



Minnesota Pollution Control Agency

July 3, 2003

Mr. John Washburn
United Grain & Energy
P.O. Box 338
Hector, MN 55342

RE: Petroleum Tank Release Site File Closure
Site: United Grain and Energy Bulk Site
Site ID#: LEAK00014709

Dear Mr. Washburn:

We are pleased to let you know that the Minnesota Pollution Control Agency (MPCA) staff has determined that your investigation and/or cleanup has adequately addressed the petroleum tank release at the site listed above. Based on the information provided, the MPCA staff has closed the release site file.

Closure of the file means that the MPCA staff does not require any additional investigation and/or cleanup work at this time or in the foreseeable future. Please be aware that file closure does not necessarily mean that all petroleum contamination has been removed from this site. However, the MPCA staff has concluded that any remaining contamination, if present, does not appear to pose a threat to public health or the environment under current conditions.

The MPCA reserves the right to reopen this file and to require additional investigation and/or cleanup work if new information, changing regulatory requirements or changed land use make additional work necessary. If you or other parties discover additional contamination (either petroleum or nonpetroleum) that was not previously reported to the MPCA, Minnesota law requires that the MPCA be immediately notified.

You should understand that this letter does not release any party from liability for the petroleum contamination under Minn. Stat. ch. 115C (2000) or any other applicable state or federal law. In addition, this letter does not release any party from liability for nonpetroleum contamination, if present, under Minn. Stat. ch. 115B (2000), the Minnesota Superfund Law.

Please note that as a result of performing the requested work you may be eligible to apply to the Petroleum Tank Release Compensation Fund (Petrofund) for partial reimbursement of the costs you have incurred in investigating and cleaning up this petroleum tank release. The Petrofund is administered by the Petroleum Tank Release Compensation Board (Petro Board) and the Minnesota Department of Commerce. To learn more about who is eligible for reimbursement, the type of work that is eligible for reimbursement, and the amount of reimbursement available, please contact Petrofund staff at 651-297-1119 or 1-800-638-0418.

Mr. John Washburn

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If future development of this property or the surrounding area is planned, it should be assumed that petroleum contamination may still be present. If petroleum contamination is encountered during future development work, the MPCA staff should be notified immediately.

For specific information regarding petroleum contamination that may remain at this leak site, please call the Leaking Underground Storage Tank File Request Program at 651/297-8499. The MPCA fact sheet *Request to Bill for Services Performed* must be completed prior to arranging a time for file review.

Thank you for your response to this petroleum tank release and for your cooperation with the MPCA to protect public health and the environment. If you have any questions regarding this letter, please call me at (651) 296-7824.

Sincerely,



Sarah Henderson
Project Manager
Petroleum Remediation Unit
Petroleum & Landfill Remediation Section
Majors & Remediation Division

SH:tf

cc: Barb Johnson, Hector City Clerk
Robert Rassmussen, Hector Fire Chief
Doug Knutson, Renville County Solid Waste Officer
Roy Hill, Pinnacle Engineering, Inc.
Minnesota Department of Commerce Petrofund Staff



Pinnacle Engineering, Inc.
101 Broadway Street West
Suite 100
Minneapolis, Minnesota 55369

Tel: 763 315-4501
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www.pineng.com

1500 First Avenue Northeast
Rochester, Minnesota 55906

Tel: 507 280-5966
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December 12, 2002

RECEIVED

DEC 16 2002

MPCA, MAR Division
Petroleum & Landfill Remediation Section

Ms. Jessie Ebertz
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

**RE: Limited Site Investigation Report
MPCA Leak #14709
United Grain & Energy Bulk Site, 100 Highway Ave., Hector
Pinnacle Project No. MN02230.00**

Dear Ms. Ebertz:

Please find enclosed the Limited Site Investigation Report for the United Grain & Energy site in Hector, MN. Pinnacle Engineering is submitting this material on behalf of our client, John Washburn.

If you have any questions or require additional information, please contact me at 763-315-4501.

Sincerely,

PINNACLE ENGINEERING, INC.

A handwritten signature in black ink that reads "Roy L. Hill".

Roy L. Hill
Geologist

Enclosures

LSI
~~ANNUAL
MONITORING
REPORT~~

For:

United Grain and Energy
100 Highway Avenue
Hector, MN

Prepared for:

United Grain and Energy
100 Highway Avenue
Hector, MN

MPCA Leak Site # 14709

Pinnacle Engineering, Inc.
101 Broadway Street West
Suite 100
Minneapolis, MN 55369

1500 First Avenue NE
Rochester, MN 55906



Leaking Petroleum Storage Tanks

Minnesota Pollution Control Agency

http://www.pca.state.mn.us/programs/lust_p.html

RECEIVED

Investigation Report Form

Fact Sheet #3.24

DEC 16 2002

MPCA, MAR Division
Petroleum & Landfill Remediation Section

Complete this form to document remedial investigation (RI) activities, including Limited Site Investigations (LSIs) and full RIs. Do not revise or delete any text or questions from this report form. Include any additional information that is important for making a site cleanup decision. If only a LSI is necessary, you may skip Section 6 and Section 7 of this report form.

Refer to Minnesota Pollution Control Agency (MPCA) fact sheet 3.1 *Leaking Underground Storage Tank Program* for the overall RI objectives, and to other MPCA fact sheets for details on investigation methods. When a tank has been excavated, refer to fact sheets 3.6 *Excavation of Petroleum Contaminated Soil During Tank Removal* and 3.7 *Excavation Report Worksheet for Petroleum Release Sites* for reporting requirements. Document the occurrence of free product using fact sheet 3.3 *Free Product: Evaluation and Recover*, and fact sheet 3.4 *Free Product Recovery Report Worksheet*.

MPCA Site ID: Leak: **00014709** Date: **12/12/02**

Responsible Party: **United Grain & Energy** R.P. phone #: **1-800-547-5576**

Consultant: **Pinnacle Engineering** Consultant phone #: **763-315-4501**

Facility Name: **United Grain & Energy Bulk Site**

Facility Address: **100 Highway Avenue** City: **Hector**

County: **Renville** Zip Code: **55342**

Site location: The required coordinate scheme for reporting site location is Universal Transverse Mercator (UTM), Extended Zone 15, 1983 North American Datum (NAD83). Refer to http://www.ot.state.mn.us/ot_files/handbook/standard/std17-1.html for Minnesota spatial data standards, or <http://mac.usgs.gov/mac/isb/pubs/factsheets/fs15799.html> for more information about UTM Coordinates.

