

Production Well #3, located approximately one-half mile north of Production Well #1, showed a response to the pumping activities at Production Wells #1 and #2A, with a maximum observed drawdown of 0.8 feet. While the response was subtle, the responses corresponded to the starting and stopping of pumping. This indicates that a hydraulic connection likely exists between Production Wells #1/#2A and Production Well #3 (this is contrary to the findings of a lack of physical connection of the aquifers between Well #1/#2A and #3).

During aquifer pumping activities all of the Water Table Aquifer wells (MW-1, MW-2, MW-3, MW-4, MW-5, MW-6 and MW-7) were monitored. Continuous water level recorders were installed in all of these wells, except MW-1, prior to the start of the long-term pumping test. Manual water levels in MW-1 were measured periodically before, during and after the pumping test. The water level data (see Appendix F) generated from the Water Table Aquifer wells during the pumping test showed no response between Frewsburg Aquifer wells.

Figure 4.6 presents the hydrographs of MW-5 and MW-5D during the pumping test and the recovery period. This hydrograph clearly illustrates that there was no physical connection between the Water Table Aquifer and the Frewsburg Aquifer at MWS/SD, even though MW-5D showed an immediate response to the pumping activities and a drawdown of approximately 11 feet.

Similarly, MW-7, which monitors the water table aquifer, is located in close proximity to Production Well #1 and test well T-3. Test well T-3, located 50 feet east of Production Well #1 showed an immediate response to pumping and showed a drawdown of approximately 14 feet during pumping. Production Well #1, which was used as a pumping well for the entire long-term test, and showed a drawdown of over 17 feet during pumping. MW-7 showed no apparent response to the pumping activity. Again, this indicates no hydraulic connection at the Site between the Water Table Aquifer and the Frewsburg Aquifer.

4.2.3 Other Hydraulic Influences

Two other hydraulic influences currently exist in the Frewsburg Aquifer. One is Production Well #4 and the other is Monarch Plastics wells.

Production Well #4 was monitored as part of the aquifer testing. It is important to note that Production Well #4 is currently being used by the Frewsburg Water District as their primary source of potable water. Production Well #4 is being used continuously at a pumping rate of approximately 150 GPM. Hydraulic monitoring of Production Well #4 during the long-term pumping test indicates that no response to the pumping test was observed at Production Well #4. However, given its distance from Production Wells #1 and #2A and the fact that the well was pumping at 150 GPM throughout the aquifer test, no response in this well was anticipated.

The Monarch Plastics' wells are located south of Production Wells #1 and #2A and southwest of the Site (on the west side of Falconer Road, south of Pearl Street as shown on Figure 4.1). Monarch Plastics (formerly known as Plastic Case) manufactures small plastic watch cases using a plastics molding process. Monarch Plastics uses water pumped from the Frewsburg Aquifer to cool their molding presses. The cooling water wells are located south of the southwest corner of the Monarch Plastics plant. There are two wells, each of which is 35 feet deep. The water is pumped via submersible pumps through a forcemain, into the presses and is discharged to the Conewango River. According to usage records kept by Monarch Plastics personnel, the plant pumps approximately 60 GPM continuously on a weekly basis from Monday morning until Saturday morning.

A review of the hydrographs from the Frewsburg Aquifer wells monitored during the aquifer testing indicated that Production Wells #1 and #2A and MW-5D all show a response to the pumping activity of Monarch Plastics. The drawdown at each of these wells in response to the pumping at Monarch Plastics is on the order of four feet.

Since Production Wells #1 and #2A are no longer pumping, Monarch Plastic's pumping is the most significant hydraulic influence on the Frewsburg Aquifer in the vicinity of the Site.

4.2.4 Analytical Results

All groundwater samples for chemical analysis were analyzed by H2M Labs for TCL VOCs using USEPA Method 502.2. In order to expedite the deliverables package, standard (non-CLP/non-NYS ASP) QA/QC data were requested. Analytical data reports provided by the laboratory are provided in Appendix H. A summary of the assessment and validation results are presented in Appendix I. All analytical data obtained as part of the IRA Program were found to be acceptable with the qualifications noted in Appendix I.

Monitoring Well Results

At the completion of the drilling and installation of MW-5D, the monitoring well was developed, purged and sampled according to protocols established during the SI. A sample was also collected from test Well T-3 (located on the property adjacent to Production Wells #1 and #2A) following purging. Test well T-3 had not been previously sampled and, due to its location within the area of concern, was added to this sampling event. Table 4.7 presents the data for these groundwater samples.

Benzene was the only TCL VOC detected in the monitoring well samples at an estimated concentration ranging from 0.6J µg/L to 3.7J µg/L. The qualified results are suspect and are believed to be not representative of Site conditions. Chlorinated solvents or their degradation products were not detected in these Frewsburg Aquifer wells.

Since September 1991, Production Wells #1 and #2A have not been used to supply drinking water to the Frewsburg Water District. VOCs were last detected in Production Wells #1 and #2A in November 1991. Since that time monthly water samples collected for the water supply monitoring program have not contained VOCs above the detection limits. Since Production Wells #1 and #2A no longer contain detectable concentrations of VOCs, VOC contamination in MW-5D and test well T-3 was not anticipated.

Pumped Groundwater Results

As stated previously, groundwater samples were collected at the beginning of the long-term pumping test, at six hour intervals during pumping and prior to the end of the pumping test. At the conclusion of the pumping test, a groundwater sample was also collected from MW-5D. No VOCs were detected in any of the samples. Appendix H contains the analytical reports, as provided by the laboratory.

4.3 CONTAMINANT MIGRATION STUDY CONCLUSIONS

Based on the findings of Task D the following conclusions are made:

i) the Frewsburg Aquifer is discontinuous beneath and within the immediate vicinity of the Site;

ii) the physical properties of the confining layers above and below the Frewsburg Aquifer (where present) significantly limit the vertical movement of groundwater beneath the Site;

iii) no physical connection of the Frewsburg Aquifer between the Site and Production Well #3 or between Production Wells #1 and #2A and Production Well #3 was identified. However, the pumping test revealed that a hydraulic connection exists between Production Wells #1/#2A and Production Well #3;

iv) a hydraulic connection exists in the Frewsburg Aquifer between Production Wells #1/#2A and MW-5D, which is located on Site. A hydraulic connection exists between Production Wells #1/#2A MW-5D and the Monarch Plastics wells. A slightly delayed hydraulic connection exists between Production Wells #1/#2A and Production Well #3;

v) no direct vertical hydraulic connection was demonstrated between the Water Table Aquifer and the Frewsburg Aquifer and no significant migration pathway between the two aquifers has been identified;

vi) no VOCs were detected in samples collected from MW-5D following well installation. No VOCs were detected in test well T-3, collected at the same time MW-5D was sampled. Contaminants are not present in the Frewsburg Aquifer under this portion of the Site;

vii) no VOCs were detected in samples collected from Production Well #1/#2A during the pumping test. During the 24-hour long-term pumping test a total of 335,200 gallons of water was pumped at an average flow rate of 228 GPM. The fact that no VOCs were detected in the samples collected during the long-term pumping test indicates that the flow of water in the Frewsburg Aquifer during pumping does not induce the migration of any contaminants within the aquifer. The source of the VOCs detected in Production Wells #1 and #2A prior to November 1991 has not been determined; and

viii) based upon the information obtained during the IRA Program, the Site does not presently appear to be a serious threat to the quality of the water supply at Production Well #3.

5.0 ALTERNATE WATER SUPPLY DATA REVIEW

5.1 DATA COLLECTION ACTIVITIES

Task C, Alternate Water Supply Data Review, involves the compilation and review of existing and readily-available hydrogeologic data and other information required to evaluate the location of an alternate water supply production well(s) for the District.

Information was obtained from the following sources:

i) published hydrogeologic reports for the Frewsburg area which include;

  a) "Groundwater Resources of the Jamestown Area, New York with Emphasis on the Hydrogeology of the Major Stream Valleys", Leslie J. Crain, 1966,

  b) "Atlas of Eleven Selected Aquifers in New York", United States Geological Survey, 1982;

ii) files on private water supply wells from at the CCHD;

iii) Plot Plan - Test Hole Data (Sheet 1) for Flakebord Plant, dated August 1, 1962 and revised July 5, 1957;

iv) stratigraphic logs and test data for the Frewsburg District Water Supply Wells and test holes (previously presented in the Site Investigation Report);

v) "Engineer's Report, Proposed Water Supply Improvements Frewsburg Water District, Town of Carroll, Chautaugua County, New York", Lozier Engineers, Inc., October 1974;

vi) "Water System Emergency Plan, Town of Carroll Water Department", Chautaugua County Health Department, Division of Environmental Health Services, dated December 1990; and

vii) communications with District water personnel, Town of Carroll personnel, and Jones Well Drilling, Inc.

A domestic water well inventory within a one mile radius of the Site obtained from the CCHD was conducted as part of the IRA. Only the names of the owners of the well and well locations within the Town of Carroll were available. Well details have not been obtained. A list of 74 owner's names and street addresses is provided in Table 5.1. Drawing No. 1 (in pocket) illustrates the approximate location of these wells. The approximate well locations were provided by District personnel.

Through personal communication from Jones Well Drilling, Inc. of Randolph, New York, there presumably exists an aquifer separate and distinct from the Frewsburg Aquifer underlying the center of the Frew's Run Valley. The name of this water bearing (gravel) zone may be referred to as the Frew's Run Aquifer. It is probable that there is a buried melt-water channel deposit of unknown thickness in the center of the Frew's Run Valley penetrated in two domestic wells (Jones and Davis from Jones Drilling Inc.). It is believed that wells installed in this aquifer may yield in excess of 20 to 30 GPM with a saturated thickness of five feet (Jones Well Drilling Inc., 1992).

Exploratory drilling (test wells) was performed in the 1960's and 1970's by the Village of Frewsburg. Available information and data on this drilling program were obtained from District personnel and include stratigraphic logs. Formations that were encountered consisted of gray clay and gravel ranging from 1 foot to 61 feet, with minimal traces of water. Further documented drilling at the Site occurred during March and April as part of the IRA. The stratigraphic logs indicate that the Frewsburg Aquifer is discontinuous in nature, on a local basis and cannot be reliably intersected with any given borehole.

Test wells drilled in the Village of Frewsburg penetrated layers of sand and gravel which may represent thin layers of "outwash" which does not outcrop in the valley wall (Crain 1966). A pumping test was performed on a Frewsburg well and was pumped at a rate of approximately 145 gpm for 12 hours and 10 minutes. The transmissibility of the aquifer appears to range from 6,900 to 7,400 GPD per foot (Crain 1966). The storage coefficients were calculated to be 0.00006 to 0.0004 which indicates artesian conditions and the permeability ranged from 2.2 to 0.26 GPD per square foot (Crain 1966).

5.2 DESCRIPTION OF THE FREWSBURG WATER SUPPLY SYSTEM

The Frewsburg Water District was founded in 1940 to provide a municipal water supply source for the Hamlet of Frewsburg. The following sections describe the historical development and operation of the Frewsburg Water District and the present operating conditions. This information is based upon conversations with District personnel, Town of Carroll personnel and a review of an engineering study performed by Lozier Engineers, Inc. for proposed water supply improvements for the Frewsburg Water District which was prepared in 1974.

5.2.1 History of the Construction of the Frewsburg Water District

Exploratory drilling for locating an aquifer of sufficient yield and water quality to meet the needs of the Hamlet of Frewsburg (Frewsburg) began in late 1940 or early 1941. Test boring T-3 (shown as monitoring well T-3 on Figure 4.1) was drilled and tested in January 1941. This boring, located at the north end of the presently fenced property surrounding District Production Wells #1 and #2A, found a number of waterbearing strata, the most productive of which occurred at a depth of 35 feet to 41 feet BGS. At the completion of the exploratory drilling, this borehole was converted into a monitoring well (called T-3 for identification purposes) with a total depth of 41 feet BGS. In early 1941, two production wells were installed in the vicinity of borehole/monitoring well T-3. District

Production Well #1 was located 50 feet west of T-3 and Production Well #2 was located 150 south of Well #1. Both wells were screened from approximately 35 feet to 40 feet BGS. Both of the wells were tested and demonstrated the ability to sustain high pumping rates of 150 GPM or more. In addition, both wells were observed to exhibit flowing artesian conditions.

Because Wells #1 and #2 were located in close proximity, these two wells could not be safely operated simultaneously. In order to meet anticipated increased demand, an exploratory drilling program was conducted in 1963 to locate a site for the installation of an additional water supply well. In 1964, District Production Well #3 was installed approximately one-half mile north of Wells #1 and #2. Well #3 was screened from approximately 41 feet to 51 feet BGS. The well was tested and yielded a sustained pumping rate of 200 GPM. District Well #3 was observed to be a non-flowing artesian well. The pump was installed in 1966 and the well was placed in service.

In early 1973, the District began receiving complaints about the quality of the drinking water supply. Complaints revolved around odor problems and high iron content. The water in the District supply wells was tested and Well #3 was found to have high iron content and a community of iron bacteria. Three alternative proposals were presented to the Town of Carroll Town Board in September 1973. Two of the alternatives dealt with treating or removing the iron from Well #3. The third alternative involved locating a new water source to replace Well #3. The Town selected the third alternative.

An exploratory drilling program was conducted in 1973 and 1974. At the completion of the program, a location was chosen and Well #4 was installed. Well #4 is located approximately one-half mile west of Frewsburg along Route 60. Well #4 was tested and certified as suitable for human consumption and put into service.

Also in 1974, several improvements were made to the Water District including the construction of a 750,000 gallon storage tank and upgrading of watermains to improve fire protection capabilities.

Additional changes have been made to the water supply system from 1974 to the late 1980s. These changes were primarily related to the additions of watermains and hookups to the system as building and development have occurred in the Hamlet of Frewsburg. Drawing 1 illustrates the location of the District Production Wells and the water supply distribution system.

5.2.2 Historical Operation of the Frewsburg Water District

The District began pumping water in 1948 or 1949 using Production Wells #1 and #2. However, due to their close proximity, Wells #1 and #2 were pumped alternately, since they could not be pumped simultaneously.

In 1966, Well #3 was placed in service. Due to its high iron concentration, Well #3 was not used as a sole source of water for the

District. Rather, Well #3 was pumped in conjunction with either Well #1 or Well #2. By doing so, the iron content was lowered and periodic odor problems were diminished.

In 1974, Well #4 was placed in service and was used extensively in place of Well #3 and in conjunction with Well #1 or #2 during the remainder of the 1970s and part of the 1980s.

During the period of 1986 through the fall of 1991, Well #4 was used as a backup water supply. During this time period, Wells #1 and #2 were the primary source of water for the District. This mode of operation remained consistent until the fall of 1991.

5.2.3 Recent Changes in the Frewsburg Water District

Later in 1990, a leak in the well casing at District Production Well #2 was discovered which was allowing water from the shallow water table aquifer to infiltrate into the potable water supply. The District hired a contractor to attempt to rehabilitate the well. Unfortunately, the attempt to seal off the leaky casing was unsuccessful and the well was abandoned.

In January 1991, a replacement well identified as District Well #2A was installed approximately 25 feet northeast of the abandoned Well #2. At the time of the drilling, Well #2A revealed very strong flowing artesian conditions. Well #2A was tested and found to provide a yield of 200 GPM which was greater than the original Well #2.

5.2.4 Current Conditions of the Frewsburg Water District

As stated previously, District Wells #1, #2 and its replacement Well #2A have historically been the major source of water for the Frewsburg Water District. From 1966 until 1974, District Well #3 was the secondary source of potable water. Well #3 was replaced by Well #4 as the secondary source of potable water for the District in 1974. The District operated under this scheme until the fall of 1991.

As discussed in Section 1.2.2, use of Wells #1 and #2A was discontinued in September 1991, and District Production Well #4 was placed into service. Since September 1991, Well #4 has been the primary source of potable water for the District.

Well #4 is currently being pumped at a continuous rate of 150 GPM. Well #3 is presently used to supplement demand for water and is pumped daily, Monday through Friday, at a maximum pumping rate of 200 GPM. The layout of the Districts Production wells and distribution system is shown on Drawing No. 1.

5.3 RESULTS

Although it appears as though the Frewsburg Aquifer exists throughout most of the region, based upon a review of historical boring logs and private water well information obtained from the CCHD and Frewsburg Water District personnel for the Town of Carroll and the Hamlet of Frewsburg, it is difficult to predict the presence of the Frewsburg Aquifer at any given location.

Even in locations where the Frewsburg Aquifer is encountered, yields from wells installed into the Aquifer can vary greatly over relatively short distances. The original Production Well #2 was installed in 1941. At the time of its installation and initial testing, Production Well #2 exhibited flowing artesian conditions and its yield was determined to be 150 GPM. In 1990, a problem developed in Production Well #2. Efforts to repair the problem and save the well were unsuccessful and the well was abandoned. In order to install a new production well, a hole was advanced into the Frewsburg Aquifer approximately 25 to 30 feet southwest of the former Production Well #2. Prior to the installation of a permanent production well, the test well was pumped and found to yield only 65 GPM. This hole was then abandoned. A second borehole was advanced approximately 25 to 30 feet northeast of the former Production Well #2. According to Frewsburg Water District personnel, when the aquifer was encountered at this location the artesian effect was so strong that a column of water rose 3 to 4 feet in the air above the top of the temporary well casing. The artesian effect was so strong that the Frewsburg Water District had to pump both Production Wells #1 and #3 to waste at 150 GPM in order to relieve the artesian pressure so that the drilling contractor could get the well materials for the permanent production well (now known as Well #2A) into the borehole. Production Well #2A was tested for yield and was found to pump at a sustained rate of 200 GPM, however, according to Frewsburg Water District personnel, the maximum yield of Well #2A has not been established. During its period of use, Well #2A typically pumped at a rate of 200 GPM into the distribution system. This information demonstrates that yields within the Frewsburg Aquifer can vary widely over relatively short distances.

The reasons for the abrupt changes in the yields of wells installed into the Frewsburg Aquifer over short distances is not well known. It is most likely that the variation in yields may be due to one or more of the following factors:

i) thickness of the aquifer;
ii) sorting of the sands and gravel; and/or
iii) percent fines (clay and silt) content.

5.4 SUMMARY

The results of the data compilation performed indicate that the distribution of the portions of the Frewsburg Aquifer capable of yielding economic quantities of groundwater for municipal purposes is inconsistent throughout the study area. There also is a great variability in water quality. An option exists to explore the development of the so called Frew's Run Aquifer should this be necessary. This unit may yield adequate quantities of water. The aquifer also has the advantage that it is nearby the existing distribution system.

Based on the current performance of the District's water supply, no further activities under this task are required.

6.0 CONCLUSIONS

Based on the results of the IRA Program, the following conclusions are made:

i) District Production Wells #3 and #4, which are currently in use, have been found not contain any VOCs;

ii) Production Well #3 is suitable for use by the Frewsburg Water District, as approved by the CCHD;

iii) the Water Table Aquifer and the Frewsburg Aquifer exists beneath part of the Site (southwestern quadrant). However, the exact areal extent of the Frewsburg Aquifer has not been fully defined;

iv) the Water Table Aquifer and the Frewsburg Aquifer are separated by the upper confining clay layer. This clay layer has a low permeability and ranges in thickness from 13.5 feet to more than 41.0 feet. The lower confining clay unit underlying the Frewsburg Aquifer was found to have a very high clay content (90.9 percent) and a low permeability. The physical properties of the confining layers below and above the Frewsburg Aquifer significantly limit the vertical movement of groundwater beneath the Site;

v) no physical or direct vertical hydraulic connection was found between the shallow Water Table Aquifer and the Frewsburg Aquifer beneath the Site;

vi) no physical connection of the Frewsburg Aquifer between the Site and Production Well #3 or between Production Wells #1/#2A and Production Well #3 was identified. However, a hydraulic connection was found to exist between Well #3 and Wells #1/#2A during the pumping test. Within the Frewsburg Aquifer, a hydraulic connection exists between Production Wells #1/#2A and MW-5D, which is located on Site, and the Monarch Plastic wells;

vii) TCE and its degradation products were not detected in groundwater samples collected from monitoring wells installed into the Frewsburg Aquifer. No VOCs were detected in samples collected from Production Wells #1 and #2A or the pumped water sampled during and/or after completion of the pumping test;

viii) based upon the results of the IRA Program, the Site does not currently appear to pose a serious threat to the water quality of Production Well #3;

ix) based on the results of the IRA Program, the source of the contaminants in Production Wells #1 and #2A has not been determined nor has the transport pathway of contamination to Wells #1 and #2A been determined;

x) the distribution of portions of the Frewsburg Aquifer which are capable of yielding sufficient quantities of groundwater for municipal uses appears to be inconsistent in the Frewsburg area; and

xi) a waterbearing gravel zone is known to exist in the Frew's Run Valley and may be a potential water supply source for the District.

7.0 RECOMMENDATIONS

Based on the results and conclusions of the IRA Program, the following recommendations are made.

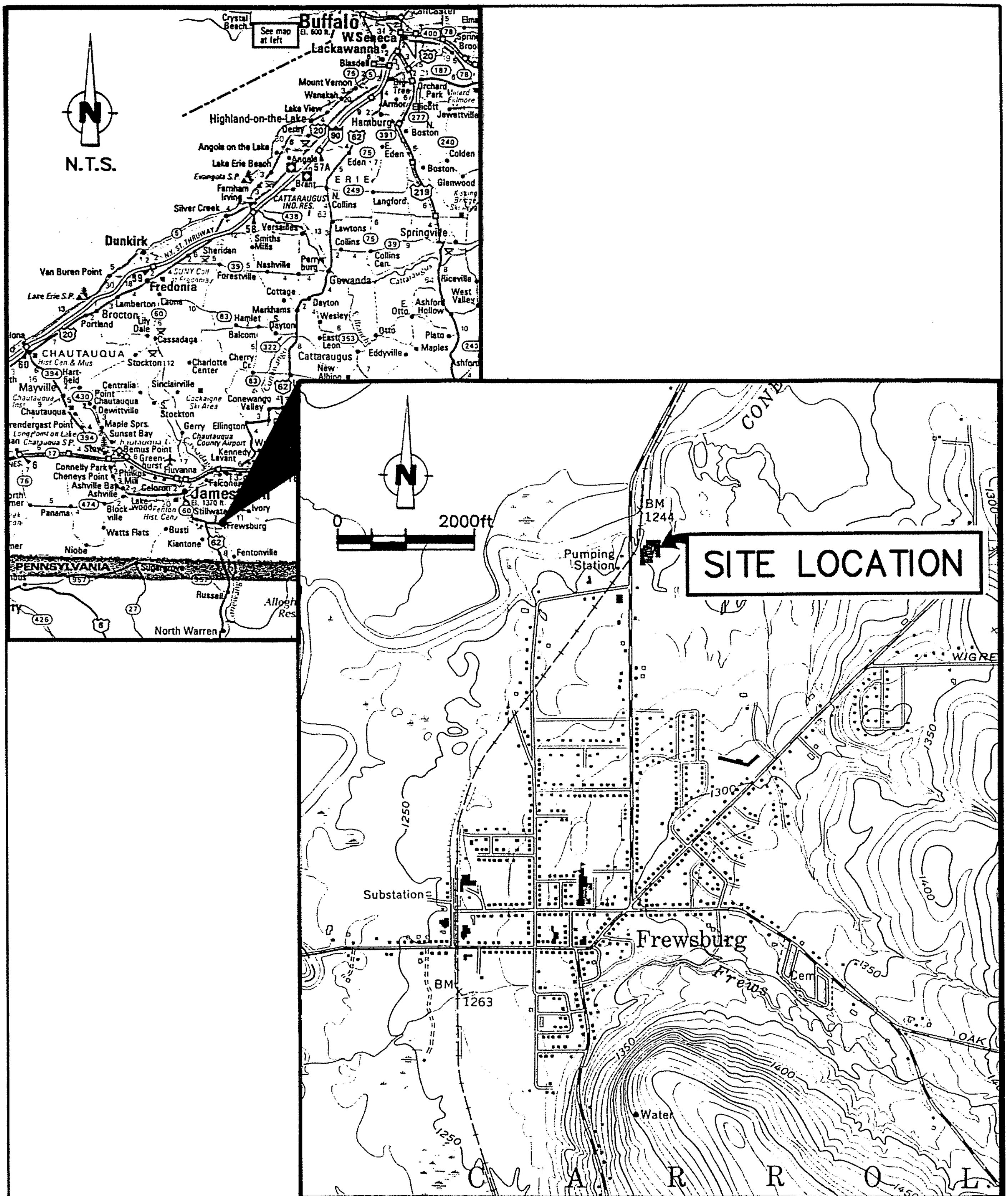
i) An additional monitoring well should be installed on Site into the Frewsburg Aquifer near the southeastern corner of the Main Building. If the aquifer is found, a shallow water table monitoring well should also be installed in the vicinity of the deep well. A pumping test should then be performed in the newly installed deep monitoring well to confirm the results of the IRA Program.

ii) The water supply monitoring performed under Task A be continued until November 1992. If the analytical results are consistent with those presented in this report, the monitoring program will be modified in the following manner:

a) delete wells # 1/# 2A from the program; and
b) reduce the sampling frequency to quarterly.

FIGURES

FIGURES



SOURCE: JAMESTOWN, N.Y.
N4200—W7907.5/7.5

figure 1.1

SITE LOCATION
VAC AIR ALLOYS DIVISION
Frewsburg, New York

CRA

2326(13)—17JUL/92—(NF)

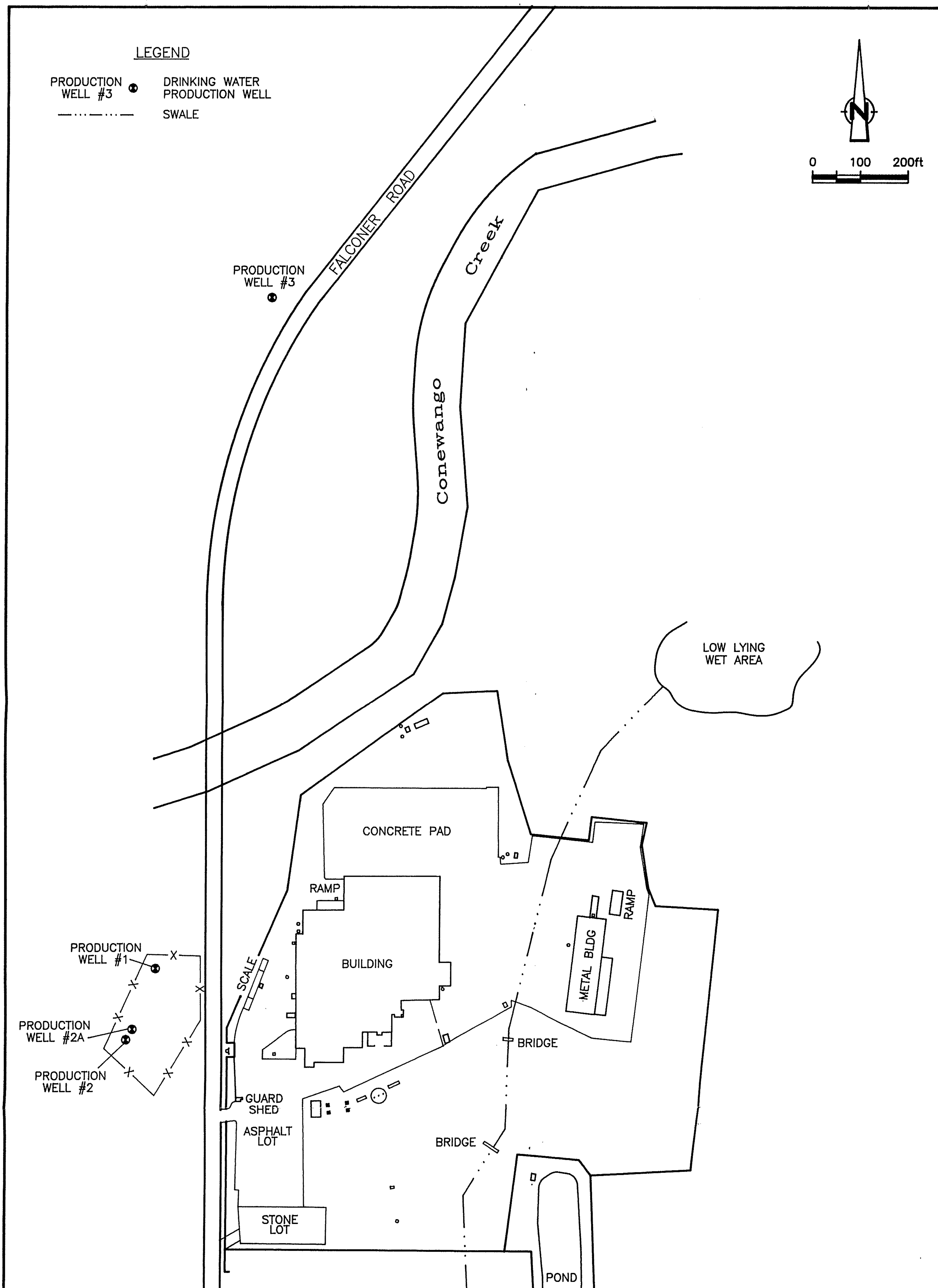


figure 1.2

SITE LAYOUT
INTERIM RESPONSE ACTIONS
VAC AIR ALLOYS DIVISION
Frewsburg, New York

CRA

2326(13)–15JUL/92–REV.0 (NF) (P–01)

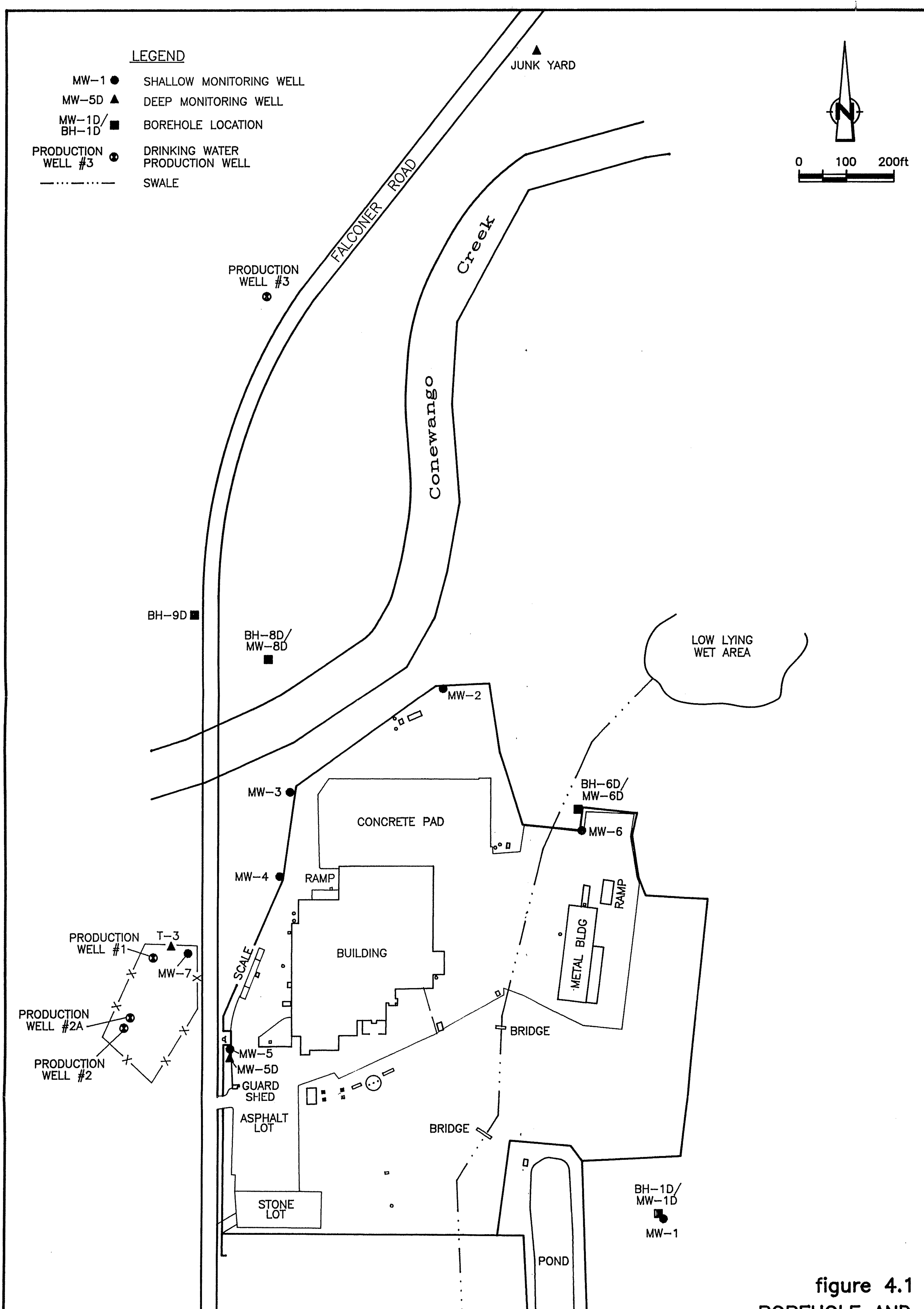


figure 4.1
BOREHOLE AND MONITORING WELL LOCATIONS
INTERIM RESPONSE ACTIONS
VAC AIR ALLOYS DIVISION
Frewsburg, New York

2326(13)-15JUL/92-REV.0 (NF) (P-03)

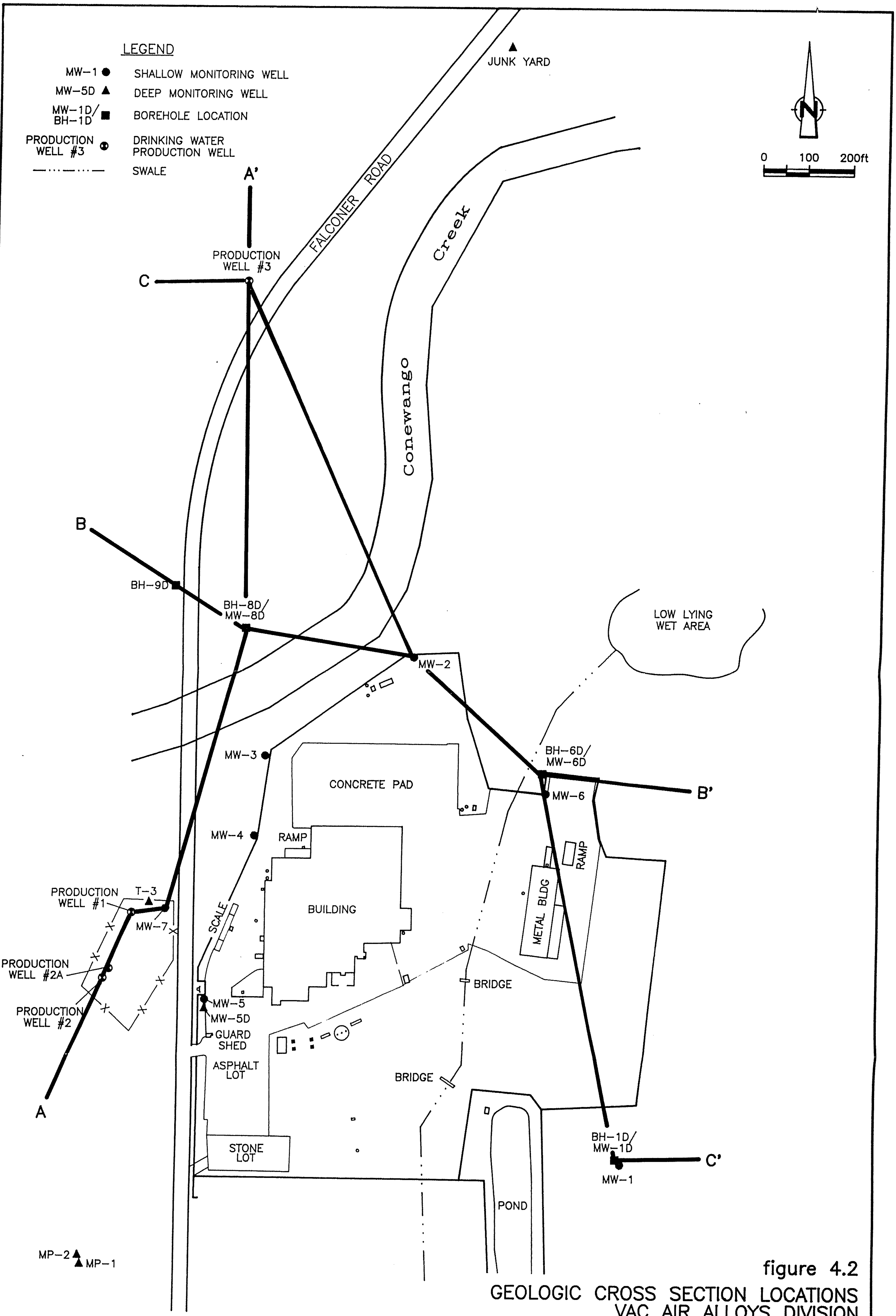


figure 4.2
GEOLOGIC CROSS SECTION LOCATIONS
VAC AIR ALLOYS DIVISION
Frewsburg, New York

CRA
2326(13)-15JUL/92-REV.0 (NF)

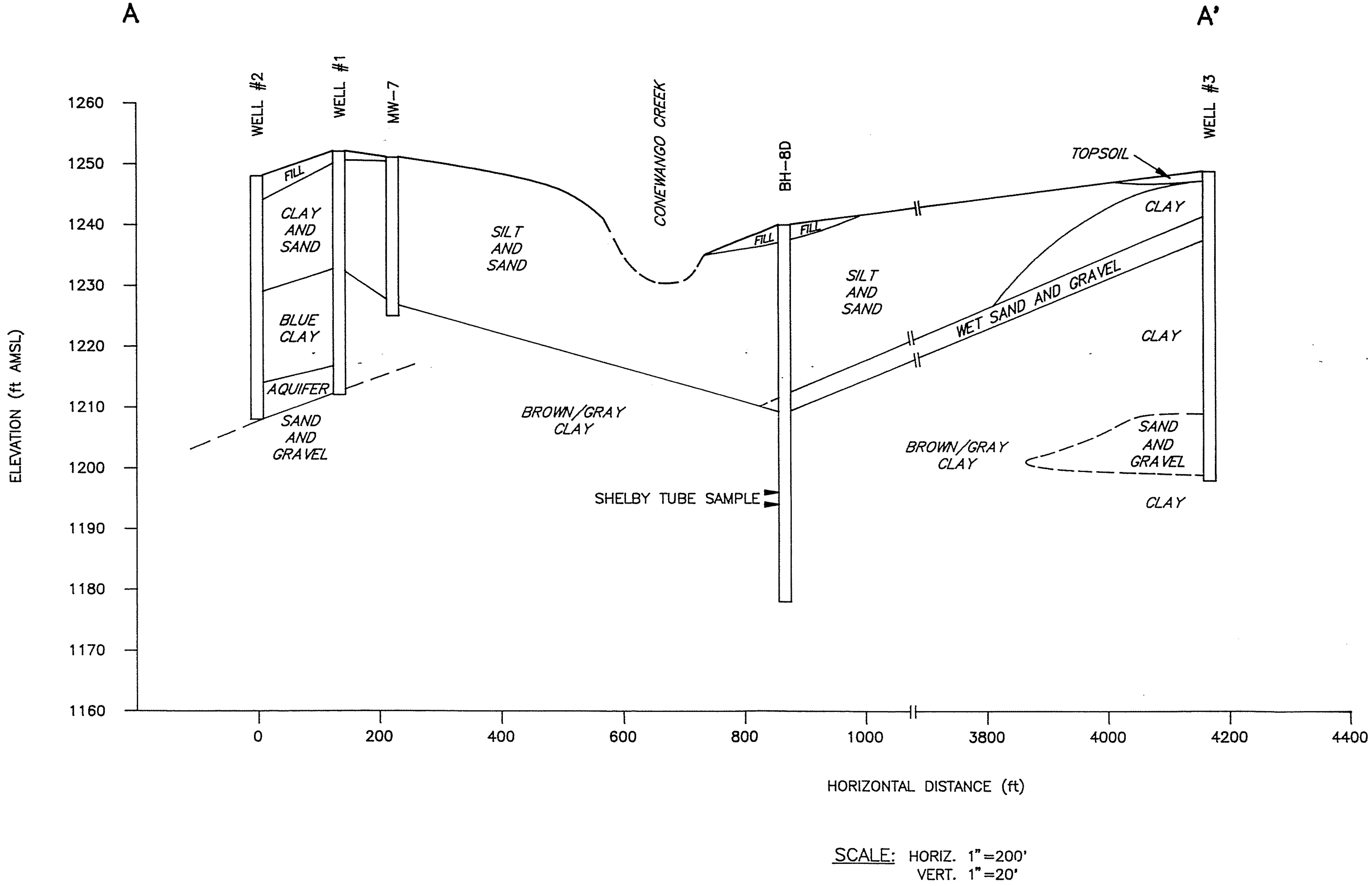


figure 4.3

GEOLOGIC CROSS SECTION A–A'
VAC AIR ALLOYS DIVISION
Frewsburg, New York

CRA

2326(13)–15JUL/92–REV.0 (NF) (X–08)

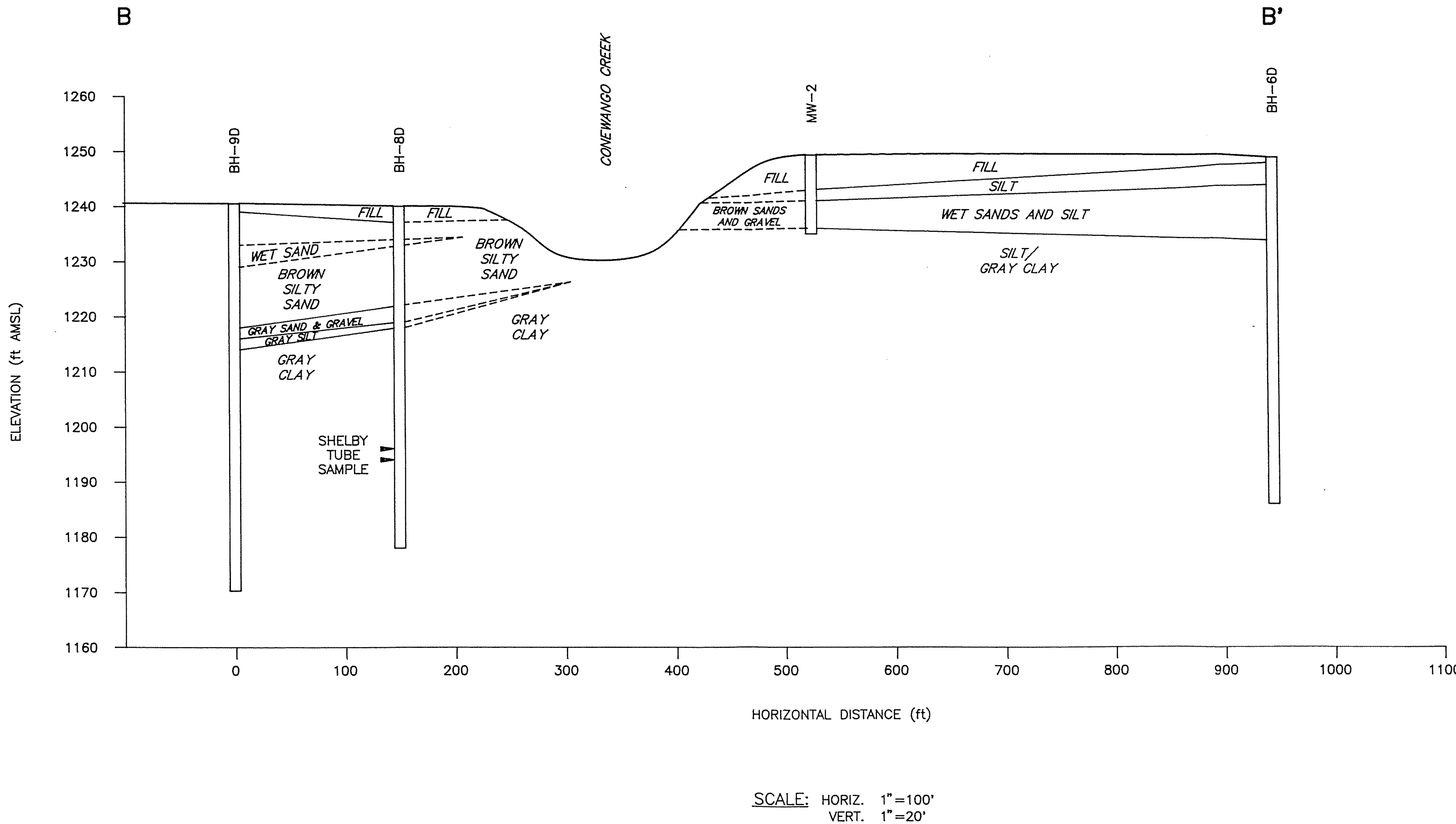


figure 4.4

GEOLOGIC CROSS-SECTION B-B'
VAC AIR ALLOYS DIVISION
Frewsburg, New York

CRA

2326(13)-15JUL/92-REV.0 (NF) (X-09)

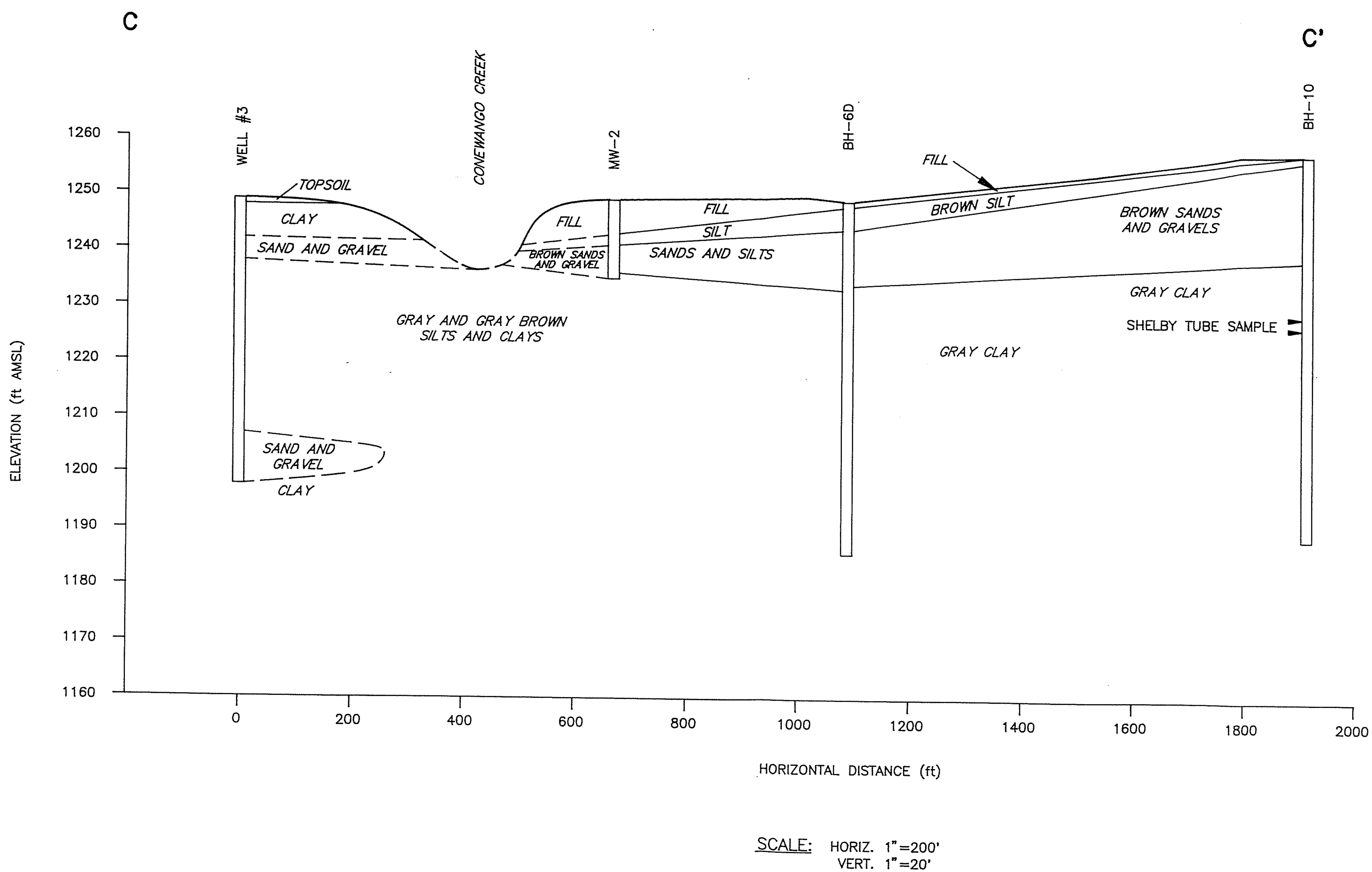


figure 4.5

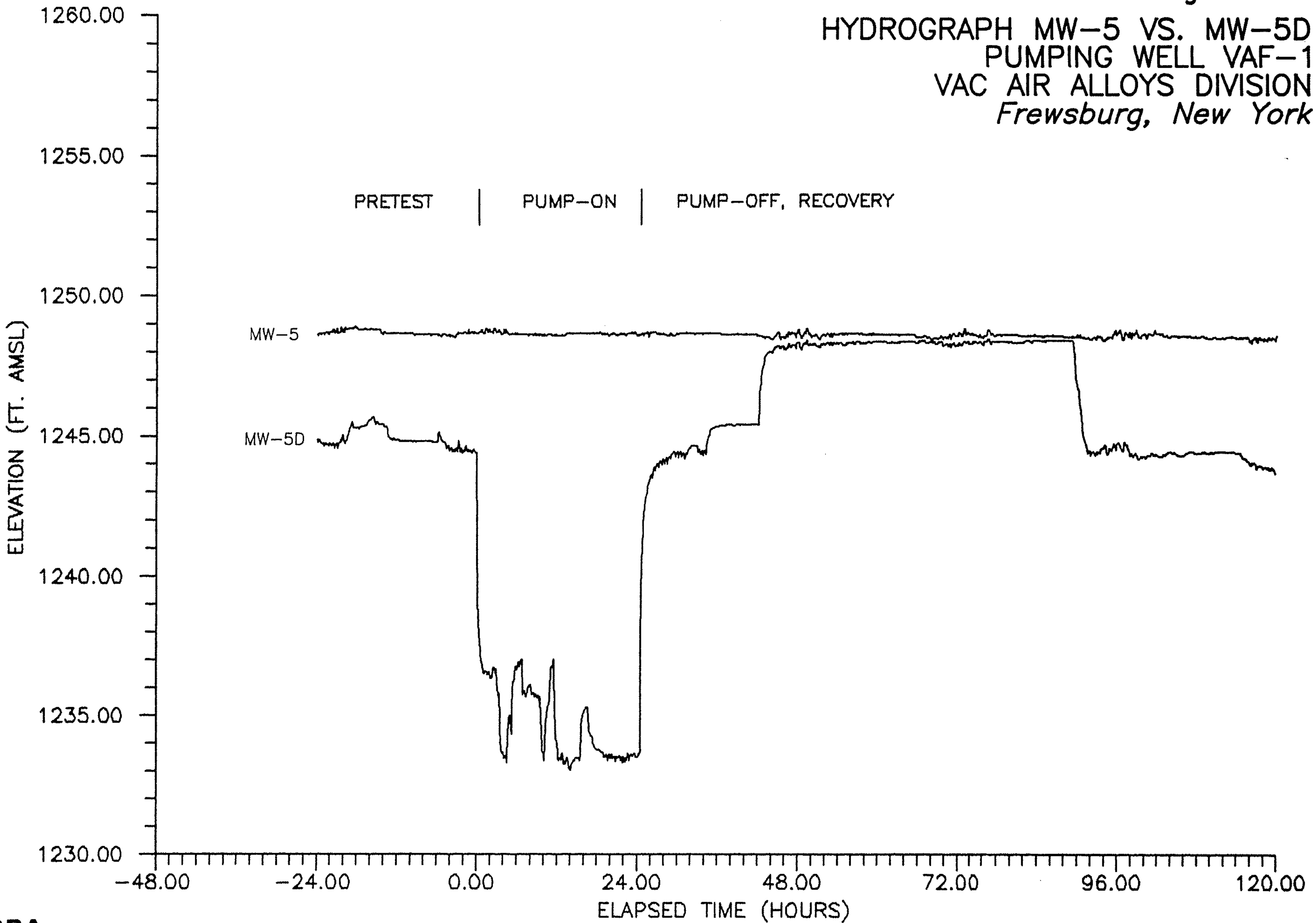
GEOLOGIC CROSS SECTION C–C'
VAC AIR ALLOYS DIVISION
Frewsburg, New York

CRA

2326(13)–15JUL/92–REV.0 (NF) (X–10)

figure 4.6

HYDROGRAPH MW–5 VS. MW–5D
PUMPING WELL VAF–1
VAC AIR ALLOYS DIVISION
Frewsburg, New York



CRA

2326(13)–17JUL/92–(NF)

TABLES

TABLES

TABLE 2.1

SUMMARY OF WATER SUPPLY MONITORING DATA
VACAIR ALLOYS DIVISION
FREWSBURG, NEW YORK

Well No./ Location	*Sample Date*	*Analytical Lab*	*Volatile Organic Compounds Detected (μg/L)*							*Comments*
			Methylene Chloride	*Trichloro-ethene*	*cis-1,2-Di-chloroethene*	*Toluene*	*Chloroform*	*Ethyl-benzene*	*Benzene*	
1	09/05/91	FLI	1	44	6	<0.5	ND	ND	ND	
	09/18/91	NYSDOH	ND	ND	ND	ND	1.0	ND	ND	
	09/19/92	Microbac	ND	465	28.1	ND	ND	ND	ND	
	09/19/91	FLI	ND	118	ND	ND	ND	ND	ND	
	09/19/91	FLI	ND	112	ND	ND	ND	ND	ND	Duplicate Analysis
	09/26/91	Microbac	ND	10.1	ND	ND	ND	ND	ND	Vial #1
	09/26/91	Microbac	ND	13.2	ND	ND	ND	ND	ND	Vial #2
	09/26/91	NYSDOH	ND	10	0.5	ND	ND	ND	ND	
	09/26/91	FLI	ND	5	ND	ND	ND	<0.5	ND	
	10/03/91	Microbac	ND	3.5	ND	ND	ND	ND	ND	Vial #1
	10/03/91	Microbac	ND	3.2	ND	ND	ND	ND	ND	Vial #2
	10/03/91	FLI	ND	2	ND	ND	ND	ND	ND	
	11/15/91	Microbac	ND	1.2	ND	ND	ND	ND	ND	
	12/30/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	01/29/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	02/27/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	03/26/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	04/23/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	05/21/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
2A	09/05/91	FLI	2	5	ND	0.6	ND	<0.5	ND	
	09/18/91	NYSDOH	ND	ND	ND	ND	1.0	ND	ND	
	09/19/91	Microbac	ND	33.6	1.0	ND	ND	ND	ND	
	09/19/91	FLI	ND	9	ND	ND	ND	ND	ND	
	09/19/91	FLI	ND	10	ND	ND	ND	ND	ND	Duplicate Analysis
	09/26/91	Microbac	ND	116	4.1	ND	ND	ND	ND	
	09/26/91	Microbac	ND	101	3.6	ND	ND	ND	ND	Duplicate Sample
	09/26/09	NYSDOH	ND	140	6	ND	ND	ND	ND	

TABLE 2.1

SUMMARY OF WATER SUPPLY MONITORING DATA
VACAIR ALLOYS DIVISION
FREWSBURG, NEW YORK

Well No./ Location	*Sample Date*	*Analytical Lab*	*Volatile Organic Compounds Detected (µg/L)*							*Comments*
			Methylene Chloride	*Trichloro-ethene*	*cis-1,2-Di-chloroethene*	*Toluene*	*Chloroform*	*Ethyl-benzene*	*Benzene*	
2A	09/26/91	FLI	ND	17	ND	ND	ND	ND	<0.5	
	10/03/91	Microbac	ND	ND	ND	ND	ND	ND	ND	Vial #1
	10/03/91	Microbac	ND	ND	ND	ND	ND	ND	ND	Vial #2
	10/03/91	FLI	ND	ND	ND	ND	ND	ND	ND	
	11/15/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	12/30/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	01/29/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	02/27/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	03/26/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	04/23/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	05/21/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
3	09/26/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	09/26/91	NYSDOH	ND	ND	ND	ND	ND	ND	ND	
	09/26/91	FLI	ND	ND	ND	ND	ND	ND	ND	
	10/03/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	10/03/91	FLI	ND	ND	ND	ND	ND	ND	ND	
	11/15/91	Microbac	ND	ND	ND	ND	1.5	3.6	ND	
	11/15/91	Microbac	ND	ND	ND	ND	1.7	2.8	ND	Duplicate Analysis
	12/30/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	01/29/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	02/27/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	03/26/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	04/23/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	05/21/92	Microbac	ND	ND	ND	ND	ND	ND	ND	

TABLE 2.1

SUMMARY OF WATER SUPPLY MONITORING DATA
VACAIR ALLOYS DIVISION
FREWSBURG, NEW YORK

			Volatile Organic Compounds Detected (μg/L)							
Well No./ Location	*Sample Date*	*Analytical Lab*	*Methylene Chloride*	*Trichloro-ethene*	*cis-1,2-Di-chloroethene*	*Toluene*	*Chloroform*	*Ethyl-benzene*	*Benzene*	*Comments*
4	09/19/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	09/19/91	FLI	ND	ND	ND	ND	ND	ND	ND	
	09/26/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	09/26/91	NYSDOH	ND	ND	ND	ND	ND	ND	ND	
	09/26/91	FLI	ND	ND	ND	ND	ND	ND	ND	
	10/03/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	10/03/91	FLI	ND	ND	ND	ND	ND	ND	ND	
	11/15/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	12/30/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	01/29/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	02/27/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	03/26/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	04/23/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
	05/21/92	Microbac	ND	ND	ND	ND	ND	ND	ND	
Town Hall (1)	09/19/91	Microbac	ND	38.0	1.0	ND	ND	ND	ND	
	09/19/91	Microbac	ND	34.9	1.2	ND	ND	ND	ND	Duplicate Sample
	09/19/91	FLI	ND	21	<0.5	ND	ND	ND	ND	
	09/19/91	FLI	ND	28	ND	ND	ND	ND	ND	Duplicate Sample
	09/26/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	09/26/91	NYSDOH	ND	ND	ND	ND	ND	ND	ND	
	09/26/91	FLI	ND	ND	ND	ND	ND	ND	ND	
	10/03/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	10/03/91	FLI	ND	ND	ND	ND	ND	ND	ND	
	11/15/91	Microbac	ND	ND	ND	ND	ND	ND	ND	

TABLE 2.1

SUMMARY OF WATER SUPPLY MONITORING DATA
VACAIR ALLOYS DIVISION
FREWSBURG, NEW YORK

Well No./ Location	*Sample Date*	*Analytical Lab*	*Volatile Organic Compounds Detected (µg/L)*							*Comments*
			Methylene Chloride	*Trichloro-ethene*	*cis-1,2-Di-chloroethene*	*Toluene*	*Chloroform*	*Ethyl-benzene*	*Benzene*	
Elementary School (1)	09/26/91	NYSDOH	ND	2	ND	ND	ND	ND	ND	
	09/26/91	Microbac	ND	ND	ND	ND	1.5	ND	ND	
	09/26/91	FLI	ND	1	ND	ND	ND	ND	ND	
	10/03/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	10/03/91	FLI	ND	ND	ND	ND	ND	ND	ND	
	11/15/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
Cemetary(1)	09/20/91	NYSDOH	ND	1	ND	ND	ND	ND	ND	
	09/26/91	Microbac	ND	ND	ND	ND	0.5	ND	ND	
	09/26/91	FLI	ND	<0.5	ND	ND	ND	ND	ND	
	10/03/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	10/03/91	FLI	ND	ND	ND	ND	ND	ND	ND	
Monarch Plastics	10/03/91	Microbac	ND	ND	ND	ND	ND	ND	ND	
	10/03/91	FLI	ND	ND	ND	ND	ND	ND	ND	

Notes:
ND Not detected at a practical quantitation limit of 0.5 µg/L.
(1) Sample collected from the Frewsburg Water District's distribution system.

TABLE 4.1

SAMPLE SUMMARY KEY
SITE INVESTIGATION
VACAIR ALLOYS
FREWSBURG, NEW YORK

Sample I.D.	*Sample Date*	*Sample Matrix*	*Sample Source*	*Sample Interval (Ft. BGS)*	*Sample Analyses*	*Notes*
S-7	04/06/92	Soil	MW-5D	32 - 34	FOC	Clay above Frewsburg Aquifer
S-13	04/07/92	Soil	MW-5D	44 - 46	FOC	Frewsburg Aquifer material
S-15	04/07/92	Soil	MW-5D	48 - 50	FOC	Clay below Frewsburg Aquifer
RB-415	04/15/92	Water	-	-	VOCs	Rinse Blank
MW-5D	04/15/92	Water	MW-5D	-	VOCs	MS/MSD Requested
MW-4A	04/15/92	Water	MW-5D	-	VOCs	Duplicate Sample
T-1	04/15/92	Water	T-3	-	VOCs	Mislabelled, Correct Label T-3
Trip Blank	04/08/92	Water	Lab	-	VOCs	Air Bubbles in Vials
1	06/04/92	Water	Production Well #1	-	VOCs	Start of Pumping Test
2	06/04/92	Water	Production Wells #1/#2A	-	VOCs	After 6 hours of Pumping
3	06/05/92	Water	Production Wells #1/#2A	-	VOCs	After 12 hours of Pumping
4	06/05/92	Water	Production Wells #1/#2A	-	VOCs	After 18 hours of Pumping
5	06/05/92	Water	Production Wells #1/#2A	-	VOCs	Prior to Completion of Pumping
6	06/05/92	Water	MW-5D	-	VOCs	At Completion of Pumping Test
7	06/05/92	Water	Production Wells #1/#2A	-	VOCs	Duplicate of Sample 5
8	06/05/92	Water	-	-	VOCs	Rinse Blank
Trip Blank	-	Water	Lab	-	VOCs	Air Bubble in one of two vials

TABLE 4.2

STRATIGRAPHIC SUMMARY
VACAIR ALLOYS
FREWSBURG, NEW YORK

Well/ Borehole No.	*Ground Elevation (Ft. AMSL)*	*Borehole Bottom (Ft. AMSL)*	*Shallow Sand/Gravel Layer*			*Confining Clay Layer*			*Deep Sand and Gravel Aqufier*			*Lower Confining Layer*	
			Depth (Ft. BGS)	*Elevation (1) (Ft. AMSL)*	*Thickness (Feet)*	*Depth (Ft. BGS)*	*Elevation (1) (Ft. AMSL)*	*Thickness (Feet)*	*Depth (Ft. BGS)*	*Elevation (1) (Ft. AMSL)*	*Thickness (Ft.)*	*Depth (Ft. BGS)*	*Elevation (1) (Ft.)*
BH-1	1256.2	1228.2	2.4	1253.8	21.6	24.0	1232.2	-	-	-	-	-	-
BH-5A-1	1250.6	1239.6	7.0	1243.6	-	-	-	-	-	-	-	-	-
BH-5A-2	1250.6	1239.6	9.0	1241.6	-	-	-	-	-	-	-	-	-
BH-5A-3	1250.4	1241.4	1.9	1248.5	-	-	-	-	-	-	-	-	-
BH-5B-1	1250.1	1241.1	7.2	1242.9	-	-	-	-	-	-	-	-	-
BH-5B-2	1250.6	1239.0	7.0	1243.6	-	-	-	-	-	-	-	-	-
BH-5B-3	1248.6	1237.6	7.3	1241.3	3.5	10.8	1237.8	-	-	-	-	-	-
BH-12-1	1256.6	1248.6	3.1	1253.5	-	-	-	-	-	-	-	-	-
BH-13-1	1250.0	1241.0	7.2	1242.8	-	-	-	-	-	-	-	-	-
MW-1	1258.4	1240.4	0.7	1257.7	14.8	15.5	1242.9	-	-	-	-	-	-
MW-2	1249.1	1235.1	6.5	1242.6	6.4	12.9	1236.2	-	-	-	-	-	-
MW-3	1250.1	1228.1	4.0	1246.1	10.5	14.5	1235.6	-	-	-	-	-	-
MW-4	1247.5	1227.5	2.3	1245.2	14.1	16.4	1231.1	-	-	-	-	-	-
MW-5	1253.9	1233.9	4.0	1249.9	>16.0	-	-	-	-	-	-	-	-
MW-6	1251.5	1233.5	2.0	1249.5	16.0	18.0	1233.5	-	-	-	-	-	-
MW-7	1251.3	1225.3	0.2	1251.1	17.1	24.0	1227.3	-	-	-	-	-	-
MW-5D	1253.9	1203.9	4.0	1249.9	16.5	20.5	1233.4	13.5	34.0	1219.9	10.7	44.7	1209.2
BH-1D	1258.5	1189.5	0.7	1257.7	14.8	20.0	1238.5	>49.0	(2)	(2)	(2)	-	-
BH-6D	1248.7	1185.7	0.8	1247.9	10.8	14.4	1233.5	>47.8	(2)	(2)	(2)	-	-
BH-8D	1240.0	1178.0	2.6	1237.4	19.4	22.0	1218.0	>62.0	(2)	(2)	(2)	-	-
BH-9D	1240.2	1170.2	0.9	1239.3	25.1	26.0	1214.2	>70.0	(2)	(2)	(2)	-	-
Well #3 (3)	1248.8	1197.9	11.0	1241.8	4.0	11.0	1237.8	29.5	40.5	1208.3	9.4	49.9	1198.9
Well #2 (3)	1251.7	1211.7	(4)	(4)	(4)	19.0	1232.7	21.0	34.5	1217.2	5.5	40.0	1211.7
Well #1 (3)	1251.7	1211.5	(4)	(4)	(4)	19.0	1232.7	21.0	34.5	1217.2	5.7	40.2	1211.5
Well #4 (3)	1248.7	(4)	(4)	(4)	(4)	0.0	1248.7	41.0	41.0	1207.7	6.0	47	1201.7

Notes:

Ft. BGS -	Feet below ground surface.
Ft. AMSL -	Feet above mean sea level.
(1)	Elevation at top of stratigraphic layer.
(2)	Frewsburg Aquifer not encountered.
(3)	Frewsburg Water District Production Well
(4)	Not noted on logs.

TABLE 4.3

MONITORING WELL INSTRUMENTATION SUMMARY
VACAIR ALLOYS
FREWSBURG, NEW YORK

Well No.	*Ground Elevation (Ft. AMSL)*	*Top of Casing Elevation (Ft. AMSL)*	*Sandpack Interval (Ft. BGS)*	*Sandpack Interval (Ft. AMSL)*	*Well Screen Interval (Ft. BGS)*	*Well Screen Interval (Ft. AMSL)*	*Bottom of Well (Ft. AMSL)*
MW-1	1258.4	1260.6	10.0 - 18.0	1248.4 - 1240.4	13.0 - 18.0	1245.4 - 1240.4	1240.4
MW-2	1249.1	1251.6	6.5 - 14.0	1242.6 - 1235.1	8.0 - 13.0	1241.1 - 1236.1	1234.1
MW-3	1250.1	1252.3	7.0 - 20.0	1243.1 - 1230.1	10.0 - 20.0	1240.1 - 1230.1	1230.1
MW-4	1247.5	1250.1	6.6 - 18.0	1240.9 - 1229.5	8.0 - 18.0	1239.5 - 1229.5	1229.5
MW-5	1253.9	1256.5	6.0 - 20.0	1247.9 - 1233.9	8.0 - 18.0	1245.9 - 1235.9	1233.9
MW-6	1251.5	1253.7	6.5 - 16.0	1245.0 - 1235.5	9.8 - 16.0	1242.5 - 1235.5	1235.5
MW-7	1251.3	1253.76	8.0 - 24.0	1243.3 - 1227.3	14.0 - 24.0	1237.3 - 1227.3	1227.3
MW-5D	1253.9	1255.14	34.0 - 45.5	1219.9 - 1208.4	40.0 - 45.0	1213.9 - 1208.9	1208.9

Notes:
Ft. AMSL - Feet above mean sea level.
Ft. BGS - Feet below groundwater surface.

TABLE 4.4

SOIL SAMPLE TEST RESULTS
VACAIR ALLOYS
FREWSBURG, NEW YORK

Parameters	*Units*	*Sample Locations* MW-5D (1) S-7 32-34 Ft. BGS	MW-5D (4) S-13 44-46 Ft. BGS	MW-5D (2) S-15 48-50 Ft. BGS
Total Organic Carbon (3)	%	0.095	0.16	0.41
Total Solids	%	79.2	91.0	77.6

Parameters	*Units*	*Sample Locations* BH-8D (1) 44-46 Ft. BGS	BH-1D (1) 31.0-33 Ft. BGS	MW-5D (2) 48-50 Ft. BGS	*MW-5D (4) 36-44 Ft. BGS*
Moisture Content Before Permeability Testing	%	23.1	35.3	32.5	-
Moisture Content After Permeability Testing	%	21.6	35.0	32.9	-
Permeability	cm/sec	2.99 x 10-8/ 2.83 x 10-8	1.75 x 10-8/ 1.66 x 10-8	2.26 x 10-8/ 2.43 x 10-8	-
Gravel Content	%	2.9	0.0	0	44.9
Sand Content	%	2.5	0.2	0	31.9
Silt Content	%	42.5	14.2	9.1	23.2 (5)
Clay Content	%	52.1	85.6	90.9	(5)

Notes:
(1) Upper confining clay layer.
(2) Lower confining clay layer.
(3) Analysis was performed on a dry weight basis.
(4) Frewsburg Aquifer
(5) Combination of clay and silt.

TABLE 4.5

MONITORING WELL PURGING SUMMARY
VACAIR ALLOYS
FREWSBURG, NEW YORK

Well No.	*Date*	*Time*	*Water Level (Ft. BTOC)*	*Initial Well Volume (Gallons)*	*Total Volume Purged (Gallons)*	*pH*	*Cond. (µmhos/cm3)*	*Temp. (°C)*
MW-5D	04/15/92	1000	9.44	5.8	0	9.99	1022	10.6
					6	7.19	604	11.3
					12	7.11	576	11.1
					18	6.98	570	11.0
					24	6.98	573	11.0
					30	7.01	571	11.0
T-3	04/15/92	1300	7.62	5.7	0	6.55	506	10.8
					6	6.43	541	10.7
					12	6.29	541	10.5
					18	6.37	534	10.6
					24	5.91	537	10.5
					30	6.10	539	10.6

Note:
BTOC - Below top of casing.

TABLE 4.6
AQUIFER TESTING OBSERVATION WELL NETWORK
VACAIR ALLOYS DIVISION
FREWSBURG, NEW YORK

Well No.	*Aquifer Monitored*	*Start Date*	*Start Time*	*Stop Date*	*Stop Time*	*Frequency*	*Method*
Production Well #1	Frewsburg	05/29/92	1240	06/09/92	1008	1 Minute Data	Recorder
Production Well #2A	Frewsburg	05/29/92	1311	06/09/92	1032	1 Minute Data	Recorder
Production Well #3	Frewsburg	05/29/92	1158	06/09/92	0859	1 Minute Data	Recorder
Production Well #4	Frewsburg	05/29/92	1341	06/09/92	1111	1 Minute Data	Recorder
Monarch Plastics #1	Frewsburg	05/29/92	1439	06/09/92	1051	1 Minute Data	Recorder
MW-1	Upper	06/04/92	1017	06/09/92	1206	Occasional	Manual
MW-2	Upper	06/04/92	0950	06/09/92	1322	1 Minute Data	Recorder
MW-3	Upper	06/04/92	1045	06/09/92	1305	1 Minute Data	Recorder
MW-4	Upper	05/29/92	1602	06/09/92	1251	1 Minute Data	Recorder
MW-5	Upper	05/29/92	1534	06/09/92	1237	1 Minute Data	Recorder
MW-5D	Frewsburg	05/29/92	1502	06/09/92	1228	1 Minute Data	Recorder
MW-6	Upper	06/04/92	1005	06/09/92	1213	1 Minute Data	Recorder
MW-7	Upper	05/29/92	1616	06/09/92	0937	1 Minute Data	Recorder
T-3	Frewsburg	06/04/92	0930	06/09/92	0955	1 Minute Data	Recorder
Junk Yard	Frewsburg	06/04/92	0841	06/09/92	0920	1 Minute Data	Recorder
River	-	06/04/92	1051	06/09/92	1304	Occasional	Manual

TABLE 4.7
MONITORING WELL GROUNDWATER SAMPLE DATA
VACAIR ALLOYS
FREWSBURG, NEW YORK

Compounds Detected (2)	*Units*	*Sample Location (1)*			*Rinse Blank*	*Trip Blank*
		MW-5D	*MW-4A (Dup. of MW-5D)*	*Well T-1*		
Benzene	μg/L	3.7J	3.6J	0.6J	ND(0.5)	ND(0.5)

Notes:
ND Not detected at the stated practical quantitation limits.
J Associated value is estimated due to outlying initial calibration
(1) All samples were collected on April 15, 1992.
(2) All other VOCs provided by Method 502.2 were not detected at a practical quantitation limit of 0.5 μg/L.

TABLE 5.1

SUMMARY OF DOMESTIC WELL OWNERS
INTERIM RESPONSE ACTIONS
VACAIR ALLOYS PLANT SITE
FREWSBURG, NEW YORK

	Well Owner	*Street Name*
1.	Robert Mason	Anna Street
2.	Robert Gulvin	Pearl Street
3.	Charles Crooks	Howard Street
4.	Mike Frew (Farm)	Ivory Road.
5.	Dennis Trostle	Route 62
6.	Wayne Hammond	Route 62
7.	Gerald Richard	Wigren Road
8.	James Suckow	Wigren Road.
9.	Frank Blank	Ivory Road
10.	Thomas Powell	Wigren Road
11.	Thomas Neathery	Wigren Road
12.	Mary Rix	Wigren Road
13.	John Mash	Bunce Road
14.	Richard Walker	Bunce Road
15	Raymond Bean	Bunce Road
16.	Oliver Smith	Bunce Road
17.	John Kost	Bunce Road
18.	Earl McNallie	Bunce Road
19.	Ed Davis	Frew Run Road
20.	Kermit Ekstrom	Peterson Road
21.	Elmer Daniels	Oak Hill Road
22.	Billy Litaker	Oak Hill Road
23.	Marcy Morreale	Scott Road
24.	Hartly	Rd. #1 - Scott Road
25.	Robert Sandberg	Ivory Road
26.	John Nash	Ivory Road
27.	Joseph Burger	Rd. #1 - Ivory Road
28.	John Elderkin	Rd. #1 - Ivory Road
29.	Stanley Collver	Harrington Road
30.	Richard Pierce	Ivory Road
31.	Floyd Segerlund	Ivory Road
32.	Floyd Coulter	Cass Run
33.	Laverne Youngberg	Page Road
34.	Alton Lindstrom	Page Road
35.	Juanita Minor	Page Road
36.	Ira Walker	Route 60
37.	Brian Cheney	Page Road
38.	Gregory Carlberg	Carlberg Road
39.	David Fritton	Emory Hill Road
40.	Tom Fenton	Ivory Road
41.	Paul Mason	474 Ivory Road
42.	Thomas Fenton	Ivory Road
43.	Richard Benton	Woodchuck Hill Road
44.	Robert Elderkin	Bragg Road

TABLE 5.1

SUMMARY OF DOMESTIC WELL OWNERS
INTERIM RESPONSE ACTIONS
VACAIR ALLOYS PLANT SITE
FREWSBURG, NEW YORK

	Well Owner	*Street Name*
45.	Frank Elderkin	Bragg Road
46.	Alvin Bragg	Bone Run Road
47.	David Miller	Oak Hill Road
48.	Tom Mahoney	Church Cross Road
49.	Michael Nelson	Church Cross Road
50.	David Eckman	Frew Run Road
51.	Richard Cable	Frew Run Road
52.	Jay Eckert	Engstrom Cross Road
53.	Norma Ecklund	Frew Run Road
54.	Gordon Danielson	Wiltsie Road
55.	Leroy Grover	Frew Run Road
56.	Frank Constantino	Wiltsie Road
57.	Ed Petranski	Wheeler Hill Road
58.	Jim Murphy	Dodge Road
59.	Dr. Roger Fales	Anderson Road
60.	Robert Gordon	Sandberg Road
61.	Harold Bennette	Bain Road
62.	Brian Nelson	Bain Road
63.	Anthony Carvella	Austin Hill Road
64.	Kenneth Eckman	Old Warren Road
65.	Gerald Waid	Old Warren Road
66.	Gerald Hatch	741 Old Warren Road
67.	James Culver	Rd. #2 Warren Road
68.	Martin Pochedly	Old Warren Road
69.	Erie Beagle Club	Old Warren Road
70.	David Himes	Old Warren Road
71.	Donald Jones	Old Warren Road
72.	Donald Gardner	Old Warren Road
73.	Timothy Jones	Old Warren Road
74.	Russell Beckwith	Scott Road
	Donna Yager	Scott Road

APPENDICES

A

APPENDIX A

WELL MW-7 BACKGROUND INFORMATION

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-19)

PROJECT NAME: VAC-AIR ALLOYS

PROJECT NO.: 2326

CLIENT: VAC-AIR ALLOYS

LOCATION: EAST OF FREWSBURG WELL FIELD

HOLE DESIGNATION: MW-7

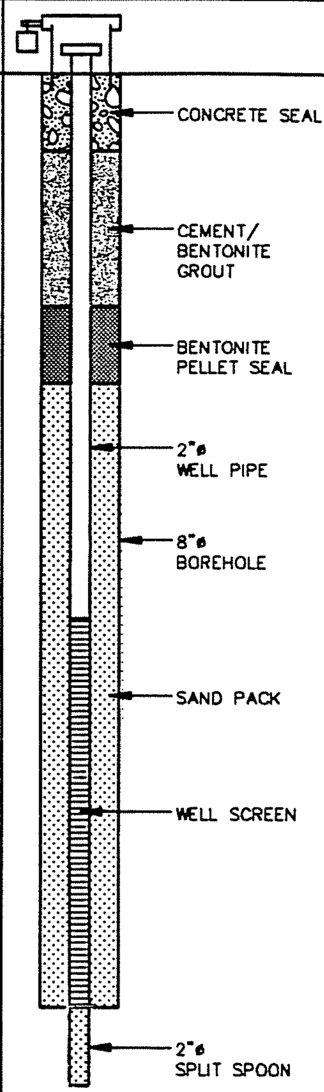
DATE COMPLETED: SEPTEMBER 23, 1991

DRILLING METHOD: 4 1/4" ID HSA

CRA SUPERVISOR: D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL
	REFERENCE ELEVATION (Top of Riser)	1253.76
	GROUND SURFACE	1251.3
	Dark brown SILT, some fine sand, little vegetation, moist, TOPSOIL	1251.1
		1250.6
2.5	Brown fine to medium GRAVEL, some fine to medium sand, some silt, moist, NATIVE	1249.3
	Brown fine SAND, some silt, trace fine gravel, moist	1247.3
5.0	Brown fine to medium GRAVEL, some fine to medium sand, some silt, occasional silty fine sand layer, moist	1245.0
7.5	Brown fine SAND, some silt, trace medium sand, trace gravel, occasional 1/2" thick sand and gravel lense, moist to wet	1242.9
	Brown fine to medium GRAVEL, some fine to medium sand, little silt, moist	
10.0	Same, except wet	1241.3
	Brown SILT, some fine to medium sand, interbeds of silty fine sand and sandy fine silt, moist to wet	1239.3
12.5	Brown fine SAND, some silt, trace medium sand, wet	1238.9
15.0	Gray brown SILT, little clay, little fine sand, interbeds of clayey silt and fine sandy silt, wet	
	Brown orange and black fine SAND, some silt, interbeds of silty fine sand and fine sandy silt, wet, some oxidation	
17.5	Same, except brown	
	Same, except fine to medium SAND, trace silt	1233.3
	Brown to brown gray fine SAND, some silt, trace clay, interbeds of sandy silt and silty sand, occasional thin clay lense	1231.9
20.0		1231.3
	Brown SILT, some fine sand, little clay, frequent thin beds of clayey silt, sandy silt and silty sand, moist to wet	
22.5	Brown fine SAND, trace silt, loose, wet	
	Brown SILT, some fine sand, trace clay, wet	1227.3
25.0	Same, except gray, little clay, moist to wet	
	Gray SILT, some clay, little fine sand, moist	1225.3
	END OF HOLE @ 26.0 FT. BGS	
27.5	NOTES:	
	1. At completion a monitoring well was installed to 24.0 ft BGS.	
30.0	2. Soil samples were retained for geologic record.	
32.5		

MONITOR INSTALLATION



SAMPLE NUMBER	STATE	'N' VALUE	HNu (ppm)
1SS		31	-
2SS		29	-
3SS		14	-
4SS		46	-
5SS		27	-
6SS		14	-
7SS		13	-
8SS		17	-
9SS		17	-
10SS		10	-
11SS		7	-
12SS		17	-
13SS		5	-

SCREEN DETAILS:
Screened Interval:
14.0 to 24.0' BGS
Length -10.0'
Diameter -2.0"
Slot # 10
Material -Stainless Steel
Sand pack interval:
8.0 to 24.0' BGS
Material -# 4 QROC

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

MEMO

To: Wai Chin Lachell

From: Bill Hamel/jk

Reference No.: 2326

Date: 4/02/92

Re: Analytical Data Quality Assessment and Validation (MW-7)
Vac Air Alloys, Frewsburg, New York
August 1991

Overview

The following document details an assessment and validation of analytical results reported for one groundwater sample (MW-7) collected on August 24, 1991. Sample MW-7 was submitted for Target Compound List (TCL) Volatile Organic Compounds (VOCs) by Method 89-1, referenced from the NYSDEC September 1989 ASP.

Evaluation of the data was based on information derived from the raw data, finished data sheets, chain of custody forms, blank data, and recovery data for matrix and surrogate spikes. The assessment of analytical and in-house data included checks for: data consistency (by observing comparability of duplicate analyses); adherence to accuracy and precision criteria; transmittal errors; and anomalously high and low parameter values.

The QA/QC criteria by which these data have been assessed are outlined in Method 89-1 and the documents entitled:

i) "Site Investigation Work Plan, Volume II, Quality Assurance Project Plan (QAPP), Vac Air Alloys Corporation, Frewsburg, New York", December 1990

ii) "Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses" (February 1, 1988), Prepared by the USEPA Data Validation Work Group

iii) "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses" (July 1, 1988), Prepared by the USEPA Data Review Work Group

iv) "CLP Organics Data Review and Preliminary Review" SOP HW-6, Revision No. 6 (March 1989)

Item i) will hereinafter be referred to as the "QAPP". Items ii) and iii) will hereinafter be referred to as the "Guidelines". Item iv) will hereinafter be referred to as the "USEPA Region II Guidelines". The data quality assessment and validation is presented in the subsections which follow.

1. SAMPLE HOLDING TIMES

Based on the criteria outlined in the relevant methods and NYSDEC sample holding times protocols, the holding time for TCL VOCs in groundwater has been established as seven days from VTSR to analysis. By comparing the sampling date and VTSR of all samples (from the notation appearing on the Chain of Custody documents) with the reported date of analysis, it is noted that sample MW-7 was analyzed within two days of VTSR, thereby fulfilling this holding time requirement.

In accordance with the QAPP, sample MW-7 was cooled to 4°C (±2C) after sampling and received by the laboratory within 48 hours of collection.

2. GC/MS TUNING AND MASS CALIBRATION - TCL VOCS

The analysis of TCL VOCs is based upon gas chromatographic/mass spectrometric (GC/MS) methods. To ensure that the data produced by the GC/MS instruments may be correctly interpreted, the tuning and performance criteria presented in the "Guidelines" have been assessed. These criteria have been established to ensure mass resolution, identification, and to some degree, sensitivity.

In general, a review of the GC/MS tuning and calibration data accompanying the H2M work orders indicated that all tuning and calibration criteria for bromofluorobenzene (BFB) were met for the analysis of VOCs. In addition, comparison of the GC/MS tuning and mass calibration summary sheets (Form Vs) with each mass listing indicated that no transcription errors occurred. Recalculation of three of the GC/MS tuning and mass calibration values reported for each mass listing indicated that these values were correctly determined and reported. Therefore, the integrity of the GC/MS tuning and mass calibration data was not suspect.

3. GC/MS CALIBRATION - TCL VOCS

In order to ensure that satisfactory instrument performance had been established for the analysis of VOCs, the laboratory generated calibration data have been assessed. Both initial and continuing calibration data were compared against the compliance requirements established by Method 89-1, NYSDEC September 1989 ASP and as presented in the "Guidelines". Based on the calibration data reported, the following observations were noted:

A. Initial Calibration - To assess the validity of the initial calibrations, the average relative response factors (RRFs) and relative standard deviations (RSDs) of system performance check compounds (SPCCs), calibration check compounds (CCCs), and the remaining compounds of interest have been evaluated.

The RRF measures the instrument response to specific compounds. RRF values falling below the minimum value required by the method indicates a detection problem due to poor sensitivity. The RSDs are calculated from the initial calibration and are used to indicate the linearity and stability of specific compound RRFs over increasing concentration. Outlying RSD values indicate potential detection and quantitation errors.

In accordance with the "Guidelines" and NYSDEC September 1989 ASP, it is recommended that all VOC initial calibration data be evaluated by the following criteria:

VOC Initial Calibration Criteria

i) VOC SPCCs must demonstrate average RRFs greater than 0.300 (bromoform >0.250);

ii) all remaining VOCs must demonstrate average RRFs greater than 0.050;

iii) VOC CCCs must demonstrate RSD values less than 30 percent; and

iv) all remaining VOCs must demonstrate RSD values less than 35 percent.

Upon review of the initial calibration data reported by Galson, it was noted that all criteria for SPCCs, CCCs, and remaining compounds were met for VOC analyses. This indicated that satisfactory compound response and linearity were established during the initial calibration for these compounds.

Recalculation of 5 percent of the TCL VOC initial calibration data indicated that all average RRF and RSD values were correctly determined and reported.

B. Continuing Calibration - To ensure that initial calibrations remained valid during sample analysis, the percent difference (%D) of compound RRFs between the initial calibration and continuing calibration was assessed. In addition, the RRF of a 50 nanogram continuing calibration check standard (RRF 50) was evaluated for all SPCCs, CCCs, and remaining TCL VOCs. Only VOCs which yielded acceptable initial calibration data were evaluated.

The RRF 50 demonstrates that instrument response was sufficiently maintained for specific compounds throughout sample analysis. Percent differences (%Ds) compare response factors of continuing calibration checks to mean response factors of the initial calibrations, and demonstrate that satisfactory linearity was maintained during sample analyses.

In accordance with the "Guidelines" and NYSDEC September 1989 ASP, it is recommended that all VOC continuing calibration data be evaluated by the following criteria:

<u>VOCs Continuing Calibration Criteria</u>

i) VOC SPCCs must demonstrate RRF 50s greater than 0.300 (bromoform >0.250);

ii) all remaining VOCs must demonstrate RRF 50s greater than 0.050;

iii) VOC CCCs must demonstrate %Ds less than 25 percent; and

iv) all remaining VOCs must demonstrate %D less than 35 percent.

Upon review of the continuing calibration data reported by H2M, it was noted that continuing calibration criteria were met for SPCCs, CCCs, and remaining TCL VOCs. This indicated that satisfactory compound response and linearity were maintained during the analyses of these compounds.

Recalculation of 5 percent of the TCL VOC continuing calibration data indicated that all RRF 50s and %Ds were correctly determined and reported.

4. INTERNAL STANDARDS PERFORMANCE - TCL VOCS

In order to ensure that GC/MS sensitivity and response are stable during each analytical sequence, the internal standard performance criteria established in Method 89-1 NYSDEC September 1989 ASP have been evaluated for the analysis of VOCs. The criteria by which the internal standards have been assessed are as follows:

i) internal standard area counts must not vary by more than a factor of two (-50% to +100%) from the associated calibration standard; and

ii) the retention time of the internal standard must not vary more than ±30 seconds from the associated calibration standard.

Upon review of the internal standard area summary sheets (Form VIIIs) accompanying the H2M work orders, it was noted that all internal standard area and retention time criteria were met for the analysis of VOCs.

5. SURROGATE SPIKE RECOVERIES

Laboratory performance on individual samples is assessed on the basis of surrogate spike recoveries. When properly employed in conjunction with sample preparation, surrogates can be used to determine the effectiveness of sample cleanup or matrix modifying techniques. In addition, fortifying the sample with a known amount of the surrogate compound prior to sample preparation serves as an indicator of the efficiency of analyte extraction, dissolution, or other analyte-matrix separation techniques. Based on the surrogate spike recoveries reported, the following observations were noted:

In accordance with Method 89-1, all samples submitted for TCL VOC determinations were spiked with the surrogate compounds 4-bromofluorobenzene, toluene-d_8, and 1,2-dichloroethane-d_4 prior to sample analysis. Sample MW-7 which was submitted for TCL VOC determinations yielded surrogate spike recoveries within the method control limits.

Recalculation of 5 percent of the surrogate spike data indicated that the surrogate spike recoveries were correctly determined and reported.

6. LABORATORY BLANK ANALYSIS

The purpose of assessing the results of laboratory blank analyses was to determine the existence and magnitude of sample contamination problems. Laboratory blanks were analyzed at the frequency of one per 20 investigative samples and/or one per analytical sequence. Based on the laboratory blank data reported, the following were noted:

The NYSDEC September 1989 ASP stipulates that VOC laboratory blanks must contain less than the Contract Required Detection Limit (CRDL) or any TCL VOC with the exception of methylene chloride, acetone, toluene, and 2-butanone, whose blank concentrations may not exceed five times the CRDL. Inspection of the VOC laboratory blank (VBLK27) yielded non-detected quantities of all TCL VOCs. Further, no tentatively identified compounds (TICs) were present in the VOC laboratory blank. This indicated that the potential for sample contamination due to laboratory conditions and/or procedures was minimal during the analysis of MW-7.

7. BLANK SPIKE ANALYSES

The recoveries of blank spike analyses are used to assess the analytical accuracy achieved by the laboratory. As the blank spike analyses are independent of potential matrix effects, they give a true indication of the analytical accuracy achieved by the laboratory for the respective analyses performed. One TCL VOC blank spike analysis was performed in conjunction with MW-7. Presented below are the blank spike results:

Blank Spike ID	Spiking VOC	Percent BS Recovery	Method (1) Control Limits	Blank (2) Spike Control Limits
MSB 10/27/91	1,1 dichloroethane	111	61-145	75-125
	Trichloroethene	103	71-120	75-125
	Benzene	109	76-127	75-125
	Toluene	108	76-125	75-125
	Chlorobenzene	105	75-130	75-125

(1) Control limits established in Method 89-1, NYSDEC September ASP

(2) Control limits established in Volume 8, NYSDEC September 1989 ASP.

All VOC blank spike recoveries were within both the blank spike and method control limits. This indicated that acceptable laboratory accuracy was achieved during the VOC analyses of the associated investigative sample.

Recalculation of 5 percent of the TCL VOC blank spike data indicated that the blank spike recoveries were correctly determined and reported.

8. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD ANALYSES-ORGANICS

The recoveries of MS/MSD analyses were used to assess the analytical accuracy of an individual sample basis, while the relative percent difference (RPD) between the MS and MSD indicated the analytical precision achieved for that sample. MS/MSD analyses were preformed for TCL VOCs sample MW-7. Presented below are the MS/MSD results:

MS/MSD Sample ID	Compound	Percent MS Recovery	Percent MSD Recovery	RPD	Method (1) Control Limits
MW-7	1,1 dichloroethene	101	120	17*	61-145(14)
	Trichloroethene	90	102	13	171-120(14)
	Benzene	93	108	15*	76-127(11)
	Toluene	86	103	17*	76-125(13)
	Chlorobenzene	90	108	18*	75-130(13)

(1) Control limits established by Method 89-1, NYSDEC September 1989, RPD Control Limits in parentheses.

* RPD value greater than method control limit.

All TCL VOC MS/MSD recoveries were within the method control limits indicating acceptable accuracy was achieved for TCL VOCs in sample MW-7. As all VOC results for MW-7 were non-detected, this would have minimal impact upon the sample data. Therefore, qualification of the MW-7 VOC data was not required on this basis.

Recalculation of 5 percent of the TCL VOC MS/MSD data indicated that the MS/MSD recoveries and RPD values were correctly determined and reported.

9. RINSATE BLANK ANALYSIS

In order to assess the efficiency of sampling device cleansing protocols performed in the field, one rinsate blank (RB-924) was collected and submitted to the laboratory for TCL VOC analysis.

The rinsate blank showed a positive concentration of 1,1,1-trichloroethane (4J µg/L). The associated sample MW-7 yielded non-detected quantities of 1,1,1 trichloroethane. Therefore, qualification of the MW-7 sample data was not required due to inadequate sampling device cleansing protocols.

The rinsate blank yielded non-detected quantities of the remaining TCL VOCs.

10. HOLD BLANK ANALYSIS

In order to evaluate potential cross contamination of sample MW-7 during laboratory handling and analysis, one hold blank (VHBLK27) was analyzed for TCL VOCs in conjunction with MW-7. The hold blank yielded non-detected quantities of all TCL VOCs and TICs. This indicated that the potential for TCL VOC cross contamination was minimal during sample handling and analysis.

11. CONCLUSION

Based on the assessment detailed in the foregoing, the analytical data produced by H2M are acceptable for their intended uses, with no specific qualifications.

Analytical Data Package For

CONESTOGA - ROVERS & ASSOCIATES
VAC - AIR ALLOY SITE
PROJECT NO.: 2326

WATER SAMPLES
Received: August 25, 1991

SAMPLE DATA SUMMARY PACKAGE

AUGUST 1991

H2M LABS, INC.
Environmental Testing Laboratories
575 Broad Hollow Road, Melville, N.Y. 11747

H2M LABS, INC.

575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

SAMPLE DATA SUMMARY PACKAGE

TABLE OF CONTENTS

CONESTOGA-ROVERS & ASSOCIATES
VAC-AIR ALLOY SITE
SAMPLES RECEIVED: 09/25/91

H2M LABS, INC.
575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

1. NYS DEC SAUMMARY PAGES

H2M LABS, INC.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND
ANALYTICAL REQUIREMENT SUMMARY

SAMPLE RECEIVED 9/25/91
CONESTOGA - ROVERS & ASSOCIATES
VAC AIR ALLOY SITE
PROJECT NO.: 2326
(CRA012)

Customer Sample Code	Laboratory Sample Code	Analytical Requirements *					
		*VOA GC/MS	*BNA GC/MS	*VOA GC	*PEST PCB	*METALS +	*OTHER
MW-7 MS/MSD	9128051	X					
RB-924	9128052	X					

* Check Appropriate Boxes

* CLP, Non-CLP (Please indicate year of protocol) 7/87
* TCL, HSL, Priority Pollutant

Page 1 of 2

H2M LABS, INC.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
VOA ANALYSES

SAMPLES RECEIVED: 9/25/91
CONESTOGA - ROVERS & ASSOCIATES
VAC AIR ALLOY SITE
PROJECT NO.: 2326
(CRA012)

SAMPLE ID	MATRIX	DATE COLLECTED	DATE REC'D AT LAB	LOW LEVEL MED LEVEL	DATE ANALYZED
MW-7	WATER	9/24/91	9/25/91	LOW	9/27/91
MW-7 MS	"	"	"	"	"
MW-7 MSD	"	"	"	"	"
RB-924	"	"	"	"	"

H2M LABS, INC.
575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

2. CHAIN OF CUSTODY DOCUMENTATION

CRA Consulting Engineers
CONESTOGA-ROVERS & ASSOCIATES
651 Colby Drive, Waterloo, Ontario Canada N2V 1C2

SHIPPED TO (Laboratory name): H2M LABS, INC

CHAIN OF CUSTODY RECORD

PROJECT №: 2326

PROJECT NAME: VAC-AIR

SAMPLER'S SIGNATURE (SIGN)

SEQ. №	SAMPLE №	DATE	TIME	SAMPLE LOCATOIN	SAMPLE TYPE	№ OF CONTAINERS	REMARKS
	RB-924	9/24/91	0930	RINSE BLANK	WATER	3	TCL VOCs
	MW-7	9/24/91	1030	MW-7		3	TCL VOCs
	~~MW-8~~ MW-7 RD 9-26	9/24/91	1045	~~MW-8~~	MW-7 (MS/MSD) RD 9-26	3	TCL VOCs
				TOTAL NUMBER OF CONTAINERS		9	

ANTICIPATED CHEMICAL HAZARDS: UNKNOWN

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:
1 (SIGN)	9/24/91 1455	2 (SIGN)
2 (SIGN)		3 (SIGN)
3 (SIGN)		4 (SIGN)
ADDITIONAL SIGNATURE SHEET REQUIRED ☐		

METHOD OF SHIPMENT:	SHIPPED BY:	RECEIVED FOR LABORATORY BY:	DATE/TIME
FED. EX	FD. OSCAR	(SIGN) Richard Ong	9-25-91 0800

CONDITION OF SEAL UPON RECEIPT:

GENERAL CONDITION OF COOLER:

COOLER OPENED BY: (SIGN) Richard Ong — DATE/TIME *: 9-25-91 1000

WHITE – CRA OFFICE COPY
YELLOW – RECEIVING LABORATORY COPY
PINK – CRA LABORATORY COPY
GOLDEN ROD – SHIPPERS

* Analysis not started until 9-30 because of delay of clients analytical request

№ 012199

AIRBILL # 3184144456

S 000

H2M LABS, INC.

575 Broad Hollow Road, Melville, N.Y. 117
(516) 694-3040 FAX: (516) 694-4122

ENVIRONMENTAL and INDUSTRIAL ANALYTICAL LABORATORY

CLIENT: CRA

SDG #: 012 DEC CLP

INTERNAL CHAIN OF CUSTODY

SAMPLES RECEIVED BY Richard Diaz DATE ~~9-26-91~~ 9/25/91 TIME 0800

SIGNATURE Richard Diaz 10/20/91

CLIENT I.D.	H2M LAB #	BOTTLE TYPE	# OF BOTTLES	TESTS REQUESTED
MW-7 MS/MSD Also	9128051	D	6	TCL VOC's
RB-924	9128052	↓	3	↓
Holding Blank	9128053	↓	2	↓

H2M LABS, INC.

575 Broad Hollow Road, Melville, N.Y. 1[illegible]
(516) 694-3040 FAX: (516) 694-4122

ENVIRONMENTAL and INDUSTRIAL ANALYTICAL LABORATORY

CLIENT: CRA

SDG #: ~~CR3691~~ 012
~~CRx #022~~ RD 9-26

~~Fgtt~~ RD 9-26

INTERNAL CHAIN OF CUSTODY

DATE	TIME	SAMPLE RELINQUISHED BY	SAMPLE RECEIVED BY	SAMPLE I.D. NO. AND BOTTLE TYPE	PURPOSE OF CHANGE OF CUSTODY	INI[illegible]
9-26-91	1100	Sign [illegible]	Sign [illegible]	All D	Analysis	
9-27-91	1300	Sign [illegible] Fridge #18	Sign [illegible]	All D1	Analysis	
9-27-91	1400	Sign [illegible]	Sign Fridge #18	All D1	Storage	
		Sign	Sign			
		Sign	Sign			
		Sign	Sign			
		Sign	Sign			
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		Sign	Sign			

H2M LABS, INC.