X coordinate (Easting) **364,332** meters

Y coordinate (Northing) **4,955,073** meters

What feature does the coordinate represent? (i.e. center of parcel, approximate center of source area, etc. Please describe) **approximate center of source area**

What method was used to determine the coordinate? (i.e. GPS receiver, map interpolation, address matching, etc. Please describe) **map interpolation**

If a paper map, digital map, aerial photo or digital orthophotoquad was used to find the site location, please provide the scale of the map or photo (i.e. 1:24,000, etc.)

1:24,000

Section 1: Emergency and High Priority Sites

1. Is an existing drinking water well impacted or likely to be impacted within a two-year travel time? Yes No
2. Are there existing vapor impacts? Yes No
3. Is there an existing surface water impact as indicated by 1) a product sheen on the surface water or 2) a product sheen or volatile organic compounds in the part per million (ppm) range in ground water in a well located close to the surface water. Yes No
4. Has the release occurred in the last 30 days? Yes No
5. Has free product been detected at the site? **If YES**, attach fact sheet 3.4 *Free Product Recovery Report Worksheet*. Yes No
6. Is sand or gravel aquifer impacted which is tapped by water wells within or potentially within 500 feet from the release source or does impacted soil overlie a geologically sensitive area? **If YES**, explain: Yes No

If you answered *YES* to any of questions 1 through 6 above describe below the actions taken to date to reduce or eliminate the risk posed by the release.

Section 2: Site and Release Information

2.1 Attach Table 1 - Tank Information. Describe the status of the other components of the tank system(s), (i.e., piping and dispensers).

All components of the system have been removed.

2.2a Describe the land use and pertinent geographic features within 1,000 feet of the site.

The site is located in a mixed commercial and residential area. The former bulk facility was located at the southeast corner of a property consisting of a Cenex gasoline station and a convenience store. To the south of the tanks is Hector Tile Company and to the northeast and east are two residential properties. The surrounding land is level.

2.2b List other potential leak sources within 500 feet of the site.

Cenex gas station

2.3 Identify and describe the source or suspected source(s) of the release.

The source was likely the ASTs that have been removed.

2.4 What was the volume of the release? (if known): **unknown** gallons

2.5 When did the release occur? (if known): **unknown**

Section 3: Excavated Soil Information

3.1 Include the Fact Sheet 3.7 *Excavation Report Worksheet* in Appendix A

3.2 Was soil excavated for off-site treatment? Yes No

Date excavated:

Volume removed: cubic yards

3.3 Indicate soil treatment type:

- land treatment
- thermal treatment
- composting/biopiling
- other ()

Name and location of treatment facility:

Section 4: Extent and Magnitude of Soil Contamination

4.1 Were soil borings conducted in or immediately adjacent to all likely sources including: *YES NO NOT PRESENT*

dispensers, yes no not present
underground storage tank basins, yes no not present
above ground storage tank areas, yes no not present
piping, yes no not present
remote fill pipes, yes no not present
and known spill areas yes no not present

4.2 To adequately define the vertical extent of contamination, soil borings should be completed at least five feet below the water table or ten feet below the deepest measurable (field screening and visual observation) contamination, whichever is deeper. Were all soil borings completed to the required depth? YES NO

4.3 To adequately evaluate site stratigraphy complete at least one boring to 20 feet below the water table, or to 20 feet below the deepest site contamination, whichever is deeper. If a confining layer is present, drill the boring in an uncontaminated area. Was this done? YES NO

If you answered *NO* to any of the three previous questions, explain why the borings were not conducted in the required locations or to the required depths (see fact sheet #3.19, *Soil and Ground Water Investigations Performed During Remedial Investigations* regarding exceptions and MPCA approval for depth of drilling):

PP-2 and PP-3 were not completed to five feet below the water table because vapor screening did not show any soil contamination. Vapor screening of the source area boring (PP-1) indicated that the contamination did not extend below 10 feet. Both PP-2 and PP-3 were advanced to at least 10 feet below this depth.

The source area boring was completed to 22 feet below the deepest contamination. Sixteen feet of uncontaminated clay separated the deepest contamination from the water table. Therefore, the boring was terminated at 32 feet.

4.4 Indicate the drilling method: hollow-stem auger
sonic drilling
push probes
other

Note: MPCA staff hydrologist approval is required before use of flight augers

- 4.5 Discuss soil borings drilled and provide rationale for their locations. Attach boring logs in Appendix D.

Five soil borings were advanced at the site. One boring (PP-1) was placed in the center of the former bulk facility and four additional borings were located outside of the diked area that contained the ASTs. The borings were advanced to between 20 and 32 feet below grade, depending on the depth to groundwater.

- 4.6 Attach Table 2 - Results of Soil Headspace Screening, In Appendix C, discuss soil headspace screening method and describe any deviation from recommended and/or required methods and procedures.
- 4.7 Attach Table 3 - Analytical Results of Soil Samples. Provide analytical results in Appendix B. In Appendix C, discuss soil sampling and analytical methods used and describe any deviation from recommended and/or required methods and procedures
- 4.8 Describe the vertical and horizontal extent and magnitude of soil contamination. Provide a plan-view map and two cross-sections that illustrate both soil head space and laboratory analytical results. See Section 13.

Based on vapor screening in the field, soil contamination extends to 10 feet below grade in the source area. Maximum soil vapor readings were observed at a depth of 6 to 8 feet. The soil sample collected at this depth contained 2.5 ppm ethylbenzene, 6.79 ppm xylenes, 680 ppm GRO and 1200 ppm DRO. Analytical results for the soil sample collected at the water table from PP-1 were below method detection limits for all targeted compounds.

No contamination was detected outside of the dike, suggesting that the release was confined to the dike area. The dike enclosed a 65 X 65 foot area.

- 4.9 Attach Table 4 - Other Contaminants Detected in Soils (Petroleum or Non-petroleum Derived). Discuss the possible sources of these compounds.
- 4.10 Is contaminated soil in contact with ground water? Yes No

If YES or if ground water contamination appears likely, then complete Section 5.

If NO (contaminated soil is not in contact with ground water), what is the distance separating the deepest contamination from the surface of

the water table? Was this distance measured during site activities, referenced from geologic information, or estimated based on professional opinion during a site visit?

15 feet

This distance was measured during site activities.

4.10 Describe observations of any evidence of a fluctuating water table and a seasonal high water table (e.g., mottling). Also, from other sources of information describe the range of natural water table fluctuations in the area.

No evidence was observed.

4.12 In your judgment, is there a sufficient distance separating the petroleum contaminated soil (or an impacted non-aquifer) from the underlying aquifer to prevent petroleum contamination of the aquifer? Please explain in detail. In your explanation, consider the data and information of this section as well as the nature of the petroleum release (i.e., volume, when it occurred, petroleum product). Yes No

If YES, a ground water contamination assessment is not necessary as part of the LSI.

If NO, a ground water contamination assessment is necessary. Complete Section 5.