575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

3. CASE NARRATIVE
   3.1 VOLATILES

H2M LABS, INC.

Case Narrative
For Volatile Organics
Samples Received: 9/25/91
SDG: CRA012

For Samples: MW-7 MS/MSD
RB-924

All holding times and surrogate recoveries were met for these samples. All percent recoveries of the matrix spike blank and sample MW-7 matrix spike/matrix spike duplicate were within the allowable limits. 4 out of 5 RPD's for the MS/MSD of sample MW-7 were outside the allowable limits. This appears to be a spiking inaccuracy in the MS solution since all surrogate recoveries are consistent.

RB-924 contained 4 J ug/L of 1,1,1-trichloroethane. This was not detected in any other sample or blanks.

All SPCC and CCC as well as RSD and %D criteria were met for both the initial and continuing calibrations.

No targeted compounds nor TIC's were identified in either the method blank or holding blank.

> I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Date Reported: October 24, 1991

Joann M. Slavin
Quality Assurance Manager

H2M LABS, INC.
575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

4. SAMPLE REPORTS
4.1 VOLATILES

H2M LABS, INC.

575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW7

Lab Name: H2M   Contract: NYSDEC

Lab Code: H2M   Case No.: CRA012   SAS No.:   SDG No.: CRA

Matrix: (soil/water) WATER   Lab Sample ID: 9128051

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: P6946

Level: (low/med) LOW   Date Received: 9/~~26~~ 25/91 9/25/91

% Moisture: not dec. 100.   Date Analyzed: 9/27/91

Column: (pack/cap) CAP   Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

S 0012

H2M LABS, INC.

575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW7

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA012 SAS No.: SDG No.: CRA

Matrix: (soil/water) WATER Lab Sample ID: 9128051

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P6946

Level: (low/med) LOW Date Received: 9/~~26~~ 25/91 10/25/91

% Moisture: not dec. 100. Date Analyzed: 9/27/91

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	4.15	~~10.~~ 15	J
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H2M LABS, INC.

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

RB924

Lab Name: H2M   Contract: NYSDEC

Lab Code: H2M   Case No.: CRA012   SAS No.:   SDG No.: CRA

Matrix: (soil/water) WATER   Lab Sample ID: 9128052

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: P6949

Level: (low/med) LOW   Date Received: 9/~~26~~ 25/91 10/25/91

% Moisture: not dec. 100.   Date Analyzed: 9/27/91

Column: (pack/cap) CAP   Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	4.	J
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

S 0014

H2M LABS, INC.
575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

RB924

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA012 SAS No.: SDG No.: CRA

Matrix: (soil/water) WATER Lab Sample ID: 9128052

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P6949

Level: (low/med) LOW Date Received: 9/~~26~~ 25/91 10/23/91

% Moisture: not dec. 100. Date Analyzed: 9/27/91

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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H2M LABS, INC.
575 Broad Hollow Road, Melville, N.Y. 11747
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5. SURROGATE SPIKE ANALYSIS RESULTS
5.1 VOLATILES

H2M LABS, INC.
575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

2A
WATER VOLATILE SURROGATE RECOVERY

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA012 SAS No.: SDG No.: CRA

	EPA SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#	OTHER	TOT OUT
1	VBLK27	99	100	98		0
2	MW7	101	103	99		0
3	MW7 MS	103	100	102		0
4	MW7 MSD	102	100	104		0
5	RB924	101	100	98		0
6	VHBLK27	100	100	108		0
7	MSB27	99	101	96		0
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	QC LIMITS
S1 (TOL) = Toluene-d8	(88-110)
S2 (BFB) = Bromofluorobenzene	(86-115)
S3 (DCE) = 1,2-Dichloroethane-d4	(76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

H2M LABS, INC.

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6. MATRIX SPIKE / MATRIX SPIKE DUPLICATE SUMMARY
6.1 VOLATILES

H2M LABS, INC.

575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

3A
WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA012 SAS No.: SDG No.: CRA

Matrix Spike - EPA Sample No.: MW7

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	MS CONCENTRATION (UG/L)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	50.	0.	50.	101	61-14[illegible]
Trichloroethene	50.	0.	45.	90	71-12[illegible]
Benzene	50.	0.	46.	93	76-12[illegible]
Toluene	50.	0.	43.	86	76-12[illegible]
Chlorobenzene	50.	0.	45.	90	75-13[illegible]

COMPOUND	SPIKE ADDED (UG/L)	MSD CONCENTRATION (UG/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	50.	60.	120	17 *	14	61-145
Trichloroethene	50.	51.	102	13	14	71-120
Benzene	50.	54.	108	15 *	11	76-127
Toluene	50.	51.	103	17 *	13	76-125
Chlorobenzene	50.	54.	108	18 *	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 4 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS:

W[illegible] VOL[illegible]TILE MA[illegible]IX S[illegible]IKE BLA[illegible] FO[illegible]

Lab Name:H[illegible]M Contract:[illegible]EC

Lab Code:H[illegible] Case No.:CRA[illegible]12 S[illegible]. No.:[illegible] SDG No.:CR[illegible]

Matrix Spike - EPA Sample No.: MSB10/27/91

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	50.00	0.00	55.43	111	75-[illegible]
Trichloroethene	50.00	0.00	51.61	103	7[illegible]-12[illegible]
Benzene	50.00	0.00	54.77	109	75-[illegible]
Toluene	50.00	0.00	53.92	108	7[illegible]-12[illegible]
Chlorobenzene	50.00	0.00	52.59	105	75-[illegible]

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of qc limits

Spike Recovery: 0 out of 10 outside limits

COMMENTS: ______________________________
____

FORM III VOA-1 1/87 Rev.

H2M LABS, INC.
575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

7. BLANK DATA SUMMARY AND RESULTS

7.1 VOLATILES

H2M LABS, INC.

575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA012 SAS No.: SDG No.: CRA

Lab File ID: P6940 Lab Sample ID: VBLK9/27/91

Date Analyzed: 9/27/91 Time Analyzed: 10:50

Matrix: (soil/water) WATER Level:(low/med) LOW

Instrument ID: 7003C

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
1	MW7	9128051	P6946	13:53
2	MW7 MS	912051MS	P6947	14:17
3	MW7 MSD	9128051MSD	P6948	14:42
4	RB924	9128052	P6949	15:07
5	VHBLK27	9128053	P6950	15:32
6	MSB27	MSB9/27/91	P6941	11:37
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COMMENTS:

H2M LABS, INC.

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(516) 694-3040 FAX: (516) 694-4122

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK27

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA012 SAS No.: SDG No.: CRA

Matrix: (soil/water) WATER Lab Sample ID: VBLK9/27/91

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P6940

Level: (low/med) LOW Date Received: 0/ 0/ 0

% Moisture: not dec. 100. Date Analyzed: 9/27/91

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

S 0023

H2M LABS, INC.
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK27

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA012 SAS No.: SDG No.: CRA

Matrix: (soil/water) WATER Lab Sample ID: VBLK9/27/91

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P6940

Level: (low/med) LOW Date Received: 0/ 0/ 0

% Moisture: not dec. 100. Date Analyzed: 9/27/91

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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H2M LABS, INC.

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VHBLK27

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA012 SAS No.: SDG No.: CRA

Matrix: (soil/water) WATER Lab Sample ID: 9128053

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P6950

Level: (low/med) LOW Date Received: 9/26/91

% Moisture: not dec. 100. Date Analyzed: 9/27/91

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

S 0025

, INC.

575 Broad Hollow Road, Melville, N.Y. 11747
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1E
:S ANALYSIS DATA SHEET
JENTIFIED COMPOUNDS

EPA SAMPLE NO.

VHBLK27

Contract: NYSDEC

. CRA012 SAS No.: SDG No.: CRA

Lab Sample ID: 9128053

ə/mL) ML Lab File ID: P6950

Date Received: 9/26/91

Date Analyzed: 9/27/91

Dilution Factor: 1.00

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

OUND NAME	RT	EST. CONC.	Q

SUMMARY

FORM I VOA-TIC

1/87 Rev.

H2M LABS, INC.
575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA012 SAS No.: SDG No.: CRA

Lab File ID (Standard): P6939 Date Analyzed: 9/27/91

Instrument ID: 7003C Time Analyzed: 10:16

Matrix:(soil/water) WATER Level:(low/med): LOW Column:(pack/cap) CAP

		IS1(BCM) AREA #	RT	IS2(DFB) AREA #	RT	IS3(CBZ) AREA #	RT
	12 HOUR STD	19608.	5.61	87643.	7.36	72480.	12.47
	UPPER LIMIT	39216.	6.11	175286.	7.86	144960.	12.97
	LOWER LIMIT	9804.	5.11	43822.	6.86	36240.	11.97
	EPA SAMPLE NO.						
1	VBLK27	18639.	5.61	75881.	7.34	63742.	12.48
2	MW7	15502.	5.61	61315.	7.35	54385.	12.46
3	MW7 MS	17509.	5.61	74850.	7.34	67526.	12.47
4	MW7 MSD	15744.	5.61	70402.	7.34	61599.	12.46
5	RB924	18808.	5.61	77312.	7.34	67834.	12.47
6	VHBLK27	17055.	5.62	74891.	7.35	65017.	12.48
7	MSB27	19845.	5.62	83190.	7.36	70349.	12.50
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IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag internal standard area values with an asterisk

B

APPENDIX B

WATER SUPPLY MONITORING DATA

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

January 8, 1992

Case No. 84347

Mr. Dennis Trostle
Vac Air Alloys Corporation
Box 650
Frewsburg, NY 14738

Subject: Samples Collected December 30, 1991

Dear Denny:

Analytical results from the subject samples collected on the above date may be found attached.

If you have any questions about these results or if we can be of further assistance to you in any way, please do not hesitate to contact our office.

Very truly yours,

J-LABS DIVISION
MICROBAC LABORATORIES, INC.

Bradley S. Mitchell

Bradley S. Mitchell

BSM/gc
Attachments

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

January 8, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: **WELL #1**

Sample No. 91L209
Date Sampled: December 30, 1991 by J-Labs Personnel (9:20 a.m.)
Date of Analysis: January 7, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 91L209 - Well #1))

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
[814] 368-6087

January 8, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: **WELL #2**

Sample No. 91L210
Date Sampled: December 30, 1991 by J-Labs Personnel (9:30 a.m.)
Date of Analysis: January 7, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 91L210 - Well #2)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

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J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

January 8, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: **WELL #3**

Sample No. 91L211
Date Sampled: December 30, 1991 by J-Labs Personnel (9:45 a.m.)
Date of Analysis: January 7, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 91L211 - Well #3)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

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P.O. Box 489, Bradford, Pennsylvania 16701
[814] 368-6087

January 8, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: **WELL #4**

Sample No. 91L211
Date Sampled: December 30, 1991 by J-Labs Personnel (10:00 a.m.)
Date of Analysis: January 7, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 91L212 - Well #4)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

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BRADFORD, PA 16701

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Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

February 14, 1992

Case No. 84347

Mr. Dennis Trostle
Vac Air Alloys Corporation
Box 650
Frewsburg, NY 14738

Subject: Samples Collected January 29, 1991

Dear Denny:

Analytical results from the subject samples collected on the above date may be found attached, with the exception of data for J-Labs Sample #92A252 (well #3) where the lab had a mishap with their autosampling equipment. A Non-Detectable concentration for 1,1,1-Trichloroethane was all that could be offered. A narrative will be forwarded upon receipt.

If you have any questions about these results or if we can be of further assistance to you in any way, please do not hesitate to contact our office.

Very truly yours,

J-LABS DIVISION
MICROBAC LABORATORIES, INC.

Bradley S. Mitchell

Bradley S. Mitchell

BSM/gc
Attachments

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

February 14, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #1

Sample No. 92A250
Date Sampled: January 29, 1992 By J-Labs Personnel (10:15 a.m.)
Date of Report: February 14, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 92A250)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

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J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

February 14, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #2

Sample No. 92A251
Date Sampled: January 29, 1992 By J-Labs Personnel (10:10 a.m.)
Date of Report: February 14, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 92A251)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

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J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

February 14, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #3

Sample No. 92A252
Date Sampled: January 29, 1992 By J-Labs Personnel (10:30 a.m.)
Date of Report: February 14, 1992

Compound	Results	Units
Bromobenzene		ug./L
Bromochloromethane		"
Bromodichloromethane		"
Bromoform		"
Bromomethane		"
Carbon Tetrachloride		"
Chlorobenzene		"
Chloroethane		"
Chloroform		"
Chloromethane		"
2-Chlorotoluene		"
4-Chlorotoluene		"
Dibromochloromethane		"
1,2-Dibromethane		"
Dibromomethane		"
1,2-Dichlorobenzene		"
1,3-Dichlorobenzene		"
1,4-Dichlorobenzene		"
Dichlorodifluoromethane		"
1,1-Dichloroethane		"
1,2-Dichloroethane		"
1,1-Dichloroethene		"
cis-1,2-Dichloroethene		"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 92A252)

Compound	Results	Units
trans-1,2-Dichloroethene		ug./L
1,2-Dichloropropane		"
1,3-Dichloropropane		"
2,2-Dichloropropane		"
1,1-Dichloropropene		"
Methylene Chloride		"
1,1,1,2-Tetrachloroethane		"
1,1,2,2-Tetrachloroethane		"
Tetrachloroethene		"
1,1,1-Trichloroethane		"
1,1,2-Trichloroethane		"
Trichloroethene		"
Trichlorofluoromethane		"
1,2,3-Trichloropropane		"
Vinyl Chloride		"

Lab Accident Indicated... Narrative and retrievable data to be forwarded ASAP

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

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J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

February 14, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #4

Sample No. 92A253
Date Sampled: January 29, 1992 By J-Labs Personnel (10:40 a.m.)
Date of Report: February 14, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 92A253)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

March 12, 1992

Case No. 84347

Mr. Dennis Trostle
Vac Air Alloys Corporation
Box 650
Frewsburg, NY 14738

Subject: Samples Collected February 27, 1992

Dear Denny:

Analytical results from the subject samples collected on the above date may be found attached.

If you have any questions about these results or if we can be of further assistance to you in any way, please do not hesitate to contact our office.

Very truly yours,

J-LABS DIVISION
MICROBAC LABORATORIES, INC.

Bradley S. Mitchell

Bradley S. Mitchell

BSM/gc
Attachments

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

March 12, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #1

Sample No. 92B258
Date Sampled: February 27, 1992 by: J-Labs Personnel (10:04 a.m.)
Date of Analysis: March 10, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 92B258)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

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J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

March 12, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #2

Sample No. 92B259
Date Sampled: February 27, 1992 by: J-Labs Personnel (10:15 a.m.)
Date of Analysis: March 10, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 92B259)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

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Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

March 12, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #3

Sample No. 92B260
Date Sampled: February 27, 1992 by: J-Labs Personnel (10:20 a.m.)
Date of Analysis: March 10, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 92B260)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

March 12, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #4

Sample No. 92B261
Date Sampled: February 27, 1992 by: J-Labs Personnel (10:35 a.m.)
Date of Analysis: March 10, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 92B261)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

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WATER ANALYSIS REPORT

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

Case No. 84347

N.Y. Lab. ID #10122

AIR • FUEL • WATER • FOOD • WASTES

CLIENT: Vac Air Alloys Corporation SYSTEM: Well #3

Sample No.		92B260			
Date Sampled by J-Labs Personnel		2-27-92			
Time Sampled		10:35 a.m.			
Date Received		2-27-92			
Location:		Well #3	Analysis Date	Analyst's Initials	
Appearance When Sampled					
Appearance After Standing					
Odor					
Temperature	°F				
pH					
Carbon Dioxide	CO_2				
Dissolved Oxygen	O_2				
Residual Chlorine	Cl_2				
Hydrogen Sulfide	H_2S				
Turbidity	NTU				
Alkalinity to Phenolphthalein	as $CaCO_3$				
Alkalinity to Methyl Orange	as $CaCO_3$				
Chlorides	Cl				
Total Hardness	$CaCO_3$				
Calcium	Ca				
Magnesium	Mg				
Sulfates	SO_4				
Phosphate	PO_4				
Manganese	Mn				
Iron (Total)	Fe	0.81	3-10-92	A.L.	
Iron (Dissolved)	Fe				
Total Solids					
Suspended Solids					
Specific Gravity (60 °F)					

Results expressed in mg/liter "ND" means not determined.

ENVIRONMENTAL HEALTH WATER BACTERIOLOGY LABORATORY
Chautauqua County Health Department, Mayville, N.Y
Approved by New York State Department of Health

PA

Lab No. 135
Date/Hour Rec'd. ____
Time Run ____
Date/Hour Rept'd. ____

Exact sampling point: Pump #3
Owner: Frewsburg Water Dept
Address: P.O.Box 497 (TVC)
Sampled by: Dan Sisson Date: 3-2-92 Time: 8:36 WO #: ____
Report results to (X) Mayville ( ) Jamestown ( ) Dunkirk
Tel. No. 569-5365

SOURCE: well ___ pre-existing X newly developed ___
drilled ___ driven ___ dug ___ depth ___ spring ___
reservoir ___ pond ___ lake ___ watercourse ___

TYPE OF SUPPLY: community municipal X community non-municipal ___
non-community ___ distribution supply ___
quasi-public ___ private ___ pool ___ beach ___

TREATMENT: none X chlorination ___ test method-dpd ___
filtration ___ residual: free ___ combined ___
other ___

PROGRAM: SFE ___ TR ___ PWS X Surveillance ___ Private ___
P & B ___ Water-Sewage Survey ___
Other: ___

Agency: (A&M, Social Services, other) ___

REMARKS: Not in Use

COMMENTS/PROBLEMS/VIOLATIONS:

INDICATE ANALYSES REQUESTED	RESULTS OF A
Std. plate count	9
Coliform - MPN	
Coliform - MF	<1
Fecal Coli - MF	
Fecal Strep	
Other	79

☐ RESAMPLING REQUESTED
☒ SATISFACTORY
☐ UNSATISFACTORY
Signed ____

Chautauqua County Health Department, Mayville, N.Y
Approved by New York State Department of Health

Date/Hour Rec'd.______
Time Run______
Date/Hour Rept'd.______

Exact sampling point: ~~Pump~~ #3
Owner: Forestburg Water Dept
Address: P.O. Box 497 (TVC)
Sampled by: D Sisson Date: 2-18-92 Time: 7:55 WO #:
Report results to (X) Mayville ( ) Jamestown ( ) Dunkirk
Tel. No. 564-5363

SOURCE: well___ pre-existing ✓ newly developed___
drilled___ driven___ dug___ depth___ spring___
reservoir___ pond___ lake___ watercourse___

TYPE OF SUPPLY: community municipal ✓ community non-municipal___
non-community___ distribution supply___
quasi-public___ private___ pool___ beach___

TREATMENT: none ✓ chlorination___ test method-dpd___
filtration___ residual: free___ combined___
other___

PROGRAM: SFE___ TR___ PWS ✓ Surveillance___ Private___
P & B___ Water-Sewage Survey___
Other:___

Agency: (A&M, Social Services, other)___

REMARKS: Not in USE

COMMENTS/PROBLEMS/VIOLATIONS:

INDICATE ANALYSES REQUESTED		RESULTS OF ANAL
	Std. plate count	2/ml
	Coliform - MPN	/10
	Coliform - MF	<1/10
	Fecal Coli - MF	/10
	Fecal Strep	/10
	Other	2/10

☐ RESAMPLING REQUESTED
☒ SATISFACTORY
☐ UNSATISFACTORY
Signed JM

2326

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

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APR 15 1992

April 6, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #1

Sample No. 92C246
Date Sampled: March 26, 1992 by J-Labs Personnel (10:15 a.m.)
Date of Analysis: April 3, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'c. (Sample 920246)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

April 6, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #2

Sample No. 92C247
Date Sampled: March 26, 1992 by J-Labs Personnel (10:10 a.m.)
Date of Analysis: April 3, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con't. (Sample 920247)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

*ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

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J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

April 6, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #3

Sample No. 92C248
Date Sampled: March 26, 1992 by J-Labs Personnel (10:30 a.m.)
Date of Analysis: April 3, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 920243)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

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Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

April 6, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #4

Sample No. 92C249
Date Sampled: March 26, 1992 by J-Labs Personnel (10:40 a.m.)
Date of Analysis: April 3, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 92C249)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 1670[illegible]

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

April 6, 1992

Case No. 84347

Mr. Dennis Trostle
Vac Air Alloys Corporation
Box 650
Frewsburg, NY 14738

Subject: Samples Collected by J-Labs Personnel March 26, 1992

Dear Denny:

Analytical results from the subject samples collected on the above date may be found attached.

Should there be any questions about these reports or if we can be of further assistance to you at anytime, do not hesitate to contact our office.

Very truly yours,

J-LABS DIVISION
MICROBAC LABORATORIES, INC.

Bradley S. Mitchell

Bradley S. Mitchell

BSM/gc
Attachments

WATER ANALYSIS REPORT

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

Case No 84347

N.Y. Lab. ID #1012

AIR • FUEL • WATER • FOOD • WASTES

CLIENT Vac Air Alloys Corporation SYSTEM:

Sample No	92C248	92C249		
Date Sampled by J-Labs Personnel	3-26-92	3-26-92		
Time Sampled	10:30 a.m.	10:40 a.m.		
Date Received	3-26-92	3-26-92		
Location:	Well #3	Well #4	Analysis Date	Analyst's Initials
Appearance When Sampled				
Appearance After Standing				
Threshold Odor Number	2		3-26-92	4 Technic ia
Odor				
Temperature °F				
pH				
Carbon Dioxide CO_2				
Dissolved Oxygen O_2				
Residual Chlorine Cl_2				
Hydrogen Sulfide H_2S				
Turbidity NTU				
Alkalinity to Phenolphthalein as $CaCO_3$				
Alkalinity to Methyl Orange as $CaCO_3$				
Chlorides Cl				
Total Hardness $CaCO_3$				
Calcium Ca				
Magnesium Mg				
Sulfates SO_4				
Phosphate PO_4				
Manganese Mn	0.06	0.27	3-27-92	B.M.
Iron (Total) Fe	0.93		3-27-92	B.M.
Iron (Dissolved) Fe				
Total Solids				
Suspended Solids				
Specific Gravity (60 °F)				

Results expressed in mg/liter "ND" means not determined

Wai Chin

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

MAY 14 1992

May 12, 1992

Case No. 84347

Mr. Dennis Trostle
Vac Air Alloys Corporation
Box 650
Frewsburg, NY 14738

Subject: Samples Collected by J-Labs Personnel April 23, 1992

Dear Denny:

Analytical results from the subject samples collected on the above date may be found attached.

Should there be any questions about these reports or if we can be of further assistance to you at anytime, do not hesitate to contact our office.

Very truly yours,

J-LABS DIVISION
MICROBAC LABORATORIES, INC.

Bradley S. Mitchell

BSM/gc
Attachments

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

May 12, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #1

Sample No. 92D269
Date Sampled: April 23, 1992 by J-Labs Personnel (10:20 a.m.)
Date of Analysis: April 29, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 93D269)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

May 12, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #2

Sample No. 92D270
Date Sampled: April 23, 1992 by J-Labs Personnel (10:22 a.m.)
Date of Analysis: April 29, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 920270)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

May 12, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #3

Sample No. 92D271
Date Sampled: April 23, 1992 by J-Labs Personnel (10:28 a.m.)
Date of Analysis: April 29, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 920271)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

May 12, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.1)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: Well #4

Sample No. 92D272
Date Sampled: April 23, 1992 by J-Labs Personnel (10:45 a.m.)
Date of Analysis: April 29, 1992

Compound	Results	Units
Bromobenzene	ND	ug./L
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 920272)

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
Methylene Chloride	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
Vinyl Chloride	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

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J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

CRA N.F. OFC
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JUN 25 1992

June 22, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.2)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: **WELL #1**
Sample No. 92E187
Date Sampled: May 21, 1992 at 1016 hours
Date of Analysis: June 4, 1992

Compound	Results	Units
Benzene	ND	ug./L
Bromobenzene	ND	"
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
n-Butylbenzene	ND	"
sec-Butylbenzene	ND	"
tert-Butylbenzene	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromo-3-chloropropane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 325137) - Well #1

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
cis-1,3-Dichloropropene	ND	"
trans-1,3-Dichloropropene	ND	"
Ethylbenzene	ND	"
Hexachlorobutadiene	ND	"
Isopropylbenzene	ND	"
p-Isopropyltoluene	ND	"
Methylene Chloride	ND	"
Naphthalene	ND	"
n-Propylbenzene	ND	"
Styrene	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
Toluene	ND	"
1,2,3-Trichlorobenzene	ND	"
1,2,4-Trichlorobenzene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
1,2,4-Trimethylbenzene	ND	"
1,3,5-Trimethylbenzene	ND	"
Vinyl Chloride	ND	"
o-Xylene	ND	"
m-Xylene	ND	"
p-Xylene (coelutes with "m")	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

June 22, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.2)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: **WELL #2**
Sample No. 92E188
Date Sampled: May 21, 1992 at 1011 hours
Date of Analysis: June 4, 1992

Compound	Results	Units
Benzene	ND	ug./L
Bromobenzene	ND	"
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
n-Butylbenzene	ND	"
sec-Butylbenzene	ND	"
tert-Butylbenzene	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromo-3-chloropropane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 925188) - Well #2

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
cis-1,3-Dichloropropene	ND	"
trans-1,3-Dichloropropene	ND	"
Ethylbenzene	ND	"
Hexachlorobutadiene	ND	"
Isopropylbenzene	ND	"
p-Isopropyltoluene	ND	"
Methylene Chloride	ND	"
Naphthalene	ND	"
n-Propylbenzene	ND	"
Styrene	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
Toluene	ND	"
1,2,3-Trichlorobenzene	ND	"
1,2,4-Trichlorobenzene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
1,2,4-Trimethylbenzene	ND	"
1,3,5-Trimethylbenzene	ND	"
Vinyl Chloride	ND	"
o-Xylene	ND	"
m-Xylene	ND	"
p-Xylene (coelutes with "m")	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

Microbac

Microbac Laboratories, Inc.
J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

June 22, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.2)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: **WELL #3**
Sample No. 92E189
Date Sampled: May 21, 1992 at 1040 hours
Date of Analysis: June 4, 1992

Compound	Results	Units
Benzene	ND	ug./L
Bromobenzene	ND	"
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
n-Butylbenzene	ND	"
sec-Butylbenzene	ND	"
tert-Butylbenzene	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromo-3-chloropropane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 92E189) - Well #3

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
cis-1,3-Dichloropropene	ND	"
trans-1,3-Dichloropropene	ND	"
Ethylbenzene	ND	"
Hexachlorobutadiene	ND	"
Isopropylbenzene	ND	"
p-Isopropyltoluene	ND	"
Methylene Chloride	ND	"
Naphthalene	ND	"
n-Propylbenzene	ND	"
Styrene	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
Toluene	ND	"
1,2,3-Trichlorobenzene	ND	"
1,2,4-Trichlorobenzene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
1,2,4-Trimethylbenzene	ND	"
1,3,5-Trimethylbenzene	ND	"
Vinyl Chloride	ND	"
o-Xylene	ND	"
m-Xylene	ND	"
p-Xylene (coelutes with "m")	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

Microbac

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J-Labs Division
P.O. Box 489, Bradford, Pennsylvania 16701
(814) 368-6087

June 22, 1992

VOLATILE ORGANIC COMPOUNDS
(BY EPA 502.2)

Client: Vac Air Alloys Corporation
Box 650, Frewsburg, NY 14738

Sampling Location: **WELL #4**
Sample No. 92E190
Date Sampled: May 21, 1992 at 1030 hours
Date of Analysis: June 4, 1992

Compound	Results	Units
Benzene	ND	ug./L
Bromobenzene	ND	"
Bromochloromethane	ND	"
Bromodichloromethane	ND	"
Bromoform	ND	"
Bromomethane	ND	"
n-Butylbenzene	ND	"
sec-Butylbenzene	ND	"
tert-Butylbenzene	ND	"
Carbon Tetrachloride	ND	"
Chlorobenzene	ND	"
Chloroethane	ND	"
Chloroform	ND	"
Chloromethane	ND	"
2-Chlorotoluene	ND	"
4-Chlorotoluene	ND	"
Dibromochloromethane	ND	"
1,2-Dibromo-3-chloropropane	ND	"
1,2-Dibromethane	ND	"
Dibromomethane	ND	"
1,2-Dichlorobenzene	ND	"
1,3-Dichlorobenzene	ND	"
1,4-Dichlorobenzene	ND	"
Dichlorodifluoromethane	ND	"
1,1-Dichloroethane	ND	"
1,2-Dichloroethane	ND	"
1,1-Dichloroethene	ND	"
cis-1,2-Dichloroethene	ND	"

Vac Air Alloys Corporation
Page 2.
Volatile Organic Compounds Con'd. (Sample 92E190) - Well #4

Compound	Results	Units
trans-1,2-Dichloroethene	ND	ug./L
1,2-Dichloropropane	ND	"
1,3-Dichloropropane	ND	"
2,2-Dichloropropane	ND	"
1,1-Dichloropropene	ND	"
cis-1,3-Dichloropropene	ND	"
trans-1,3-Dichloropropene	ND	"
Ethylbenzene	ND	"
Hexachlorobutadiene	ND	"
Isopropylbenzene	ND	"
p-Isopropyltoluene	ND	"
Methylene Chloride	ND	"
Naphthalene	ND	"
n-Propylbenzene	ND	"
Styrene	ND	"
1,1,1,2-Tetrachloroethane	ND	"
1,1,2,2-Tetrachloroethane	ND	"
Tetrachloroethene	ND	"
Toluene	ND	"
1,2,3-Trichlorobenzene	ND	"
1,2,4-Trichlorobenzene	ND	"
1,1,1-Trichloroethane	ND	"
1,1,2-Trichloroethane	ND	"
Trichloroethene	ND	"
Trichlorofluoromethane	ND	"
1,2,3-Trichloropropane	ND	"
1,2,4-Trimethylbenzene	ND	"
1,3,5-Trimethylbenzene	ND	"
Vinyl Chloride	ND	"
o-Xylene	ND	"
m-Xylene	ND	"
p-Xylene (coelutes with "m")	ND	"

ND indicates that no amount greater than 0.5 ug./L was detected.

Analyses by N.Y. Lab. ID #10795

J-LABS DIVISION
MICROBAC LABORATORIES, INC.
BRADFORD, PA 16701

C

APPENDIX C

HYDRO GROUP, INC.

EVALUATION REPORT - PRODUCTION WELL #3

HYDRO GROUP™

LAYNE WELL & PUMP DIVISION

March 19, 1992

Conestoga Rovers Inc.
7703 Niagara Falls Boulevard
Buffalo, New York 14304

CRA N.F. C.
RECEIVED
MAR 20 1992

Attention: Ms. Waichin Lachell

Reference: Frewsburg Water District
Town of Carroll, Well No. 3
Our Job No. 210404

Dear Ms. Lachell:

The attached data is provided at the request of Mr. Tom Fenton of the Frewsburg Water District and in accordance with our recent telephone conversation. The data provided includes:

The Record of Well & Pump
Installer's Report of 02/13/92
Drawing of the Well with Well Log
Record of Test 05/07/64 through 05/10/64
Crews Daily Progress Report 02/06/92 through 02/13/92

The Installer's Report shows test results after recent service. The short test, 30 minutes at each rate of flow, indicates that the well and pump are performing practically the same as when the pump was first installed in the well and better than when the well was drilled. We, therefore, feel that the well can produce 200 gpm on a sustained basis without breaking suction. It is known that if the discharge pressure is reduced, the pump can and will overpump the well, and the level will drop to the point where the pump starts sucking air. At this time, we feel that the pump is performing properly.

We have also enclosed some data regarding **Hydro Group, Inc., Layne Well & Pump Division**, for your reference. We are interested in working with you on this project and any future water work projects involving ground water exploration, drilling, treatment and pumping systems.

I expect to be in the Buffalo area within the next few weeks and would like to visit with you to discuss this project and any other similar type of work. In the meantime, should you have any questions, please do not hesitate in contacting this office.

Very truly yours,

LAYNE WELL & PUMP DIVISION

A. Dean Beugless

A. Dean Beugless
Sr. Technical Representative

Hydro Group, Inc Pittsford, NY 14534 (716) 381-5300

CC: Mr. Tom Fenton
Frewsburg Water District

HYDRO GROUP, INC.

LAYNE WELL & PUMP DIVISION

WELL AND PUMP SERVICE FOR:

FREWSBURG WATER DISTRICT, TOWN OF CARROLL, FREWSBURG, NEW YORK

WELL NO. 3 PUMP NO. 53084 (Layne)

Date of Test	Static Level	Pumping Level	Capacity GPM	Discharge Pressure	Specific Capacity Per/Ft. of Drawdown	Comments
05/10/64	5.3'	31.67	200	-	7.58	Original Well Test
03/03/66	15'	26'	201	140 psi	18.27	Test with New Pump 8 PRHC-12, 30 HP, Air Line 47'
02/06/92	14'	25'6"	200	148 "	17.39	Before cleaning well.
02/13/92	14'	25'6"	200	148 "	17.39	After cleaning well and servicing pump; operate at less than 145 psi discharge pressure.

HYDRO GROUP, INC.

INSTALLER'S REPORT

Completion Date February 13, 1992

Owner Frewsburg Water District — Customer's Well No. 3

Location Falconer Road — L. N. Y. Co. Well No. 3

City Frewsburg — State New York

PUMP

Pump No. 53084 Type PRHC Setting to Suction Flange 47'8" Suction 2'10" of 6"

Basket - Size Discharge 6" Size of Tubing 2" Size of Shafting 1-3/16"

Make Layne Size Pump 8" No. of Stages 12 Impellers Br. or C. I. Br.

Head H.P. Max. Lgth. Disch. 40' Weight Pump Flgd. or Cpld. Discharge Cpld.

Changes in Pump, if any None

How long did you operate Pump? 3 hours Length of Air Line from Base Plate 50'-51' to gauge

Operating instructions given to Tom Fenton Title

Report by letter any difficulties or extra expense on job

Amarillo Right Angle Serial #0L55878
Ratio 1-1

MOTOR

Make US Volts 208 Phase 3 H. P. 30

Frame A326UP Model Type RU Cycle 60

Amperes 80.5 R. P. M. 1800 Form Serial 3874794

Upper Bearing No. 7218BY Lower Bearing No. 6210-J

WELL

Capacity (GPM) 200 Pumping Level 25'6" Static Level 14' Pressure 148

Size of Air Release Valve - Depth of Well from Base Plate 59'7"

Installer M. L. Weir What changes did you make in Well? None. Air agitate 28 hours. 50 gal. acid; 18 lbs. HTH

LIST ON REVERSE SIDE, ALL PARTS USED AND ANY OTHER REMARKS.

TEST

TIME	R.P.M.	PUMPING LEVEL	G.P.M.	PUMP PRESSURE	MAIN PRESSURE	VOLTAGE	AMP.	H.P.
5 minutes		Static 14'	0	Shutoff 200	Final test and pretest the same.			
30 "		20'0"	100	170	Development did not help production values.			
30 "		22'4"	150	160				
30 "		25'6"	200	148				
30 "		29'0"	250	122				
30 "		32'0"	300	108				

M. L. Weir

FOR HYDRO GROUP, INC.

PUMP REPAIR PARTS AND MATERIALS USED

JOB # ------

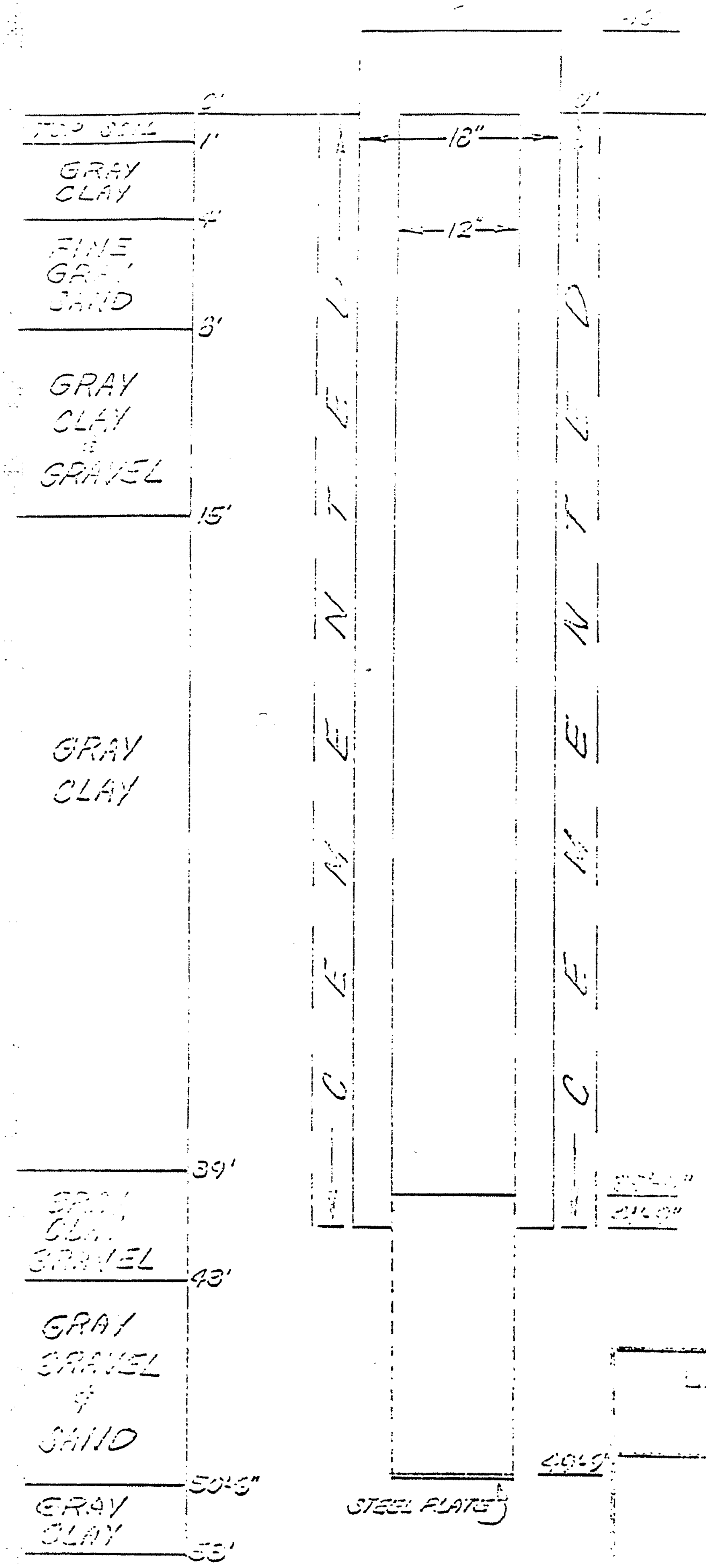
OWNER Frewsburg

PUMP # 53084

QTY.	ITEM	UNIT PRICE	TOTAL
	SUCTION PIPE Dia _____ Lgth _____		
	Strainer		
	BOWLS		
	Suction Nozzle		
	Suction Nozzle Bushing		
	Discharge Nozzle		
	Discharge Nozzle Bushing		
	Bowl Intermediates		
	Intermediate Bushing		
	Wear Rings		
	Collets		
	Impeller Shaft		
	Sand Collar		
	Set Screw		
	Bowl Studs		
	Bowl Nuts		
	Seals		
	Main Bearing Dos		
	"DO" Special		
	COLUMN & SHAFT Size _____		
	Bottom Column Pipe		
	Bottom Column Shaft		
	Intermediate Column		
	Intermediate Shaft		
	Top Column Pipe		
	Top Column Flange		
	Top Column Shaft		
	Rubber Bearings		
	Lock Ring		
	Oil Tubing		
	Top Special		
	DO Special		
	Oil Tube Bearings		
	Monel Sleeves		
	Shaft Couplings		
	Column Couplings		
	HEAD Size _____		
	Motor Shaft (long) (short)		
	Adjusting Nut & Key		
	Water Slinger		
	Shaft Coupling		
	Packing		
	Zerk Fittings		
	Lantern Ring		
	Separator Ring		
	Stuffing Box		
	Stuffing Box Bushing		

QTY.	ITEM	UNIT PRICE	TOTAL
	Mechanical Seal		
	Packing Gland		
	Followers		
	Studs		
	Nuts		
	AIRLINE Length 51' MEADVILLE STOCK		
	Plastic Size ¼" OD		
	Copper Size _____ OD		
	Airline Gauge		
	Bicycle Pump		
	Cement for Grouting		
	Oil		
	Lubricator		
1	Pressure Gauge 300 lb.		
	Fittings		
	MOTOR		
	Repairs		
	Motor Bearings		
	CLEANING CHEMICALS		
18	HTH lbs.		
	Other:		
50	Gallons Muriatic Acid		
	MISCELLANEOUS MATERIALS		
1	Inertol gallon		
2	Permatex tubes		
1	Keytite can		
	Rags		
	Tie Wire (Copper) (SS)		
	Eye Rods		
	Wedges		
	Layne Grease		
	Other:		
2	Rolls Electrical Tape		

GENERAL REMARKS: Pump running excellent and in very good condition. Did replace two 5' pieces of oil tube. Customer had these in storage from Well No. 2.



Casing: 50'-5" of [illegible] [illegible] 41' of 12" STEEL PIPE T-C

Screen: 10' of 12" EVERDUR
Plug: STEEL PLATE

Pump

Type [illegible]	Lab No. 33024
Setting 47'-3" to SF	Size 8"
Suction 3' of 6"	Stages 12
Basket NONE	Impeller [illegible]
Discharge 6"x10' [illegible]	Head TF-818
Tubing 2"	[illegible] 140"
Shafting 1 3/16"	Air Line 47' [illegible]

Motor

Make U.S.	Type RU
Volts 220 440	Cycle 60
Phase 3	Amp. 76 38
H. P. 30	R.P.M. 1800
Frame A-326UP	Form VERTICAL
Model VHS	Serial 3374794
Upper Brg.	Lower Brg.

Well

Started 4-30-64	Static Level 5'-4"
First Test 5-7-64	Production 200
Final Test 3-3-66	Pumping Level 29'-7"
Accepted 3-3-66	Guarantee 200
Total Depth 59'-3"	Head 140"
Method ROTARY	

Driller: I.W. [illegible]
Installer: R.L. PETERSON

LAYNE-NEW YORK CO., INC. [illegible]
WATER SUPPLY CONTRACTORS

VILLAGE OF FREWSBURG
FREWSBURG, N. Y.

DRAWN BY [illegible]
LAYNE WELL NO. 1
Their #3
APPROVED [illegible]
DRAWING [illegible]

FORM 23 5M-8-62WP

LAYNE-NEW YORK CO., INC.

1250 WEST ELIZABETH AVENUE, LINDEN, NEW JERSEY

RECORD OF TEST

WELL No. LAYNE #1

DATE 5-7-64 / 5-8-64

FOR VILLAGE OF FREWSBURG, N. Y.

WELL LOCATED AT

TIME	ENGINE R. P. M.	PUMP R. P. M.	PUMP PRESS.	MAIN PRESS.	PUMPING LEVEL	AIR PRESS.	INCHES WEIR, ORIFICE OR METER	G. P. M.
1600	STARTED TEST							200
1700					18' 4"		9½	200
2000					21' 5"		9½	200
2100					21' 8½		9½	200
2200					22'		9½	200
0500					23' 3-3/4		9	195
0600					24' 1"		9½	200
0700					24' 3½		9½	200
0800					24' 5½		9½	200
0900					24' 7½		9½	200
1000					24' 9		9½	200
1120					25' 1"		9½	200
1200					25' 3-3/4		9½	200
1310					25' 5½		9½	200
1400					25' 7"		9½	200
1450					25' 8½		9½	200

MAKE AND SIZE OF ENGINE OR MOTOR USED CONT. GAS ENGINE

REMARKS:

DESCRIPTION OF PUMP USED

TYPE LAYNE

STAGES 6

SIZE 8"

SHOP NO.

DISCHARGE 6"

DEPTH OF SETTING 46'

SUCTION FT. OF INCH PIPE

SIZE OF PULLEY

4 INCH ORIFICE ON 6 PIPE

WIDTH OF WEIR

DEPTH AIR LINE ELECTRIC TAPE

AIR PRESSURE WHEN NOT PUMPING

STATIC LEVEL 5' 4½" G.L.

HEIGHT OF GAUGE ABOVE BASE { MAIN GAUGE / PUMP GAUGE

WITNESS FOR PURCHASER

I. W. SHEATZ

FOR LAYNE-NEW YORK CO.

FORM 23 5M-8-62WP

LAYNE-NEW YORK CO., INC.

1250 WEST ELIZABETH AVENUE, LINDEN, NEW JERSEY

RECORD OF TEST

WELL No. LAYNE #1

DATE 5-8-64 5-9-64 5-10-64

FOR VILLAGE OF FREWSBURG, NEW YORK

WELL LOCATED AT

TIME	ENGINE R. P. M.	PUMP R. P. M.	PUMP PRESS.	MAIN PRESS.	PUMPING LEVEL	AIR PRESS.	INCHES WEIR, ORIFICE OR METER	G. P. M.
1710					25' 10¼"		9½	200
1915					26' 4"		9½	200
2210					26' 9½		9½	200
SAT.								
0740					27' 6½		9½	200
0835					27' 8-3/4"		9½	200
0950					27' 10-3/4"		9½	200
1220					28' 1½		9½	200
1505					28' 4-3/4"		9½	200
1820					29' 10½		9½	200
2140					30' 4-3/4		9½	200
SUN.								
0735					31' 4"		9½	200
1235					31' 8½		9½	200
1515					31' 10"		9½	200
2100					31' 9½		9½	200

MAKE AND SIZE OF ENGINE OR MOTOR USED CONT. GAS ENGINE

REMARKS:

DESCRIPTION OF PUMP USED

TYPE LAYNE

STAGES 6

SIZE 8

SHOP NO.

DISCHARGE 6"

DEPTH OF SETTING 46'

SUCTION FT. OF INCH PIPE

SIZE OF PULLEY

4 INCH ORIFICE ON 6 PIPE

WIDTH OF WEIR

DEPTH AIR LINE ELECTRIC TAPE

AIR PRESSURE WHEN NOT PUMPING

STATIC LEVEL 5' 4½ G.L.

HEIGHT OF GAUGE ABOVE BASE: MAIN GAUGE / PUMP GAUGE

WITNESS FOR PURCHASER

I. W. SHEATZ

FOR LAYNE-NEW YORK CO.

FIELD DEPT. DAILY PROGRESS R... ... e-New York Company, Inc.

Sales # ? Owner Krewsburg Water District Well # 3 Date 2-6-92

EMPLOYEE NAME & CLASSIFICATION	No. of Hours	O/T Hours
Driller:		
Installer: ML Weir	10	
Helper: K Mook	10	
Helper:		
Trucker:		
Other:		

RENTAL EQUIPMENT ON JOB (Type):	No. of Hours

ENTIRE CREW TIME DISTRIBUTION	No. of Hours
Preparation	
Moving	
Set Up	1
Drilling	
Run Pipe	2
Set Screen	
Grout	
Backfill	
Gravel Pack	
Set Pump	
Develop	
Test	3.5
Remove Pump	3.5
Tear Down	
Move	
Repairs	
Cleaning Pump Column & Parts	
Test Hole	
Cores	
Equipment Down Time	
Waiting Time	
Equipment Maintenance	
General Shop	
Sand Blasting	
Painting	
Welding	
TOTAL	10

DRILLING FROM ______ TO ______
(Show time start to stop)

DIAMETER HOLE: ______

CASING USED: ______ DIA. ______

SCREEN USED: Type ______ Size ______

Opening ______

CEMENT USED: ______

BENTONITE USED: ______

GRAVEL USED: ______ Size ______

HTH USED: ______

DEVELOPMENT TIME:

ZONE 1 2 3 4 (please circle)

SETTING: ______ (show depth)

HRS. DEV. w/AIR	HRS. PUMPED w/PUMP

DESCRIPTION OF WORK: Set up to work 1 hr. Run flow test on well + pump 3.5 hrs. Pull pump from well 3.5 hrs Set surge equipment in well 2 hrs.

10 hrs

RECEIVED AT

FEB 13 1992

PITTSFORD, N.Y.

Above Time and Material Approved by: ______

FOR HYDRO GROUP

Title ______ Date ______

Use back of sheet if necessa[ry] USE A [SEPA]RATE REPORT FOR EACH SALES NO.

FIELD DEPT. DAILY PROGRESS RI e-New York Company, Inc.

Sales # ________ Owner Drewsburg N.Y. Well # 3 Date 2-10-92

EMPLOYEE NAME & CLASSIFICATION	No. of Hours	O/T Hours
Driller:		
Installer: M L Weir	9	
Helper: K. Mook	9	
Helper:		
Trucker:		
Other:		

RENTAL EQUIPMENT ON JOB (Type):	No. of Hours
175 CFM Compressor	2

ENTIRE CREW TIME DISTRIBUTION	No. of Hours
Preparation	
Moving	
Set Up	
Drilling	
Run Pipe	
Set Screen	
Grout	
Backfill	
Gravel Pack	
Set Pump	
Develop	7
Test	
Remove Pump	
Tear Down	
Move	
Repairs	
Cleaning Pump Column & Parts	
Test Hole	
Cores	
Equipment Down Time	2
Waiting Time	
Equipment Maintenance	
General Shop	
Sand Blasting	
Painting	
Welding	
TOTAL	9

DRILLING FROM ________ TO ________
(Show time start to stop)

DIAMETER HOLE: ________

CASING USED: ________ DIA. ________

SCREEN USED: Type ________ Size ________

Opening ________

CEMENT USED: ________

BENTONITE USED: ________

GRAVEL USED: ________ Size ________

HTH USED: ________

DEVELOPMENT TIME:

ZONE 1 2 3 4 (please circle)

SETTING: ________ (show depth)

HRS. DEV. w/AIR ________ HRS. PUMPED w/PUMP ________

DESCRIPTION OF WORK: Very cold weather 2 hrs getting deisel engine On crane started. Agitating with out air 5 hrs. Agitating with air 2 hrs.