The groundwater samples collected from the source area (PP-1) and from PP- 2 indicate that the release did penetrate the soil column to groundwater.

Section 5: Aquifer Characteristics/Ground Water Contamination Assessment

Complete Section 5 if groundwater has been contaminated or may become contaminated. Aquifer determination is made during the LSI. It is based upon the stratigraphy and a hydraulic conductivity measurement calculated from grain size distribution analysis. The site stratigraphy gives the context within which the hydraulic conductivity measurement can be interpreted. Please refer to Fact Sheet 3.19, *Soil and Ground Water Investigations Performed During Remedial Investigations* for methods and requirements.

5.1 Provide an average hydraulic conductivity value (K) measured:

$$K = 4.40 \text{ ft/day}$$

Indicate the method of measurement (i.e., Hazen, Masch and Denny, Kozeny-Carmen, etc.): Grain-size distribution approximations by **Hazen** method(s).

Indicate the locations and depths of soil samples submitted for grain size analyses. Provide the results of grain size analyses and other information used for the determination of K-values in Appendix F.

Soil samples collected from PP-1 at depths of 20-24 feet and 24-28 feet below grade were submitted for grain size analysis. Soils from these horizons were chosen to demonstrate the range of soil types at the site.

5.2 Calculate a range for aquifer transmissivity (T) using the equation $T = Kb$, where b is the thickness of the aquifer:

$$T_{\text{High}} = 14.4 \text{ ft}^2/\text{day}$$

$$T_{\text{Low}} = 12 \text{ ft}^2/\text{day}$$

Determine the aquifer thickness (b) from geologic logs of soil borings, water well logs, and available published information. Attach water well logs in Appendix D. If the transmissivity of a contaminated hydrogeologic unit is greater than 50 ft²/day, it is considered an aquifer (for the purpose of the LUST program), and monitoring wells will be necessary.

In SB-1 and SB-5 a dry layer of silt was encountered at 28 feet below grade. Groundwater in SB-1 was at a depth of 25 feet. Therefore, the thickness of the near surface saturated zone appears to be 3 feet thick.

- 5.3 Discuss in detail the site geology and stratigraphy, including a discussion of local and regional hydrogeology, using soil boring data and cross sections, geologic logs of near-by water wells, and available published information.

Boring logs from wells in the area indicate that glacial till consisting of interbedded sandy clay and sand extends to roughly 400 feet below the surface. The till rests on Precambrian igneous and metamorphic bedrock.

Published information indicates that groundwater in shallow till (<100 feet below grade) tends to flow from higher morainal areas toward stream valleys. Buffalo Creek is approximately 4 miles north of Hector, so shallow groundwater flow is likely to the north. Groundwater that penetrates into deeper till follows the regional flow to the south.

REFERENCES:

Lindholm, G.F. et al., Water Resources Crow River Watershed, south-Central Minnesota, Atlas HA-528, Minnesota Department of Natural Resources, St. Paul, Minnesota, 1974.

- 5.4 Attach Table 5- Water Level Measurements and Depths of Water Samples Collected from Borings. Indicate the method used to measure the water levels in borings, and the depth water samples were collected from borings. Allow water levels in borings to equilibrate to static conditions, and the adjust the effective screened intervals in borings to intercept the static water table prior to water sample collection. Discuss groundwater flow direction.**

After completing each boring, the water level in the boring was allowed to equilibrate and depth to groundwater was measured with a water level tape.

Boring PP-4 was advanced to 24 feet before encountering groundwater. Once the water table was intersected, groundwater entered the boring to a level of 14 feet below grade. The boring also collapsed, so the screen was set at a depth of 19 feet.

Boring PP-5 was advanced to 6 feet below where saturated soil was identified; however, the boring did not produce enough water for sampling.

Groundwater levels were deepest in borings PP-5 and PP-2; therefore, groundwater flow is likely to the northeast.

- 5.5 Attach Table 6 - Analytical Results of Water Samples Collected from Borings. Summarize the analytical results of groundwater samples collected as part of an LSI. Discuss the extent and magnitude of groundwater contamination. Also provide a discussion on QA/QC, including information on the samples collected and laboratory analyses performed.**

Groundwater samples were collected through a PVC screen placed in the boring. Dedicated polyethylene tubing fitted with a check valve was repeatedly pushed into the boring to force groundwater into the tube and to the surface. Single-use latex gloves were worn during the sampling to avoid cross contamination. Groundwater samples for VOC analyses were collected in HCL-preserved 40 ml vials. Groundwater samples for DRO analysis were collected in HCL-preserved one-liter amber bottles. For the VOC analysis, the vials were filled until a positive meniscus was observed to eliminate headspace in the sample. The samples were stored on ice in a cooler with chain-of-custody documentation for delivery to the contract laboratory. Down hole equipment was decontaminated with Alconox solution and rinsed between samples.

The DRO samples were analyzed using Wisconsin Modified methods, and VOCs were analyzed using MDH Method 465F.

Groundwater contamination was detected in borings PP-1 and PP-2. The groundwater sample collected from PP-1 contained 2.1 ppb benzene, 4.4 ppb toluene, 7.9 ppb ethylbenzene, 15.7 ppb xylenes, 440 ppb GRO and 7,500 ppb DRO. PP-2 contained 1.2

ppb toluene and 180 ppb DRO. Analytical results for groundwater samples collected from the other borings were below method detection limits for all targeted compounds.

Therefore, groundwater contamination appears to be limited to below the former bulk facility, with only minor contamination extending beyond the diked area. It should be noted that perched groundwater in contact with contaminated soil was encountered inside the dike (approximately 4 feet below grade). It is likely that some of this water entered the soil boring and mixed with the deeper groundwater during sampling. Therefore, the analytical results for the groundwater sample collected from PP-1 may show higher contaminant levels than what has actually reached the deeper water table.

QA/QC information, including matrix spikes and chromatograms, are submitted in Appendix B.

- 5.6 Attach Table 7 - Other Contaminants Detected in Water Samples Collected from Borings (Petroleum or Non-petroleum Derived). Discuss the possible sources of these contaminants and provide a discussion of QA/QC information.**

The groundwater sample collected from PP-1 contained other petroleum-derived contaminants. The source for these contaminants is likely the subject release.

QA/QC information, including matrix spikes and chromatograms, are submitted in Appendix B.

- 5.7 Laboratory certification number: 055-999-334**

Additional Ground Water Investigation

Complete **Section 6** only if: 1) *an aquifer has been impacted at or above Minnesota Department of Health HRLs*, 2) *an aquifer has been impacted below the HRLs, but the levels are likely to reach the HRLs*, or 3) *there is an insufficient distance separating the petroleum contaminated soil (or an impacted non-aquifer) from the underlying aquifer*. Complete **Section 7** only if remediation is anticipated. Regardless of whether you are submitting a *LSI* or a *full RI*, all sections following Section 7 must be completed.