Above Time and Material Approved by:

____

Title ________ Date ________

FOR FOR HYDRO GROUP

Use back of sheet if necessa[ry]

USE A [SEPA]RATE REPORT FOR EACH SALES NO

FIELD DEPT. DAILY PROGRESS R... ... e-New York Company, Inc.

Sales # ______ Owner Trewsburg N.Y. Well # 3 Date 2-11-92

EMPLOYEE NAME & CLASSIFICATION	No. of Hours	O/T Hours
Driller:		
Installer: ML Weir	10	
Helper: K. Mook	10	
Helper:		
Trucker:		
Other:		

RENTAL EQUIPMENT ON JOB (Type):	No. of Hours
175 CFM Compressor	10

DRILLING FROM ______ TO ______
(Show time start to stop)

DIAMETER HOLE: ______

CASING USED: ______ DIA. ______

SCREEN USED: Type ______ Size ______

Opening ______

CEMENT USED: ______

BENTONITE USED: ______

GRAVEL USED: ______ Size ______

HTH USED: ______

ENTIRE CREW TIME DISTRIBUTION	No. of Hours
Preparation	
Moving	
Set Up	
Drilling	
Run Pipe	
Set Screen	
Grout	
Backfill	
Gravel Pack	
Set Pump	
Develop	10
Test	
Remove Pump	
Tear Down	
Move	
Repairs	
Cleaning Pump Column & Parts	
Test Hole	
Cores	
Equipment Down Time	
Waiting Time	
Equipment Maintenance	
General Shop	
Sand Blasting	
Painting	
Welding	
TOTAL	10

DEVELOPMENT TIME:

ZONE 1 2 3 4 (please circle)

SETTING: ______ (show depth)

HRS. DEV. w/AIR	HRS. PUMPED w/PUMP

DESCRIPTION OF WORK: Develop well 10 hrs with air
Pick up 1 BBL muriatic acid.
Cleaning and inspecting pump.

Above Time and Material Approved by:

Title ______ Date ______

FOR FOR HYDRO GROUP

Use back of sheet if necessa...

USE A ...RATE REPORT FOR EACH SALES NO.

Sales # ________ Owner Brewsburg NY. Well # 3 Date 2-12-92

EMPLOYEE NAME & CLASSIFICATION	No. of Hours	O/T Hours
Driller:		
Installer: M L Weir	11	
Helper: K. Mook	11	
Helper:		
Trucker:		
Other:		

RENTAL EQUIPMENT ON JOB (Type):	No. of Hours
175 CFM Compressor	11

ENTIRE CREW TIME DISTRIBUTION	No. of Hours
Preparation	
Moving	
Set Up	
Drilling	
Run Pipe	
Set Screen	
Grout	
Backfill	
Gravel Pack	
Set Pump	
Develop	11
Test	
Remove Pump	
Tear Down	
Move	
Repairs	
Cleaning Pump Column & Parts	
Test Hole	
Cores	
Equipment Down Time	
Waiting Time	
Equipment Maintenance	
General Shop	
Sand Blasting	
Painting	
Welding	
TOTAL	11

DRILLING FROM ________ TO ________
(Show time start to stop)

DIAMETER HOLE: ________

CASING USED: ________ DIA. ________

SCREEN USED: Type ________ Size ________

Opening ________

CEMENT USED: ________

BENTONITE USED: ________

GRAVEL USED: ________ Size ________

HTH USED: ________

DEVELOPMENT TIME:

ZONE 1 2 3 4 (please circle)

SETTING: ________ (show depth)

HRS. DEV. w/AIR ________ HRS. PUMPED w/PUMP ________

DESCRIPTION OF WORK: Agitating acid in well 4hrs. with out air. Agitating with air 2 hrs. Put in 18 lbs of HTH and agitate with out air 5 hrs. Cleaning and Painting pump.

Above Time and Material Approved by:

________________________ ________________________

Title ________ Date ________ FOR FOR HYDRO GROUP

Use back of sheet if necessa[ry] USE A [SEPA]RATE REPORT FOR EACH SALES NO.

FIELD DEPT. DAILY PROGRESS R

e-New York Company, Inc.

Sales #______ Owner Lewisburg WY. Well # 3 Date 3-13-92

EMPLOYEE NAME & CLASSIFICATION	No. of Hours	O/T Hours
Driller:		
Installer: M L Weir	10	
Helper: K. Mook	10	
Helper:		
Trucker:		
Other:		

RENTAL EQUIPMENT ON JOB (Type):	No. of Hours
175 CFM Compressor	1

ENTIRE CREW TIME DISTRIBUTION	No. of Hours
Preparation	
Moving	
Set Up	
Drilling	
Run Pipe	1.5
Set Screen	
Grout	
Backfill	
Gravel Pack	
Set Pump	4.5
Develop	1
Test	3
Remove Pump	
Tear Down	
Move	
Repairs	
Cleaning Pump Column & Parts	
Test Hole	
Cores	
Equipment Down Time	
Waiting Time	
Equipment Maintenance	
General Shop	
Sand Blasting	
Painting	
Welding	
TOTAL	10

DRILLING FROM ______ TO ______
(Show time start to stop)

DIAMETER HOLE: ______

CASING USED: ______ DIA. ______

SCREEN USED: Type ______ Size ______

Opening ______

CEMENT USED: ______

BENTONITE USED: ______

GRAVEL USED: ______ Size ______

HTH USED: ______

DEVELOPMENT TIME:

ZONE 1 2 3 4 (please circle)

SETTING: ______ (show depth)

HRS. DEV. w/AIR ______ HRS. PUMPED w/PUMP ______

DESCRIPTION OF WORK: Blow to waste 1 hr. to get chlorine out. Pull surge pipe 1½ hr. Set pump 4½ hrs. Pump to waste 3 hrs. Clean up jobsite

Above Time and Material Approved by:

______

Title ______ Date ______

FOR FOR HYDRO GROUP

Use back of sheet if necessa

USE A \RATE REPORT FOR EACH SALES :O.

D

APPENDIX D

MONITORING WELL/BOREHOLE INSTALLATION PROCEDURES

TABLE OF CONTENTS

D.1.0 BOREHOLES/MONITORING WELL INSTALLATION PROCEDURES

A total of four boreholes and one monitoring well were installed beginning on March 16, 1992. Drilling was performed by Empire Soils Investigations (ESI) under the supervision of CRA personnel. Monitoring well/borehole locations were selected on conjunction with the New York State Department of Environmental Conservation (NYSDEC) Field Representative and are illustrated on Figure 4.1.

The monitoring well/boreholes were installed as follows:

i) The drilling rig and associated equipment was decontaminated prior to initiating drilling activities and between monitoring well/borehole locations in accordance with the protocols established in the SI QAPP.

ii) Each borehole was initially advanced in the upper confining clay layer using 12 1/4-inch I.D. continuous flight hollow-stem augers. Continuous split-spoon soil samples were collected in advance of the augering operation by standard penetration test methods. Augering and sampling continued until the borehole was advanced a minimum of five feet into the upper confining clay layer.

iii) The borehole was enlarged to a nominal 18-inch diameter and a 14-inch O.D. steel surface casing was inserted into the borehole and grouted in place by tremming 80 to 100 gallons of grout into the bottom of the augers at depth. The augers were then removed and the 14-inch casing was inserted into the open borehole to the appropriate depth.

The casing was seated into the confining layer, the grout inside the casing was flushed using potable water and the remainder of the annulus outside the 14-inch casing was grouted to within 5 feet of the ground surface using a tremmie pipe. The grout was allowed to set overnight.

iv) The integrity of the grout seal was tested by filling the inside of the casing with water and measuring the decrease in the water level within the casing, if any, for a minimum period of 5 minutes. Drilling proceeded only after the grout seal passed the test.

v) Drilling was continued using 8 1/4-inch I.D. augers below the 14-inch diameter surface casing. Continuous split spoon samples were collected in advance of the augering operation. The 8 1/4-inch I.D. augers were advanced to the anticipated depth of the Frewsburg Aquifer at each location. A 6-inch I.D. intermediate casing then was grouted in place by tremming 100 to 120 gallons of grout to the bottom of the borehole. An appropriate length of 6-inch I.D. steel casing, sealed at the bottom with a one foot grout plug was inserted into the borehole. The 6-inch I.D. casing was filled with water to overcome buoyancy. The remainder of the annulus was backfilled with grout to the top of the 14-inch casing using a tremmie pipe.

vi) The grout around the 6-inch casing was allowed to set overnight at a minimum and the integrity of the grout seal was tested as above;

vii) The borehole was advanced below the bottom of the 6-inch casing using a 4-inch I.D. flush-mount casing as a temporary casing in combination with wet rotary drilling methods. Continuous split-spoon samples were collected in advance of the casing operation. The casing was advanced in 2 foot increments using a 300 pound hammer or by pushing with the rig hydraulics. Soil material (slough) which had pushed up into the 4-inch casing as it was advanced was washed out using potable water and a suitably sized tricone drilling bit. The 4-inch casing was installed until the bottom of the Frewsburg Aquifer was encountered or until it was determined that the Frewsburg Aquifer was not present. Borehole installations ranged in depth from 50 to 70 feet BGS.

viii) At location MW-5D, the Frewsburg Aquifer was encountered at a depth of 34 to 44.7 feet BGS. At the completion of sampling, MW-5D did not exhibit flowing artesian conditions. Therefore, a conventional monitoring well was installed as follows:

a) the 4-inch temporary casing was advanced into the lower confining layer to collect soil samples and was then withdrawn to the top of the confining layer underlying the Frewsburg Aquifer. The bottom of the open borehole advanced into the lower confining layer and was plugged using a mixture of sand and bentonite pellets to prevent this short section of borehole from acting as a sump,

b) a 2-inch diameter stainless steel riser pipe coupled to a 5 foot long 2-inch diameter #10 slot stainless steel well screen was installed through the temporary casing,

c) a #1 size morey silica sandpack (equivalent to a #4 quartzite sand) was placed around the well while withdrawing the temporary casing to 2 feet above the top of the screen,

d) a bentonite pellet seal measuring approximately 2 foot thick was installed above the sandpack;

e) the annulus above the bentonite seal was backfilled with cement/bentonite grout using standard positive displacement techniques,

f) a protective casing was embedded into the cement/bentonite grout and a concrete security collar was installed around the surface casing; and

ix) at borehole locations (BH-1D, BH-6D, BH-8D and BH-9D), the Frewsburg Aquifer was not encountered. These boreholes were completed as follows:

a) a cement/bentonite grout was tremmied to the bottom of the borehole through the 4-inch diameter temporary casing to the top of ground surface,

b) the temporary casing was removed and the 14-inch surface casing and the 6-inch intermediate casing were cut off at or below ground surface.

D.2.0 COLLECTION OF SOIL SAMPLES

During the installation of monitoring wells/boreholes, soil samples were collected from the Frewsburg Aquifer and the confining clay layers above and below the Frewsburg Aquifer. Three Shelby tubes of undisturbed soils were collected for analyses. Two Shelby tubes were collected from the upper confining layer (above the Frewsburg Aquifer) from 29 to 31 feet BGS at BH-1D and from 44 to 46 feet BGS at BH-8D. One Shelby tube was collected from the lower confining clay layer (below the Frewsburg Aquifer) at 48 to 50 feet BGS at BH-5D.

Shelby tube samples were collected through the augers or 4-inch (I.D.) temporary casing. Each of the thin walled Shelby tubes was pushed two feet using the drilling rig hydraulics. The tube sample was allowed to swell for 5 to 10 minutes prior to removal from the borehole. Upon removal from the borehole, the Shelby tube was capped and sealed according to the following procedure:

i) the outside of the Shelby tube was cleaned;
ii) the top and bottom of the Shelby tube samples were trimmed;
iii) the top and bottom of the Shelby tube samples were sealed with wax;
iv) the top and bottom of the tubes were covered with plastic caps which were attached to the Shelby tubes with duct tape;
v) the taped caps were sealed with wax; and
vi) the Shelby tubes samples were labelled.

Shelby tube samples were submitted to Huntingdon Analytical Services (HAS) in Middleport, New York. The tube samples were handled carefully and transported in a vertical position. The Shelby tube samples were submitted for the determination of permeability, grain size, and moisture content.

A sample of the Frewsburg Aquifer material was also collected by continuous split spoon sampling. Attempts to collect a Shelby tube sample of the Frewsburg Aquifer were unsuccessfully due to the nature of the coarse aquifer material. The sand and gravel aquifer material submitted to HAS for grain size analysis and percent moisture content.

Soil samples were also collected for fractional organic carbon (FOC) content from the clay layers above the Frewsburg Aquifer at MW-5D (32 to 34 feet BGS) and below the Frewsburg Aquifer at MW-5D (48 to 50 feet BGS) and from the Frewsburg Aquifer at MW-5D (44 to 46 feet BGS). These three soil samples were collected in precleaned sample containers provided by the laboratory. A precleaned stainless steel knife was used to transfer the soil from the split spoon sampler of Shelby tube into the sample bottle. Samples were labelled and placed in a cooler with ice and transported via overnight courier to H2M labs for analysis.

D.3.0 WELL DEVELOPMENT

Well MW-5D was developed on April 10, 1992 in accordance with protocols established in the SI QAPP. Due to the use of wet rotary methods used to install MW-5D, an attempt was made to maintain a water balance (e.g., water used to drill versus water returned to the surface). In order to compensate for any potential water lost during drilling into the Aquifer, 20 well volumes were purged from well MW-5D during development.

Development was performed using a peristaltic pump. Dedicated tubing was provided for the well and a precleaned stainless steel bailer was used to surge the screened interval to aid in developing the filter pack around the screen. As each volume of water was removed from the well, pH, conductivity and temperature were measured and recorded. All water removed during purging was contained in 55-gallon drums and stored at the Site for disposal in accordance with the applicable regulations.

The well was allowed to stabilize for approximately one week prior to sampling.

E

APPENDIX E

BOREHOLES/MONITORING WELL STRATIGRAPHIC AND INSTRUMENTATION LOGS

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-20)

PROJECT NAME: VAC-AIR (IRA)

PROJECT NO.: 2326

CLIENT: S.G. KEYWELL CO.

LOCATION: 15' NORTHWEST OF MW-1

BH-1D

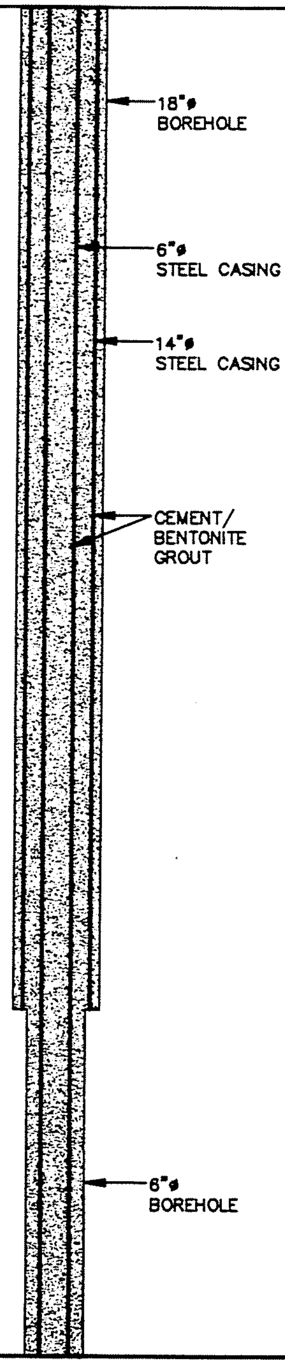
HOLE DESIGNATION: MW-1D (Page 1 of 3)

DATE COMPLETED: MARCH 23, 1992

DRILLING METHOD:

CRA SUPERVISOR: D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	1258.5				
	For stratigraphy from 0.0 to 18.0' BGS see log MW-1					
2.5						
5.0						
7.5						
10.0						
12.5						
15.0						
17.5						
20.0		1238.5				
	Gray SILT, some fine sand, little medium sand, little clay, trace coarse sand, moist to wet NATIVE	1237.9		1SS	X	3
22.5	Gray SILT and CLAY, some fine sand, trace medium sand, moist to wet	1236.5		2SS	X	6
	Gray CLAY, some silt, little fine sand, trace medium sand, moist					
25.0	Same, except moist to wet			3SS	X	10
	Same, except trace fine round gravel, trace fine sand, moist					
27.5				4SS	X	6
30.0				5ST	X	
	Same, except gray brown, no gravel					
32.5				6SS	X	7



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-20)

PROJECT NAME: VAC-AIR (IRA)

PROJECT NO.: 2326

CLIENT: S.G. KEYWELL CO.

LOCATION: 15' NORTHWEST OF MW-1

HOLE DESIGNATION: BH-1D MW-1D (Page 2 of 3)

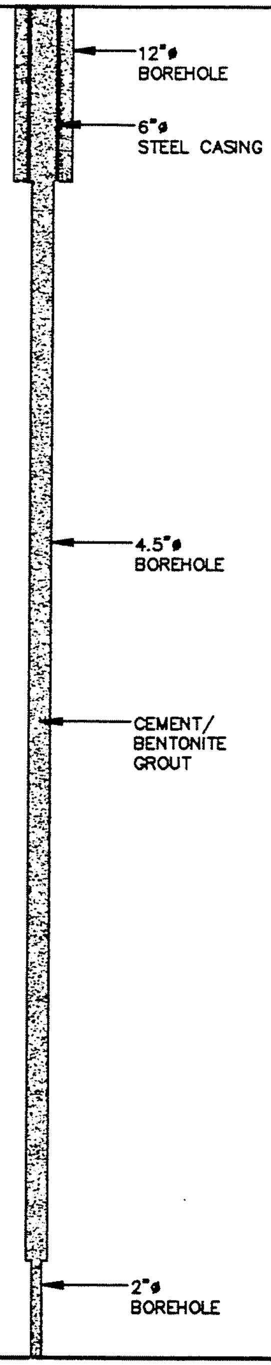
DATE COMPLETED: MARCH 23, 1992

DRILLING METHOD:

CRA SUPERVISOR: D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
			7SS		7
35.0					
			8SS		4
37.5	Gray CLAY, some silt, trace fine sand, moist to wet				
			9SS		17
40.0			10SS		15
42.5	Same, except brown gray, moist		11SS		13
			12SS		8
45.0					
			13SS		11
47.5	Same, except gray				
			14SS		15
50.0			15SS		16
52.5			16SS		20
			17SS		13
55.0	Same, with trace fine gravel				
			18SS		9
57.5	Same, with no gravel				
			19SS		16
60.0			20SS		11
62.5			21SS		16
			22SS		13
65.0					
			23SS		3

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-20)

PROJECT NAME: VAC-AIR (IRA)
PROJECT NO.: 2326
CLIENT: S.G. KEYWELL CO.
LOCATION: 15' NORTHWEST OF MW-1

HOLE DESIGNATION: BH-1D MW-1D
(Page 3 of 3)
DATE COMPLETED: MARCH 23, 1992
DRILLING METHOD:
CRA SUPERVISOR: D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
			2"ø BOREHOLE	23SS	X	3
67.5			CEMENT/ BENTONITE GROUT	24SS	X	11
	END OF HOLE @ 69.0 FT. BGS	1189.5				
70.0						
72.5						
75.0						
77.5						
80.0						
82.5						
85.0						
87.5						
90.0						
92.5						
95.0						
97.5						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-21)

PROJECT NAME: VAC-AIR (IRA)

PROJECT NO.: 2326

CLIENT: S.G. KEYWELL CO.

LOCATION: 15' SOUTH OF MW-5

HOLE DESIGNATION: MW-5D (Page 1 of 2)

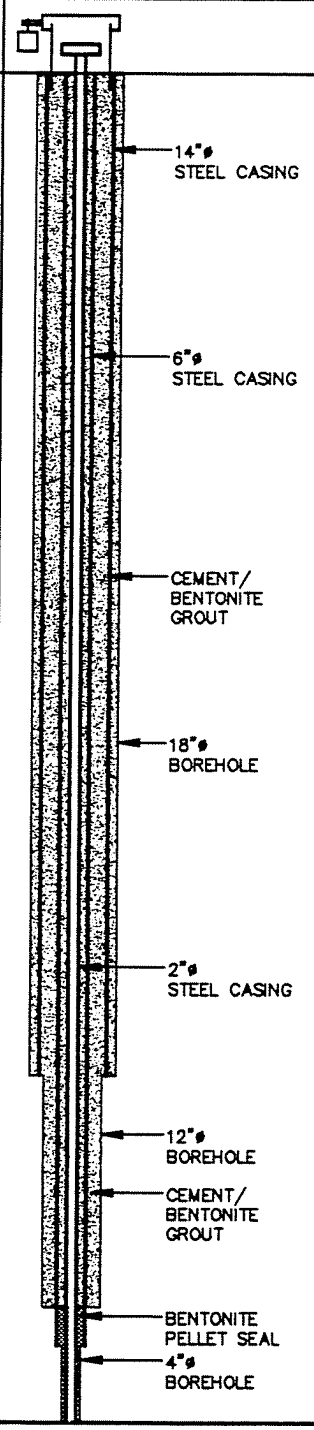
DATE COMPLETED: APRIL 8, 1992

DRILLING METHOD:

CRA SUPERVISOR: D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	REFERENCE POINT (Top of Riser)	1255.14			
	GROUND SURFACE	1253.9			
	For stratigraphy from 0.0 to 20.0' BGS see log MW-5				
2.5					
5.0					
7.5					
10.0					
12.5					
15.0					
17.5					
20.0	Gray brown fine to medium SAND, some silt, wet, NATIVE	1233.9 1233.4	1SS	X	14
22.5	Gray brown and brown gray CLAY, some silt, little fine sand, moist to wet Same, except gray		2SS	X	15
25.0			3SS	X	10
	Brown gray and gray CLAY, some silt, little fine sand, moist to wet	1227.9	4SS	X	5
27.5					
30.0	Same, with trace fine to medium gravel		5SS	X	5
			6SS	X	9
32.5	Brown CLAY, some silt, some fine sand, trace fine to medium gravel, moist to wet		7SS	X	7

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-21)

PROJECT NAME: VAC-AIR (IRA)

PROJECT NO.: 2326

CLIENT: S.G. KEYWELL CO.

LOCATION: 15' SOUTH OF MW-5

HOLE DESIGNATION: MW-5D (Page 2 of 2)

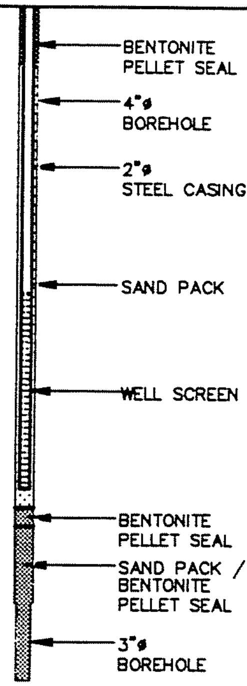
DATE COMPLETED: APRIL 8, 1992

DRILLING METHOD:

CRA SUPERVISOR: D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	Brown and gray fine to medium GRAVEL, trace fine to medium sand, wet	1219.9			
35.0	Same, with some medium to coarse sand, little silt, trace coarse gravel		8SS	X	26
37.5			9SS	X	28
			10SS	X	21
40.0	Brown medium to coarse sand, some fine to medium gravel, little silt, trace fine sand, trace coarse gravel, wet	1213.9	11SS	X	30
42.5			12SS	X	27
45.0	Brown SILT, some clay, trace fine sand and medium rounded gravel, moist	1209.2	13SS	X	25
	Brown CLAY, some silt, trace fine sand and medium rounded gravel, moist	1207.9			
47.5	Gray SILT, some clay, little fine sand, moist	1207.3	14SS	X	44
	Brown CLAY, some silt, trace fine sand, moist	1205.9	15ST	X	
50.0	END OF HOLE @ 50.0 FT. BGS	1203.9			
52.5					
55.0					
57.5					
60.0					
62.5					
65.0					

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
40.0 to 45.0' BGS
Length −5.0'
Diameter −2.0"
Slot # 10
Material −Stainless Steel
Sand pack interval:
34.0 to 45.5' BGS
Material −Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-22)

PROJECT NAME: VAC-AIR (IRA)

PROJECT NO.: 2326

CLIENT: S.G. KEYWELL CO.

LOCATION: 30' NORTH NORTHWEST OF MW-6

HOLE DESIGNATION: MW-6D BH-6D
(Page 1 of 2)

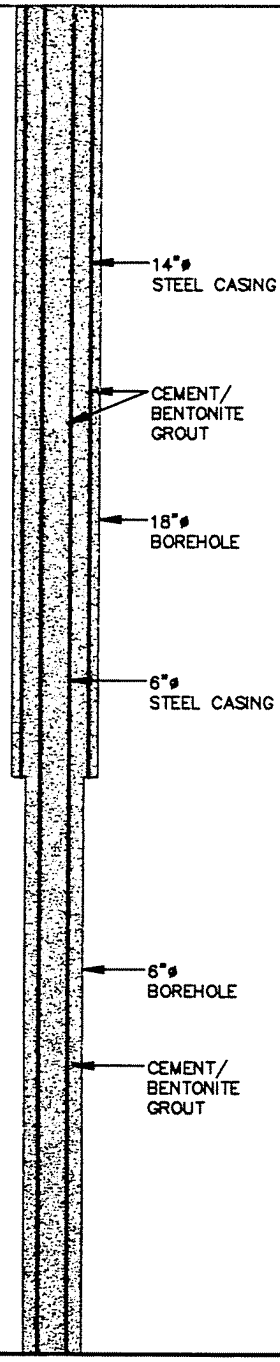
DATE COMPLETED: APRIL 1, 1992

DRILLING METHOD:

CRA SUPERVISOR: D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	1248.7			
	For stratigraphy from 0.0 to 16.0' BGS see log MW-6				
2.5					
5.0					
7.5					
10.0					
12.5					
15.0					
	Brown to greenish brown CLAY, some silt, little fine sand, trace fine gravel, moist, NATIVE	1232.7			
17.5	Same, except greenish brown to gray brown		1SS		6
			2SS		6
20.0	Same, except gray, trace fine sand		3SS		6
22.5			4SS		6
			5SS		3
25.0	Gray SILT, some clay, trace fine sand, moist	1223.7	6SS		14
27.5	Gray SILT and CLAY, trace fine sand, moist to wet	1221.7	7SS		7
	Gray SILT, some clay, little fine sand, moist to wet	1219.7			
30.0	Same, with some fine sand, little clay		8SS		7
32.5			9SS		14

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

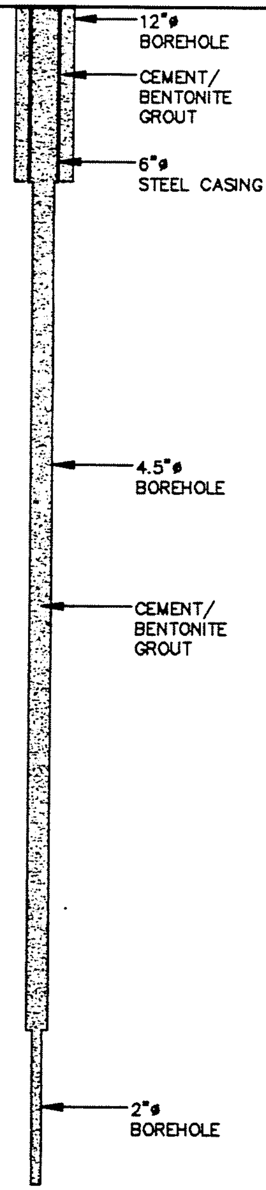
(L-22)

PROJECT NAME: VAC-AIR (IRA)
PROJECT NO.: 2326
CLIENT: S.G. KEYWELL CO.
LOCATION: 3' NORTH NORHWEST OF MW-6

HOLE DESIGNATION: MW-6D BH-6D
(Page 2 of 2)
DATE COMPLETED: APRIL 1, 1992
DRILLING METHOD:
CRA SUPERVISOR: D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL
35.0	Same, except gray brown, some clay	
37.5	Brown and gray CLAY, some silt, moist, thinly laminated	1211.7
40.0	Same, except gray, trace fine gravel	
42.5	Same, with no gravel	
45.0		
47.5	Same, with trace fine sand	
50.0		
52.5	Same, except brown gray	
55.0	Same, except gray	
57.5	Same, except gray brown	
60.0		
62.5	END OF HOLE @ 63.0 FT. BGS	1185.7
65.0		

MONITOR INSTALLATION



SAMPLE

NUMBER	STATE	'N' VALUE
10SS	X	7
11SS	X	11
12SS	X	12
13SS	X	9
14SS	X	16
15SS	X	9
16SS	X	19
17SS	X	12
18SS	X	11
19SS	X	20
20SS	X	9
21SS	X	13
22SS	X	11
23SS	X	10
24SS	X	16

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-23)

BH-8D

PROJECT NAME: VAC-AIR (IRA)

HOLE DESIGNATION: MW-8D
(Page 1 of 2)

PROJECT NO.: 2326

DATE COMPLETED: APRIL 3, 1992

CLIENT: S.G. KEYWELL CO.

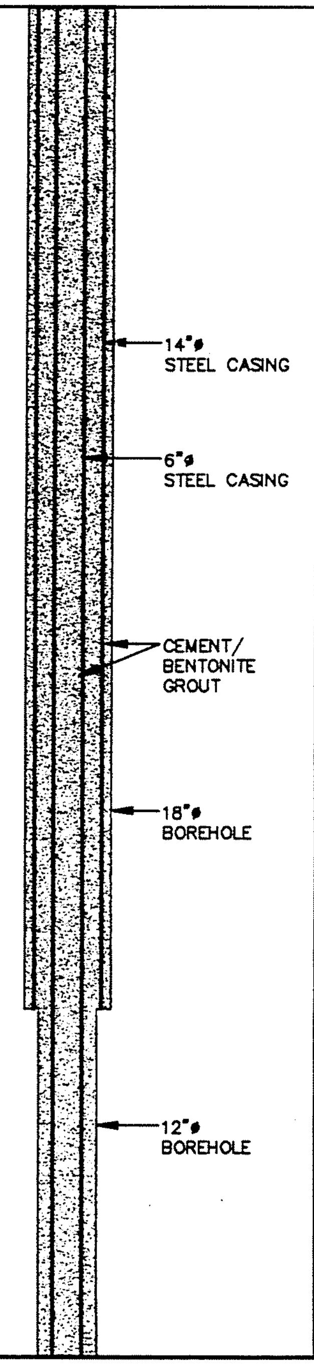
DRILLING METHOD:

LOCATION: 30' NORTH OF CONEWANGO RIVER, WEST SIDE OF FORMER RR ROW

CRA SUPERVISOR: D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	1240.0			
	Brown and black SILT, some fine sand and clay, little gravel, cinders and vegetation, moist to wet, FILL		1SS	X	6
2.5	Same, with trace blue glass and rock fragments	1237.4			
	Mottled brown fine to medium SAND, some silt, trace clay, moist, NATIVE		2SS	X	7
5.0			3SS	X	4
	Same, except moist to wet				
7.5			4SS	X	5
	Same, except mottled brown and orange, little clay, trace fine gravel, moist		5SS	X	7
10.0	Same, except gray, no gravel				
			6SS	X	1
12.5	Same, except gray to brown gray, trace coarse sand, trace vegetation		7SS	X	5
	Same, except dark gray, trace fine black, shale gravel				
15.0			8SS	X	2
17.5			9SS	X	3
	Same, with little coarse sand, moist to wet				
	Gray coarse SAND and fine GRAVEL, some fine to medium sand, wet	1221.9	10SS	X	6
20.0	Gray fine to medium SAND, some silt, little clay, little fine gravel, moist to wet				
	Brown gray SILT, some clay, little fine to medium sand, moist to wet	1218.9	11SS	X	8
22.5	Gray to brown gray CLAY, some silt, little fine to medium sand, moist	1218.0	12SS	X	8
25.0			13SS	X	5
27.5			14SS	X	5
			15SS	X	4
30.0	Same, except gray brown and green brown				
			16SS	X	12
	Same, except brown gray				
32.5			17SS	X	10

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-23)

PROJECT NAME: VAC-AIR (IRA)

PROJECT NO.: 2326

CLIENT: S.G. KEYWELL CO.

LOCATION: 30' NORTH OF CONEWANGO RIVER, WEST SIDE OF FORMER RR ROW

HOLE DESIGNATION: BH-8D MW-8D (Page 2 of 2)

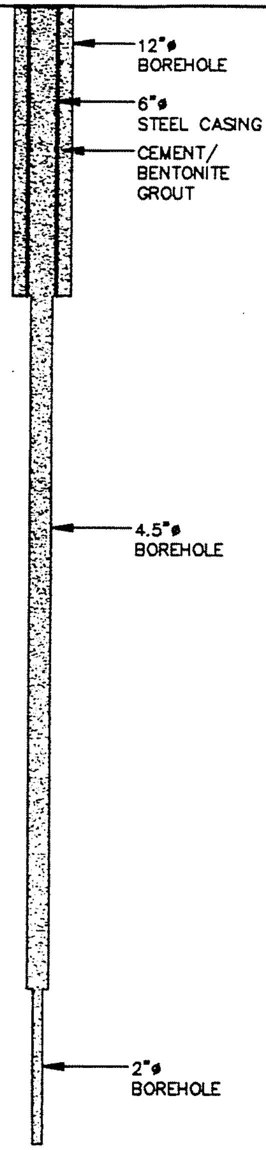
DATE COMPLETED: APRIL 3, 1992

DRILLING METHOD:

CRA SUPERVISOR: D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	Same, with trace fine sand				
35.0			18SS		8
	Same, with trace fine gravel		19SS		18
37.5	Same, except gray, some fine to medium gravel				
			20SS		6
40.0	No recovery				
			21SS		26
	Same, except brown gray				
42.5					
			22SS		21
45.0			23ST		
	Same, with trace fine to medium gravel				
			24SS		13
47.5	Same, except trace fine gravel				
			25SS		15
50.0					
			26SS		27
52.5					
			27SS		12
55.0			28SS		12
	Same, except gray				
			29SS		16
57.5					
			30SS		27
60.0					
			31SS		15
	END OF HOLE @ 62.0 FT. BGS	1178.0			
62.5					
65.0					

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

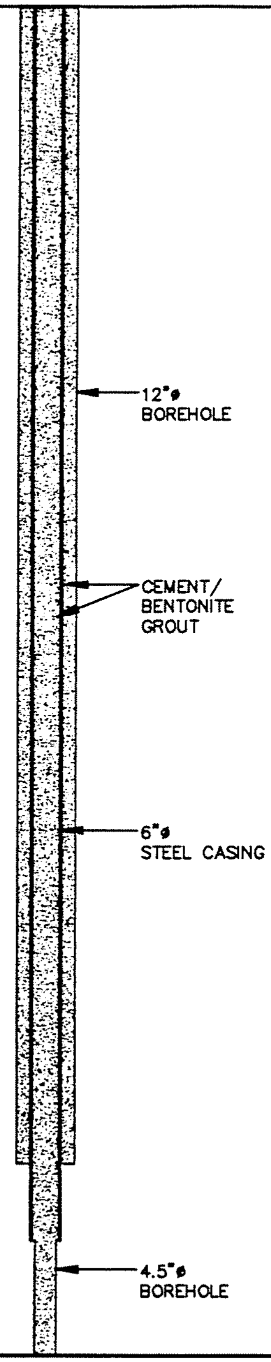
(L-24)

BH-9D

PROJECT NAME:	VAC-AIR (IRA)	HOLE DESIGNATION:	MW-9D (Page 1 of 3)
PROJECT NO.:	2326	DATE COMPLETED:	MAY 22, 1991
CLIENT:	S.G. KEYWELL CO.	DRILLING METHOD:	8 1/2" ID HSA
LOCATION:	NORTH OF CONEWANGO RIVER, WEST OF FALCONER ROAD	CRA SUPERVISOR:	D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL
	GROUND SURFACE	1240.2
	Brown fine SAND, some silt, trace clay, trace vegetation, moist, TOPSOIL	1239.3
2.5	Brighlty mottled gray SILT, some clay, trace fine sand, moist, NATIVE	
	Mottled brown SILT, some fine to medium sand, little clay, moist	1236.2
5.0	Mottled brown fine to medium SAND, some silt, moist	
	Same, except moist to wet	
7.5	Same, except moist	
	Same, except olive brown, little silt, wet	1230.2
10.0	Mottled brown and gray SILT, some fine to medium sand, moist to wet	1229.4
12.5	Gray fine to medium SAND, some silt, wet	1226.2
15.0	Gray and brown SILT, some fine to medium sand, moist to wet	1224.2
17.5	Gray fine to medium SAND, little silt, trace clay, trace roots, wet	
20.0	Same, except fine sand, some medium sand, little silt, trace clay, trace vegetatation, moist to wet	
	Same, except fine to medium sand,	
22.5	Dark gray medium to coarse SAND, little fine to medium rounded gravel, wet	1216.2
25.0	Gray SILT, little fine sand, moist to wet	1214.2
27.5	Gray CLAY, some silt, trace fine sand, moist	
30.0		
32.5		

MONITOR INSTALLATION



SAMPLE NUMBER	STATE	'N' VALUE
1SS	X	3
2SS	X	8
3SS	X	5
4SS	X	9
5SS	X	>1
6SS	X	>1
7SS	X	>1
8SS	X	3
9SS	X	2
10SS	X	2
11SS	X	2
12SS	X	12
13SS	X	12
14SS	X	12
15SS	X	5
16SS	X	9
17SS	X	13

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-24)

PROJECT NAME: VAC-AIR (IRA)

PROJECT NO.: 2326

CLIENT: S.G. KEYWELL CO.

LOCATION: NORTH OF CONEWANGO RIVER, WEST OF FALCONER ROAD

BH-9D

HOLE DESIGNATION: MW-9D (Page 2 of 3)

DATE COMPLETED: MAY 22, 1991

DRILLING METHOD: 8 1/2" ID HSA

CRA SUPERVISOR: D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
35.0				18SS	X	8
	Same, with trace fine rounded gravel					
37.5	Same, with no gravel			19SS	X	23
40.0				20SS	X	9
	Same, with little fine sand			21SS	X	9
42.5			4.5"φ BOREHOLE	22SS	X	11
45.0	Same, with trace fine gravel			23SS	X	12
47.5				24SS	X	15
50.0				25SS	X	18
	Same, with no gravel		CEMENT/ BENTONITE GROUT	26SS	X	15
52.5				27SS	X	13
55.0	Gray CLAY, some silt, little fine sand, trace fine gravel, moist			28SS	X	15
57.5	Same, except trace fine sand			29SS	X	29
				30SS	X	17
60.0	Gray SILT, some clay, some fine sand, trace fine gravel, moist	1180.2		31SS	X	25
62.5				32SS	X	28
65.0				33SS	X	23

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-24)

PROJECT NAME: VAC-AIR (IRA)

PROJECT NO.: 2326

CLIENT: S.G. KEYWELL CO.

LOCATION: NORTH OF CONEWANGO RIVER, WEST OF FALCONER ROAD

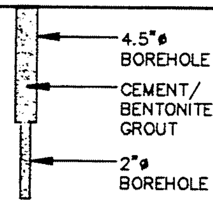
BH-9D

HOLE DESIGNATION: MW-9D (Page 3 of 3)

DATE COMPLETED: MAY 22, 1991

DRILLING METHOD: 8 1/2" ID HSA

CRA SUPERVISOR: D. OSCAR

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION ft AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	Same, except some fine to medium sand, little clay, trace fine gravel, moist					
67.5				34SS	X	34
				35SS	X	32
70.0	END OF HOLE @ 70.0 FT. BGS	1170.2				
72.5						
75.0						
77.5						
80.0						
82.5						
85.0						
87.5						
90.0						
92.5						
95.0						
97.5						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ◯ WATER FOUND ∇ STATIC WATER LEVEL ▼

F

APPENDIX F

AQUIFER TESTING PROCEDURES AND RESULTS

TABLE OF CONTENTS

F.1.0 INTRODUCTION

This appendix describes the details of the aquifer testing program conducted as part of the IRA Work Plan at the VacAir Alloys facility in Frewsburg, New York and presents the data collected as part of the aquifer testing program.

F.2..0 PREPARATION FOR AQUIFER TESTING

Prior to the start of the aquifer testing phase of the IRA Program, the following activities were performed:

i) installation of recording pressure transducers to provide continuous hydraulic monitoring;

ii) determine the point of discharge for the water generated during the aquifer testing program;

iii) provide a water meter to monitor flow rates and total flow during pumping events; and

iv) provide a means of aerating the pumped water prior to discharge to the ground surface to remove any potential VOCs which may have entered the aquifer during pumping.

On May 29, 1992, Telog pressure transducer recorders were installed in the following wells:

i) District Production Well #1;

ii) District Production Well #2A;

iii) District Production Well #3;

iv) District Production Well #4;

v) Monarch Plastics Well #1 (the most southerly well);

vi) MW-4;

vii) MW-5;

viii) MW-5D; and

ix) MW-7.

The Telog recorders consist of a computer programmable datalogger coupled to a strain-gauge type pressure transducer. The recorders were installed in the wells and programmed to take water levels at one minute intervals. By taking simultaneous manual water levels and current readings from each recorder, the data is then converted to monitor the water levels in elevation in feet above mean sea level (Ft. AMSL). The recorders were also synchronized to monitor water levels at the same time.

In addition to the nine Telog recorders that were installed on May 29, 1992, five additional Telog recorders were installed on June 4, 1992 prior to the start of the long-term pumping test in the following wells:

i) well T-3;
ii) MW-2;
iii) MW-3;
iv) MW-6; and
v) a well north of Production Well #3 (identified as the "Junk Yard Well").

The locations of the wells which were monitored during aquifer testing are shown on Figure 4.1.

Through discussion with District personnel, it was determined that the water generated from the pumping tests on Well #2A should be pumped through the existing forcemain from Production Wells #1 and #2A north to a 4-inch pipe which extends through the north wall of the pumphouse for Production Well #3 which discharged to the ground. This pumping scenario was approved by the NYSDEC Field Representative.

Because all of the flow metering equipment for District Production Wells #1 and #2A is on the distribution side of the water supply system, it was necessary to install a temporary water meter to monitor the pumping activities. A 4-inch diameter vane-type water meter was rented from the Hydro Group. This meter had an analog readout which read directly in gallons per minute (up to 800 GPM) and a digital flow totalizer. The meter was connected to the discharge pipe which extended outside of the pumphouse for Production Well #3.

During the step-drawdown set, meter readings were recorded at changes in the flow rate and periodically during each step in flow. During the long term pumping test, meter readings were recorded periodically to monitor the flow rate and total flow over the duration of the pumping test. Flow rates were recorded to the nearest 10 GPM. Total flow was recorded to the nearest 50 gallons.

The IRA Work Plan stated that a nozzle would be installed on the discharge pipe to aerate the water generated during pumping in order to remove any VOCs that may potentially be present from the water prior to contact with the ground surface. However, a nozzle would have created back pressure in the pumping system which would lower the maximum pumping rate to be used during the aquifer testing. Instead, the discharge was aerated by installing a 90° elbow at the end of the discharge piping. The elbow directed the discharge stream forcefully onto a steel sluice which was installed temporarily to channel the runoff from pumping activities. The force of the water striking the metal sluice created extreme turbulence which effectively aerated the water discharge. The steel sluice also served to prevent soil erosion as the effluent from the pumping activities was discharged to the ground surface.

F.3.0 STEP-DRAWDOWN TEST

A step-drawdown test was performed on June 2, 1992 to determine the maximum pumping rate to be used for the long-term pumping test.

The step-test began at 1140 hours using Production Well #2A. The initial flow rate obtained was 110 to 120 GPM. Gradually, the flow increased to 130 to 140 GPM but this was less than what was anticipated. The step-test was continued from 1140 hours to 1308 hours using Well #2A. The average pumping rate for this 88 minute step was 130 GPM with a resultant drawdown of approximately 15 feet.

In order to obtain greater pumping rates, District Well #1 was also pumped at 1308 hours. The pumping rate was increased to 200 GPM. This rate was maintained until 1400 hours. The average pumping rate for this 52 minute step was 197 GPM with a resultant drawdown of approximately 16 feet.

At 1400 hours, the flow rate was increased to 250 GPM. This rate was maintained until 1500 hours. The average pumping rate for this 60 minute step was 266 GPM with a resultant drawdown of approximately 21 feet.

At 1500 hours, an attempt was made to determine the maximum sustainable pumping rate that could be achieved while pumping Production Wells #1 and #2A simultaneously. Short-term flow rates approached 300 GPM but a flow rate greater than 250 GPM could not be sustained.

At 1510, the pump in Well #2A was shut down and the pump in Well #1 was allowed to operate alone until 1521 hours. This was done to determine the maximum sustained yield which could be pumped from District Well #1 should it be selected as the pumping well for the long-term pumping test. The average pumping rate obtained from this 11 minute step was approximately 218 GPM.

Based upon the results of the step-drawdown test, a pumping rate of 230 GPM was selected for the long-term test. In addition, it was determined that Production Well #1 would be utilized as the pumping well since Well #2A did not appear to be capable of pumping a sustained rate greater than 140 GPM. The NYSDEC approved these changes and startup for the long-term pumping test was scheduled for June 4, 1992.

F.4.0 LONG-TERM PUMPING TEST

The long-term pumping test began at 1230 hours on June 4, 1992 utilizing Production Well #1. Initially, a pumping rate of 250 GPM was maintained. At 1315 the flow rate decreased to approximately 230 GPM. At 1515 hours, District personnel informed Keywell that the water level in Well #1 had drawn down to the point that the pump had broken suction in the water column. In order to avoid damage to the well and pump, the District requested that the pumping rate be reduced. At 1524 hours the flow rate was reduced to 200 GPM while the pumping situation was reviewed.

Based upon pumping conditions at Well #1, it was decided to run the remainder of the long-term pumping test with both wells #1 and #2A pumping. This would increase the potential maximum flow rate for the pumping well and would help to create a larger cone of depression in the Frewsburg Aquifer.

At 1529 hours, the pump in Well #2A was turned on and the remainder of the pumping test proceeded with both wells pumping. Because both pumps were running it was difficult to maintain a constant pumping rate throughout the test.

The long-term pumping test continued until 1300 hours on June 5, 1992. During the 24 1/2 hour pumping test, 335,200 gallons were pumped resulting in an average flow rate of 228 GPM for the entire test.

The water level data collected by means of the data loggers and pressure transducers were reduced to elevations and are presented on a series of water level hydrographs attached to this appendix.

F.5.0 AIR MONITORING DURING THE LONG-TERM PUMPING TEST

As required by the IRA Work Plan, air monitoring was performed periodically during the long-term pumping test to detect any organic vapors that may have been released from the pumping test discharge water.

Air monitoring was performed at approximately hourly intervals during the pumping test at the discharge point of the pumped water. Air monitoring was performed with an MSA Photon photoionization detector (PID). The Photon was calibrated daily according to manufacturer's specifications. No organic vapors were detected above background during the long-term pumping test.

F.6.0 COLLECTION OF GROUNDWATER SAMPLES DURING THE LONG TERM PUMPING TEST

As required by the IRA Work Plan, groundwater samples were collected from the pumping wells at the start of the pumping test and at approximately six hour intervals for the duration of the test.

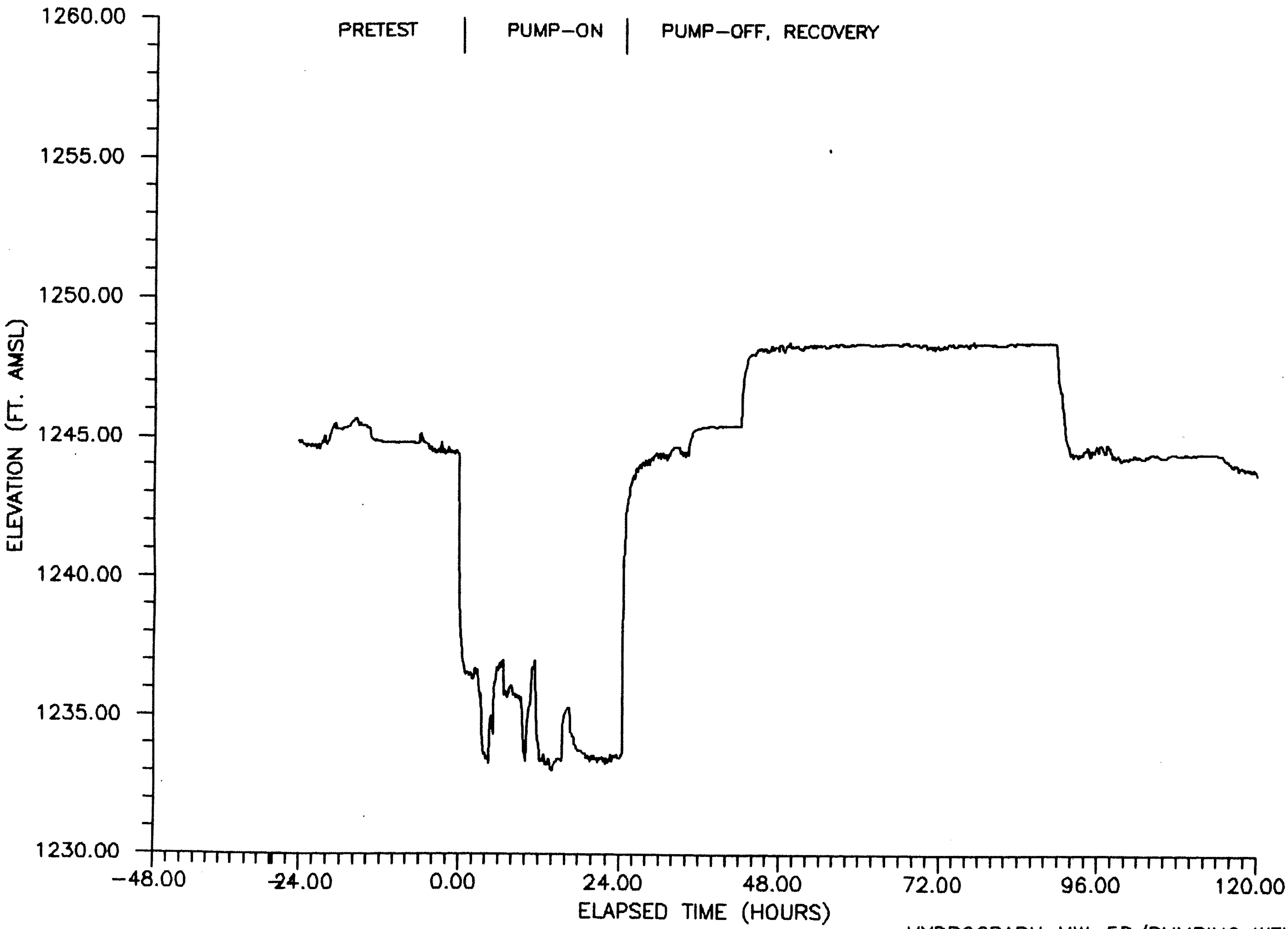
Samples were collected from a sampling port located in the pumphouse for Production Well #2. Samples were collected from the sampling port directly into the laboratory supplied sample containers. The sampling port was left running during the pumping test to assure that each sample contained fresh groundwater.