Section 6. Extent and Magnitude of Ground Water Contamination

- 6.1** Discuss drilling and installation of wells, including the rationale for their locations. Attach boring logs in Appendix D.
- 6.2** Attach Table 8 - Monitoring Well Completion Information.
- 6.3** Attach Table 9 - Summary of Water Levels Measured in Wells.
- 6.4** Attach Table 10 - Analytical Results of Water Samples Collected from Wells. Indicate here whether samples were purged or unpurged (see fact sheet 3.23). If purged, indicate purging method.
- 6.5** Attach Table 11 - Other Contaminants Detected in Water Samples Collected from Wells (Petroleum or Non-Petroleum Derived). Indicate here whether samples were purged or unpurged (see fact sheet 3.23). If purged, indicate purging method.
- 6.6** Describe the extent and magnitude of the ground water contamination. Discuss the presence of non-petroleum compounds, if detected, and identify possible sources of these compounds. Also provide a discussion on QA/QC, including information on the samples collected and laboratory analyses performed.
- 6.7** Is there a clean or nearly clean (below HRLs) down-gradient monitoring well Yes No located along the longitudinal axis of the contaminant plume?
(approximately 20 degrees plus or minus the axis)
- 6.8** Is there a worst case well completed through the source area(s) of the Yes No

release?

If you have answered *NO* to any of the above two questions, please explain why a well was not completed in the required location.

6.9 Provide an estimate of the longitudinal length of the dissolved contaminant plume: _____ feet

6.10 Calculate groundwater flow velocity (based on Darcy's Law) using the average K-value, average horizontal hydraulic gradient, and effective porosity. Provide documentation in Appendix F.

Hydraulic Conductivity (K) = _____ Method _____
Porosity (n) = _____ method/reference _____
Average horizontal gradient (dh/dl) = _____
Calculated GW velocity (v) = _____ cm/s _____ ft/day

6.11 Using the calculated groundwater flow velocity (above), is there a receptor within a five-year travel time? Yes No

If *YES*, provide the unique well number and identify the location of the receptor(s).

6.12 Were any deep monitoring wells completed at the site? Yes No

If *YES*, list them and indicate their depths:

Contact the MPCA project hydrologist before installing a deep monitoring well. A deep monitoring well may be necessary if: 1) Contamination exists more than 10 feet below the water table or 2) the impacted aquifer is a drinking water aquifer or is hydraulically connected to the aquifer(s) presently utilized by a water supply well located within 500 feet of the release source.

If contamination is present at depth in the aquifer or in deeper aquifers, additional deep wells may be required. Provide the following information if deep wells are installed:

Vertical Gradient (dv/dl)
Inferred GW Flow Direction

Provide the following information for the deep aquifer unit if it appears to be hydrogeologically distinct from the upper unit.

Porosity (n):
Hydraulic Conductivity (K)

Submit this RI report after completing a minimum of *two quarterly sampling events*. Groundwater monitoring should continue until MPCA response is received.

Section 7: Evaluation of Natural Attenuation

Refer to the fact sheet #3.21 *Assessment of Natural Attenuation at Petroleum Release Sites*.

Note: Evaluation of natural attenuation is not required unless requested by MPCA staff.

7.1 Attach Table 12 - Natural Attenuation Parameters. Discuss the results. Specifically, compare the concentrations of the inorganic parameters inside and outside the plume.

7.2 In your judgment, is natural biodegradation occurring at this site? Please Yes No Explain.

If active remediation is anticipated, discuss reasons why natural attenuation (including biodegradation) can not adequately remediate the contaminants to acceptable risk levels.

Section 8: Well Receptor Information/Assessment

Include in Appendix E, copies of the water supply well logs obtained from MGS, MDH, drillers, and where applicable, from County well management authorities.

- 8.1 Attach Table 13 - Properties Located Within 500 Feet of the Release Source. Provide a map identifying the features listed in Table 13.

Please refer to Figure 2 for the location of properties within 500 feet of the release.

- 8.2 Were all property owners within 500 feet of the release source successfully contacted to determine if water wells are present? Yes No
If *NO*, please explain.

- 8.3 Attach Table 14 - Water Supply Wells Located within 500 Feet of the Release Source and Municipal or Industrial Wells Within ½ Mile.

- 8.4 Discuss the results of the ground water receptor survey and any analytical results from sampling conducted at nearby water wells. Comment on the risks to water supply wells identified within 500 feet from the release source as well as the risk posed by or to any municipal or industrial wells found within ½ mile. Specifically indicate whether water supply wells identified utilize the impacted aquifer. (Note: an impacted aquifer separated from another aquifer by a clay lens may not be considered a separate aquifer).

No water supply wells were identified within 500 feet of the release and no active municipal or industrial wells were identified within ½ mile of the release.

An emergency municipal well (unique #241566) is located 2,000 feet to the north of the site. This well is 400 feet deep and is cased to 377 feet. The water & wastewater superintendent, Mr. Jerome Schuller, indicated that he does not expect that the well will be used because the active supply wells now have backup power systems.

- 8.5 Is municipal water available in the area? Yes No

- 8.6 Are there any plans for ground water development in the impacted aquifer within 1/2 mile of the site, or one mile down-gradient of the site if the aquifer is fractured? Please give the name, title and telephone number of the person that was contacted for this information (below). Yes No

Jerome Schuller, Water & Wastewater Superintendent, Telephone 320-848-2122

Section 9: Surface Water Risk Assessment

9.1 Are there any surface waters or wetlands located within ¼ mile of the site? Yes No

If YES, list them: _____

9.2 If surface water is present down-gradient of the site, is there a clean down-gradient monitoring well (temporary or permanent) located between the site and the surface water? YES NO N/A

9.3 If you answered NO to question 9.2, we assume that contamination discharges to surface water. Therefore, complete the following information:

Name of receiving water:

Receiving water classification

ORVW?

Yes No

Plume width, (W):

feet

Plume thickness, (H):

feet

Hydraulic conductivity, (K):

gal/day/ft²

Horizontal gradient, (dh/dl):

(unitless)

Discharge, (Q) = $H * W * K * (dh/dl) / 1440$

gal/min

Applicable chronic standard (7050 or 7052)

Applicable max. standard (7050 or 7052)

Applicable FAV (7050 or 7052)

Contaminant concentration in ground water

9.4 If you answered YES to question 9.2, identify the clean down-gradient boring or monitoring well, the distance to the surface water feature, and discuss the contamination risk potential.

Section 10: Vapor Risk Assessment/Survey

10.1 Is there a history of vapor impacts in the vicinity of the site ? Yes No

If **YES**, describe:

10.2 Is there any indication that free product or contaminated ground water may be traveling off-site within the utility corridors? Yes No

If **YES**, utility backfill investigation is required (refer to Fact Sheet 3.19). Discuss the investigation rationale and results.