At the completion of the pumping test a groundwater sample was collected from MW-5D using a bottom loading teflon bailer. The sample was collected from groundwater poured from the bailer into the sample containers. MW-5D was sampled without purging.

Samples collected during the pumping test were labelled and then placed in a cooler with ice. At the completion of the pumping test, the samples were packed and shipped via overnight courier to H2M Labs, Inc. of Melville, New York. The samples were analyzed for the TCL VOCs using SW-846 Method 8240. A summary of the pumped groundwater samples collected is presented in Table 4.1.

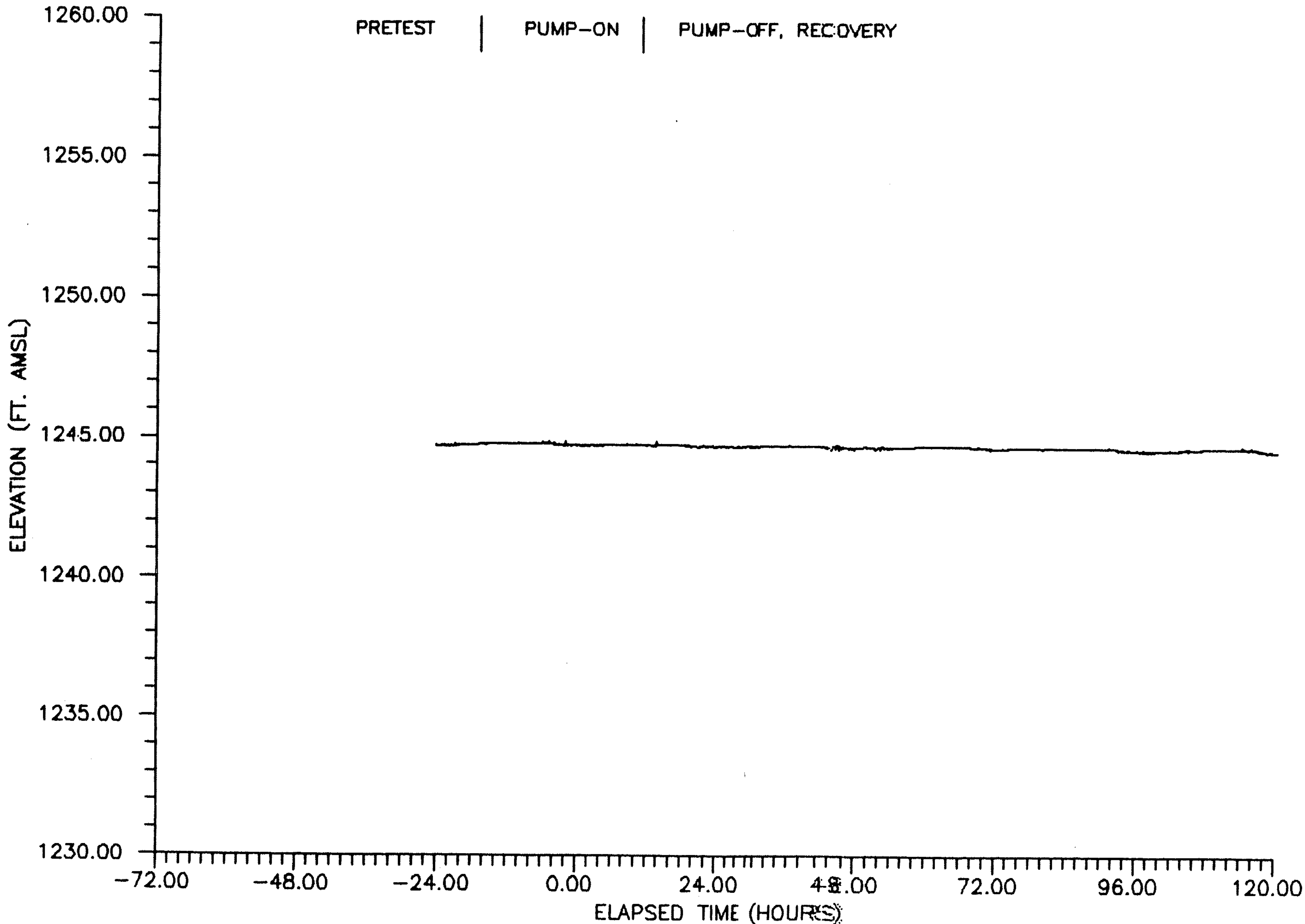
APPENDIX F-1

WATER LEVEL HYDROGRAPHS



HYDROGRAPH MW-5D/PUMPING WELL VAF-1
I.R.A. PROGRAM
VACAIR SITE FREWSBURG NEW YORK

CRA



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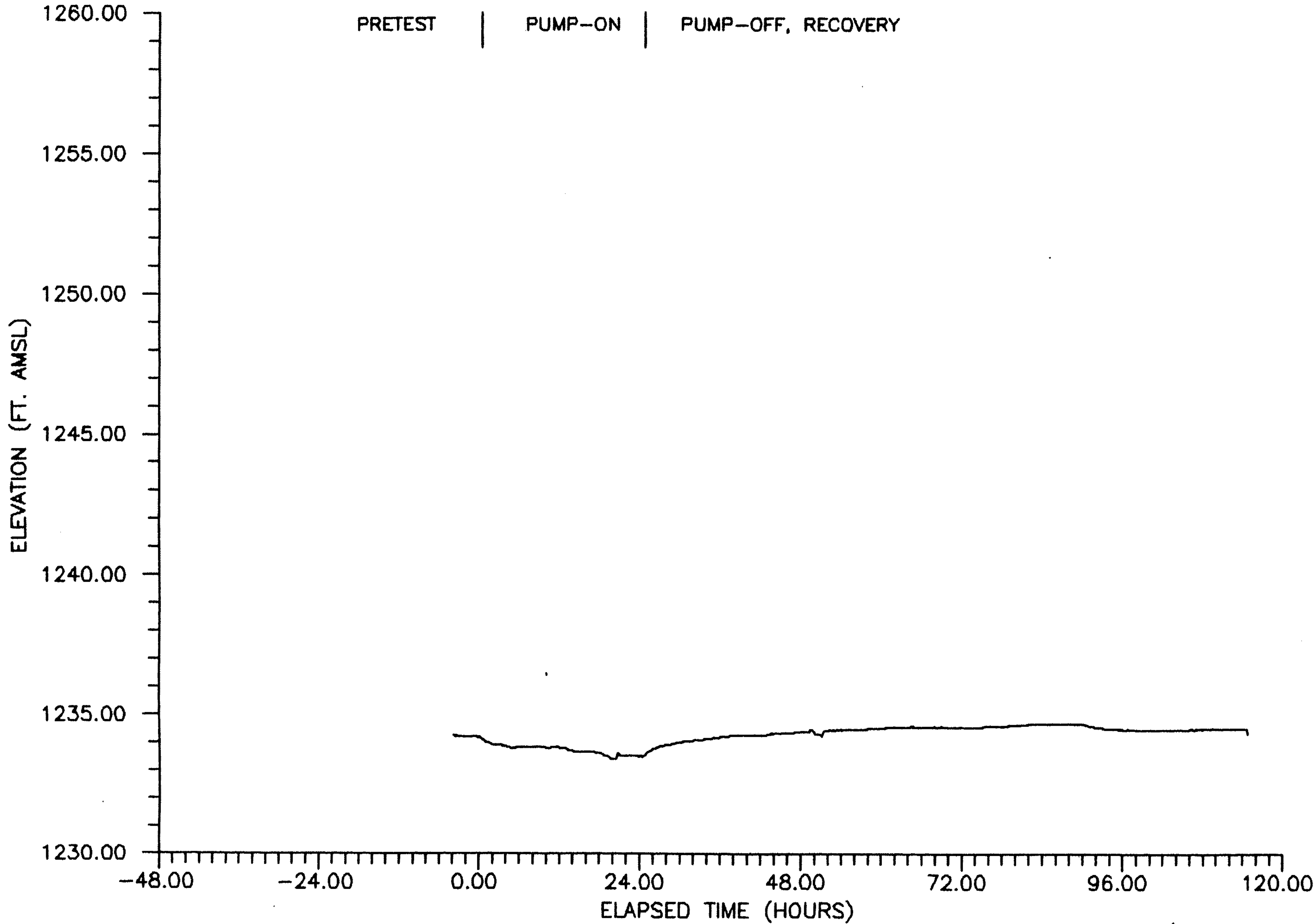
I.R.A. PROGRAM



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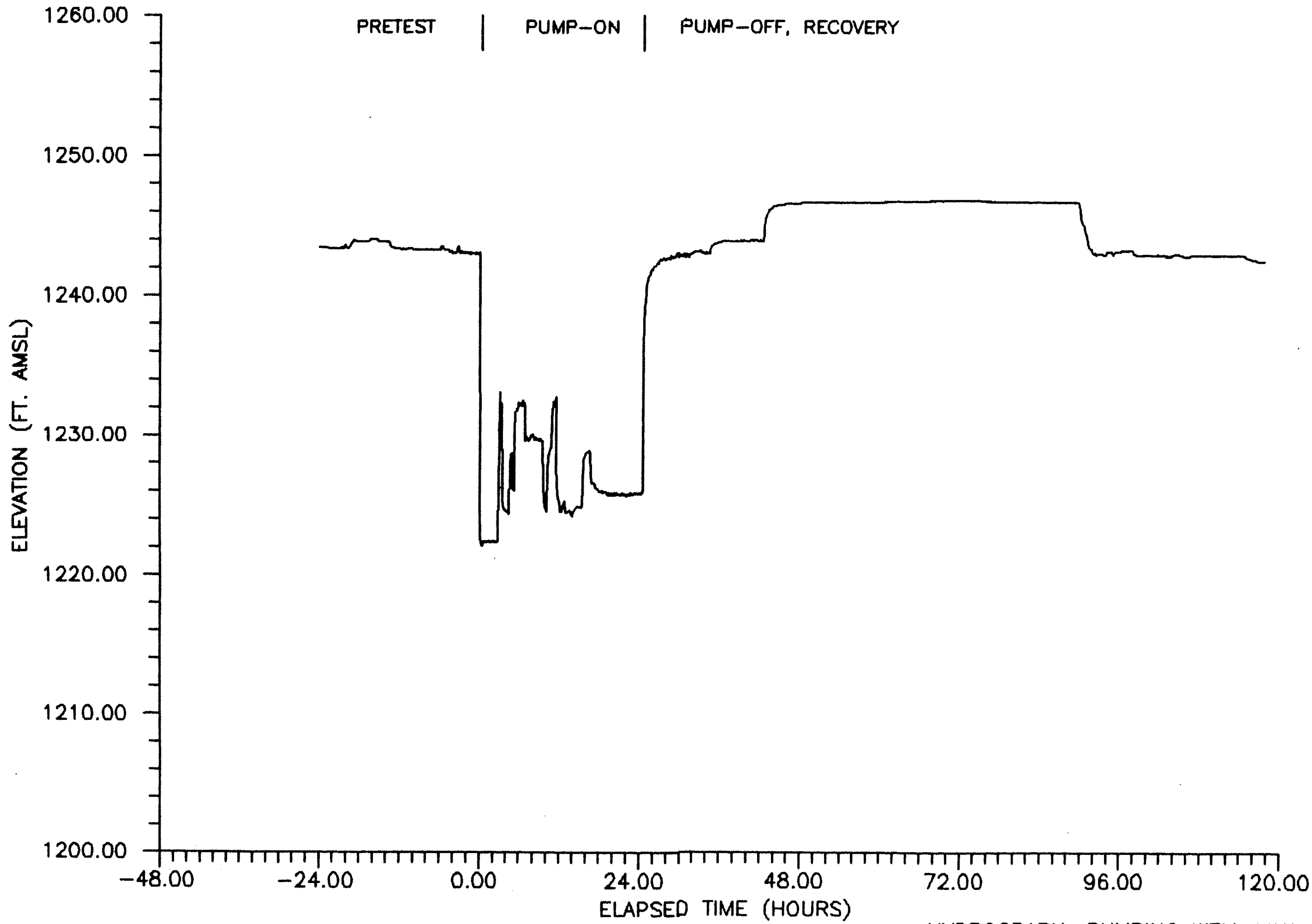
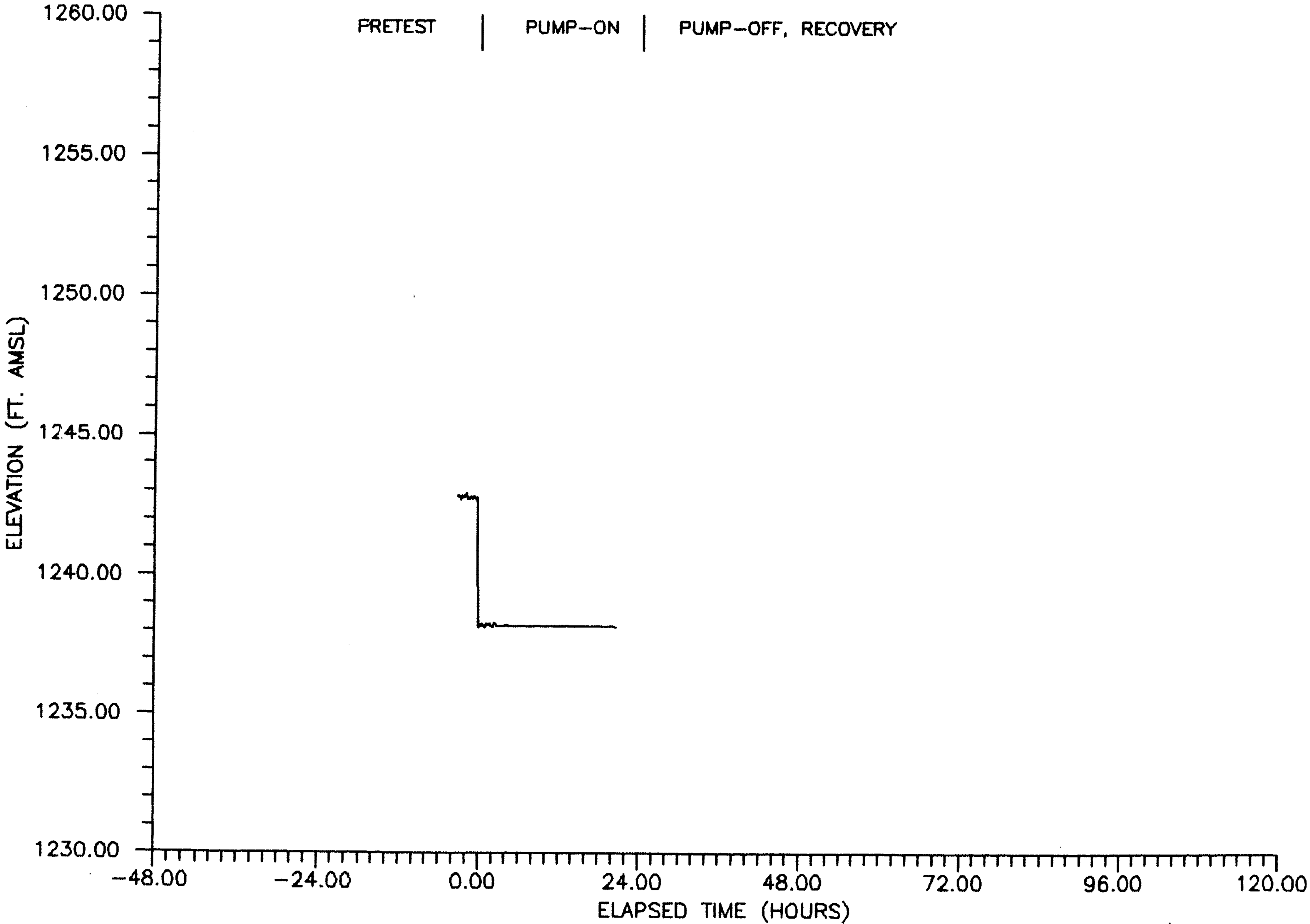
I.R.A. PROGRAM
VACAIR SITE. FREWSBURG. NEW YORK

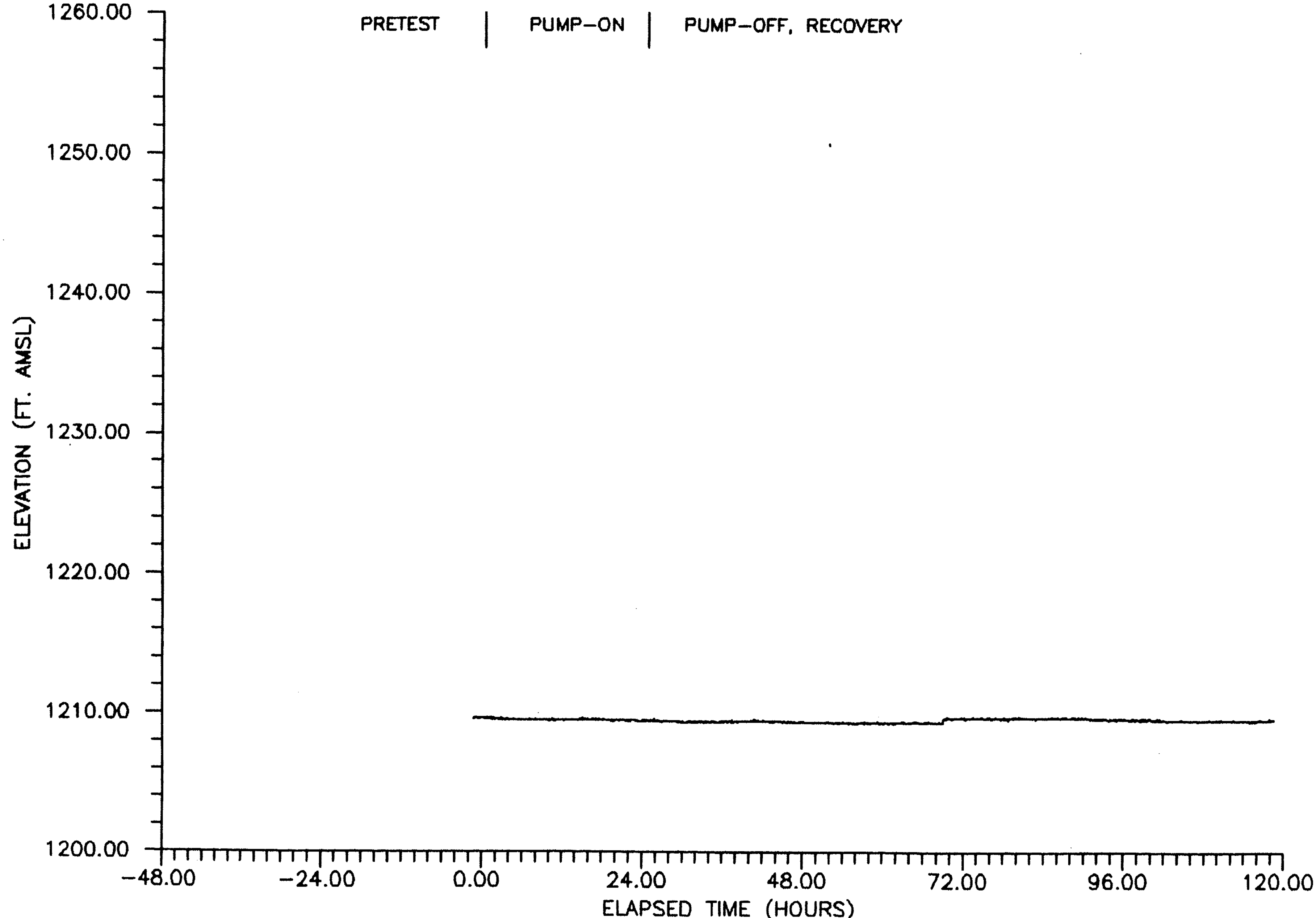
CRA



HYDROGRAPH, PUMPING WELL VAF-1
I.R.A. PROGRAM



HYDROGRAPH VAF-T3/PUMPING WELL VAF-1
I.R.A. PROGRAM



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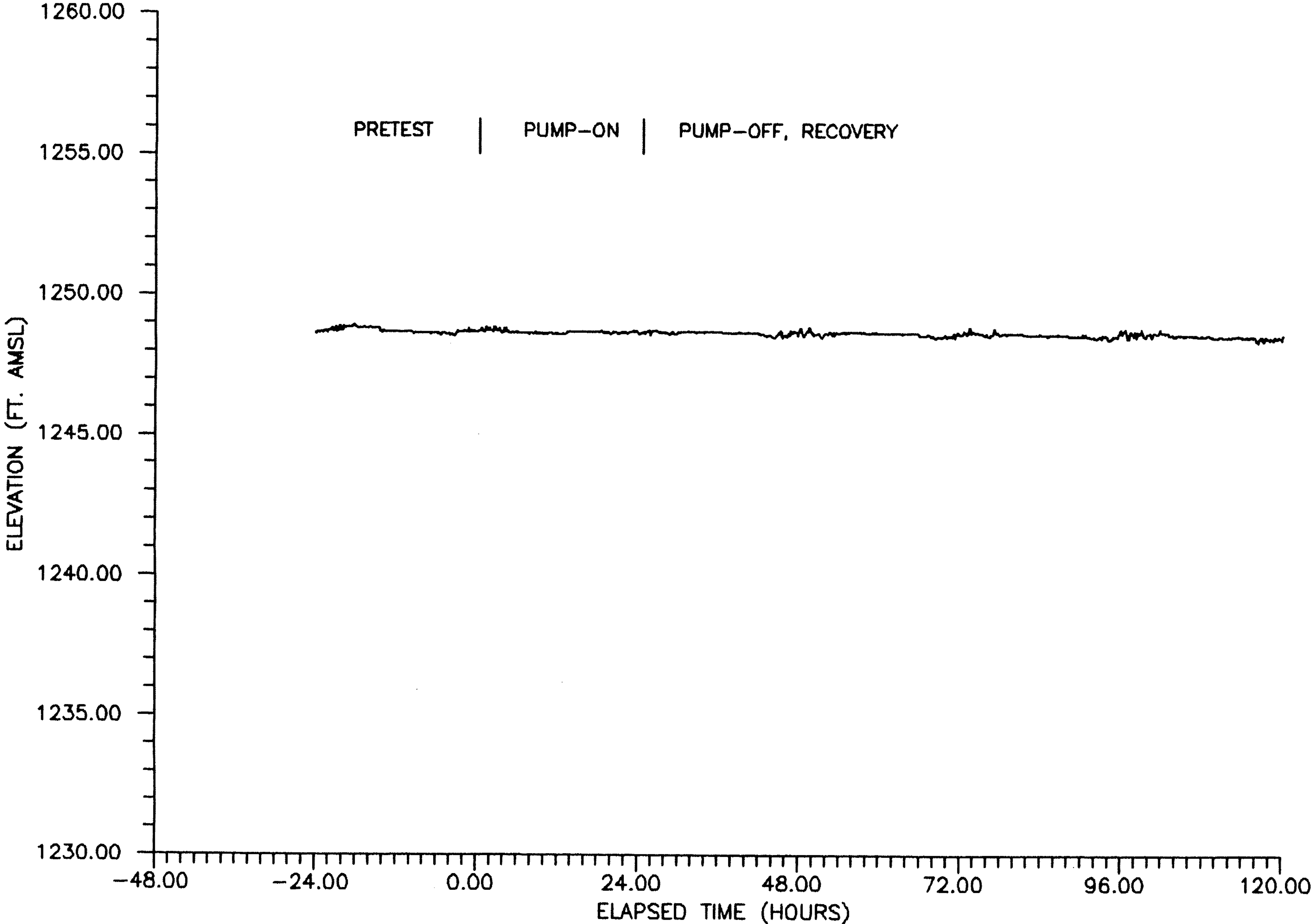
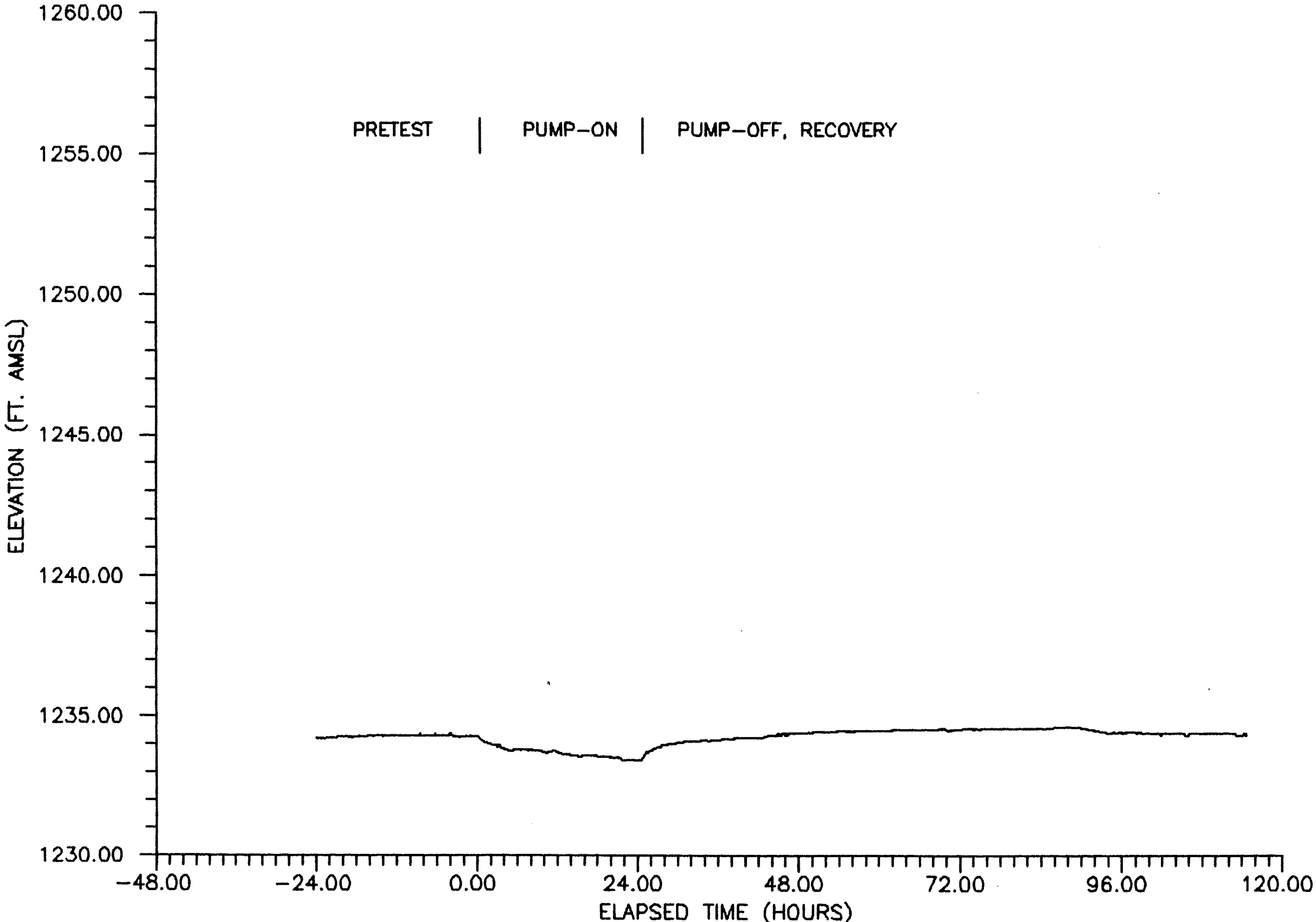
I.R.A. PROGRAM
VACAIR SITE, FREWSBURG, NEW YORK

CRA



HYDROGRAPH MW-5/PUMPING WELL VAF-1
I.R.A. PROGRAM
VACAIR SITE, FREWSBURG, NEW YORK

CRA



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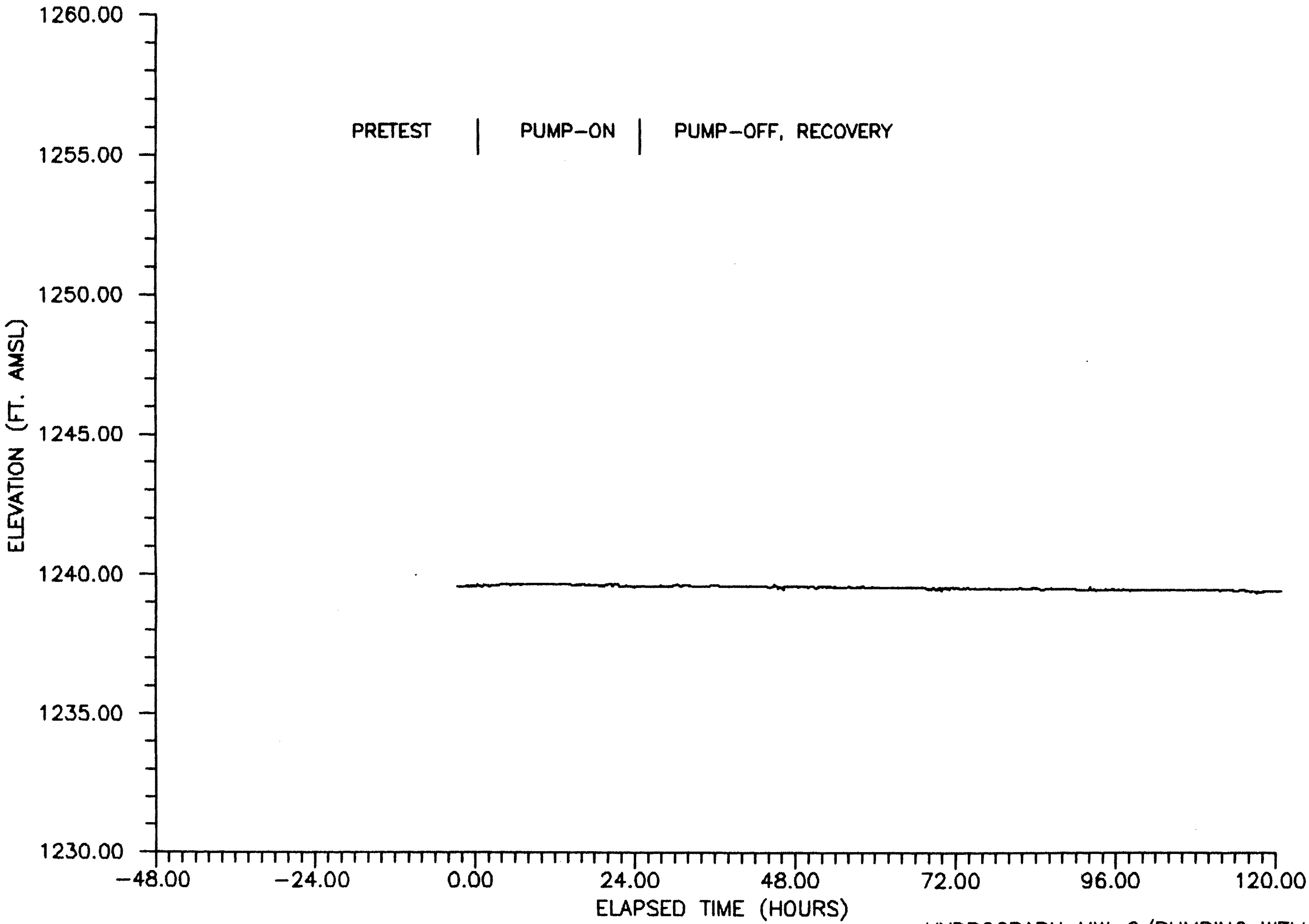
I.R.A. PROGRAM
VACAIR SITE, FREWSBURG, NEW YORK

CRA



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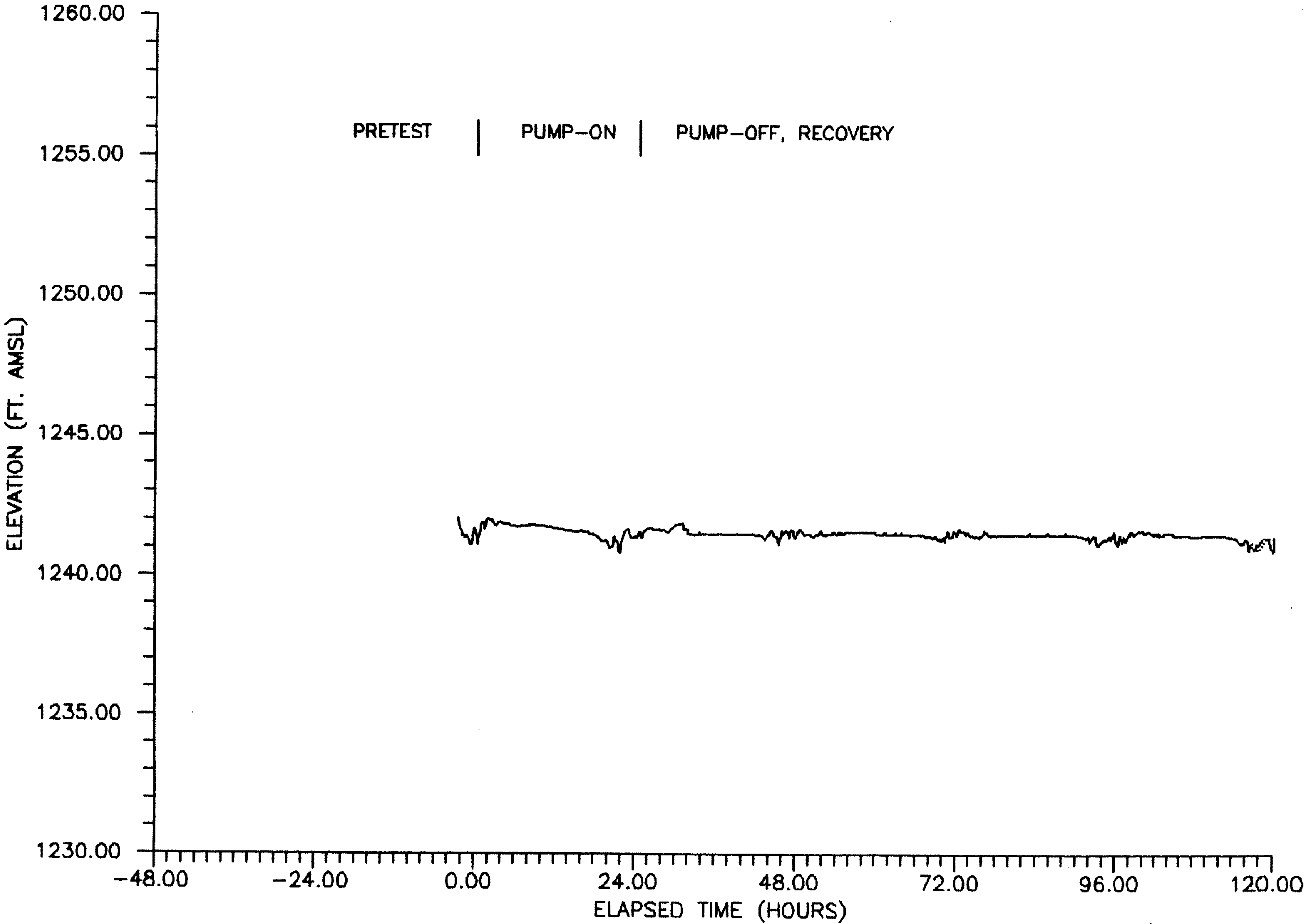
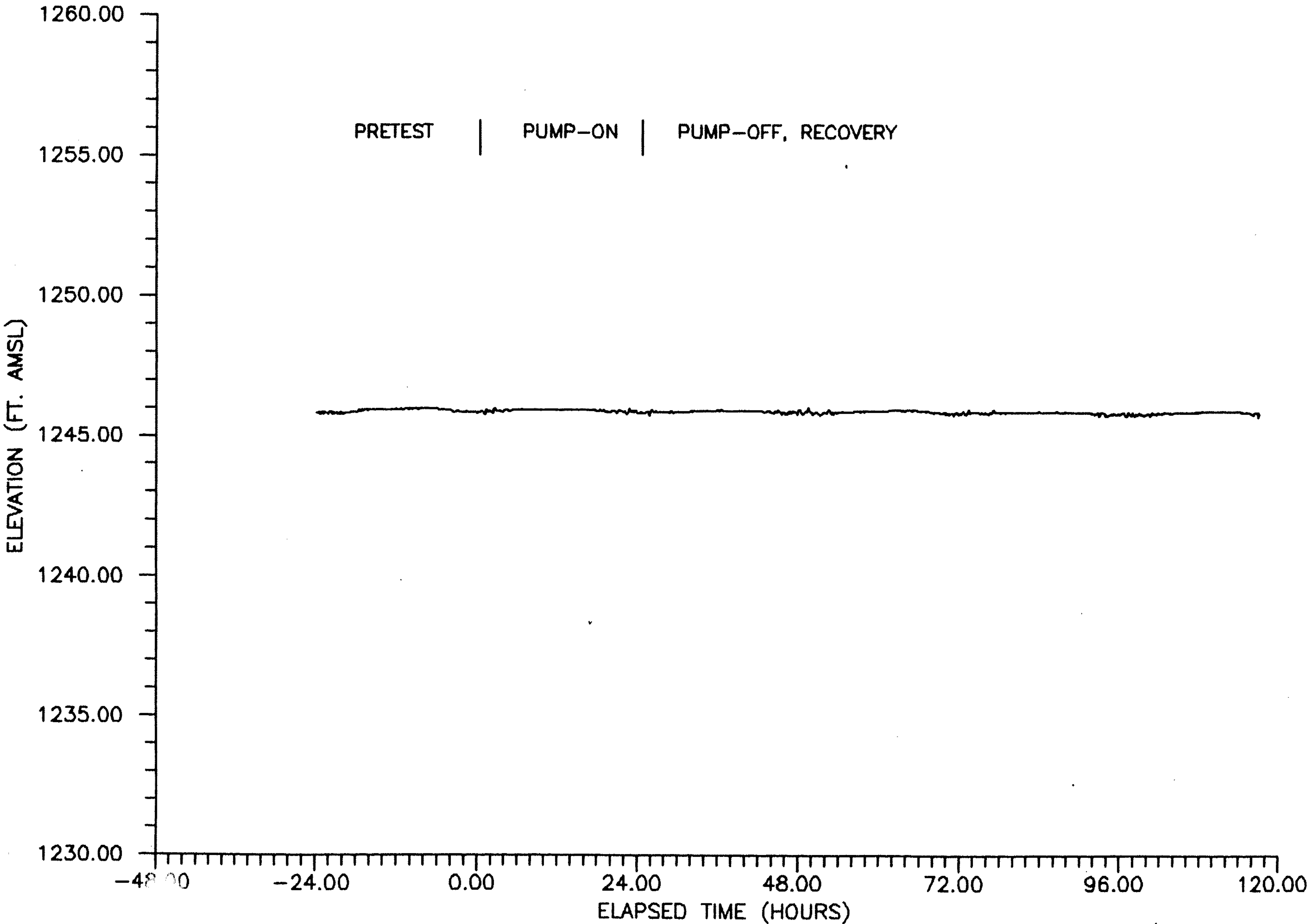
I.R.A. PROGRAM
VACAIR SITE, FREWSBURG, NEW YORK

CRA



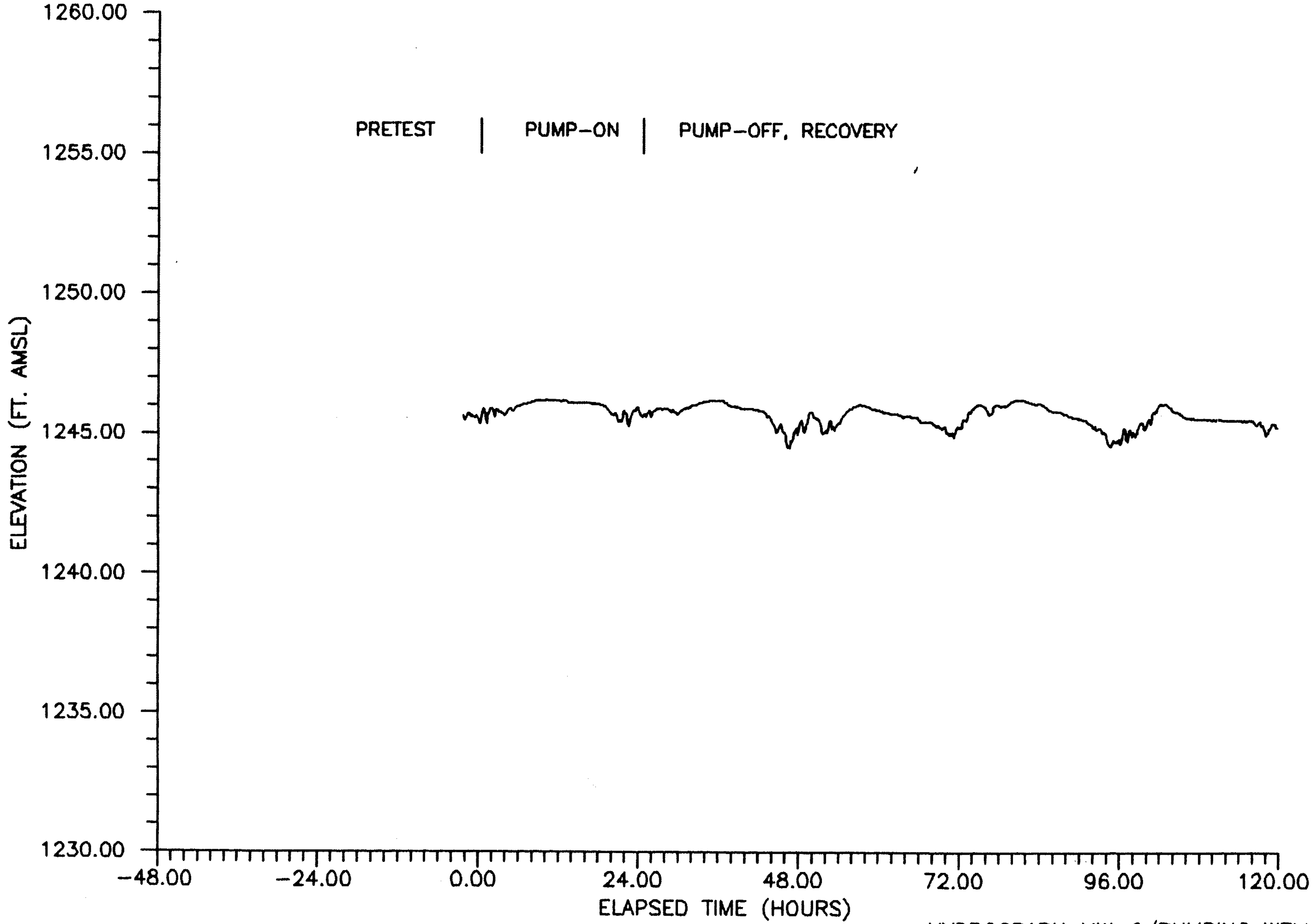
HYDROGRAPH MW-3/PUMPING WELL VAF-1
I.R.A. PROGRAM
VACAIR SITE, FREWSBURG, NEW YORK

CRA



HYDROGRAPH MW-7/PUMPING WELL VAF-1
I.R.A. PROGRAM
VACAIR SITE, FREWSBURG, NEW YORK

CRA



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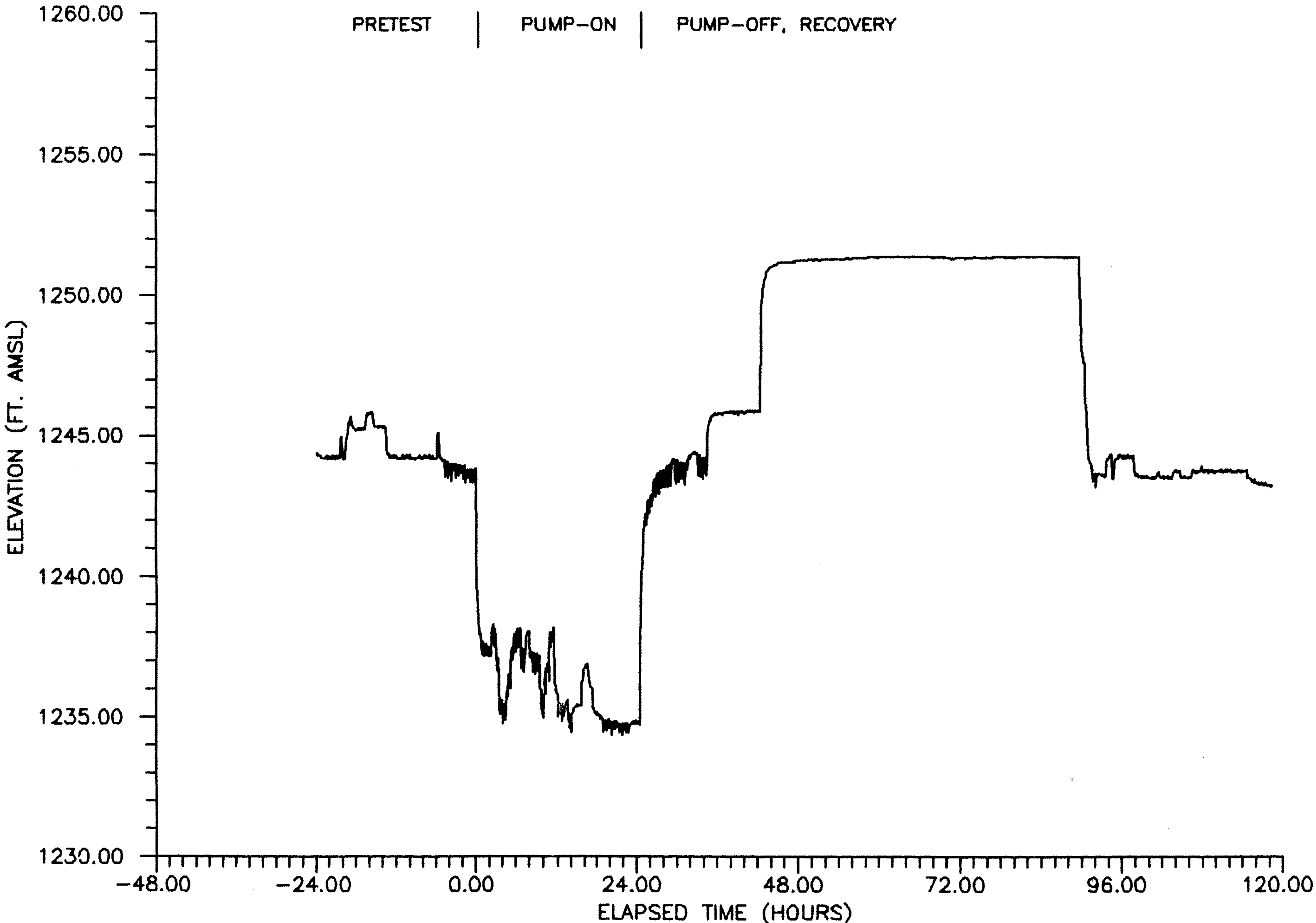
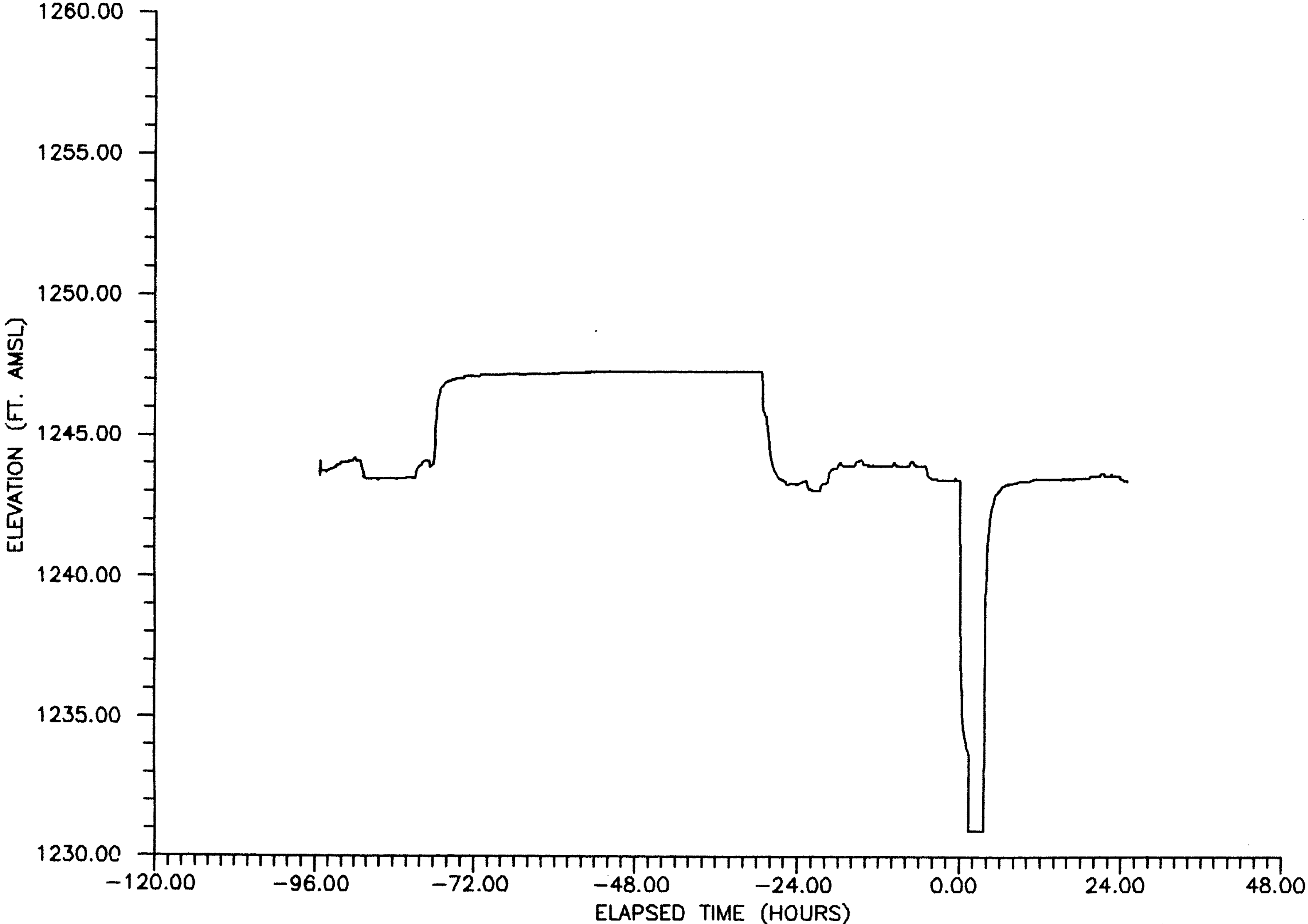
I.R.A. PROGRAM
VACAIR SITE, FREWSBURG, NEW YORK