10.3 Discuss the potential for vapor migration/accumulation near the site. Your discussion should consider: Soil types, product type, presence and distribution of free product or high concentrations of dissolved product. Also, using cross-sections to illustrate the relationship, compare the depth of contamination with the location of underground utility lines, location and depth of storm and sanitary sewers, and location of nearby basements and sumps.

The risk of vapor migration or accumulation is low. The clay rich soil underlying the site will limit the migration of any vapors that may be present. The closest structure to the source area is the on-site convenience store, which does not have a basement. The closest basement is at a residence 200 feet to the northeast. No vapors were detected in soil borings outside of the diked area of the former bulk facility.

10.4 Conduct a vapor survey if the vapor risk assessment indicated a risk of vapor impacts to buildings or utilities. Ask occupants of nearby buildings if they have smelled petroleum odors. See fact sheet 3.20 *Potential Receptor Surveys and Risk Evaluation Procedures at Petroleum Release Sites*. Identify all vapor monitoring locations on an attached site map by labeling each monitoring location with a number. Tabulate the list of vapor monitoring locations in Table 15. Vapor monitoring methods, including instruments used, must be discussed in Appendix C. Provide a detailed description of each vapor monitoring location and an interpretation of the vapor monitoring results below.

Attach Table 15 - Results of Vapor Monitoring.

Section 11: Discussion

11.1 Discuss the risks associated with the remaining soil contamination:

Risks associated with the contaminated soil are low. Contaminated soil is confined to the source area and no hydrocarbon vapors were detected in soil borings beyond the diked area. Significant vapor migration through the clay rich soil would not be expected. The closest potential vapor receptor is a basement 200 feet to the northeast. Impacted soil in the source area is separated from the water table by 15 feet of clay, limiting the potential for the soil to act as a source of groundwater impact. The diked area has been graded to a level surface and the surface on which the former ASTs rested has been covered by approximately 3 feet of mixed clay, sand and gravel fill. The contaminated soil is located at an unused portion of the property and is covered by weeds and grass.

11.2 Discuss the risks associated with the impacted ground water:

Risks associated with the contaminated groundwater are low. It appears that only minor DRO impact has migrated beyond the diked area of the facility, indicating that contaminant migration is being limited by the clay rich soil underlying the site. Groundwater impact at the source is also low, such that significant down-gradient migration would not be expected. No groundwater receptors were identified within 500 feet of the source area. The closest receptor identified is an emergency municipal well located 2,000 feet to the north of the site.

11.3 Discuss other concerns not mentioned above:

Section 12: Conclusions and Recommendations

12.1 Recommendation for site:

- site closure
- additional vapor monitoring
- additional ground water monitoring
- active remediation

12.2 Base the recommendation above on fact sheet #3.1 *Leaking Underground Storage Tank Program*. Describe below how you applied the policy to support your recommendation. If closure is recommended, please summarize significant site investigative events and describe how site specific risk issues have been adequately addressed or minimized to acceptable low risk levels.

After closure of a bulk facility, soil borings were completed where five former ASTs were located. Soils were screened for hydrocarbon vapors and readings up to 34 ppm were obtained. Based on this information, a release was reported to the State Duty Officer on April 26, 2002.

On August 5, 2002, an Initial Site Assessment (ISA) consisting of five soil borings was completed. Hydrocarbon impacted soil was found to be localized to the source area, extending from approximately 3 to 10 feet below grade. Low levels of groundwater contamination were found in the source area and to the east of the former diked area of the bulk facility.

Based on the lack of risks associated with the identified contamination, leak site closure is being recommended. No hydrocarbon vapors were identified beyond the former diked area of the bulk facility. Clay rich soil at the site would be expected to limit the migration of vapors and the closest potential vapor receptor is a basement approximately 200 feet to the northeast. Low levels of groundwater impact indicate that the contaminated soil is not acting as a significant source of dissolved hydrocarbons.

The only potential groundwater receptor identified is an emergency municipal well located 2,000 feet to the north of the site. Given the minor groundwater impact and the clay rich soil underlying the site, movement of contamination beyond the source area should be limited.

Contaminated soil remaining in the source area has been covered by 3 feet of mixed clay, sand and gravel fill. This part of the property is unused and is covered with weeds and grass.

12.3 If additional monitoring is recommended, indicate the proposed monitoring schedule and frequency. Conduct quarterly monitoring until the MPCA responds to this report.

12.4 If active remediation is proposed, then recommend a conceptual approach by listing the remedial technologies or combination of technologies that are likely feasible. MPCA staff will review this RI report at a higher than normal priority to determine if active remediation is required. We will respond with either a request for proposal for additional monitoring or a Corrective Action Design report.

Section 13: Figures

Attach the following figures in order of discussion in the text:

- Site location map using a U.S. Geological Survey 7.5 minute quadrangle map.
- One or more site map showing:
 - Structures
 - Locations and depths of on-site buried utilities
 - All past and present petroleum storage tanks, piping, and dispensers
 - Extent of soil excavation
 - Boring and well locations (including any drinking water wells on site)
 - Horizontal extent of soil contamination
 - Horizontal extent of ground water contamination
 - Location of end points for all geologic cross sections.

Distinguish sequential elements of investigations by dates, symbols, etc. in the key.

- Ground water gradient contour maps (for sites with monitoring wells) for each gauging event.
- Well receptor survey map showing 1/2 mile radius, 500 foot radius, water supply wells, other potential sources of contamination, using a U.S. Geological Survey 7.5 minute quadrangle.
- Vapor survey map showing utilities and buildings with basements and monitoring locations (if a survey was required).
- Provide at least two (2) geologic cross sections, including utilities.