CRA



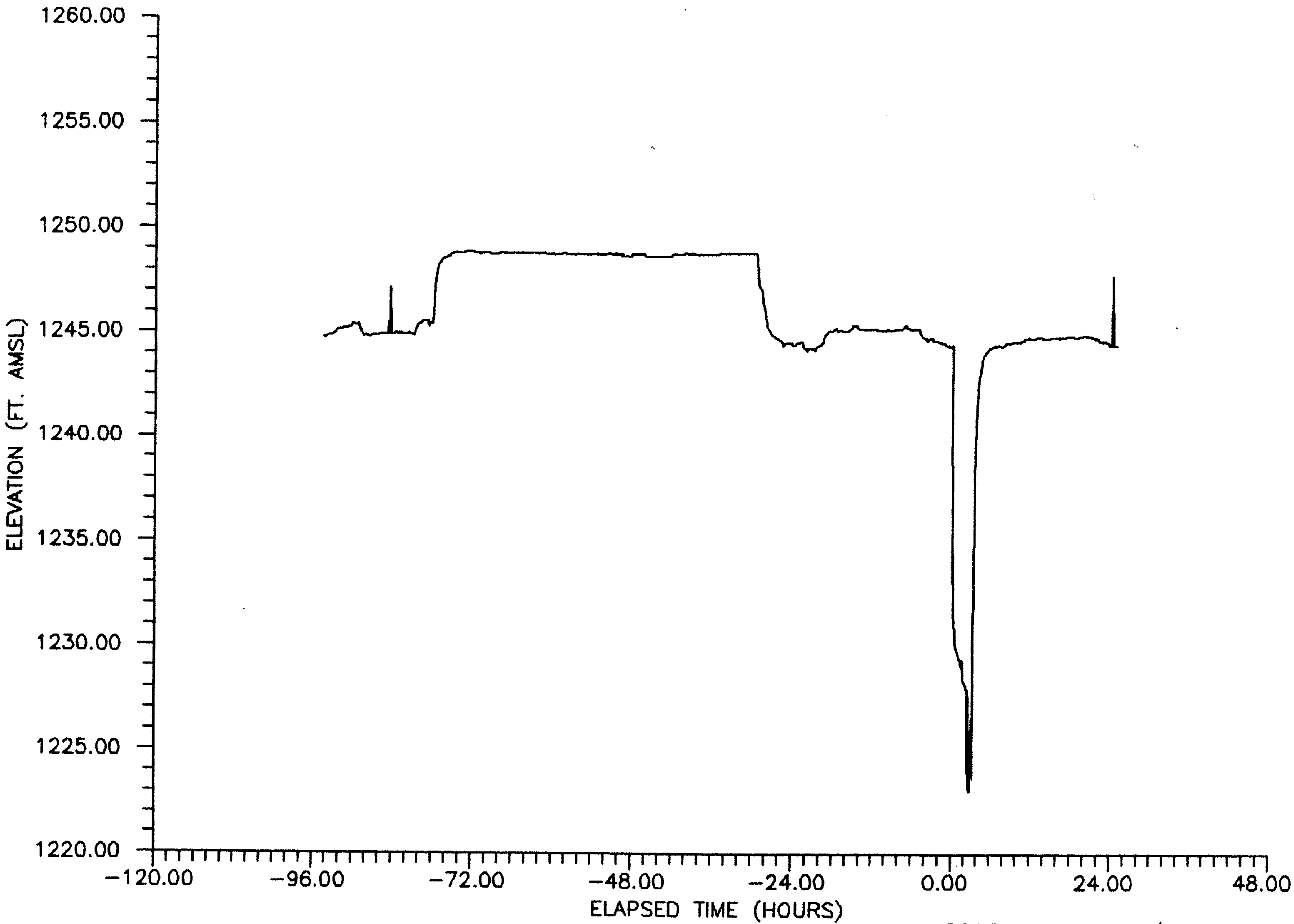
HYDROGRAPH MP-1/PUMPING WELL VAF-1
I.R.A. PROGRAM
VACAIR SITE, FREWSBURG, NEW YORK

CRA



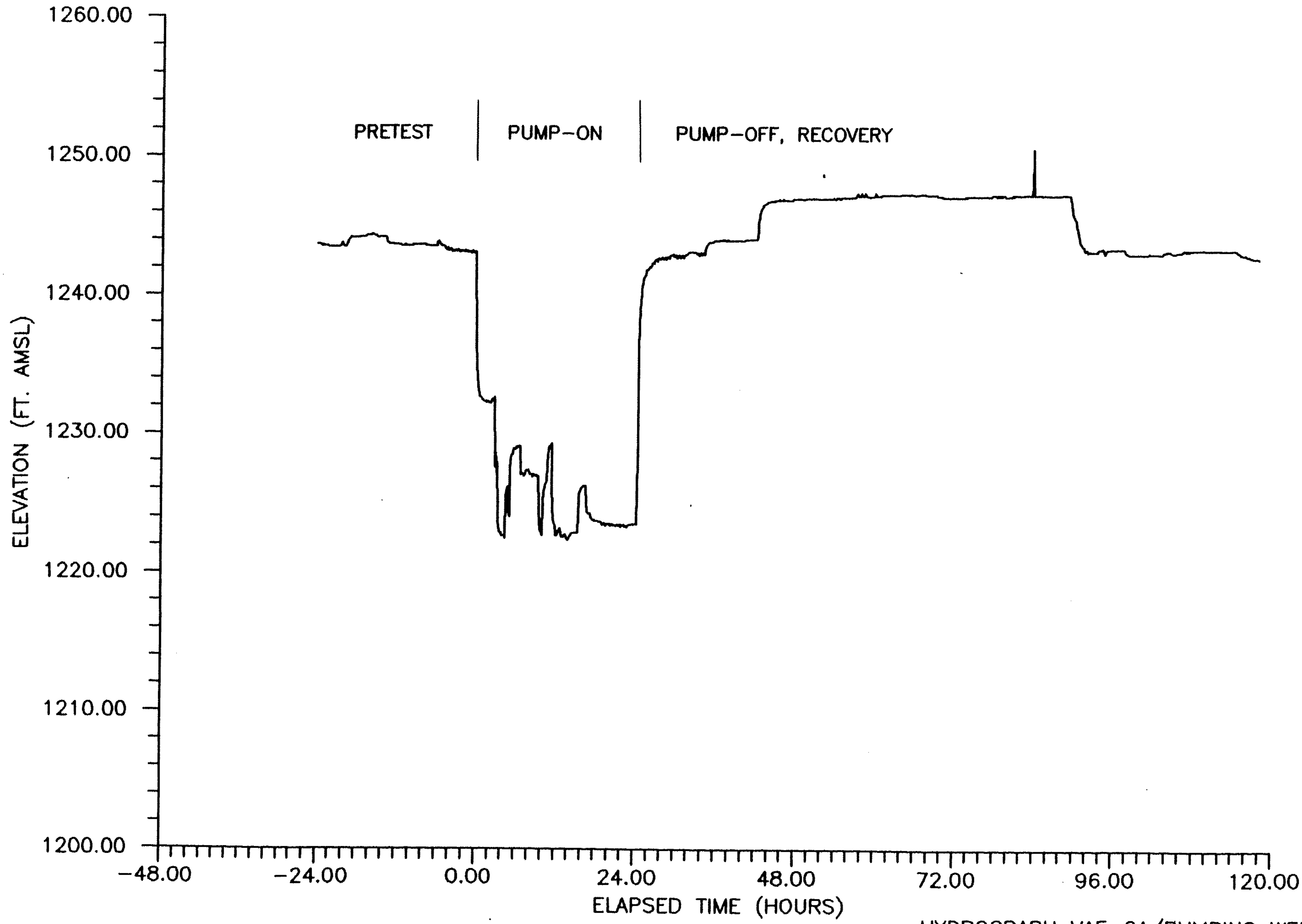
HYDROGRAPH VAF−1/STEP TEST
I.R.A. PROGRAM
VACAIR SITE, FREWSBURG, NEW YORK

CRA



HYDROGRAPH VAF−2A/STEP TEST
I.R.A. PROGRAM
VACAIR SITE, FREWSBURG, NEW YORK

CRA



HYDROGRAPH VAF-2A/PUMPING WELL VAF-1
I.R.A. PROGRAM
VACAIR SITE, FREWSBURG, NEW YORK

CRA

APPENDIX G

SOIL SAMPLING DATA REPORTS

Huntingdon
Consulting Engineers Environmental Scientists

Empire Soils Investigations, Inc., Division

Corporate Offices
140 Telegraph Road
Box 297
Middleport, New York 14105
(716)735-3502
Fax: (716)735-9027

GEOTECHNICAL TESTING REPORT
VAC-AIR
FREWSBURG, NEW YORK

FOR:
CONESTOGA-ROVERS & ASSOCIATES
NIAGARA FALLS, NEW YORK

JOB NO. BD-92-022
MAY, 1992

Huntingdon
Consulting Engineers Environmental Scientists

Empire Soils Investigations, Inc., Division

Corporate Offices
140 Telegraph Road
Box 297
Middleport, New York 14105
(716)735-3502
Fax: (716)735-9027

June 1, 1992

Mr. Doug Oscar
Conestoga-Rovers & Associates
7703 Niagara Falls Boulevard
Niagara Falls, New York 14304

Dear Mr. Oscar:

SUBJECT: **GEOTECHNICAL TESTING, SOIL SAMPLES**
VAC-AIR, FREWSBURG, NEW YORK

Transmitted herewith are the results of geotechnical testing performed on soil samples from the subject project.

A total of three (3) tube samples and one (1) jar sample was delivered to our laboratory in Middleport, New York May 6, 1992, and catalogued and identified as follows:

LAB NO.	BORING NO.	SAMPLE DEPTH (FT)	SAMPLE TYPE
1228.001	MW-1D	31.0 - 33.0	TUBE
1228.002	MW-8D	44.0 - 46.0	TUBE
1228.003	MW-5D	48.0 - 50.0	TUBE
1228.004	MW-5D	36.0 - 44.0	JAR(S)

You had advised us that samples from Boring No. MW-5D could be contaminated with low levels of TCE and therefore would require special handling in the laboratory.

After visual examination of the samples, we notified you that additional sample material would be desirable for Lab No. 1228.004 due to the coarse grained nature of the material (Frewsburg Aquifer). An additional four (4) jars of this material was delivered to our laboratory on May 26, 1992, and combined with the original sample.

As you requested, we have performed grain size distribution test (ASTM D 422) on all the samples. Individual grain size distribution reports are presented in Appendix A.

In addition, you requested flexible wall permeability test (ASTM D 5084) on material from the thin wall tube samples. Permeability test reports are contained in Appendix B.

Huntingdon
Consulting Engineers Environmental Scientists

Empire Soils Investigations, Inc., Division
Corporate Offices
140 Telegraph Road
Box 297
Middleport, New York 14105
(716)735-3502
Fax: (716)735-9027

The material contained in the tube samples was identified as glacial lake sediments. Lab Nos. 1228.001 and 1228.003 exhibited distinct varves approximately ¾" to 1" thick inclined at about five degrees from horizontal. Lab No. 1228.002 contained a trace of gravel and exhibited faint horizontal sedimentation bedding.

It has been a pleasure working with your firm on this interesting project. Should you have any questions, or in case we may be of further service, do not hesitate to contact the undersigned at 716-735-3400.

Respectfully submitted,

Jorgen F. Christiansen

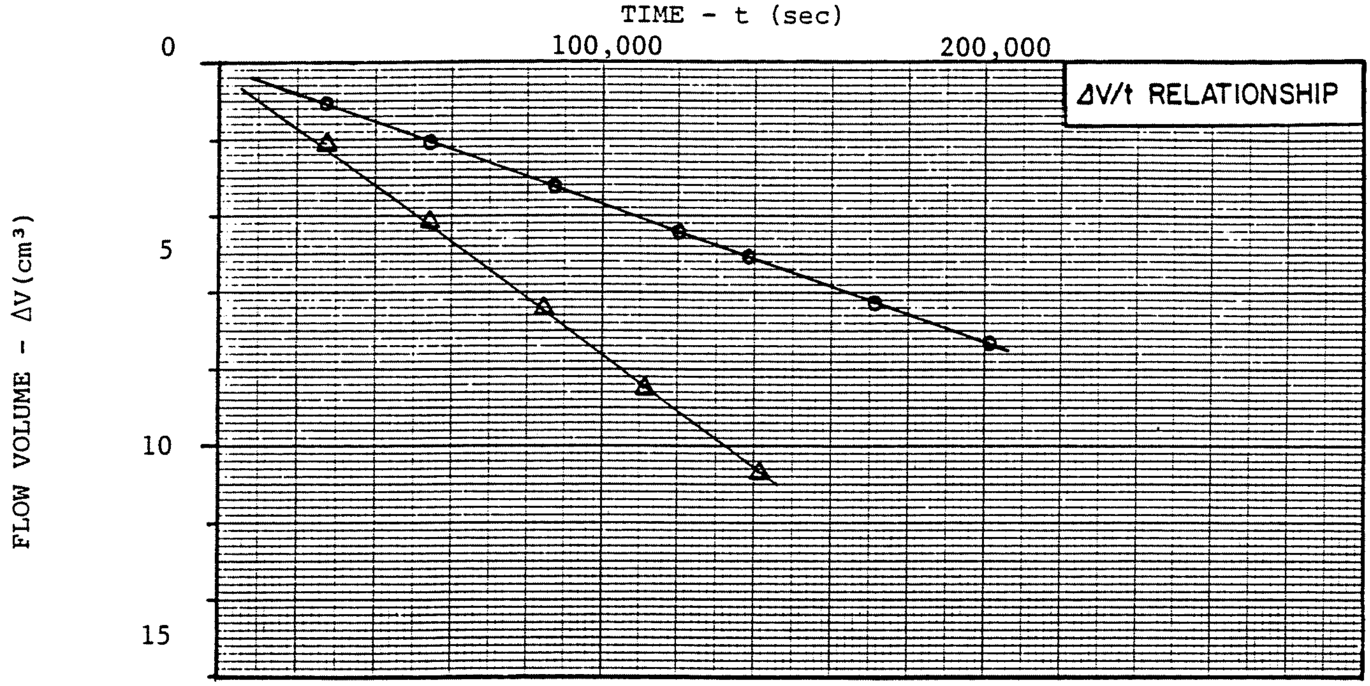
Jorgen F. Christiansen, PE
Senior Scientist, Geotechnical Testing

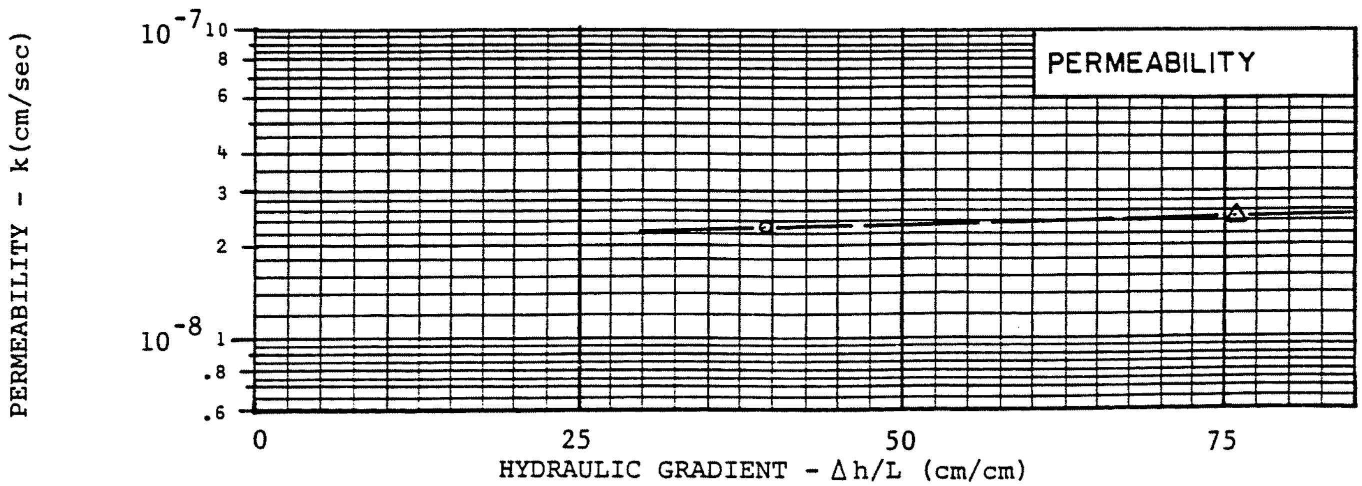
JFC/srk

Enclosures

APPENDIX A
GRAIN SIZE DISTRIBUTION

TEST DATA:			SAMPLE DATA:
Specimen Height (cm):		9.36	Sample Identification: LAB NO. 1228.003
Specimen Diameter (cm):		7.19	BORING MW 5D; 48.0' - 50.0'
Dry Unit Weight (pcf):		91.8	Visual Description: Grey SILT & CLAY,
Moisture Content Before Test (%):		32.5	slightly inclined varves
Moisture Content After Test (%):		32.9	Remarks:
Cell Confining Pressure (psi):		95.0	
Test Pressure (psi):	85.2	90.0	Maximum Dry Density
Back Pressure (psi):	80.2	80.1	(ASTM D ____) (pcf):
Differential Head (psi):	5.0	9.9	Optimum Moisture Content (%):
Flow Rate ($\Delta V/t$)(cm^3/sec)	O 3.60×10^{-5}	Δ 7.49×10^{-5}	Percent Compaction:
Permeability (cm/sec):	O 2.26×10^{-8}	Δ 2.43×10^{-8}	Permeameter Type: FLEXIBLE WALL





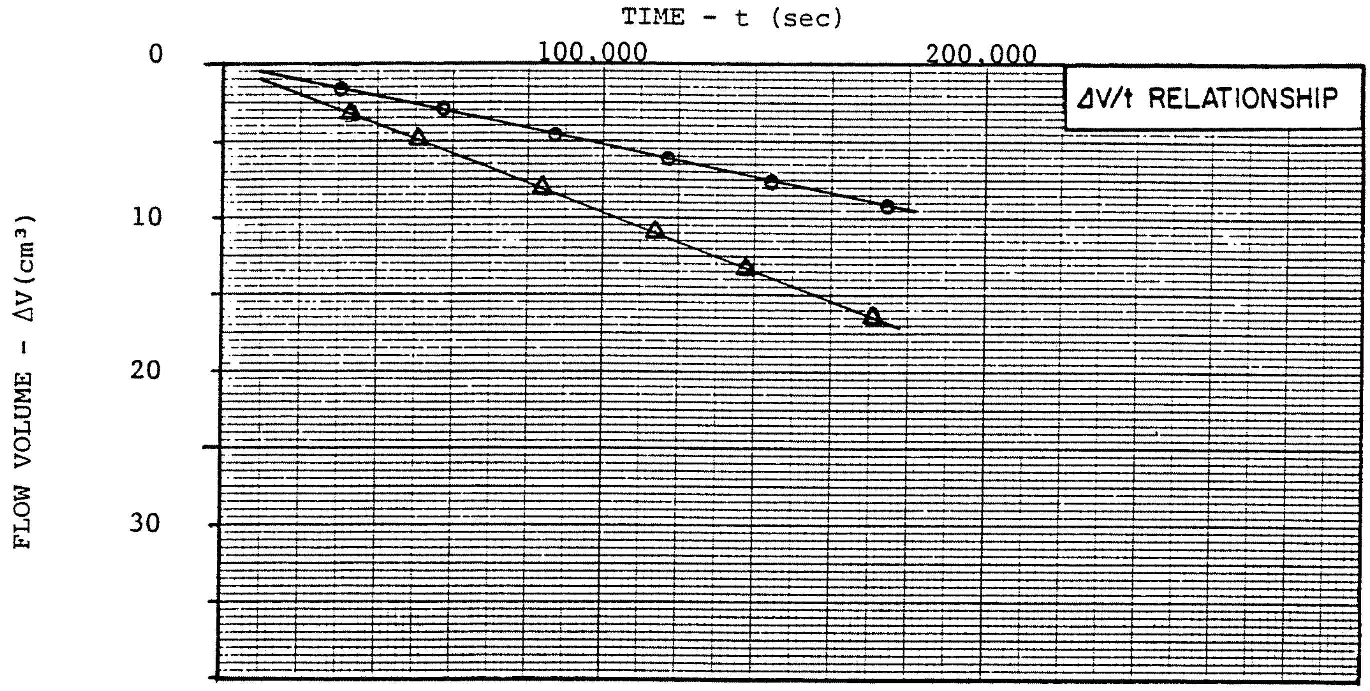
EMPIRE SOILS INVESTIGATIONS INC.

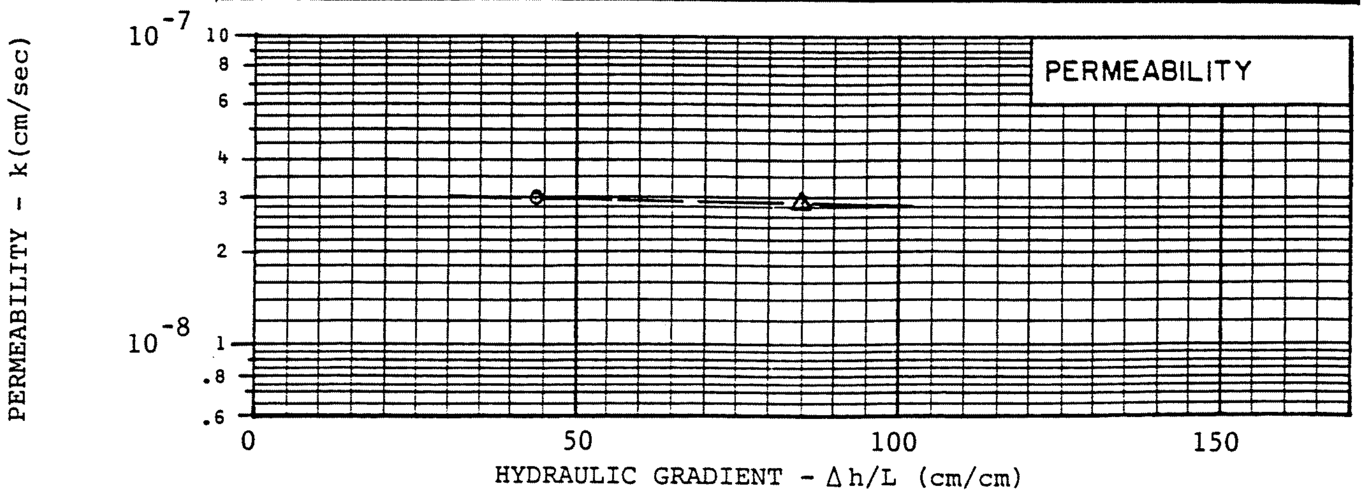
PERMEABILITY TEST REPORT

VAC-AIR
FREWSBURG, NEW YORK

DR BY:	CK'D:	DATE: MAY	PROJ.NO.

TEST DATA:			SAMPLE DATA:
Specimen Height (cm):		8.46	Sample Identification: LAB NO. 1228.002
Specimen Diameter (cm):		7.16	BORING MW-8D, 44.0' - 46.0'
Dry Unit Weight (pcf):		107.3	Visual Description: Grey SILT & CLAY,
Moisture Content Before Test (%):		23.1	trace gravel
Moisture Content After Test (%):		21.6	Remarks:
Cell Confining Pressure (psi):		95.0	
Test Pressure (psi):	85.1	90.2	Maximum Dry Density
Back Pressure (psi):	80.1	80.2	(ASTM D ____) (pcf):
Differential Head (psi):	5.0	10.0	Optimum Moisture Content (%):
Flow Rate ($\Delta V/t$)(cm^3/sec)	O 5.25×10^{-5}	Δ 9.67×10^{-5}	Percent Compaction:
Permeability (cm/sec):	O 2.99×10^{-8}	Δ 2.83×10^{-8}	Permeameter Type: FLEXIBLE WALL





EMPIRE SOILS INVESTIGATIONS INC.

PERMEABILITY TEST REPORT

VAC-AIR
FREWSBURG, NEW YORK

DR BY: JFC	CK'D. JFC	DATE: MAY, 1992	PROJ.NO. BD-92-022

TEST DATA:

Specimen Height (cm): 6.33

Specimen Diameter (cm): 7.19

Dry Unit Weight (pcf): 88.2

Moisture Content Before Test (%): 35.3

Moisture Content After Test (%): 35.0

Cell Confining Pressure (psi): 95.0

Test Pressure (psi): 85.0 | 90.2

Back Pressure (psi): 79.2 | 78.7

Differential Head (psi): 5.8 | 11.5

Flow Rate (ΔV/t)(cm³/sec) O 4.79×10^{-5} Δ 8.82×10^{-5}

Permeability (cm/sec): O 1.75×10^{-8} Δ 1.66×10^{-8}

SAMPLE DATA:

Sample Identification: LAB NO. 1228.001

BORING MW-1D, 31.0' - 33.0'

Visual Description: Grey SILT & CLAY, slightly inclined varves

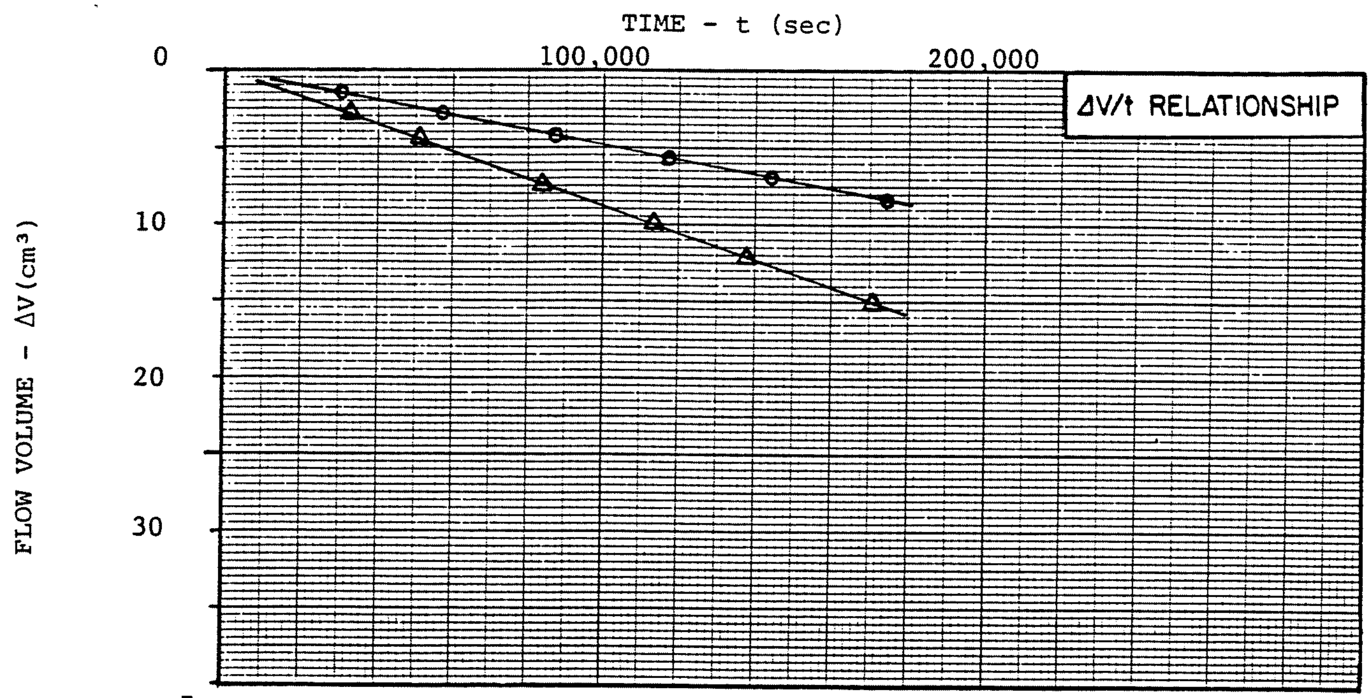
Remarks:

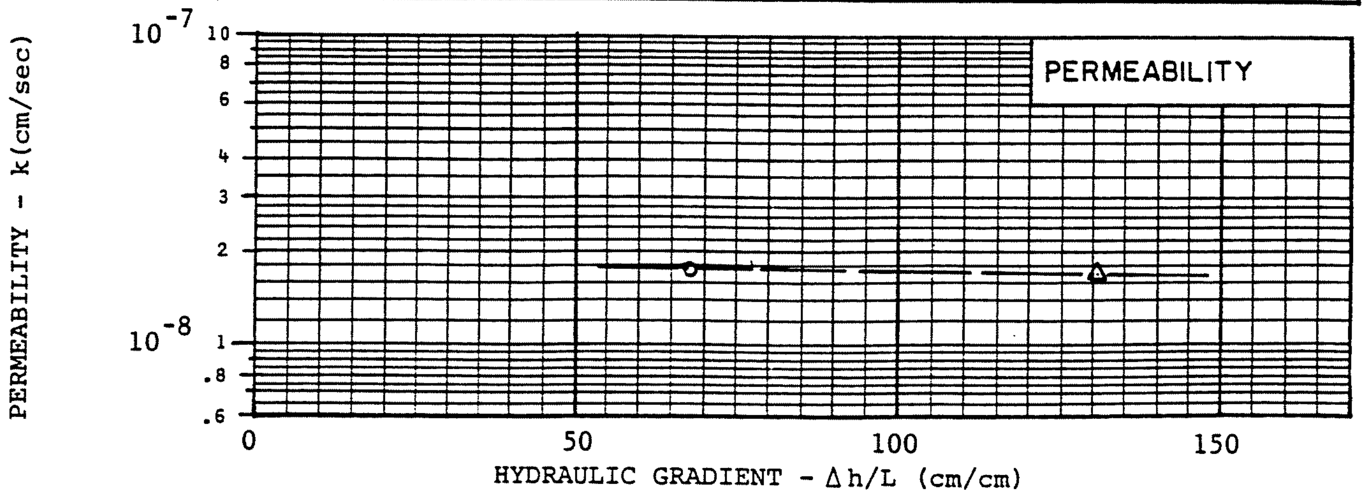
Maximum Dry Density (ASTM D ____) (pcf):

Optimum Moisture Content (%):

Percent Compaction:

Permeameter Type: FLEXIBLE WALL





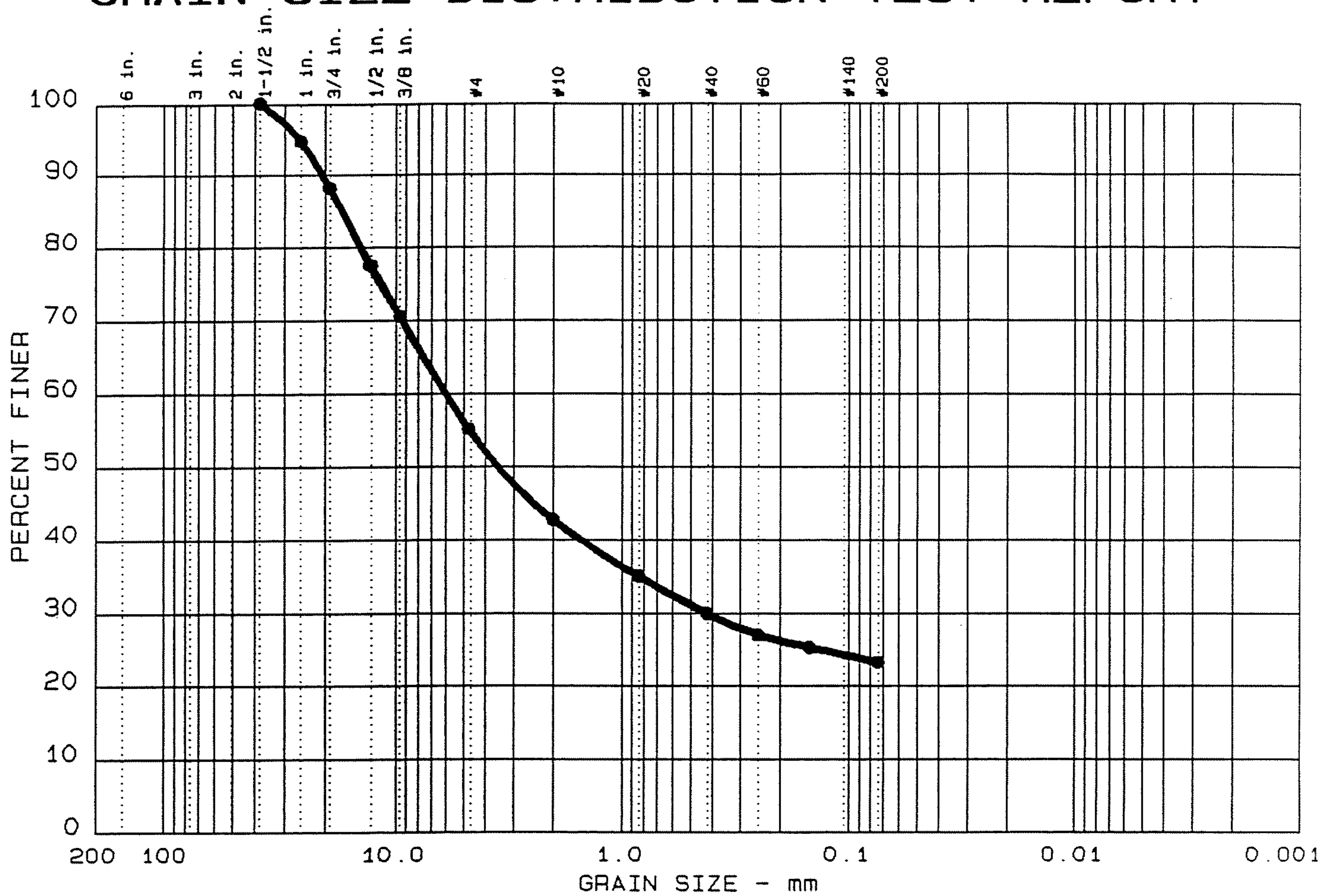
EMPIRE SOILS INVESTIGATIONS INC.

PERMEABILITY TEST REPORT

VAC-AIR
FREWSBURG, NEW YORK

APPENDIX B
PERMEABILITY TESTS

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	2	0.0	44.9	31.9	23.2	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			16.79	6.03	3.51	0.427				

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN GRAVEL, Some Sand & Fines		

Project No.: BD-92-022

Project: VAC - AIR

● Location: MW-5D / S-9 & S-10 & S-12 / 36'- 44'

Date: MAY 29, 1992

GRAIN SIZE DISTRIBUTION TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC

Remarks:

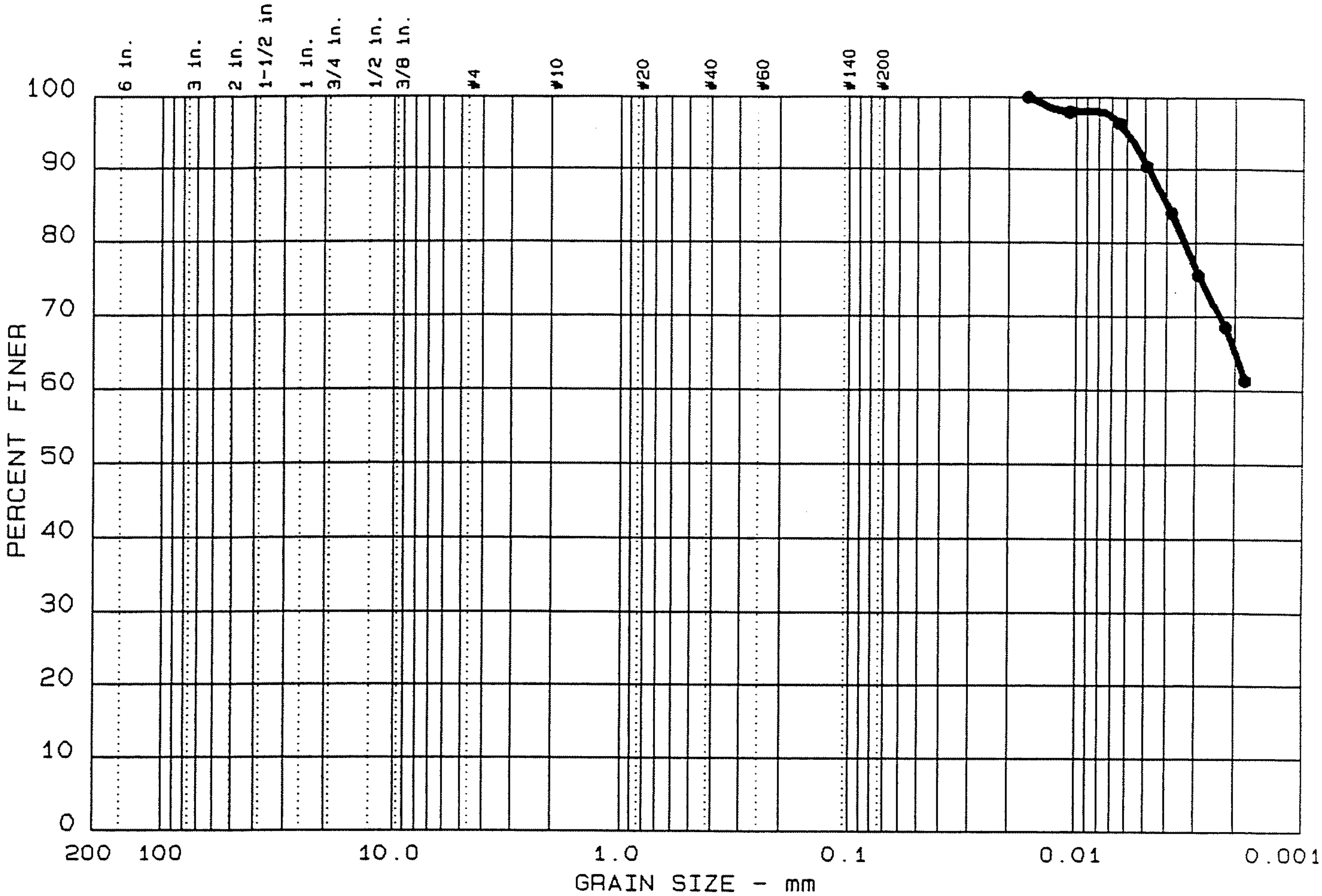
CLIENT: CONESTOGA ROVERS ASSOCIATES

WATER CONTENT: 8.8%

LAB NO. 1228.004

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	1	0.0	0.0	0.0	9.1	90.9

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●										

MATERIAL DESCRIPTION	USCS	AASHTO
● BROWN CLAY, trace silt		

Project No.: BD-92-022
Project: VAC - AIR
● Location: MW-5D / 48'- 50'

Date: MAY 29, 1992

GRAIN SIZE DISTRIBUTION TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC

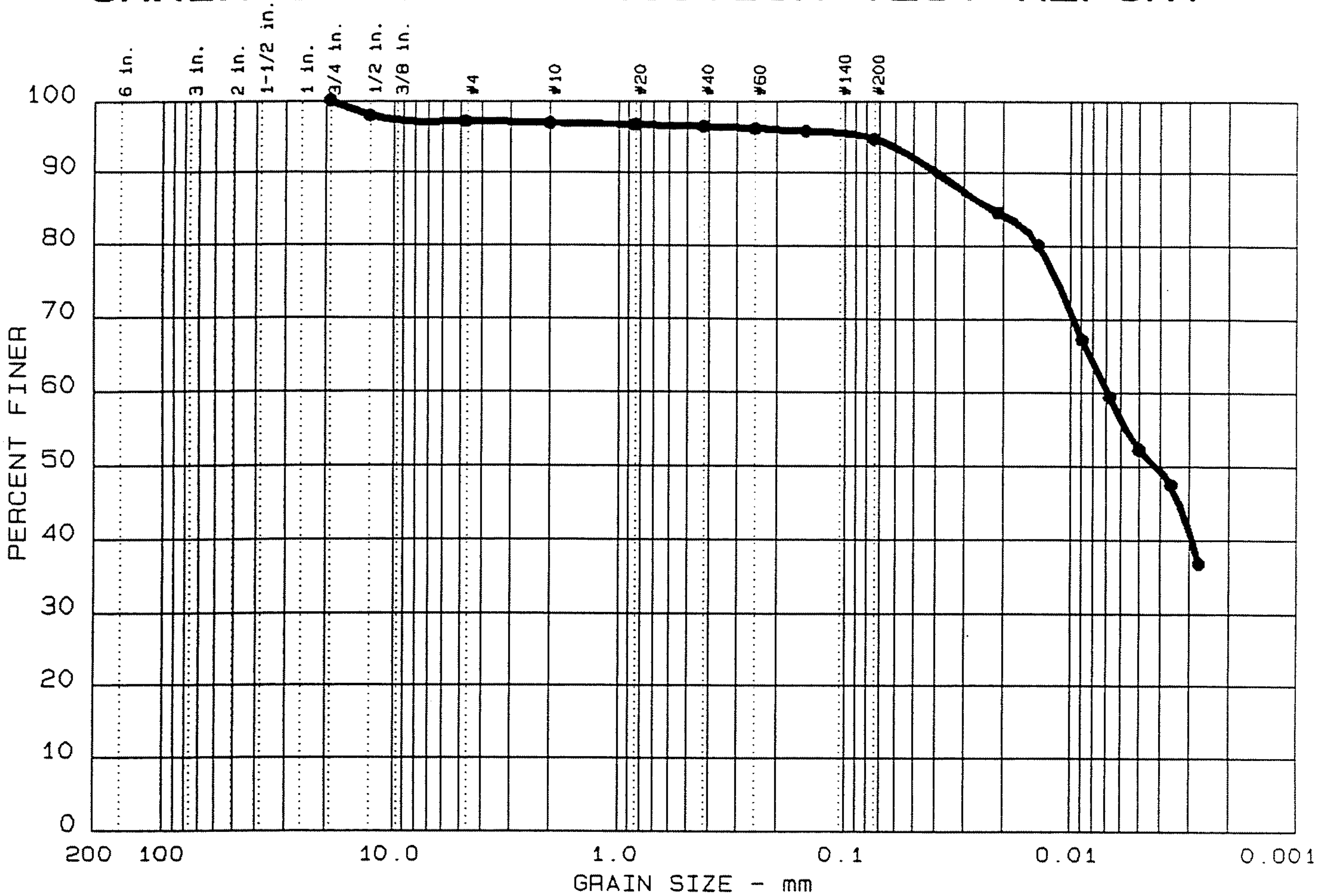
Remarks:

CLIENT: CONESTOGA ROVERS ASSOCIATES

LAB NO. 1228.003

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
●	6	0.0	2.9	2.5	42.5	52.1

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●					0.00					

MATERIAL DESCRIPTION	USCS	AASHTO
● GREY CLAY AND SILT, trace gravel & sand		

Project No.: BD-92-022
Project: VAC-AIR
● Location: MW-8D / 44'- 46'

Date: MAY 21, 1992

GRAIN SIZE DISTRIBUTION TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC

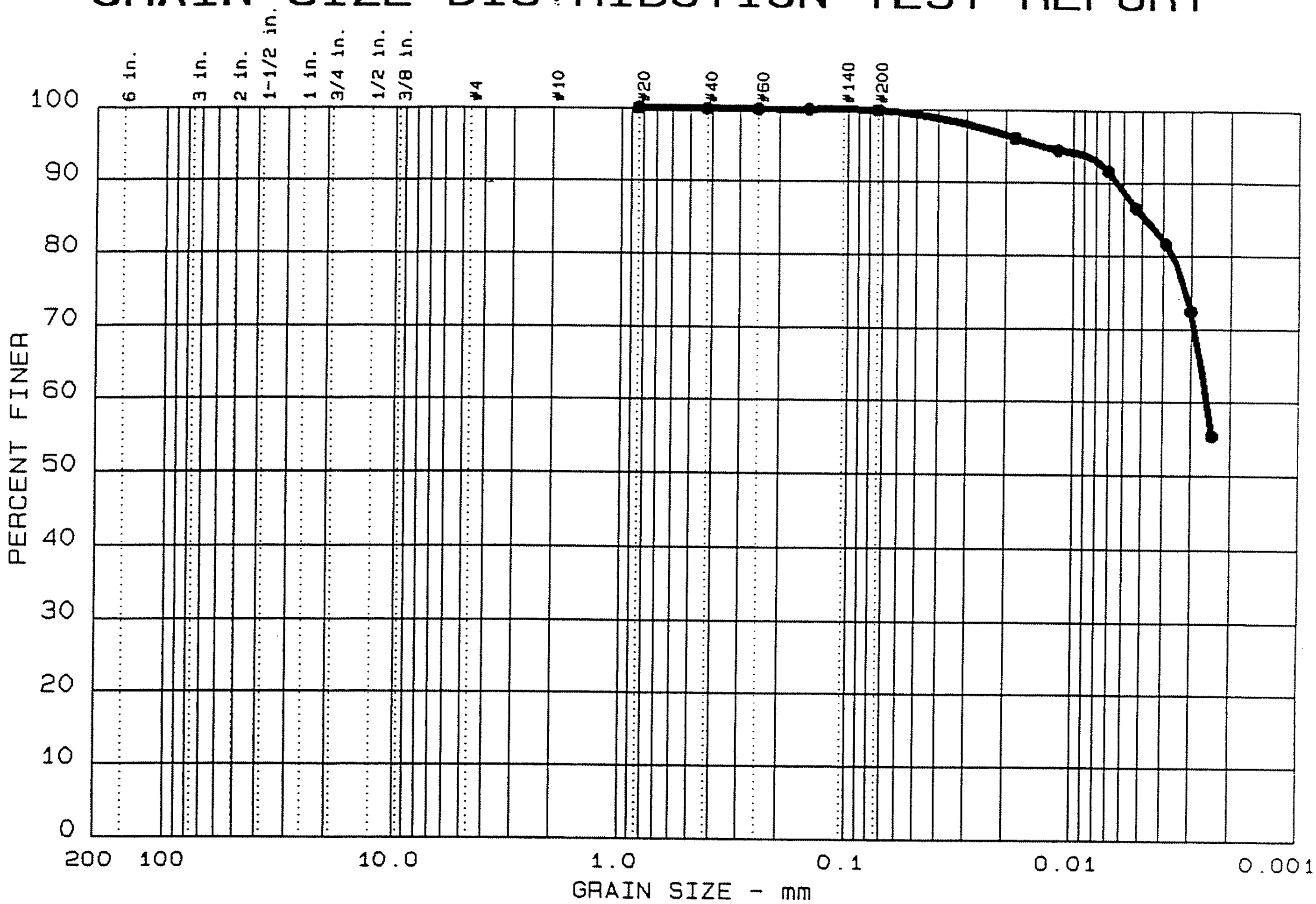
Remarks:

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

LAB NO. 1228.002

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
● 5	0.0	0.0	0.2	14.2	85.6

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●										

MATERIAL DESCRIPTION	USCS	AASHTO
● GREY CLAY, Little Silt, trace sand		

Project No.: BD-92-022
Project: VAC-AIR
● Location: MW-1D / 31'- 33'

Date: MAY 21, 1992

GRAIN SIZE DISTRIBUTION TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC

Remarks:

CLIENT: CONESTOGA-ROVERS & ASSOCIATES

LAB NO. 1228.001

Figure No. 1

H

APPENDIX H

GROUNDWATER SAMPLING DATA REPORTS

H2M LABS, INC.