FIGURES

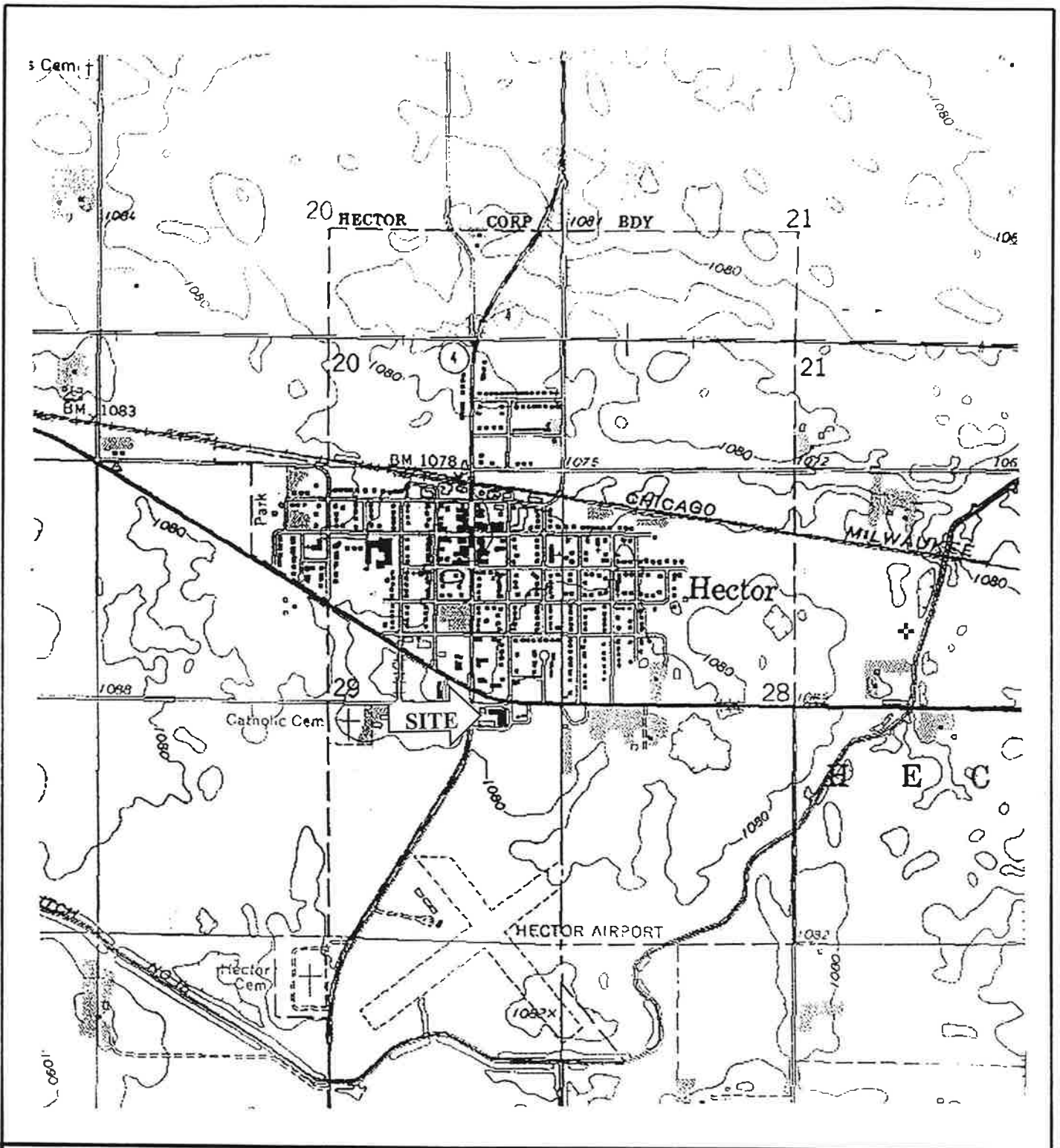
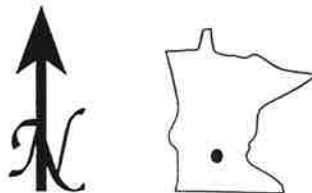


Figure 1.

Site Location Map
 United Grain & Energy - Bulk Facility
 260 Main Street
 Hector, Minnesota



Pinnacle Engineering, Inc.
 101 Broadway Street West, Suite 100
 Minneapolis, MN 55369
 Phone: (763) 315-4501
 Fax: (763) 315-4507

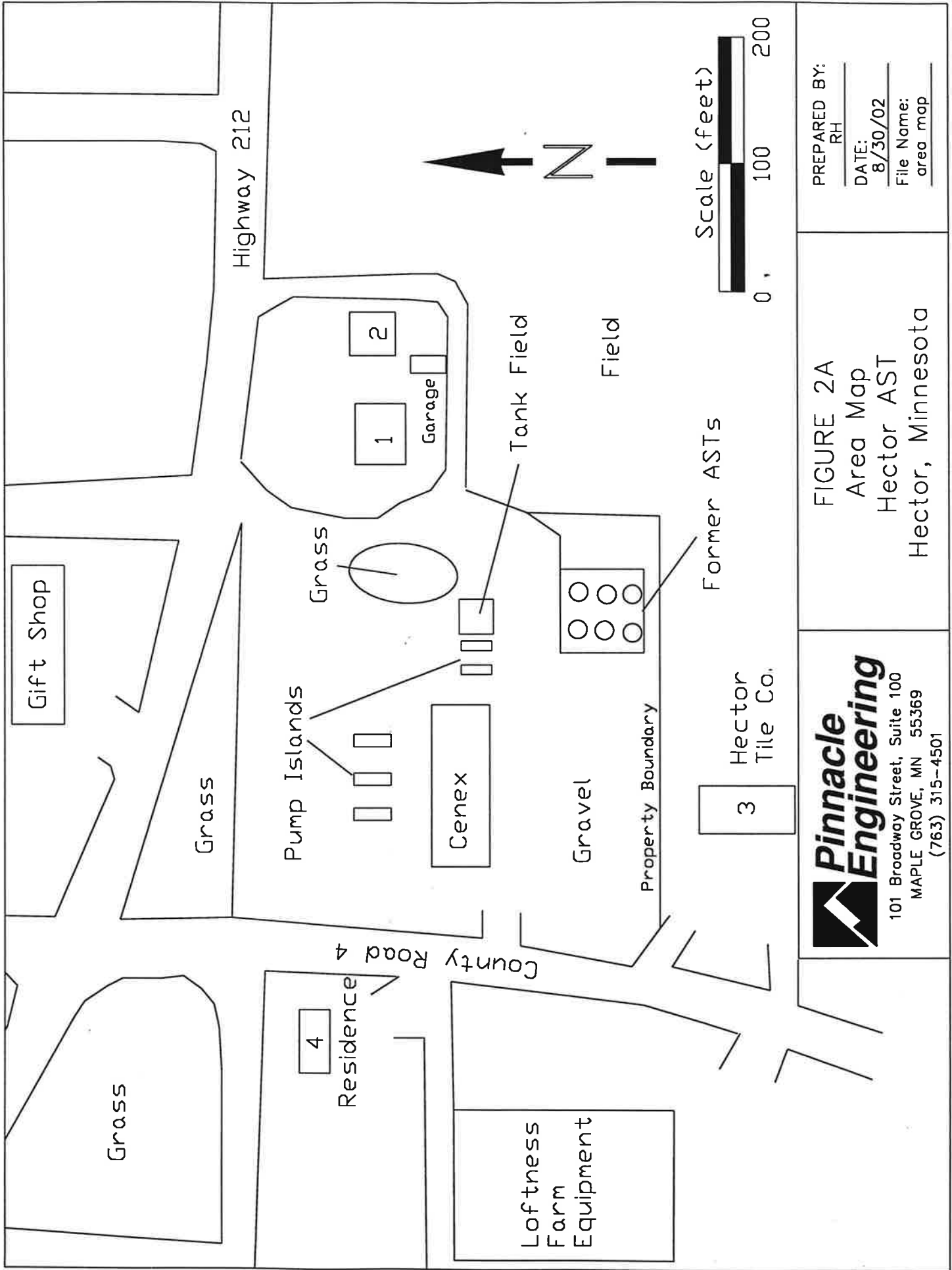


Date:
 September 10, 2002

Prepared By:
 R. Hill

Scale:
 1:24,000

Reviewed By:
 M. Hultgren



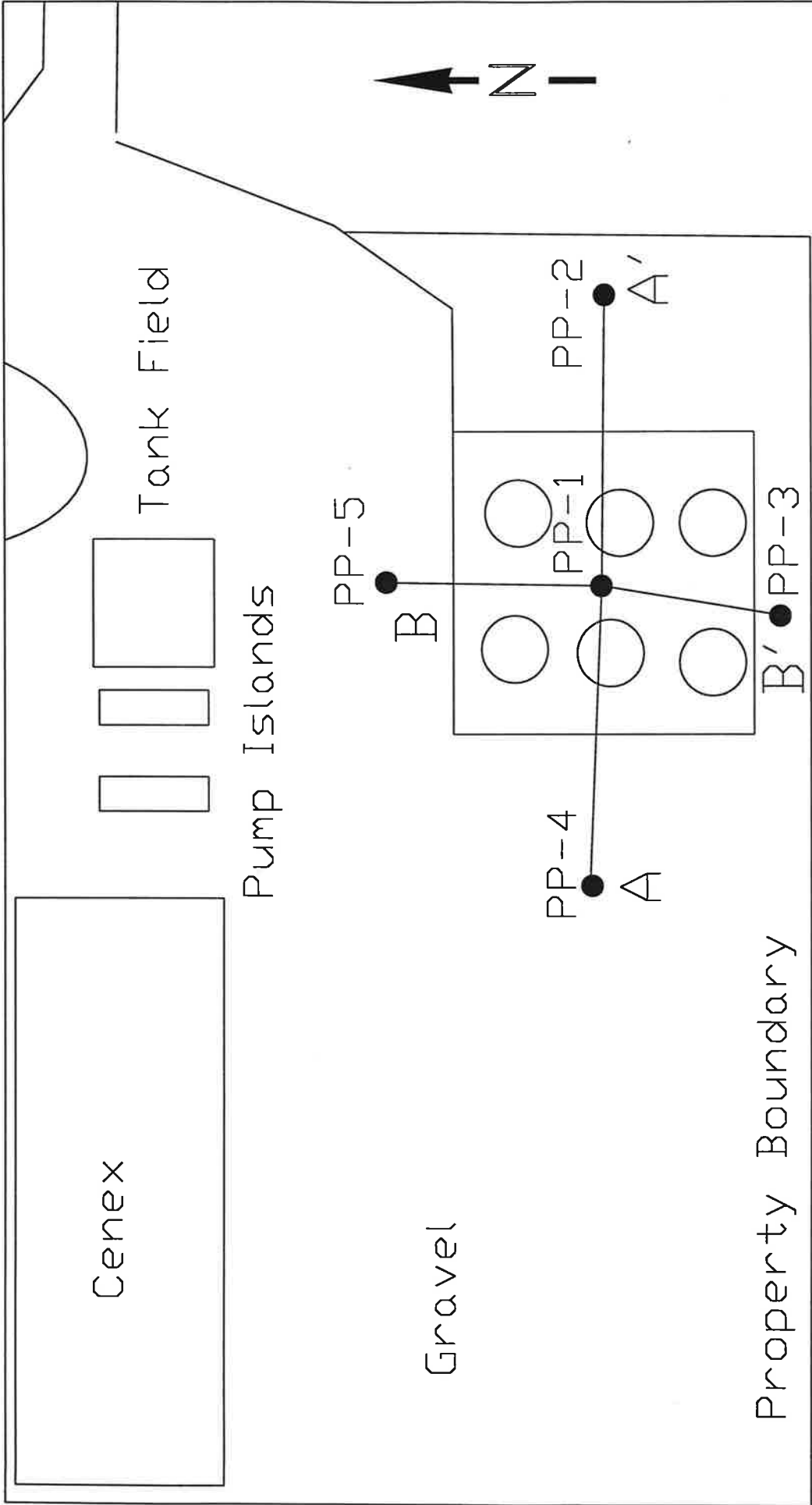
PREPARED BY:
RH

DATE:
8/30/02

File Name:
area map

FIGURE 2A
Area Map
Hecor AST
Hector, Minnesota

Pinnacle Engineering
101 Broadway Street, Suite 100
MAPLE GROVE, MN 55369
(763) 315-4501



Scale (feet)