CONESTOGA - ROVERS & ASSOCIATES

VAC-AIR ALLOYS SITE
PROJECT: 2326
SAMPLES RECEIVED 4/09/92 & 4/17/92
CRA028

TABLE OF CONTENTS

H2M LABS, INC.

I. CHAIN OF CUSTODY DOCUMENTATION

CRA Consulting Engineers
CONESTOGA-ROVERS & ASSOCIATES
651 Colby Drive, Waterloo, Ontario Canada N2V 1C2

SHIPPED TO (Laboratory name): H2M LABS

CHAIN OF CUSTODY RECORD

PROJECT Nº: 2326

PROJECT NAME: VAC-AIR ALLOYS I.R.A. PROGRAM

SAMPLER'S SIGNATURE (SIGN) [signature]

SEQ. Nº	SAMPLE Nº	DATE	TIME	SAMPLE LOCATOIN	SAMPLE TYPE	Nº OF CONTAINERS	REMARKS
	S-7	4/6/92	1315	MW-5D, 34'		1	TOC
	S-13	4/7/92	1415	MW-5D, 44-46'		1	TOC
	S-15	4/7/92	1445			1	TOC
				TOTAL NUMBER OF CONTAINERS		3	

NOTE: ANALYZE EACH SAMPLE FOR TOC

9211064 → 066

ANTICIPATED CHEMICAL HAZARDS: POSSIBLE ORGANICS

RELINQUISHED BY:	DATE/TIME	RECEIVED BY:
1 [signature] (SIGN)	04/08/92 1930	2 (SIGN)
2 (SIGN)		3 (SIGN)
3 (SIGN)		4 (SIGN)
ADDITIONAL SIGNATURE SHEET REQUIRED ☐		

METHOD OF SHIPMENT:	SHIPPED BY:	RECEIVED FOR LABORATORY BY:	DATE/TIME
FED EX	D. OSCAR	(SIGN) [signature]	4-9-92 0930

CONDITION OF SEAL UPON RECEIPT: GENERAL CONDITION OF COOLER:	COOLER OPENED BY:	DATE/TIME
	(SIGN) [signature]	4-9-92 1000

WHITE – CRA OFFICE COPY
YELLOW – RECEIVING LABORATORY COPY
PINK – CRA LABORATORY COPY
GOLDEN ROD – SHIPPERS

A 0003

Nº 20143

CRA Consulting Engineers
CONESTOGA-ROVERS & ASSOCIATES
651 Colby Drive, Waterloo, Ontario Canada N2V 1C2

SHIPPED TO (Laboratory name): H2M LABS

CHAIN OF CUSTODY RECORD

PROJECT Nº: 2326

PROJECT NAME: VAC AIR

SAMPLER'S SIGNATURE (SIGN)

SEQ. Nº	SAMPLE Nº	DATE	TIME	SAMPLE LOCATOIN	SAMPLE TYPE	Nº OF CONTAINERS	REMARKS
	RB-415	4/15/92	1030	RB-415	WATER	2	VOC'S
	MW-4A		1045	MW-4A		2	VOC'S
	MW-5D		1100	MW-5D		2	VOC'S
	"		"	"		2	MS/MSD
	T-1		1355	T-1		2	VOC'S
	TRIP BLANK	4/8/92	—	TRIP BLANK		2	VOCS
	NOTE;	AIR	BUBBLES IN BOTH				
		TRIP	BLANK VIALS!				
				TOTAL NUMBER OF CONTAINERS		12	

ANTICIPATED CHEMICAL HAZARDS: UNKNOWN

RELINQUISHED BY: 1 (SIGN)	DATE/TIME 4/16/92 1100	RECEIVED BY: 2 (SIGN)
RELINQUISHED BY: 2 (SIGN)	DATE/TIME	RECEIVED BY: 3 (SIGN)
RELINQUISHED BY: 3 (SIGN)	DATE/TIME	RECEIVED BY: 4 (SIGN)
ADDITIONAL SIGNATURE SHEET REQUIRED ☐		

METHOD OF SHIPMENT: FED EX.	SHIPPED BY: D. OSCAR	RECEIVED FOR LABORATORY BY: (SIGN)	DATE/TIME 4-17-92 0930
CONDITION OF SEAL UPON RECEIPT: GENERAL CONDITION OF COOLER:		COOLER OPENED BY: (SIGN)	DATE/TIME 4-17-92 0930

WHITE – CRA OFFICE COPY
YELLOW – RECEIVING LABORATORY COPY
PINK – CRA LABORATORY COPY
GOLDEN ROD – SHIPPERS

9213286 → 290

A 0004

Nº 20151

H2M LABS, INC.

II. SAMPLE REPORTS

H2M LABS, INC.
575 Broad Hollow Road, Melville, N.Y. 11747
(516)694-3040 FAX:(516)694-4122

LAB NO: 9211065

CONESTOGA-ROVER & ASSOCIATES
MR. BILL HAMEL
7702 NIAGARA FALLS BLVD.
NIAGARA FALLS, NY 14304

TYPE...... SOIL
ROUTINE
METHOD.... GRAB

DATE COLLECTED. 04/07/92
DATE RECEIVED.. 04/09/92
COLLECTED BY... CL99
PROJECT NO..... 2326

POINT NO:
LOCATION: S-13

REMARKS: VAC-AIR ALLOYS
I.R.A. PROGRAM

Analyzed - 5/3/92

PARAMETER (S)	RESULTS	UNITS
TOTAL ORGANIC CARBON(TOC)	1570	mg/kg
TOTAL SOLIDS	91.0	%

COPIES TO:

DATE ISSUED 05/06/92

Stanley Isaacson
LABORATORY DIRECTOR

ORIGINAL

A 0097

H2M LABS, INC.
575 Broad Hollow Road, Melville, N.Y. 11747
(516)694-3040 FAX:(516)694-4122

LAB NO: 9211066

CONESTOGA-ROVER & ASSOCIATES
MR. BILL HAMEL
7702 NIAGARA FALLS BLVD.
NIAGARA FALLS, NY 14304

TYPE...... SOIL
ROUTINE
METHOD.... GRAB

DATE COLLECTED. 04/07/92
DATE RECEIVED.. 04/09/92
COLLECTED BY... CL99
PROJECT NO..... 2326

POINT NO:
LOCATION: S-15

REMARKS: VAC-AIR ALLOYS
I.R.A. PROGRAM

Analysis date 5/3/92

PARAMETER (S)	RESULTS	UNITS
TOTAL ORGANIC CARBON(TOC)	4090	mg/kg
TOTAL SOLIDS	77.6	%

COPIES TO:

DATE ISSUED 05/06/92

Stanley [signature]
LABORATORY DIRECTOR

ORIGINAL

A 0008

H2M LABS, INC.

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Method 502.2)

SAMPLE NO.

MW-4A

Lab Name: H2M LABS, INC. Contract:

Lab Code: Case No: CRA28 SAS No: SDG No: CRA028

Matrix: Water Lab Sample ID: 9212286

Sample vol.: 5 mls Lab File ID: PE06

Column: (pack/cap) cap Date Received: 4/17/92

Dilution Factor 1.0 Date Analyzed: 4/22/92

CAS NO.	COMPOUND	CONC UNITS ug/L	Q
75-71-8	Dichlorodifluoromethane	0.5	U
74-87-3	Chloromethane	0.5	U
75-01-4	Vinyl Chloride	0.5	U
74-83-9	Bromomethane	0.5	U
75-00-3	Chloroethane	0.5	U
75-69-4	Trichlorofluoromethane	0.5	U
75-35-4	1,1-Dichloroethene	0.5	U
75-09-2	Methylene Chloride	0.5	U
156-60-5	trans-1,2-Dichloroethene	0.5	U
75-34-3	1,1-Dichloroethane	0.5	U
590-20-7	2,2-Dichloropropane	0.5	U
540-59-0	cis-1,2-Dichloroethene	0.5	U
67-66-3	Chloroform	0.5	U
74-97-5	Bromochloromethane	0.5	U
71-55-6	1,1,1-Trichloroethane	0.5	U
563-58-6	1,1-Dichloropropene	0.5	U
56-23-5	Carbon Tetrachloride	0.5	U
107-06-2	1,2-Dichloroethane	0.5	U
79-01-6	Trichloroethene	0.5	U
78-87-5	1,2-Dichloropropane	0.5	U
75-27-4	Bromodichloromethane	0.5	U
74-95-3	Dibromomethane	0.5	U
10061-01-5	cis-1,3-Dichloropropene	0.5	U
10061-02-6	trans-1,3-Dichloropropene	0.5	U
79-00-5	1,1,2-Trichloroethane	0.5	U
142-28-9	1,3-Dichloropropane	0.5	U
127-18-4	Tetrachloroethene	0.5	U
124-48-1	Dibromochloromethane	0.5	U
108-90-7	Chlorobenzene	0.5	U

DATE REPORTED: MAY 0 6 1992

JMSlavin

John J. Molloy, P.E.
Laboratory Director

H2M LABS, INC.

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Method 502.2)

SAMPLE NO.

MW-4A

Lab Name: H2M LABS, INC. Contract: ______

Lab Code: ______ Case No: CRA28 SAS No: ______ SDG No: CRA028

Matrix: Water Lab Sample ID: 9212286

Sample vol.: 5 mls Lab File ID: PE06

Column: (pack/cap) cap Date Received: 4/17/92

Dilution Factor 1.0 Date Analyzed: 4/22/92

CAS NO.	COMPOUND	CONC UNITS ug/L	Q
530-20-6	1,1,1,2-Tetrachloroethene	0.5	U
75-25-2	Bromoform	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	U
108-86-1	Bromobenzene	0.5	U
95-49-8	o-Chlorotoluene	0.5	U
106-43-4	p-Chlorotoluene	0.5	U
541-73-1	m-Dichlorobenzene	0.5	U
106-46-7	p-Dichlorobenzene	0.5	U
95-50-1	o-Dichlorobenzene	0.5	U
120-82-1	1,2,4-Trichlorobenzene	0.5	U
87-68-3	Hexachlorobutadiene	0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	U
71-43-2	Benzene	3.6	
108-88-3	Toluene	0.5	U
100-41-4	Ethylbenzene	0.5	U
108-38-3	m-Xylene	0.5	U
106-42-3	p-Xylene	0.5	U
95-47-6	o-Xylene	0.5	U
100-42-5	Styrene	0.5	U
98-82-8	Isopropylbenzene (Cumeme)	0.5	U
103-65-1	n-Propylbenzene	0.5	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
98-06-6	tert. Butylbenzene	0.5	U
95-63-6	1,2,4-Trimethylbenzene	0.5	U
135-98-8	sec-Butylbenzene	0.5	U
99-87-6	p-Isopropyltoluene (p-Cymene)	0.5	U
104-51-8	n-Butylbenzene	0.5	U
91-20-3	Naphthalene	0.5	U

DATE REPORTED: MAY 0 6 1992

John J. Molloy, P.E.
Laboratory Director

A 0010

H2M LABS, INC.

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Method 502.2)

SAMPLE NO.

MW-5D

Lab Name: H2M LABS, INC. Contract: ____________

Lab Code: ________ Case No: CRA28 SAS No: ________ SDG No: CRA028

Matrix: Water Lab Sample ID: 9212287

Sample vol.: 5 mls Lab File ID: PE03

Column: (pack/cap) cap Date Received: 4/17/92

Dilution Factor 1.0 Date Analyzed: 4/22/92

CAS NO.	COMPOUND	CONC UNITS ug/L	Q
75-71-8	Dichlorodifluoromethane	0.5	U
74-87-3	Chloromethane	0.5	U
75-01-4	Vinyl Chloride	0.5	U
74-83-9	Bromomethane	0.5	U
75-00-3	Chloroethane	0.5	U
75-69-4	Trichlorofluoromethane	0.5	U
75-35-4	1,1-Dichloroethene	0.5	U
75-09-2	Methylene Chloride	0.5	U
156-60-5	trans-1,2-Dichloroethene	0.5	U
75-34-3	1,1-Dichloroethane	0.5	U
590-20-7	2,2-Dichloropropane	0.5	U
540-59-0	cis-1,2-Dichloroethene	0.5	U
67-66-3	Chloroform	0.5	U
74-97-5	Bromochloromethane	0.5	U
71-55-6	1,1,1-Trichloroethane	0.5	U
563-58-6	1,1-Dichloropropene	0.5	U
56-23-5	Carbon Tetrachloride	0.5	U
107-06-2	1,2-Dichloroethane	0.5	U
79-01-6	Trichloroethene	0.5	U
78-87-5	1,2-Dichloropropane	0.5	U
75-27-4	Bromodichloromethane	0.5	U
74-95-3	Dibromomethane	0.5	U
10061-01-5	cis-1,3-Dichloropropene	0.5	U
10061-02-6	trans-1,3-Dichloropropene	0.5	U
79-00-5	1,1,2-Trichloroethane	0.5	U
142-28-9	1,3-Dichloropropane	0.5	U
127-18-4	Tetrachloroethene	0.5	U
124-48-1	Dibromochloromethane	0.5	U
108-90-7	Chlorobenzene	0.5	U

DATE REPORTED: MAY 0 6 1992

JMolloy

John J. Molloy, P.E.
Laboratory Director

A 0011

H2M LABS, INC.

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Method 502.2)

SAMPLE NO.

MW-5D

Lab Name: H2M LABS, INC. Contract: ______

Lab Code: ______ Case No: CRA28 SAS No: ______ SDG No: CRA028

Matrix: Water Lab Sample ID: 9212287

Sample vol.: 5 mls Lab File ID: PE03

Column: (pack/cap) cap Date Received: 4/17/92

Dilution Factor 1.0 Date Analyzed: 4/22/92

CAS NO.	COMPOUND	CONC UNITS ug/L	Q
530-20-6	1,1,1,2-Tetrachloroethene	0.5	U
75-25-2	Bromoform	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	U
108-86-1	Bromobenzene	0.5	U
95-49-8	o-Chlorotoluene	0.5	U
106-43-4	p-Chlorotoluene	0.5	U
541-73-1	m-Dichlorobenzene	0.5	U
106-46-7	p-Dichlorobenzene	0.5	U
95-50-1	o-Dichlorobenzene	0.5	U
120-82-1	1,2,4-Trichlorobenzene	0.5	U
87-68-3	Hexachlorobutadiene	0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	U
71-43-2	Benzene	3.7	
108-88-3	Toluene	0.5	U
100-41-4	Ethylbenzene	0.5	U
108-38-3	m-Xylene	0.5	U
106-42-3	p-Xylene	0.5	U
95-47-6	o-Xylene	0.5	U
100-42-5	Styrene	0.5	U
98-82-8	Isopropylbenzene (Cumeme)	0.5	U
103-65-1	n-Propylbenzene	0.5	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
98-06-6	tert. Butylbenzene	0.5	U
95-63-6	1,2,4-Trimethylbenzene	0.5	U
135-98-8	sec-Butylbenzene	0.5	U
99-87-6	p-Isopropyltoluene (p-Cymene)	0.5	U
104-51-8	n-Butylbenzene	0.5	U
91-20-3	Naphthalene	0.5	U

DATE REPORTED: MAY 0 6 1992

John J. Molloy, P.E.
Laboratory Director

A 0042

H2M LABS, INC.

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Method 502.2)

SAMPLE NO.: RB-415

Lab Name: H2M LABS, INC. Contract: ____________

Lab Code: ________ Case No: CRA28 SAS No: ________ SDG No: CRA028

Matrix: Water Lab Sample ID: 9212289

Sample vol.: 5 mls Lab File ID: PE08

Column: (pack/cap) cap Date Received: 4/17/92

Dilution Factor 1.0 Date Analyzed: 4/22/92

CAS NO.	COMPOUND	CONC UNITS ug/L	Q
75-71-8	Dichlorodifluoromethane	0.5	U
74-87-3	Chloromethane	0.5	U
75-01-4	Vinyl Chloride	0.5	U
74-83-9	Bromomethane	0.5	U
75-00-3	Chloroethane	0.5	U
75-69-4	Trichlorofluoromethane	0.5	U
75-35-4	1,1-Dichloroethene	0.5	U
75-09-2	Methylene Chloride	0.5	U
156-60-5	trans-1,2-Dichloroethene	0.5	U
75-34-3	1,1-Dichloroethane	0.5	U
590-20-7	2,2-Dichloropropane	0.5	U
540-59-0	cis-1,2-Dichloroethene	0.5	U
67-66-3	Chloroform	0.5	U
74-97-5	Bromochloromethane	0.5	U
71-55-6	1,1,1-Trichloroethane	0.5	U
563-58-6	1,1-Dichloropropene	0.5	U
56-23-5	Carbon Tetrachloride	0.5	U
107-06-2	1,2-Dichloroethane	0.5	U
79-01-6	Trichloroethene	0.5	U
78-87-5	1,2-Dichloropropane	0.5	U
75-27-4	Bromodichloromethane	0.5	U
74-95-3	Dibromomethane	0.5	U
10061-01-5	cis-1,3-Dichloropropene	0.5	U
10061-02-6	trans-1,3-Dichloropropene	0.5	U
79-00-5	1,1,2-Trichloroethane	0.5	U
142-28-9	1,3-Dichloropropane	0.5	U
127-18-4	Tetrachloroethene	0.5	U
124-48-1	Dibromochloromethane	0.5	U
108-90-7	Chlorobenzene	0.5	U

DATE REPORTED: MAY 0 6 1992

John J. Molloy
Laboratory Director

0063

H2M LABS, INC.

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Method 502.2)

SAMPLE NO.

RB-415

Lab Name: H2M LABS, INC. Contract: ______

Lab Code: ______ Case No: CRA28 SAS No: ______ SDG No: CRA028

Matrix: Water Lab Sample ID: 9212289

Sample vol.: 5 mls Lab File ID: PE08

Column: (pack/cap) cap Date Received: 4/17/92

Dilution Factor 1.0 Date Analyzed: 4/22/92

CAS NO.	COMPOUND	CONC UNITS ug/L	Q
530-20-6	1,1,1,2-Tetrachloroethene	0.5	U
75-25-2	Bromoform	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	U
108-86-1	Bromobenzene	0.5	U
95-49-8	o-Chlorotoluene	0.5	U
106-43-4	p-Chlorotoluene	0.5	U
541-73-1	m-Dichlorobenzene	0.5	U
106-46-7	p-Dichlorobenzene	0.5	U
95-50-1	o-Dichlorobenzene	0.5	U
120-82-1	1,2,4-Trichlorobenzene	0.5	U
87-68-3	Hexachlorobutadiene	0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	U
71-43-2	Benzene	0.5	U
108-88-3	Toluene	0.5	U
100-41-4	Ethylbenzene	0.5	U
108-38-3	m-Xylene	0.5	U
106-42-3	p-Xylene	0.5	U
95-47-6	o-Xylene	0.5	U
100-42-5	Styrene	0.5	U
98-82-8	Isopropylbenzene (Cumeme)	0.5	U
103-65-1	n-Propylbenzene	0.5	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
98-06-6	tert. Butylbenzene	0.5	U
95-63-6	1,2,4-Trimethylbenzene	0.5	U
135-98-8	sec-Butylbenzene	0.5	U
99-87-6	p-Isopropyltoluene (p-Cymene)	0.5	U
104-51-8	n-Butylbenzene	0.5	U
91-20-3	Naphthalene	0.5	U

DATE REPORTED: MAY 0 6 1992

J Molloy

John J. Molloy, P.E.
Laboratory Director

A 003

H2M LABS, INC.

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Method 502.2)

SAMPLE NO.

T-1

Lab Name: H2M LABS, INC. Contract: ____________

Lab Code: __________ Case No: CRA28 SAS No: ________ SDG No: CRA028

Matrix: Water Lab Sample ID: 9212288

Sample vol.: 5 mls Lab File ID: PE07

Column: (pack/cap) cap Date Received: 4/17/92

Dilution Factor 1.0 Date Analyzed: 4/22/92

CAS NO.	COMPOUND	CONC UNITS ug/L	Q
75-71-8	Dichlorodifluoromethane	0.5	U
74-87-3	Chloromethane	0.5	U
75-01-4	Vinyl Chloride	0.5	U
74-83-9	Bromomethane	0.5	U
75-00-3	Chloroethane	0.5	U
75-69-4	Trichlorofluoromethane	0.5	U
75-35-4	1,1-Dichloroethene	0.5	U
75-09-2	Methylene Chloride	0.5	U
156-60-5	trans-1,2-Dichloroethene	0.5	U
75-34-3	1,1-Dichloroethane	0.5	U
590-20-7	2,2-Dichloropropane	0.5	U
540-59-0	cis-1,2-Dichloroethene	0.5	U
67-66-3	Chloroform	0.5	U
74-97-5	Bromochloromethane	0.5	U
71-55-6	1,1,1-Trichloroethane	0.5	U
563-58-6	1,1-Dichloropropene	0.5	U
56-23-5	Carbon Tetrachloride	0.5	U
107-06-2	1,2-Dichloroethane	0.5	U
79-01-6	Trichloroethene	0.5	U
78-87-5	1,2-Dichloropropane	0.5	U
75-27-4	Bromodichloromethane	0.5	U
74-95-3	Dibromomethane	0.5	U
10061-01-5	cis-1,3-Dichloropropene	0.5	U
10061-02-6	trans-1,3-Dichloropropene	0.5	U
79-00-5	1,1,2-Trichloroethane	0.5	U
142-28-9	1,3-Dichloropropane	0.5	U
127-18-4	Tetrachloroethene	0.5	U
124-48-1	Dibromochloromethane	0.5	U
108-90-7	Chlorobenzene	0.5	U

DATE REPORTED: MAY 0 6 1992

JMMolloy

John J. Molloy, P.E.
Laboratory Director

H2M LABS, INC.

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Method 502.2)

SAMPLE NO.

T-1

Lab Name: H2M LABS, INC. Contract: ____________

Lab Code: ________ Case No: CRA28 SAS No: ________ SDG No: CRA028

Matrix: Water Lab Sample ID: 9212288

Sample vol.: 5 mls Lab File ID: PE07

Column: (pack/cap) cap Date Received: 4/17/92

Dilution Factor 1.0 Date Analyzed: 4/22/92

CAS NO.	COMPOUND	CONC UNITS ug/L	Q
530-20-6	1,1,1,2-Tetrachloroethene	0.5	U
75-25-2	Bromoform	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	U
108-86-1	Bromobenzene	0.5	U
95-49-8	o-Chlorotoluene	0.5	U
106-43-4	p-Chlorotoluene	0.5	U
541-73-1	m-Dichlorobenzene	0.5	U
106-46-7	p-Dichlorobenzene	0.5	U
95-50-1	o-Dichlorobenzene	0.5	U
120-82-1	1,2,4-Trichlorobenzene	0.5	U
87-68-3	Hexachlorobutadiene	0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	U
71-43-2	Benzene	0.6	
108-88-3	Toluene	0.5	U
100-41-4	Ethylbenzene	0.5	U
108-38-3	m-Xylene	0.5	U
106-42-3	p-Xylene	0.5	U
95-47-6	o-Xylene	0.5	U
100-42-5	Styrene	0.5	U
98-82-8	Isopropylbenzene (Cumeme)	0.5	U
103-65-1	n-Propylbenzene	0.5	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
98-06-6	tert. Butylbenzene	0.5	U
95-63-6	1,2,4-Trimethylbenzene	0.5	U
135-98-8	sec-Butylbenzene	0.5	U
99-87-6	p-Isopropyltoluene (p-Cymene)	0.5	U
104-51-8	n-Butylbenzene	0.5	U
91-20-3	Naphthalene	0.5	U

DATE REPORTED: MAY 0 6 1992

John J. Molloy, P.E.
Laboratory Director

A 003

H2M LABS, INC.

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Method 502.2)

SAMPLE NO.

TRIP BLANK

Lab Name: H2M LABS, INC. Contract: ____________

Lab Code: __________ Case No: CRA28 SAS No: ________ SDG No: CRA028

Matrix: Water Lab Sample ID: 9212290

Sample vol.: 5 mls Lab File ID: PE09

Column: (pack/cap) cap Date Received: 4/17/92

Dilution Factor 1.0 Date Analyzed: 4/22/92

CAS NO.	COMPOUND	CONC UNITS ug/L	Q
75-71-8	Dichlorodifluoromethane	0.5	U
74-87-3	Chloromethane	0.5	U
75-01-4	Vinyl Chloride	0.5	U
74-83-9	Bromomethane	0.5	U
75-00-3	Chloroethane	0.5	U
75-69-4	Trichlorofluoromethane	0.5	U
75-35-4	1,1-Dichloroethene	0.5	U
75-09-2	Methylene Chloride	0.5	U
156-60-5	trans-1,2-Dichloroethene	0.5	U
75-34-3	1,1-Dichloroethane	0.5	U
590-20-7	2,2-Dichloropropane	0.5	U
540-59-0	cis-1,2-Dichloroethene	0.5	U
67-66-3	Chloroform	0.5	U
74-97-5	Bromochloromethane	0.5	U
71-55-6	1,1,1-Trichloroethane	0.5	U
563-58-6	1,1-Dichloropropene	0.5	U
56-23-5	Carbon Tetrachloride	0.5	U
107-06-2	1,2-Dichloroethane	0.5	U
79-01-6	Trichloroethene	0.5	U
78-87-5	1,2-Dichloropropane	0.5	U
75-27-4	Bromodichloromethane	0.5	U
74-95-3	Dibromomethane	0.5	U
10061-01-5	cis-1,3-Dichloropropene	0.5	U
10061-02-6	trans-1,3-Dichloropropene	0.5	U
79-00-5	1,1,2-Trichloroethane	0.5	U
142-28-9	1,3-Dichloropropane	0.5	U
127-18-4	Tetrachloroethene	0.5	U
124-48-1	Dibromochloromethane	0.5	U
108-90-7	Chlorobenzene	0.5	U

DATE REPORTED: MAY 0 6 1992

John J. Molloy, P.E.
Laboratory Director

A 0017

H2M LABS, INC.

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Method 502.2)

SAMPLE NO.

TRIP BLANK

Lab Name: H2M LABS, INC. Contract: ____________

Lab Code: __________ Case No: CRA28 SAS No: ________ SDG No: CRA028

Matrix: Water Lab Sample ID: 9212290

Sample vol.: 5 mls Lab File ID: PE09

Column: (pack/cap) cap Date Received: 4/17/92

Dilution Factor 1.0 Date Analyzed: 4/22/92

CAS NO.	COMPOUND	CONC UNITS ug/L	Q
530-20-6	1,1,1,2-Tetrachloroethene	0.5	U
75-25-2	Bromoform	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	U
108-86-1	Bromobenzene	0.5	U
95-49-8	o-Chlorotoluene	0.5	U
106-43-4	p-Chlorotoluene	0.5	U
541-73-1	m-Dichlorobenzene	0.5	U
106-46-7	p-Dichlorobenzene	0.5	U
95-50-1	o-Dichlorobenzene	0.5	U
120-82-1	1,2,4-Trichlorobenzene	0.5	U
87-68-3	Hexachlorobutadiene	0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	U
71-43-2	Benzene	0.5	U
108-88-3	Toluene	0.5	U
100-41-4	Ethylbenzene	0.5	U
108-38-3	m-Xylene	0.5	U
106-42-3	p-Xylene	0.5	U
95-47-6	o-Xylene	0.5	U
100-42-5	Styrene	0.5	U
98-82-8	Isopropylbenzene (Cumeme)	0.5	U
103-65-1	n-Propylbenzene	0.5	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
98-06-6	tert. Butylbenzene	0.5	U
95-63-6	1,2,4-Trimethylbenzene	0.5	U
135-98-8	sec-Butylbenzene	0.5	U
99-87-6	p-Isopropyltoluene (p-Cymene)	0.5	U
104-51-8	n-Butylbenzene	0.5	U
91-20-3	Naphthalene	0.5	U

DATE REPORTED: MAY 0 6 1992

J.M. Moller

John J. Moller P.E.
Laboratory Director

A 0018

III. QC SUMMARY

A. VOLATILE ORGANICS

H2M LABS, INC.

WATER VOLATILE SURROGATE RECOVERY

Lab Name: H2M LABS, INC. Contract No.:

Lab Code: Case No: SAS No: SDG No: CRA 098

	SAMPLE NO.	S1 (BFB) #	S2 (TFT) #	S3 (CFB) #	OTHER	TOT OUT
01	METHOD BLANK #1			100		
02	MW-5D			101		
03	MW-5D MS			106		
04	MW-5D MSD			105		
05	MW-4A			97		
06	T-1			96		
07	RB-H15			92		
08	TRIP BLANK			90		
09	MSB 4/23/99			107		
10	METHOD BLANK #2			100		
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QC LIMITS

S1 (BFB) = Bromofluorobenzene ( )
S2 (TFT) = a,a,a-Trifluorotoluene ( )
S3 (CFB) = Chlorofluorobenzene (60-140)

Column to be used to flag recovery values
* Values outside of contract required QC limits
D = Surrogates diluted out

H2M LABS, INC.

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

(Method 502.2)

Lab Name: H2M LABS, INC. Contract: ____

Lab Code: ____ Case No: ____ SAS No: ____ SDG No: CRA028

Matrix Spike - Sample No.: MW-5D

COMPOUNDS	SPIKE ADDED (ug/L)	SAMPLE CONC (ug/L)	MS CONC (ug/L)	MS % REC	#	MSD CONC (ug/L)	MSD % REC	#	% RPD
Dichlorodifluoromethane	20	0	15.2	76		16.0	80		5
Chloromethane			38.7	97		38.7	97		0
Vinyl Chloride			—	—		—	—		—
Bromomethane			37.8	95		37.2	93		2
Chloroethane			—	—		—	—		—
Trichlorofluoromethane			23.6	118		22.6	113		4
1,1-Dichloroethene			20.2	101		19.3	96		5
Methylene Chloride			20.0	100		19.3	96		4
trans-1,2-Dichloroethene			21.4	107		20.9	104		3
1,1-Dichloroethane			20.6	103		19.8	99		4
2,2-Dichloropropane			43.2	108		41.6	104		4
cis-1,2-Dichloroethene			—	—		—	—		—
Chloroform			20.5	102		20.1	100		2
Bromochloromethane			21.2	106		20.2	101		5
1,1,1-Trichloroethane			21.9	109		21.0	105		4
1,1-Dichloropropene			24.5	122		23.3	116		5
Carbon Tetrachloride			21.6	108		20.9	104		4
1,2-Dichloroethane			20.8	104		20.0	100		4
Trichloroethene			20.5	102		19.9	99		3
1,2-Dichloropropane			21.6	108		20.6	103		5
Bromodichloromethane			21.7	108		20.7	103		5
Dibromomethane			21.2	106		20.1	100		6
cis-1,3-Dichloropropene			21.6	108		20.9	104		4
trans-1,3-Dichloropropene			22.4	112		21.8	109		3
1,1,2-Trichloroethane			20.5	102		20.2	101		1
1,3-Dichloropropane			21.5	107		20.6	103		4
Tetrachloroethene			21.7	108		21.0	105		4
Dibromochloromethane			20.7	103		20.6	103		0
Chlorobenzene	↓	↓	43.4	108		42.4	106		1

3

H2M LABS, INC.

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

(Method 502.2)

Lab Name: H2M LABS, INC. Contract: ____________

Lab Code: ________ Case No: ________ SAS No: ________ SDG No: ________

Matrix Spike - Sample No.: ____________

COMPOUNDS	SPIKE ADDED (ug/L)	SAMPLE CONC (ug/L)	MS CONC (ug/L)	MS % REC	#	MSD CONC (ug/L)	MSD % REC	#	% RPD
1,1,1,2-Tetrachloroethene	20	0	—	—		—			
Bromoform			21.5	107		21.3	106		1
1,1,2,2-Tetrachloroethane			18.9	94		19.7	98		4
1,2,3-Trichloropropane			20.6	103		20.8	104		1
Bromobenzene			22.2	111		22.0	110		1
o-Chlorotoluene			23.2	116		22.4	112		3
p-Chlorotoluene			21.4	107		21.1	105		1
m-Dichlorobenzene			22.0	110		21.9	109		1
p-Dichlorobenzene			21.8	109		21.6	108		1
o-Dichlorobenzene			20.9	104		20.8	104		0
1,2,4-Trichlorobenzene			20.6	103		20.8	104		1
Hexachlorobutadiene			20.7	103		20.0	100		3
1,2,3-Trichlorobenzene			20.1	100		20.7	103		3
Benzene		3.7	23.4	98		22.7	95		3
Toluene		0	21.3	106		20.0	100		6
Ethylbenzene			22.1	110		23.1	115		4
m-Xylene			33.6	84		32.9	82		2
p-Xylene			—	—		—	—		—
o-Xylene			21.2	106		19.1	95		11
Styrene			16.0	80		16.3	82		2
Isopropylbenzene (Cumeme)			20.2	101		19.8	99		2
n-Propylbenzene			20.2	101		19.9	99		2
1,3,5-Trimethylbenzene			17.4	87		17.0	85		2
tert. Butylbenzene			19.9	99		18.5	92		7
1,2,4-Trimethylbenzene			16.1	80		19.4	97		19
sec-Butylbenzene			19.5	97		21.2	106		9
p-Isopropyltoluene (p-Cymene			19.9	99		19.3	96		3
n-Butylbenzene			20.6	103		19.0	95		8
Naphthalene			17.9	89		19.2	96		7

H2M LABS, INC.

VOLATILE MATRIX SPIKE BLANK
(QC Check Sample)

(Method 502.2)

Lab Name: H2M LABS, INC. Contract: ____________

Lab Code: ______ Case No: ______ SAS No: ______ SDG No: CRA 028

Matrix Spike - Sample No: MSB 4/22/92

COMPOUND	SPIKE ADDED ug/L	MSB CONC. ug/L	* RPD %	% Rec.
Dichlorodifluoromethane	20	17.4	13	87
Chloromethane	40	39.2	2	98
Vinyl Chloride	-	-	-	
Bromomethane	40	36.3		91
Chloroethane	-	-	-	
Trichlorofluoromethane	20	23.0	15	115
1,1-Dichloroethene		20.2	1	101
Methylene Chloride		19.9	0	100
trans-1,2-Dichloroethene		21.1	6	106
1,1-Dichloroethane		20.2	1	101
2,2-Dichloropropane	40	42.6	6	106
cis-1,2-Dichloroethene	-	-	-	
Chloroform	20	20.9	4	104
Bromochloromethane		21.2	6	106
1,1,1-Trichloroethane		21.3	6	106
1,1-Dichloropropene		23.7	18	118
Carbon Tetrachloride		21.2	6	106
1,2-Dichloroethane		20.6	3	103
Trichloroethene		20.1	0	100
1,2-Dichloropropane		21.4	7	107
Bromodichloromethane		21.5	8	107
Dibromomethane		21.6	8	108
cis-1,3-Dichloropropene		22.0	10	110
trans-1,3-Dichloropropene		23.2	16	116
1,1,2-Trichloroethane		21.2	6	106
1,3-Dichloropropane		22.0	10	110
Tetrachloroethene		22.4	12	112
Dibromochloromethane		21.3	6	106
Chlorobenzene	40	43.5	9	109

Column to be used to flag recovery values with an asterisk.

* % RPD = 20%

Spike Recovery: 0 out of 29 outside limits.

H2M LABS, INC.

VOLATILE MATRIX SPIKE BLANK
(QC Check Sample)

(Method 502.2)

Lab Name: H2M LABS, INC. Contract: ____________

Lab Code: ________ Case No: ________ SAS No: ________ SDG No: CRA 028

Matrix Spike - Sample No: MSB 4/22/92

COMPOUND	SPIKE ADDED ug/L	MSB CONC. ug/L	* RPD %	% Rec.
1,1,1,2-Tetrachloroethene	-	-	-	
Bromoform	20	22.1	10	110
1,1,2,2-Tetrachloroethane		20.7	4	104
1,2,3-Trichloropropane		21.6	8	108
Bromobenzene		22.6	13	113
o-Chlorotoluene		22.5	12	112
p-Chlorotoluene		22.4	12	112
m-Dichlorobenzene		22.6	13	113
p-Dichlorobenzene		22.2	11	111
o-Dichlorobenzene		21.3	6	106
1,2,4-Trichlorobenzene		21.6	8	108
Hexachlorobutadiene		21.8	9	109
1,2,3-Trichlorobenzene		21.5	8	108
Benzene		20.8	4	104
Toluene		20.6	3	103
Ethylbenzene		22.4	12	112
m-Xylene	40	33.9	15	85
p-Xylene	-	-	-	
o-Xylene	20	21.1	6	106
Styrene		16.4	18	82
Isopropylbenzene (Cumeme)		19.9	0	100
n-Propylbenzene		20.1	0	100
1,3,5-Trimethylbenzene		17.0	15	85
tert. Butylbenzene		17.2	4	86
1,2,4-Trimethylbenzene		16.2	19	81
sec-Butylbenzene		19.7	2	98
p-Isopropyltoluene (p-Cymene)		19.5	2	98
n-Butylbenzene		20.0	0	100
Naphthalene		19.5	2	98

Column to be used to flag recovery values with an asterisk.

* % RPD = 20%

Spike Recovery: 0 out of 29 outside limits.

H2M LABS, INC.

METHOD BLANK SUMMARY

Lab Name: H2M LABS, INC. Contract: ____

Lab Code: ____ Case No: ____ SAS No: ____ SDG No: CRA 028

Lab File ID: PE 02 Lab Sample ID: Nanopure Blank

Date Analyzed: 4/22/92 Time Analyzed: 11:25

Instrument ID: PE 8500

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	MW-4A	9212286	PE 06	16:20
02	MW-5D	9212287	PE 03	12:42
03	MW-5D MS	9212287MS	PE 04	13:56
04	MW-5D MSD	9212287 MSD	PE 05	15:08
05	T-1	9212288	PE 07	17:31
06	RB-415	9212289	PE 08	18:42
07	Trip Blank	9212290	PE 09	19:52
08		MSB 4-22-92	PE 10	21:02
09		Nanopure blank	PE 11	22:15
10				
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FORM IV VOA

H2M LABS, INC.

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Method 502.2)

SAMPLE NO.

NANOPURE BLANK

Lab Name: H2M LABS, INC. Contract: ______

Lab Code: ______ Case No: CRA28 SAS No: ______ SDG No: CRA028

Matrix: Water Lab Sample ID: METHOD BLANK 1

Sample vol.: 5 mls Lab File ID: PE02

Column: (pack/cap) cap Date Received: ______

Dilution Factor 1.0 Date Analyzed: 4/22/92

CAS NO.	COMPOUND	CONC UNITS ug/L	Q
75-71-8	Dichlorodifluoromethane	0.5	U
74-87-3	Chloromethane	0.5	U
75-01-4	Vinyl Chloride	0.5	U
74-83-9	Bromomethane	0.5	U
75-00-3	Chloroethane	0.5	U
75-69-4	Trichlorofluoromethane	0.5	U
75-35-4	1,1-Dichloroethene	0.5	U
75-09-2	Methylene Chloride	0.5	U
156-60-5	trans-1,2-Dichloroethene	0.5	U
75-34-3	1,1-Dichloroethane	0.5	U
590-20-7	2,2-Dichloropropane	0.5	U
540-59-0	cis-1,2-Dichloroethene	0.5	U
67-66-3	Chloroform	0.5	U
74-97-5	Bromochloromethane	0.5	U
71-55-6	1,1,1-Trichloroethane	0.5	U
563-58-6	1,1-Dichloropropene	0.5	U
56-23-5	Carbon Tetrachloride	0.5	U
107-06-2	1,2-Dichloroethane	0.5	U
79-01-6	Trichloroethene	0.5	U
78-87-5	1,2-Dichloropropane	0.5	U
75-27-4	Bromodichloromethane	0.5	U
74-95-3	Dibromomethane	0.5	U
10061-01-5	cis-1,3-Dichloropropene	0.5	U
10061-02-6	trans-1,3-Dichloropropene	0.5	U
79-00-5	1,1,2-Trichloroethane	0.5	U
142-28-9	1,3-Dichloropropane	0.5	U
127-18-4	Tetrachloroethene	0.5	U
124-48-1	Dibromochloromethane	0.5	U
108-90-7	Chlorobenzene	0.5	U

H2M LABS, INC.

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Method 502.2)

SAMPLE NO.

NANOPURE BLANK

Lab Name: H2M LABS, INC. Contract: ______

Lab Code: ______ Case No: CRA28 SAS No: ______ SDG No: CRA028

Matrix: Water Lab Sample ID: METHOD BLANK 1

Sample vol.: 5 mls Lab File ID: PE02

Column: (pack/cap) cap Date Received: ______

Dilution Factor 1.0 Date Analyzed: 4/22/92

CAS NO.	COMPOUND	CONC UNITS ug/L	Q
530-20-6	1,1,1,2-Tetrachloroethene	0.5	U
75-25-2	Bromoform	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	U
108-86-1	Bromobenzene	0.5	U
95-49-8	o-Chlorotoluene	0.5	U
106-43-4	p-Chlorotoluene	0.5	U
541-73-1	m-Dichlorobenzene	0.5	U
106-46-7	p-Dichlorobenzene	0.5	U
95-50-1	o-Dichlorobenzene	0.5	U
120-82-1	1,2,4-Trichlorobenzene	0.5	U
87-68-3	Hexachlorobutadiene	0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	U
71-43-2	Benzene	0.5	U
108-88-3	Toluene	0.5	U
100-41-4	Ethylbenzene	0.5	U
108-38-3	m-Xylene	0.5	U
106-42-3	p-Xylene	0.5	U
95-47-6	o-Xylene	0.5	U
100-42-5	Styrene	0.5	U
98-82-8	Isopropylbenzene (Cumeme)	0.5	U
103-65-1	n-Propylbenzene	0.5	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
98-06-6	tert. Butylbenzene	0.5	U
95-63-6	1,2,4-Trimethylbenzene	0.5	U
135-98-8	sec-Butylbenzene	0.5	U
99-87-6	p-Isopropyltoluene (p-Cymene)	0.5	U
104-51-8	n-Butylbenzene	0.5	U
91-20-3	Naphthalene	0.5	U

H2M LABS, INC.

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Method 502.2)

SAMPLE NO.

NANOPURE BLANK

Lab Name: H2M LABS, INC. Contract: ______

Lab Code: ______ Case No: CRA28 SAS No: ______ SDG No: CRA028

Matrix: Water Lab Sample ID: METHOD BLANK 2

Sample vol.: 5 mls Lab File ID: PE11

Column: (pack/cap) cap Date Received: ______

Dilution Factor 1.0 Date Analyzed: 4/22/92

CAS NO.	COMPOUND	CONC UNITS ug/L	Q
75-71-8	Dichlorodifluoromethane	0.5	U
74-87-3	Chloromethane	0.5	U
75-01-4	Vinyl Chloride	0.5	U
74-83-9	Bromomethane	0.5	U
75-00-3	Chloroethane	0.5	U
75-69-4	Trichlorofluoromethane	0.5	U
75-35-4	1,1-Dichloroethene	0.5	U
75-09-2	Methylene Chloride	0.5	U
156-60-5	trans-1,2-Dichloroethene	0.5	U
75-34-3	1,1-Dichloroethane	0.5	U
590-20-7	2,2-Dichloropropane	0.5	U
540-59-0	cis-1,2-Dichloroethene	0.5	U
67-66-3	Chloroform	0.5	U
74-97-5	Bromochloromethane	0.5	U
71-55-6	1,1,1-Trichloroethane	0.5	U
563-58-6	1,1-Dichloropropene	0.5	U
56-23-5	Carbon Tetrachloride	0.5	U
107-06-2	1,2-Dichloroethane	0.5	U
79-01-6	Trichloroethene	0.5	U
78-87-5	1,2-Dichloropropane	0.5	U
75-27-4	Bromodichloromethane	0.5	U
74-95-3	Dibromomethane	0.5	U
10061-01-5	cis-1,3-Dichloropropene	0.5	U
10061-02-6	trans-1,3-Dichloropropene	0.5	U
79-00-5	1,1,2-Trichloroethane	0.5	U
142-28-9	1,3-Dichloropropane	0.5	U
127-18-4	Tetrachloroethene	0.5	U
124-48-1	Dibromochloromethane	0.5	U
108-90-7	Chlorobenzene	0.5	U

H2M LABS, INC.

VOLATILE ORGANICS ANALYSIS DATA SHEET

(Method 502.2)

SAMPLE NO.

NANOPURE BLANK

Lab Name: H2M LABS, INC. Contract: ______

Lab Code: ______ Case No: CRA28 SAS No: ______ SDG No: CRA028

Matrix: Water Lab Sample ID: METHOD BLANK 2

Sample vol.: 5 mls Lab File ID: PE11

Column: (pack/cap) cap Date Received: ______

Dilution Factor 1.0 Date Analyzed: 4/22/92

CAS NO.	COMPOUND	CONC UNITS ug/L	Q
530-20-6	1,1,1,2-Tetrachloroethene	0.5	U
75-25-2	Bromoform	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	U
108-86-1	Bromobenzene	0.5	U
95-49-8	o-Chlorotoluene	0.5	U
106-43-4	p-Chlorotoluene	0.5	U
541-73-1	m-Dichlorobenzene	0.5	U
106-46-7	p-Dichlorobenzene	0.5	U
95-50-1	o-Dichlorobenzene	0.5	U
120-82-1	1,2,4-Trichlorobenzene	0.5	U
87-68-3	Hexachlorobutadiene	0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	U
71-43-2	Benzene	0.5	U
108-88-3	Toluene	0.5	U
100-41-4	Ethylbenzene	0.5	U
108-38-3	m-Xylene	0.5	U
106-42-3	p-Xylene	0.5	U
95-47-6	o-Xylene	0.5	U
100-42-5	Styrene	0.5	U
98-82-8	Isopropylbenzene (Cumeme)	0.5	U
103-65-1	n-Propylbenzene	0.5	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
98-06-6	tert. Butylbenzene	0.5	U
95-63-6	1,2,4-Trimethylbenzene	0.5	U
135-98-8	sec-Butylbenzene	0.5	U
99-87-6	p-Isopropyltoluene (p-Cymene)	0.5	U
104-51-8	n-Butylbenzene	0.5	U
91-20-3	Naphthalene	0.5	U

CODES USED ON LINEARITY REPORTS

(RESTEK) P I D

DATE												
RUN #												
S_o												
L												
N												
CONC.												
RANGE												
BENZ.		BENZENE										
K		TRICHLOROETHENE										
TOL.		TOLUENE										
N		TETRACHLOROETHENE										
Q		CHLOROBENZENE										
EB		ETHYLBENZENE										
m-XYL		m-XYENE										
p-XYL		p-XYLENE										
o-XYL		o-XYLENE										
STYRENE →												
CUMENE →												
n-PRB		n-PROPYLBENZENE										
BrB		BROMOBENZENE										
1,3,5-TMB		1,3,5-TRIMETHYLBENZENE										
o-CT		o-CHLOROTOLUENE										
p-CT		p-CHLOROTOLUENE										
t-BB		t-BUTYLBENZENE										
1,2,4-TMA		1,2,4-TRIMETHYLBENZENE										
s-BB		S-BUTYLBENZENE										
p-CYMENE →												
m-DCB		m-DICHLOROBENZENE										
p-DCB		p- " "										
n-BB		n-BUTYLBENZENE										
o-DCB		o-DICHLOROBENZENE										
1,2,4-TCB		1,2,4-TRICHLOROBENZENE										
HCBD		HEXACHLOROBUTADIENE										
NAPHTHA.		NAPHTHALENE										
1,2,3-TCB		1,2,3-TRICHLOROBENZENE										

CODES USED ON LINEARITY REPORTS

(RESTEK) H A L L

DATE	
RUN #	
SOLN	
CONC. RANGE	
CCl_2F_2	DICHLORODIFLUOROMETHANE
CM	CHLOROMETHANE
VC	VINYL CHLORIDE
BM	BROMOMETHANE
CE	CHLOROETHANE
MM	TRICHLOROFLUOROMETHANE
B	1,1-DICHLOROETHENE
C	METHYLENE CHLORIDE
D	trans-1,2-DICHLOROETHENE
E	1,1-DICHLOROETHANE
2,2-DCP	2,2-DICHLOROPROPANE
F	cis-1,2-DICHLOROETHENE
G	CHLOROFORM
R	BROMOCHLOROMETHANE
I	1,1,1-TRICHLOROETHANE
1,1-DCP(ENE)	1,1-DICHLOROPROPENE
J	CARBON TETRACHLORIDE
H	1,2-DICHLOROETHANE
K	TRICHLOROETHENE
X	1,2-DICHLOROPROPANE
L	BROMODICHLOROMETHANE
DBM	DIBROMOMETHANE
Z (cis)	cis-1,3-DICHLOROPROPENE
AA (trans)	trans-1,3-DICHLOROPROPENE
M	1,1,2-TRICHLOROETHANE
1,3-DCP	1,3-DICHLOROPROPANE
N	TETRACHLOETHENE
O	CHLORODIBROMOMETHANE
EDB	
Q	CHLOROBENZENE
BB	1,1,1,2-TETRACHLOETHANE
P	BROMOFORM
CC	1,1,2,2-TETRACHLOROETHANE
1,2,3-TCP	1,2,3-TRICHLOROPROPANE
BrB	BROMOBENZENE
o-CT	o-CHLOROTOLUENE
p-CT	p-CHLOROTOLUENE
m-DCB	m-DICHLOROBENZENE
p-DCB	p- "
o-DCB	o- "
DBCP	
1,2,4-TCB	1,2,4-TRICHLOROBENZENE
HCBD	HEXACHLOROBUTADIENE
1,2,3-TCB	1,2,3-TRICHLOROBENZENE

A 0032

502.2
AROMATIC LINEARITY

3/23/92

RUN#	PE 4	PE 6	PE 7	PE 8	PE 9	AVG.	% RSD
AMOUNT(NG)	5	25	50	100	200		
COMPOUNDS							
BENZENE	54531	44223.33	42117.8	40013.14	42835.38	44708.3	12.74
K	28831	24532.52	24556.12	24106.04	23570.45	25119.23	8.41
TOLUENE	47966.2	39593.36	38844.52	38224.16	42929.65	41511.58	9.73
N	21446.2	20630.08	18158.58	18713.98	18347.21	19459.21	7.62
Q	53705.2	47077.8	44629.34	41181.07	45869.99	46492.68	9.88
EB	41274.2	31479.16	31325.76	32445.28	29999.16	33304.71	13.63
m/p-XYL	47339.2	39212.92	40177.58	47731.29	51186.38	45129.47	11.51
o-XYL	40861.6	31322.2	31611.24	34336.17	41965.35	36019.31	14.10
STYRENE	58284	53512.16	55163.92	63965.88	75539.9	61293.17	14.53
CUMENE	39116.4	28963.88	30029.58	29366.9	32399.99	31975.35	13.16
n-PrB	34868.2	30986.08	31050.28	32119.78	36852.19	33175.31	7.80
BrB	50887.4	41702.52	42340.12	44178.44	55073.39	46836.37	12.54
o-CT/135TMB	43585.9	38220.06	39320.39	45515.34	54559.13	44240.16	14.69
p-CT	51888.2	41557.92	41156.74	45644.78	57179.59	47485.45	14.59
t-BB	28844	24121.8	24693.5	26249.12	27075.55	26196.79	7.23
124-TMB	41926.8	33957.56	34740.78	36328.78	46571.97	38705.18	13.92
s-BB	34270.6	27039.32	27180.52	28595.33	32171.4	29851.43	10.79
p-CYMENE	30831.4	25635.48	26758.84	27881.38	31659.92	28553.4	9.10
m-DCB	45353.6	36039.84	36332.46	38259.05	43272.86	39851.56	10.60
p-DCB	48378.2	37742.36	37644.46	39796.96	47389.18	42190.23	12.51
n-BB	27880.6	28946.64	28727.78	30968.46	35561.06	30416.91	10.16
o-DCB	41168.2	33001.52	31134.2	31524.6	34708.83	34307.47	11.91
124-TCB	31185.8	24969.08	24522.58	24643.11	25443.23	26156.76	10.83
HCBD	22992.4	18361.64	17568.76	17550.27	16141.07	18522.83	14.16
NAPHTHALENE	41037.6	34630.23	33248.86	33998.73	38418.69	36266.91	9.18
123-TCB	31039.2	23853.48	23638.24	23754.71	23920.45	25241.22	12.85

A 0033

502.2 HALOGENS LINEARITY HALL

3/23/92							
RUN#	PE 4	PE 6	PE 7	PE 8	PE 9	AVG.	% RSD
AMOUNT(NG)	5	25	50	100	200		
COMPOUNDS							
CCl2F2	8092	7680	8469	7910	7160	7861.984	6.20
CM/VC	6333	7820	7424	8013	9013	7720.597	12.59
BM/CE	6246	7591	8672	9054	9122	8137.029	15.02
MM	19245	18262	19388	20471	24417	20356.67	11.80
B	19579	21118	23206	25399	26396	23139.54	12.31
C	30115	32603	35529	34076	34257	33315.89	6.21
D	25636	26678	29408	27448	29066	27647.15	5.76
E	26226	26289	28589	29225	28651	27796.18	5.13
F/2,2DCP	20641	25152	27539	27593	28171	25819.07	12.08
G	46914	42941	43448	41534	40228	43012.98	5.85
R	25925	23597	24392	23530	22862	24061.58	4.88
I	31945	32434	34309	35192	34986	33773.25	4.42
1,1DCPene	18726	20486	22643	22368	22695	21383.43	8.15
J	38729	37622	39048	41310	39938	39329.35	3.52
H	39569	36011	33966	34951	33686	35636.58	6.68
K	27554	34389	33405	33431	34256	32607.03	8.78
X	30206	30432	28997	30540	28688	29772.41	2.90
L	20151	20227	23010	23237	22914	21907.72	7.18
DBM	20613	25255	23924	21846	22496	22827.23	7.92
Z	19836	24972	27438	26997	27026	25253.72	12.58
AA	19584	21142	24028	25360	24881	22999.16	10.93
M	35501	35723	36716	34871	33595	35281.32	3.27
1,3DCP	18884	20887	22714	23118	22993	21718.39	8.39
N	45148	40021	40058	40031	38475	40746.55	6.26
O	20520	20272	21388	21196	21523	20979.7	2.63
EDB	12264	14058	15225	15440	15048	14407.08	9.09
Q/BB	24076	26016	25247	25382	25486	25241.47	2.83
P	11845	8621	10755	12129	12575	11225.03	13.38
CC	21879	24753	25985	25625	25029	24650.15	6.58
1,2,3TCP	20401	21525	21837	21565	20391	21143.86	3.28
BrB	7102	7887	8819	9403	8585	8359.281	10.63
o-CT	12073	8431	10038	10636	10019	10239.39	12.81
p-CT	21411	19033	18953	16256	16813	18493.12	11.10
m-DCB	18366	17022	18408	19450	18980	18445.2	4.94
p-DCB	23951	22834	24034	24140	22518	23495.35	3.23
o-DCB	22111	19849	22121	21429	20853	21272.72	4.49
DBCP	4941	4877	5029	5482	5165	4997.596	8.08
1,2,4TCB	17156	18383	21237	22838	22024	20327.46	12.01
HCBD	36962	35055	34898	24901	30481	32459.42	14.93
1,2,3TCB	19024	21088	20416	20890	21897	20663.07	5.13

A 0034

H2M LABS, INC.

VOLATILE CONTINUING CALIBRATION CHECK

(Method 502.2)

Lab Name: H2M LABS, INC. Contract: ____

Lab Code: ____ Case No: ____ SAS No: ____ SDG No: CRA 028

Instrument ID: PE 8500 Calibration Date(s): 4/22/92 Time: 10:07

Lab File ID: PE 01 Init. Calib. Date: 3/23/92

Column: Rtx-502.2

COMPOUND	CALIB. CHECK SPIKE ug/L	SPIKE CONC. ug/L	* RPD %
Dichlorodifluoromethane	20	17.3	14
Chloromethane	40	44.2	10
Vinyl Chloride	-	-	-
Bromomethane	40	44.0	10
Chloroethane	-	-	-
Trichlorofluoromethane	20	24.1	20
1,1-Dichloroethene		20.0	0
Methylene Chloride		20.7	4
trans-1,2-Dichloroethene		21.5	8
1,1-Dichloroethane		20.6	3
2,2-Dichloropropane	40	43.7	9
cis-1,2-Dichloroethene		-	-
Chloroform		21.2	6
Bromochloromethane		21.6	8
1,1,1-Trichloroethane		21.8	9
1,1-Dichloropropene		23.6	18
Carbon Tetrachloride		21.7	8
1,2-Dichloroethane		21.4	7
Trichloroethene		20.6	3
1,2-Dichloropropane		22.1	10
Bromodichloromethane		21.7	8
Dibromomethane		22.0	10
cis-1,3-Dichloropropene		22.2	11
trans-1,3-Dichloropropene		22.9	14
1,1,2-Trichloroethane		21.4	7
1,3-Dichloropropane		21.9	10
Tetrachloroethene		22.2	11
Dibromochloromethane		21.7	8
Chlorobenzene	40	43.4	8

* % RPD = 20%

H2M LABS, INC.

VOLATILE CONTINUING CALIBRATION CHECK

(Method 502.2)

Lab Name: H2M LABS, INC. Contract: ____________

Lab Code: ________ Case No: ________ SAS No: ________ SDG No: ________

Instrument ID: PE 8500 Calibration Date(s): 4/22/92 Time: 10:07

Lab File ID: PE 01 Init. Calib. Date: 3/23/92

Column: Rtx- 502.2

COMPOUND	CALIB. CHECK SPIKE ug/L	SPIKE CONC. ug/L	* RPD %
1,1,1,2-Tetrachloroethene	-	-	-
Bromoform	20	23.3	16
1,1,2,2-Tetrachloroethane		21.2	6
1,2,3-Trichloropropane		22.4	12
Bromobenzene		23.3	16
o-Chlorotoluene		23.3	16
p-Chlorotoluene		21.7	8
m-Dichlorobenzene		22.1	10
p-Dichlorobenzene		21.5	8
o-Dichlorobenzene		21.0	5
1,2,4-Trichlorobenzene		20.6	3
Hexachlorobutadiene		21.0	5
1,2,3-Trichlorobenzene		20.6	3
Benzene		20.5	2
Toluene		20.3	2
Ethylbenzene		20.7	4
m-Xylene	40	32.4	19
p-Xylene	-	-	-
o-Xylene	20	20.4	2
Styrene		16.4	18
Isopropylbenzene (Cumeme)		19.1	4
n-Propylbenzene		19.4	3
1,3,5-Trimethylbenzene		16.4	18
tert. Butylbenzene		18.3	8
1,2,4-Trimethylbenzene		16.9	16
sec-Butylbenzene		18.8	6
p-Isopropyltoluene (p-Cymene)		18.8	6
n-Butylbenzene		18.3	8
Naphthalene		18.6	7

* % RPD = 20%

H2M LABS, INC.

B. TOTAL ORGANIC CARBON

H2M LABS INC

WET CHEM Q.C. SUMMARY

CLIENT ID NO. CRA026

LAB NO. 9211064 - 9211066

DATE RECEIVED 4/09/92

UNITS TOC = mg/kg, TS = %

MATRIX SOIL

MS

DUP

ANALYTE	BLANK	SPIKED SAMPLE RESULT	SPIKE ADDED	SAMPLE RESULT	PERCENT RECOVERY	INITIAL SAMPLE RESULT	DUPLICATE SAMPLE RESULT	RPD	H2M LAB. NO. OF SAMPLE USED FOR MS/MSD
TOC (80-120)	< 20.0	6289	1918	4090	114.7	4450	4090	8.4	9211066
TOC	---	6255	2641	4090	82.0	---	---	---	9211066
TS	---	---	---	---	---	79.2	79.2	0.0	9211064

RPD < 20%

I-D / H x100

H2M LABS, INC.

CONESTOGA - ROVERS & ASSOCIATES

VAC-AIR ALLOYS SITE
PROJECT: 2326
SAMPLES RECEIVED 6/06/92
CRA029

TABLE OF CONTENTS

H2M LABS, INC.

I. CHAIN OF CUSTODY DOCUMENTATION

Page ____ of ____

CHAIN OF CUSTODY RECORD

PROJECT NO. 2326

CLIENT NAME VAC-AIR

SAMPLE SITE

SAMPLER'S SIGNATURE

SAMPLE NO.	DATE	TIME	ORIGIN/SOURCE	# OF CONTAINERS	DESCRIPTION COMP	DESCRIPTION GRAB	DESCRIPTION OTHER	ANALYSES/TESTS REQUESTED
1	6/4/92	1300	VAC-AIR	4		X		VOC's / MS/MSD
2	6/4/92	1910	VAC-AIR	2		X		VOC's
3	6/5/92	0100	VAC-AIR	2		X		VOC's
4	6/5/92	0730	VAC-AIR	2		X		VOC's
5	6/5/92	1215	VAC-AIR	2		X		VOC's CUSTODY TRANSFER Relinquished by 6-6-92
6	6/5/92	1245	VAC-AIR	2		X		VOC's Received by
7	6/5/92	1300	VAC-AIR	2		X		VOC's
8	6/5/92	1550	VAC-AIR	2		X		VOC's
			TRIP BLANK	2		X		VOC's NOTE: AIR BUBBLE IN 1 OF THE VIALS

RELINQUISHED BY SIGNATURE PRINT DOUGLAS J. OSCAR	DATE/TIME 6/5/92 1550	RECEIVED BY Fed Express SIGNATURE PRINT	DATE/TIME ~~1039 AM~~ 6/5/92	RELINQUISHED BY Fed Ex SIGNATURE Air Bill # PRINT 4194153213	DATE/TIME 1029 AM 6/6/92
RECEIVED BY SIGNATURE PRINT Ann McEAFFREY	DATE/TIME 1030 AM 6/6/92	RELINQUISHED BY SIGNATURE PRINT Ann McEAFFREY	DATE/TIME 6-8-92 0800	RECEIVED AT LAB BY SIGNATURE PRINT R. Diaz	DATE/TIME For ALL SAMPLES EXCEPT #5 & 6 (See Above)

REMARKS PERFORM QUICK-TURNAROUND ANALYSIS ON SAMPLES #5 + #6. PROVIDE RESULTS MONDAY JUNE 8, 1992

CONESTOGA-ROVERS & ASSOCIATES
7703 Niagara Falls Boulevard
Niagara Falls, New York 14304

A 0003

H2M LABS, INC.

575 Broad Hollow Road, Melville, N.Y. 11
(516) 694-3040 FAX: (516) 694-4122

ENVIRONMENTAL and INDUSTRIAL ANALYTICAL LABORATORY

CLIENT: CRA Batch QC
SDG #: 029 W/ EPA 7/88 Detection Limits

Detection Limit for Vinyl Chloride must be at 2 ug/l

INTERNAL CHAIN OF CUSTODY

SAMPLES RECEIVED BY Richard Diaz DATE 6-8-92 TIME 0800

SIGNATURE Richard Diaz * Package Due 6-17-92 *

CLIENT I.D.	H2M LAB #	BOTTLE TYPE	# OF BOTTLES	TESTS REQUESTED
Sample #1 MS/MSD Also	9218398	D	RD 6-8 ~~2~~ 4	TCL VOC's by 8240
Sample #2 ~~MS/MSD Also~~	9218399	↓	~~4~~ 2	↓
Sample #3	9218400		2	
Sample #4	9218401		↓	
Sample #5	9218402			
Sample #6	9218403			
Sample #7	9218404			
Sample #8	9218405			
Trip Blank	9218406	↓	↓	↓

H2M LABS, INC.

575 Broad Hollow Road, Melville, N.Y. 1[illegible]
(516) 694-3040 FAX: (516) 694-4122

ENVIRONMENTAL and INDUSTRIAL ANALYTICAL LABORATORY

CLIENT: CRA

SDG #: 029

* Custody transfer for #'s 5 + 6 on external C-O-C

RY 6-8

INTERNAL CHAIN OF CUSTODY

DATE	TIME	SAMPLE RELINQUISHED BY	SAMPLE RECEIVED BY	SAMPLE I.D. NO. AND BOTTLE TYPE	PURPOSE OF CHANGE OF CUSTODY	INIT
6/8/92	1300	Sign [signature]	Sign [signature]	* All D Except #'s 5 + 6	Analysis	
		Sign	Sign			
		Sign	Sign			
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II. SAMPLE REPORTS

H2M LABS, INC.
575 Broad Hollow Road, Melville, N.Y. 11747
(516) 694-3040 FAX: (516) 694-4122

QUALIFIERS FOR REPORTING ORGANICS DATA

Value - If the result is a value greater than or equal to the quantification limit, report the value.

U - Indicates compound was analyzed for but not detected. Report the minimum quantification limit for the sample with the U (e.g., 10U) based on necessary concentration/dilution actions. (This is not necessarily the instrument detection limit). The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable quantification limit for the sample.

J - Indicates as estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified quantification limit but greater than zero (e.g.: If limit of quantification is 10 ug/l and a concentration of 3 ug/l is calculated, report as 3J).

C - This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >= 10 ng/ul in the final extract should be confirmed by GC/MS.

B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

E - This flag identifies compounds whose concentrations are outside the calibration range of the analysis. If one or more compounds have a response greater than full scale, the extract must be diluted and reanalyzed, according to the specifications in Exhibit D. All compounds with a response greater than full scale should be flagged with an "E" on the original report of analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: for total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered seperately.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag.

X - This flag indicates compounds with spectra that do not meet identification criteria as detailed in Exhibit(E)E-61 section 6.1.3 but are believed to be present.

Z - Indicates analyte was present at the reported concentration in the pre-screening analysis.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SAMPLE#1

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA SAS No.: SDG No.: CRA029

Matrix: (soil/water) WATER Lab Sample ID: 9218398

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P9213

Level: (low/med) LOW Date Received: 6/ 8/92

% Moisture: not dec. 100. Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	2 ~~10~~.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

JV 6/10/

6/12/92

John J. Molloy, P.E.
Laboratory Director

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SAMPLE#1

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA SAS No.: SDG No.: CRA029

Matrix: (soil/water) WATER Lab Sample ID: 9218398

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P9213

Level: (low/med) LOW Date Received: 6/ 8/92

% Moisture: not dec. 100. Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
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11.				
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24.				
25.				
26.				
27.				
28.				
29.				
30.				

FORM I VOA-TIC 1/87 Rev

JMolloy
6/12/92
John J. Molloy, P.E.
Laboratory Director

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SAMPLE#2

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA SAS No.: SDG No.: CRA029

Matrix: (soil/water) WATER Lab Sample ID: 9218399

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P9216

Level: (low/med) LOW Date Received: 6/ 8/92

% Moisture: not dec. 100. Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	2 ~~10~~.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

JU 6/12

6/12/92
John J. Molloy, P.E.
Laboratory Director

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A 0010

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SAMPLE#2

Lab Name: H2M   Contract: NYSDEC

Lab Code: H2M   Case No.: CRA   SAS No.:   SDG No.: CRA029

Matrix: (soil/water) WATER   Lab Sample ID: 9218399

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: P9216

Level: (low/med) LOW   Date Received: 6/ 8/92

% Moisture: not dec. 100.   Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP   Dilution Factor: 1.00

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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6/12/92
John J. Molloy, P.E.
Laboratory Director

A 0011

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SAMPLE#3

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA SAS No.: SDG No.: CRA029

Matrix: (soil/water) WATER Lab Sample ID: 9218400

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P9217

Level: (low/med) LOW Date Received: 6/ 8/92

% Moisture: not dec. 100. Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	2 ~~10.~~	U JU 6/10
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

6/12/92
John J. Molloy, P.E.
Laboratory Director

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SAMPLE#3

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA SAS No.: SDG No.: CRA029

Matrix: (soil/water) WATER Lab Sample ID: 9218400

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P9217

Level: (low/med) LOW Date Received: 6/ 8/92

% Moisture: not dec. 100. Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC 1/87 Rev

6/12/92
John J. Molloy, P.E.
Laboratory Director

A 0013

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SAMPLE#4

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA SAS No.: SDG No.: CRA029

Matrix: (soil/water) WATER Lab Sample ID: 9218401

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P9218

Level: (low/med) LOW Date Received: 6/ 8/92

% Moisture: not dec. 100. Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	2 ~~10~~.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

JU 6/10

John J. Molloy, P.E.
Laboratory Director
6/12/92

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A 0014

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SAMPLE#4

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA SAS No.: SDG No.: CRA029

Matrix: (soil/water) WATER Lab Sample ID: 9218401

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P9218

Level: (low/med) LOW Date Received: 6/ 8/92

% Moisture: not dec. 100. Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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6/12/92
John J. Molloy, P.E.
Laboratory Director

A 0015

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SAMPLE4

Lab Name: H2M   Contract: NYSDEC

Lab Code: H2M   Case No.:   SAS No.:   SDG No.: CRA

Matrix: (soil/water) WATER   Lab Sample ID: [illegible]

Sample wt/vol: 5 (g/mL) ML   Lab File ID: [illegible]

Level: (low/med) LOW   Date Received: [illegible]

% Moisture: not dec..   Date Analyzed: [illegible]

Column: (pack/cap) CAP   Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

JJMolloy
6/12/92
John J. Molloy, P.E.
Laboratory Director

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1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

[illegible]

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: SAS No.: SDG No.: [illegible]

Matrix: (soil/water) WATER Lab Sample ID: [illegible]

Sample wt/vol: 5 (g/mL) ML Lab File ID: [illegible]

Level: (low/med) LOW Date Received: [illegible]

% Moisture: not dec.. Date Analyzed: [illegible]

Column: CAP Dilution Factor: 1.00000

Number TICs found: 0

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	None Found			
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6/12/92
John J. Molloy, P.E.
Laboratory Director

FORM I VOA-TIC 1/87 Rev.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SAMPLE#:

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: SAS No.: SDG No.: CRA

Matrix: (soil/water) WATER Lab Sample ID: 9218403

Sample wt/vol: 5 (g/mL) ML Lab File ID: F917b

Level: (low/med) LOW Date Received: 05/05/92

% Moisture: not dec.. Date Analyzed: 5/06/92

Column: (pack/cap) CAP Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	1.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
133-02-7	Xylene (total)	5.	U

6/12/92
John J. Molloy, P.E.
Laboratory Director

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SAMPLE#

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: . SAS No.: . SDG No.: CRA

Matrix: (soil/water) WATER Lab Sample ID: P012407

Sample wt/vol: 5 (g/mL) ML Lab File ID: P917

Level: (low/med) LOW Date Received: 06 05/92

% Moisture: not dec.. Date Analyzed: 6 05 92

Column: CAP Dilution Factor: 1.00 01

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	None Found			
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6/12/92
John J. Molloy, P.E.
Laboratory Director

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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SAMPLE#7

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA SAS No.: SDG No.: CRA029

Matrix: (soil/water) WATER Lab Sample ID: 9218404

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P9219

Level: (low/med) LOW Date Received: 6/ 8/92

% Moisture: not dec. 100. Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	2 ~~10~~.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

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JJMolloy 6/12/92
John J. Molloy, P.E.
Laboratory Director

FORM I VOA 1/87 Rev

A 0020

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SAMPLE#7

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA SAS No.: SDG No.: CRA029

Matrix: (soil/water) WATER Lab Sample ID: 9218404

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P9219

Level: (low/med) LOW Date Received: 6/ 8/92

% Moisture: not dec. 100. Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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6/12/92
John J. Molloy, P.E.
Laboratory Director

A 0021

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SAMPLE#8

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA SAS No.: SDG No.: CRA029

Matrix: (soil/water) WATER Lab Sample ID: 9218405

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P9220

Level: (low/med) LOW Date Received: 6/ 8/92

% Moisture: not dec. 100. Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	2 ~~10~~.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

JJM 6/12/92

John J. Molloy, P.E.
Laboratory Director

FORM I VOA 1/87 Rev

A 0023

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SAMPLE#8

Lab Name: H2M   Contract: NYSDEC

Lab Code: H2M   Case No.: CRA   SAS No.:   SDG No.: CRA029

Matrix: (soil/water) WATER   Lab Sample ID: 9218405

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: P9220

Level: (low/med) LOW   Date Received: 6/ 8/92

% Moisture: not dec. 100.   Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP   Dilution Factor: 1.00

Number TICs found: 0   CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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6/12/92
John J. Molloy, P.E.
Laboratory Director

A 0023

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TRIPBLK.

Lab Name: H2M   Contract: NYSDEC

Lab Code: H2M   Case No.: CRA   SAS No.:   SDG No.: CRA029

Matrix: (soil/water) WATER   Lab Sample ID: 9218406

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: P9221

Level: (low/med) LOW   Date Received: 6/ 8/92

% Moisture: not dec. 100.   Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP   Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	2 ~~10~~.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

JV 6/1

4/12/92
John J. Molloy, P.E.
Laboratory Director

III. QC SUMMARY

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TRIPBLK.

Lab Name: H2M   Contract: NYSDEC

Lab Code: H2M   Case No.: CRA   SAS No.:   SDG No.: CRA029

Matrix: (soil/water) WATER   Lab Sample ID: 9218406

Sample wt/vol: 5.000 (g/mL) ML   Lab File ID: P9221

Level: (low/med) LOW   Date Received: 6/ 8/92

% Moisture: not dec. 100.   Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP   Dilution Factor: 1.00

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
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6/12/92

John J. Molloy, P.E.
Laboratory Director

A 0025

H2M LABS, INC.

A. VOLATILE ORGANICS

2A

WATER VOLATILE SURROGATE RECOVERY

Lab Name : H2M   Contract:NYSDEC

Lab Code:H2M   Case No.:.   SAS No.:.   SDG No.:CRA

	EPA SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#		TOT OUT
01	VBLK06	99	98	97		0
02	SAMPLE#5	99	98	97		0
03	SAMPLE#6	96	100	99		0
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		QC LIMITS
S1 (TOL)	= Toluene-d8	(88-110)
S2 (BFB)	= Bromofluorobenzene	(86-115)
S3 (DCE)	= 1,2-Dichloroethane-d4	(76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

2A
WATER VOLATILE SURROGATE RECOVERY

Lab Name: H2M　　　　Contract: NYSDEC

Lab Code: H2M　　Case No.: CRA　　SAS No.:　　SDG No.: CRA029

	EPA SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#	OTHER	TOT OUT
1	VBLK09	101	100	96		0
2	SAMPLE#1	102	101	102		0
3	SAMPLMS	101	102	97		0
4	SAMPLMSD	103	103	102		0
5	SAMPLE#2	101	101	99		0
6	SAMPLE#3	102	101	103		0
7	SAMPLE#4	103	102	104		0
8	SAMPLE#7	100	103	104		0
9	SAMPLE#8	101	103	104		0
10	TRIPBLK.	99	100	104		0
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		QC LIMITS
S1 (TOL)	= Toluene-d8	(88-110)
S2 (BFB)	= Bromofluorobenzene	(86-115)
S3 (DCE)	= 1,2-Dichloroethane-d4	(76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: H2M   Contract: NYSDEC

Lab Code: H2M   Case No.: CRA   SAS No.:   SDG No.: CRA029

Matrix Spike - EPA Sample No.: SAMPLE#1

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	MS CONCENTRATION (UG/L)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	50.	0.	42.	83	61-145
Trichloroethene	50.	0.	44.	88	71-120
Benzene	50.	0.	46.	92	76-127
Toluene	50.	0.	45.	90	76-125
Chlorobenzene	50.	0.	47.	94	75-130

COMPOUND	SPIKE ADDED (UG/L)	MSD CONCENTRATION (UG/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	50.	43.	86	3	14	61-145
Trichloroethene	50.	45.	90	2	14	71-120
Benzene	50.	48.	97	5	11	76-127
Toluene	50.	48.	96	6	13	76-125
Chlorobenzene	50.	50.	99	5	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS:

4A

VOLATILE METHOD BLANK SUMMARY

Lab Name: HCM Contract: [illegible]

Lab Code: HCM Case No.: . SAS No.: . SDG No.: [illegible]

Lab File ID: [illegible] Lab Sample ID: VBL [illegible]

Date Analyzed: 6/04/92 Time Analyzed: 11:3[illegible]

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: [illegible]

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	SAMPLE#5	~~[illegible]~~ 9218402	[illegible]P9175	13:31
02	SAMPLE#6	~~[illegible]~~ 9218403	[illegible]P9176	13:5[illegible]
03				
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gms 6/12/92

COMMENTS:

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA SAS No.: SDG No.: CRA029

Lab File ID: P9209 Lab Sample ID: VBLK6/9/92

Date Analyzed: 6/ 9/92 Time Analyzed: 11:35

Matrix: (soil/water) WATER Level:(low/med) LOW

Instrument ID: 7003C

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
1	SAMPLE#1	9218398	P9213	13:23
2	SAMPLMS	9218398MS	P9214	13:49
3	SAMPLMSD	9218398MSD	P9215	14:14
4	SAMPLE#2	9218399	P9216	14:40
5	SAMPLE#3	9218400	P9217	15:06
6	SAMPLE#4	9218401	P9218	15:32
7	SAMPLE#7	9218404	P9219	15:58
8	SAMPLE#8	9218405	P9220	16:23
9	TRIPBLK.	9218406	P9221	16:49
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COMMENTS:

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK02

Lab Name: HCI   Contract: NYSDEC

Lab Code: -IM   Case No.:   SAS No.:   SDG No.: CPA029

Matrix: (soil/water) WATER   Lab Sample ID: VBLK0/6/9

Sample wt/vol: 5 (g/mL) ML   Lab File ID: F9171

Level: (low/med) LOW   Date Received: ~~__/__/__~~ gms 6/12

% Moisture: not dec..   Date Analyzed: 6/06/92

Column: (pack/cap) CAP   Dilution Factor: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethane	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	1.	J
108-10-1	4-Methyl-2-pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

JMolloy
6/12/92
John J. Molloy, P.E.
Laboratory Director

A 0033

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK06

Lab Name: HCM Contract: NYSDEC

Lab Code: H2M Case No.: SAS No.: SDG No.: CPA029

Matrix: (soil/water) WATER Lab Sample ID: VBLK-6/6/92

Sample wt/vol: 5 (g/mL) ML Lab File ID: P9171

Level: (low/med) LOW Date Received: [illegible]/92

% Moisture: not dec. Date Analyzed: [illegible]/92

Column: CAP Dilution Factor: 1.0000

Number TICs found: 0

CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	None Found			
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6/12/92
John J. Molloy, P.E.
Laboratory Director

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK09

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA SAS No.: SDG No.: CRA029

Matrix: (soil/water) WATER Lab Sample ID: VBLK6/9/92

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P9209

Level: (low/med) LOW Date Received: 0/ 0/ 0

% Moisture: not dec. 100. Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	2~~10.~~	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

J M Slaver
6/12/92
John J. Molloy, P.E.
Laboratory Director

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK09

Lab Name: H2M Contract: NYSDEC

Lab Code: H2M Case No.: CRA SAS No.: SDG No.: CRA029

Matrix: (soil/water) WATER Lab Sample ID: VBLK6/9/92

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: P9209

Level: (low/med) LOW Date Received: 0/ 0/ 0

% Moisture: not dec. 100. Date Analyzed: 6/ 9/92

Column: (pack/cap) CAP Dilution Factor: 1.00

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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FORM I VOA-TIC 1/87 Rev.

JMMolloy
6/12/92
John J. Molloy, P.E.
Laboratory Director

A 0036

APPENDIX I

DATA VALIDATION AND ASSESSMENT RESULTS

MEMO

To: Wai Chin Lachell

From: Bill Hamel/Doreen Carden/jk/js

Reference No.: 2326

Date: 5/22/92

Re: Data Assessment and Validation
Tasks B and D
VacAir Alloys Division
Frewsburg, New York

The following memo details the analytical data assessment and validation for results obtained by H2M Labs Inc. on samples collected during April 1992 at the VacAir Alloys Site. The samples submitted for analysis consisted of the following:

Matrix	*Investigative Samples*	*Field Duplicates*	*Rinsate Blanks*	*Trip Blanks*	*Total*
Soil	3	0	0	0	3
Water	2	1	1	1	5
Total					8

A summary of the analytical methods and parameters for which the samples were submitted is presented in Table 1.

Evaluation of the data was based on information derived from the finished data sheets, chain of custody forms, blank data, and recovery data for matrix and surrogate spikes. The assessment of analytical and in-house data included checks for: adherence to accuracy and precision criteria; transmittal errors; and anomalously high and low parameter values.

The QA/QC criteria by which these data have been assessed are outlined in the methods referenced in Table 1 and the documents entitled:

i) "Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses" (February 1, 1988), Prepared by the USEPA Data Validation Work Group

ii) "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses" (July 1, 1988), Prepared by the USEPA Data Review Work

iii) "CLP Organics Data Review and Preliminary Review SOP HW-6 Revision No. 6 (March 1989)

Item i) and Item ii) will hereinafter be referred to as the "Guidelines". Item iii) will hereinafter be referred to as the "USEPA Region II Guidelines". The data quality assessment and validation is presented in the subsections which follow:

1. SAMPLE HOLDING TIMES

Based on the criteria outlined in the relevant methods and NYSDEC sample holding time protocols, the following sample holding time requirements have been established for groundwater and soil matrices.

VOCs	-	7 days from VTSR(1) to analyses
TOC	-	26 days from VTSR to analyses

By comparing the VTSR of all samples (from the notation appearing on the chain of custody documents) with the reported dates of extraction and/or analysis, it is noted that all samples submitted for VOC, and TOC determinations were analyzed prior to expiration of their prescribed holding times.

2. GC CALIBRATION (GC VOCS)

In order to ensure that satisfactory instrument performance has been established for the analysis of GC VOCs, the laboratory generated calibration data have been assessed. Both initial and continuing calibration data were compared against the compliance requirements established by Method 502.2 (EPA 600 4/88/039, December 1988). Based on the calibration data reported, the following observations were noted:

A. Initial Calibration - Based on recalculation of 5 percent of the initial calibration data, it is apparent that all Calibration Factors (CFs) and Relative Standard Deviations (RSDs) between CFs for GC VOCs were correctly determined and reported. Thirty-one compounds yielded outlying RSD values as shown in Table 2.

In accordance with the USEPA Region II Guidelines, qualifications of sample data in which initial calibrations yielded outlying RSD values was required as follows:

(1) VTSR - Validated Time of Sample Receipt.

	%RSD Between 10% - 50%	*%RSD Between 50% - 90%*	*%RSD Greater than 90%*
Positive Sample Data	J	J	J
Non-Detected Sample Data	-	UJ	R

J Estimated data
UJ Estimated quantitation limit
R Unusable data
\- No qualification of sample data required

Presented in Table 2 are samples associated with initial calibrations having outlying % RSD values. Presented below are those sample data which required qualifications based on the above mentioned criteria.

Sample ID	*Analysis Date*	*GC VOC*	*Qualified Concentration* (ug/L)
MW-4A	4/22/92	Benzene	3.6J
MW-5D	4/22/92	Benzene	3.7J
T-1	4/22/92	Benzene	0.6J

J The associated value is estimated due to outlying initial calibration.

B. Continuing Calibration - In order to measure the linearity of the calibration over a specific time period, the present difference (%D) between the CFs for the initial calibration and the CFs of continuing calibration check standards were evaluated. Inspection of the continuing calibration data indicated that all percent differences were correctly determined and yielded values less than or equal to the maximum allowable limit of 20 percent. This indicated that satisfactory linearity was maintained during the analyses of the investigative samples.

Recalculation of 5 percent of the GC VOC continuing data indicated that all CFs and %Ds between CFs were correctly determined and reported.

3. SURROGATE SPIKE RECOVERIES

Laboratory performance on individual samples is assessed on the basis of surrogate spike recoveries. When properly employed in conjunction with sample preparation, surrogates can be used to determine the effectiveness of sample cleanup or matrix modifying techniques. In addition, fortifying the sample with a known amount of the surrogate compound prior to sample preparation serves as an indicator of the efficiency of analyte extraction, dissolution, or other analyte-matrix separation techniques.

All samples submitted to GC VOC determinations were spiked with the surrogate compound chlorofluorobenzene. All samples submitted for GC VOCs yielded surrogate spike recoveries within the laboratory control limits.

4. METHOD BLANK ANALYSES

Method blank analyses were assessed to determine the existence and magnitude of sample contamination due to laboratory conditions or procedures. All method blanks were prepared from deionized water, and analyzed at a minimum frequency of one per 20 investigative samples. The results of the method blank analyses for GC VOC and TOC determinations showed non-detectable quantities of the compounds of interest. This indicated that the potential for sample contamination attributable to laboratory conditions or procedures was minimal during these analyses.

5. BLANK SPIKE ANALYSES

The recoveries of blank spike analyses are used to assess the analytical accuracy achieved by the laboratory. As the blank spike analyses are independent of potential matrix effects, they give a true indication of the analytical accuracy achieved by the laboratory for the respective analyses performed. Blank spike analyses were performed for GC VOC determinations at a frequency of one per 20 investigative samples.

All GC VOC blank spike analyses yielded recoveries within the laboratory control limits indicating that acceptable laboratory accuracy was achieved during these analyses.

6. MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

The recoveries of MS/MSD analyses are used to assess the analytical accuracy on an individual sample basis, while the percent reproducibility (RPD) between the MS and MSD indicates the analytical precision achieved for that sample. MS/MSD analyses were performed at a frequency of one per 20 determinations.

MW-5D was analyzed as an MS/MSD sample for GC VOCs. One GC VOC yielded an outlying MS recovery as shown below:

Sample ID	*Parameter*	*Compound*	*MS Recovery*	*Control Limits*
MW-5D	VOCs	Dichlorodifluoromethane	76	80-120

Since the MS recovery was marginally low (by 4 percent) and the MSD recovery was within laboratory control limits, qualification of the affected sample data was not required on this basis.

7. MATRIX SPIKE (MS) ANALYSES - INORGANICS

In order to evaluate the effects that the matrix may have on the digestion, measurement procedures, and accuracy of a particular analysis, samples are fortified with a known concentration of the analyte of concern and analyzed as matrix spike samples. A matrix spike analysis was performed on sample S-15 for TOC determinations. The TOC matrix spike recovery (114.7 percent) was within the established control limits of 80-120 percent.

8. DUPLICATE SAMPLE ANALYSES - INORGANICS

The method(s) precision (relative percent difference (RPD) of duplicate analyses) was determined from the analysis of duplicate samples. A duplication sample analysis was performed for TOC determinations on sample S-15.

The TOC duplicate data for S-15 demonstrated satisfactory precision of the analytical methodologies (RPD of 8.4 percent).

9. FIELD DUPLICATE RESULTS

A field duplicate was taken and submitted "blind" to the laboratory in order to assess the aggregate analytical and sampling protocol precision. The field duplicate collected consisted of sample MW-5D and its field duplicate MW-4A. The field duplicate results for VOCs showed adequate reproducibility, which indicated that satisfactory laboratory and sampling protocol precision was achieved for these parameters during this sampling event.

10. RINSATE BLANK RESULTS

In order to assess the efficiency of the sampling device cleansing protocols performed in the field, one rinsate blank (RB-415) was collected and submitted to the laboratory for analysis. The results of the rinsate blank analysis showed non-detected quantities of GC VOCs. This indicated that adequate sampling device decontamination protocols were adhered to for this sampling event.

11. TRIP BLANK RESULTS

To evaluate the possibility of contamination arising from sample transport, the environment, and/or shipping, a trip blank was submitted to the laboratory for GC VOC analysis. the results of the trip blank analyses for GC VOC showed non-detectable quantities of the compounds of interest.

Therefore, the potential for contamination due to sample transport, the environment and/or shipping was minimal during the sampling event.

12. CONCLUSION

Based on this QA/QC review, these data are judged acceptable for their intended uses within specific qualifications noted herein.

TABLE 1

TASKS B & D
SUMMARY OF ANALYSES AND SAMPLING COLLECTION
SAMPLING EVENT - APRIL 1992
DATA EVALUATION
VACAIR ALLOYS DIVISION
FREWSBURG, NEW YORK

Sample I.D.	*Matrix*	*Parameter*	*Method Reference*
S-7	Soil	TOC	Lloyd Kahn
S-13	Soil	TOC	Lloyd Kahn
S-15	Soil	TOC	Lloyd Kahn
RB-415	Water	VOCs	502.2(1)
MW-4A	Water	VOCs	502.2(1)
MW-5D	Water	VOCs	502.2(1)
T-1	Water	VOCs	502.2(1)
Trip Blank	Water	VOCs	502.2(1)

Note:

(1) Method for the Determination of Organic Compounds in Drinking Water (EPA-600/4-88/039 December 1988).

MEMO

To:	WaiChin Lachell
From:	Doreen Carden/js
Reference No.:	2326
Date:	7/01/92
Re:	Data Assessment and Validation Tasks B and D VacAir Alloys Division Frewsburg, New York

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The following memo details the analytical data assessment and validation for results obtained by H2M Labs, Inc. on samples collected during June 1992 at the VacAir Alloys Site. The samples submitted for analysis consisted of the following:

Matrix	*Investigative Samples*	*Rinsate Blanks*	*Trip Blanks*	*Total*
Water	7	1	1	9

A summary of the analytical methods and parameters for which the samples were submitted is presented in Table 1.

Evaluation of the data was based on information derived from the finished data sheets, chain of custody forms, blank data, and recovery data for matrix and surrogate spikes. The assessment of analytical and in-house data included checks for: adherence to accuracy and precision criteria; transmittal errors; and anomalously high and low parameter values.

The QA/QC criteria by which these data have been assessed are outlined in the methods referenced in Table 1 and the documents entitled:

i) "Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses" (February 1, 1988), Prepared by the USEPA Data Validation Work Group.

Item i) will hereinafter be referred to as the "Guidelines".

1. <u>SAMPLE HOLDING TIMES</u> - Based on the criteria outlined in the relevant methods and NYSDEC sample holding time protocols, the following sample

holding time requirements have been established for groundwater and soil matrices.

Volatile Organic Compounds (VOCs)	7 days from VTSR[1] to analyses

By comparing the VTSR of all samples (from the notation appearing on the chain of custody documents) with the reported dates of extraction and/or analysis, it is noted that all samples submitted for VOC determinations were analyzed prior to expiration of their prescribed holding times.

2. <u>SURROGATE SPIKE RECOVERIES</u> - Laboratory performance on individual samples is assessed on the basis of surrogate spike recoveries. When properly employed in conjunction with sample preparation, surrogates can be used to determine the effectiveness of sample cleanup or matrix modifying techniques. In addition, fortifying the sample with a known amount of the surrogate compound prior to sample preparation serves as an indicator of the efficiency of analyte extraction, dissolution, or other analyte-matrix separation technique.

   All samples submitted for VOC determinations were spiked with the surrogate compounds bromofluorobenzene, toluene-d_8, and 1,2-dichloroethane-d_4. All samples analyzed yielded surrogate spike recoveries within laboratory control limits.

3. <u>METHOD BLANK ANALYSES</u> - Method blank analyses were assessed to determine the existence and magnitude of sample contamination due to laboratory conditions or procedures. All method blanks were prepared from deionized water, and analyzed at a minimum frequency of one per 20 investigative samples. Bromoform was detected in one method blank VOC analysis at a concentration of 1J[2] µg/L. However, bromoform was non-detected in the associated samples. The remaining VOC method blank results showed non-detected quantities of the compounds of interest. This indicated that the potential for sample contamination attributable to laboratory conditions or procedures was minimal during these analyses.

4. <u>MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)</u> - The recoveries of MS/MSD analyses are used to assess the analytical accuracy on an individual sample basis, while the percent reproducibility (RPD) between the MS and MSD indicates the analytical precision achieved for that sample. MS/MSD samples were performed at a frequency of one per 20 determinations.

   Sample #1 (Municipal Well #1) was analyzed as an MS/MSD sample for

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1 VTSR - Validated Time of Sample Receipt.

2 J - Value estimated at stated detection limit.

VOCs. All VOC MS/MSD analyses yielded spike recoveries and RPD values within laboratory control limits, indicating satisfactory analytical accuracy and precision were achieved for these samples.

5. FIELD DUPLICATE RESULTS - A field duplicate was taken and submitted "blind" to the laboratory in order to assess the aggregate analytical and sampling protocol precision. The field duplicate collected consisted of Sample #5 (Municipal Wells #1 and #2A) and its field duplicate Sample #7. The field duplicate results for VOCs showed adequate reproducibility, which indicated that satisfactory laboratory and sampling protocol precision was achieved for these parameters during this sampling event.

6. RINSATE BLANK RESULTS - In order to assess the efficiency of the sampling device cleansing protocols performed in the field, one rinsate blank (Sample #8) was collected and submitted to the laboratory for analysis. The results of the rinsate blank analysis showed non-detected quantities of VOCs. This indicated that adequate sampling device decontamination protocols were adhered to for this sampling event.

7. TRIP BLANK RESULTS - To evaluate the possibility of contamination arising from sample transport, the environment, and/or shipping, a trip blank was submitted to the laboratory for GC VOC analysis. The results of the trip blank analyses for GC VOC showed non-detectable quantities of the compounds of interest. Therefore, the potential for contamination due to sample transport, the environment and/or shipping was minimal during the sampling event.

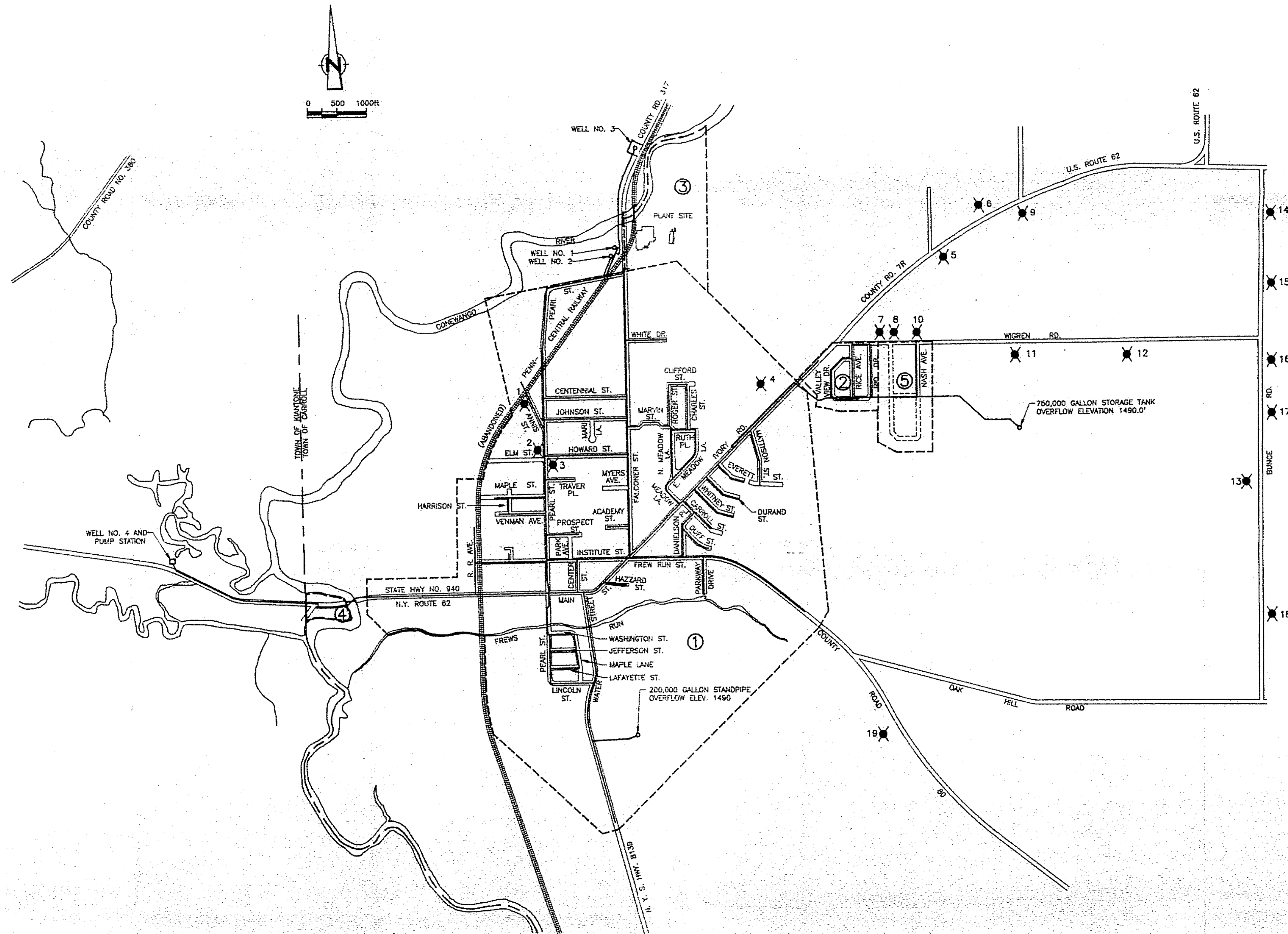
8. CONCLUSION - Based on this QA/QC review, these data are judged acceptable for their intended uses.

TABLE 1

SAMPLE SUMMARY KEY
VACAIR ALLOYS DIVISION
FREWSBURG, NEW YORK

Collection Date	*Sample I.D.*	*Matrix*	*Parameter*	*Method*	*VTSR(1) Date*	*Analysis Date*
6/04/92	Sample #1 Municipal Well #1	Water	TCL VOCs	8240	6/08/92	6/09/92
6/04/92	Sample #2 Municipal Well #2	Water	TCL VOCs	8240	6/08/92	6/09/92
6/05/92	Sample #3 Municipal Wells #1 and #2A	Water	TCL VOCs	8240	6/08/92	6/09/92
6/05/92	Sample #4 Municipal Wells #1 and #2A	Water	TCL VOCs	8240	6/08/92	6/09/92
6/05/92	Sample #5 Municipal Wells #1 and #2A	Water	TCL VOCs	8240	6/06/92	6/06/92
6/05/92	Sample #6 MW-5D	Water	TCL VOCs	8240	6/06/92	6/06/92
6/05/92	Sample #7 Field Duplicate of Sample #5	Water	TCL VOCs	8240	6/08/92	6/09/92
6/05/92	Sample #8 Rinsate Blank	Water	TCL VOCs	8240	6/08/92	6/09/92
	Trip Blank	Water	TCL VOCs	8240	6/08/92	6/09/92

VTSR Validated Time of Sample Receipt



LEGEND

- - - - - -	LIMIT OF DISTRICT
— — — —	MUNICIPAL BOUNDARY
———	WATERMAIN
✱ 1	DOMESTIC WELL LOCATIONS

DIST. NO.	KEY	ESTABLISHED
①	FREWSBURG WATER DISTRICT	8-21-40
②	VALLEY VIEW EXTENSION	12-4-59
③	VACAIR ALLOYS PLANT (FORMER FLAKEBOARD) EXTENSION	8-2-59
④	JAMESTOWN REINDERING EXTENSION	10-6-66
⑤	COUNTRY CLASSICS EXTENSION	8-10-77

Nº	Revision	Date	Initial

Approved

VAC AIR ALLOYS DIVISION
FREWSBURG, NEW YORK

INTERIM RESPONSE ACTIONS

DOMESTIC WELL LOCATIONS

CRA
CONESTOGA-ROVERS & ASSOCIATES

Drawn by: KEM	Scale: 1"=1000'	Date: JUNE 1992	File Nº: P-02 (NF-23)	Rev.Nº: 0
Designed by: JI				
Checked by: MM	Field book:	Project Nº: 2326	Drawing Nº: 1	