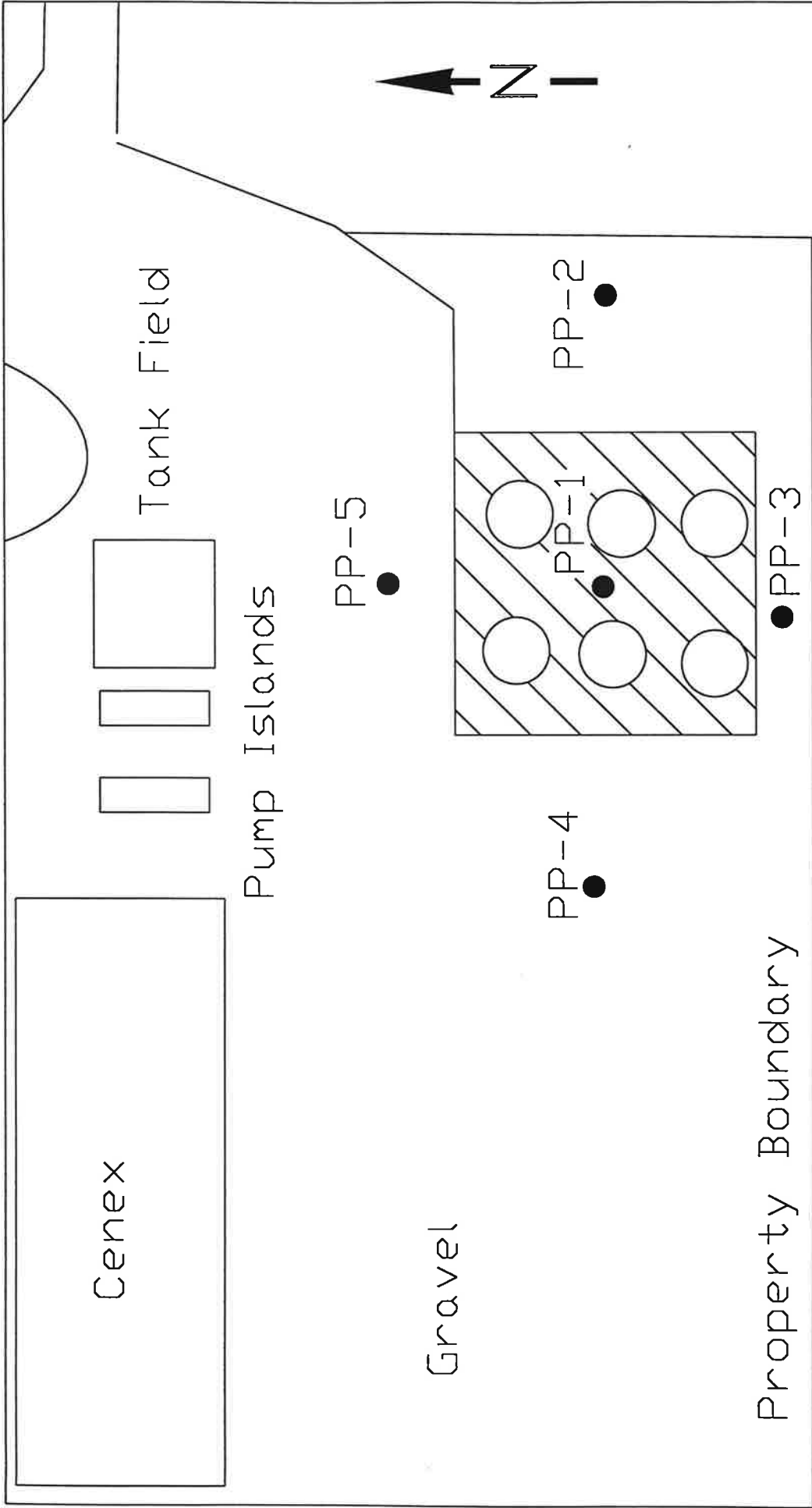


Hector
Tile Co.

Pinnacle Engineering
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 MAPLE GROVE, MN 55369
 (763) 315-4501

FIGURE 2B
 Site/Soil Boring Location Map
 Hector AST
 Hector, Minnesota

PREPARED BY:
 RH
 DATE:
 8/30/02
 File Name:
 area map



Scale (feet)

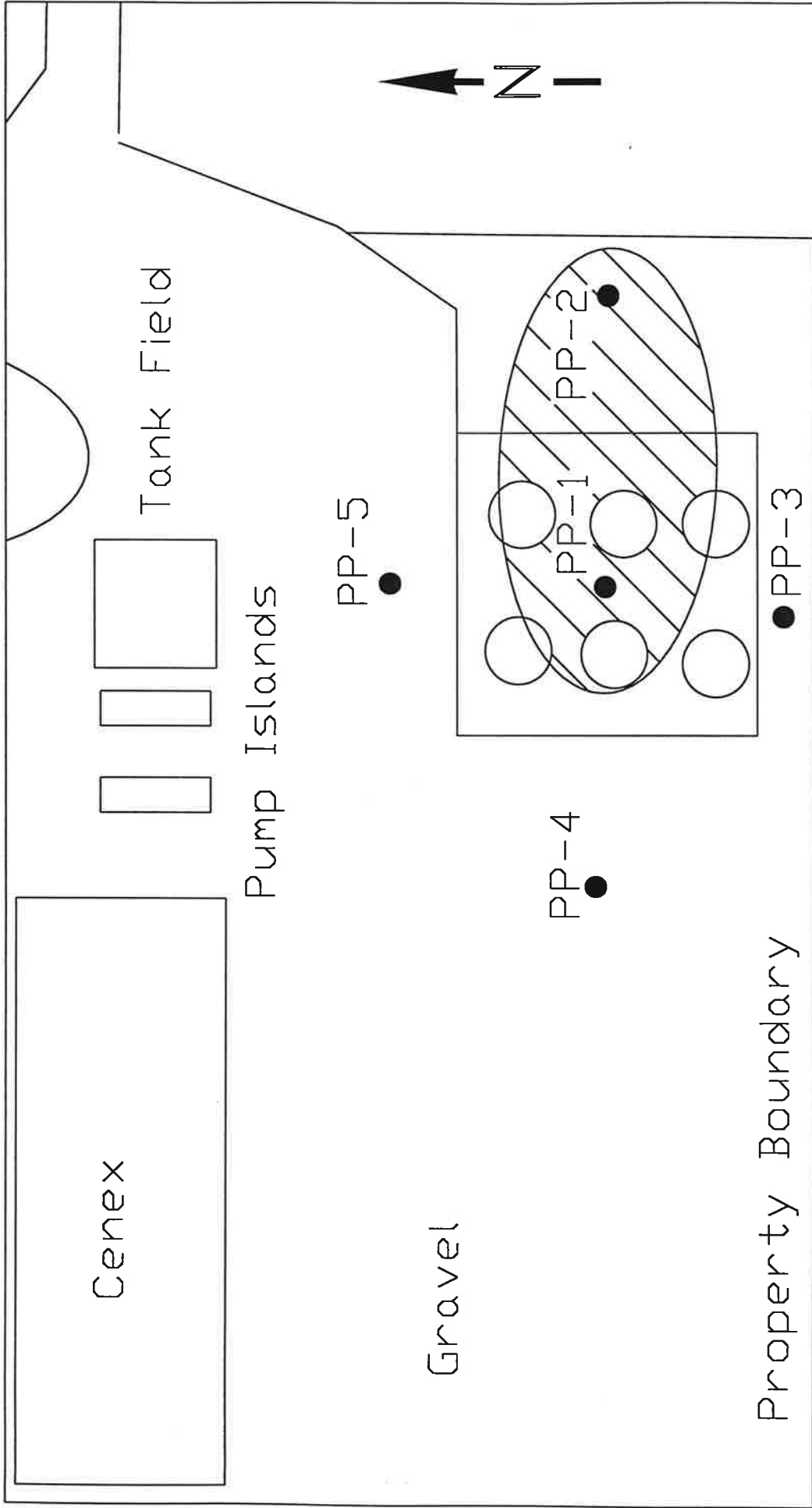


Hector
Tile Co.

Pinnacle Engineering
 101 Broadway Street, Suite 100
 MAPLE GROVE, MN 55369
 (763) 315-4501

FIGURE 2C
 Extent of Soil Contamination
 Hector AST
 Hector, Minnesota

PREPARED BY:
 RH
 DATE:
 8/30/02
 File Name:
 area map



Scale (feet)

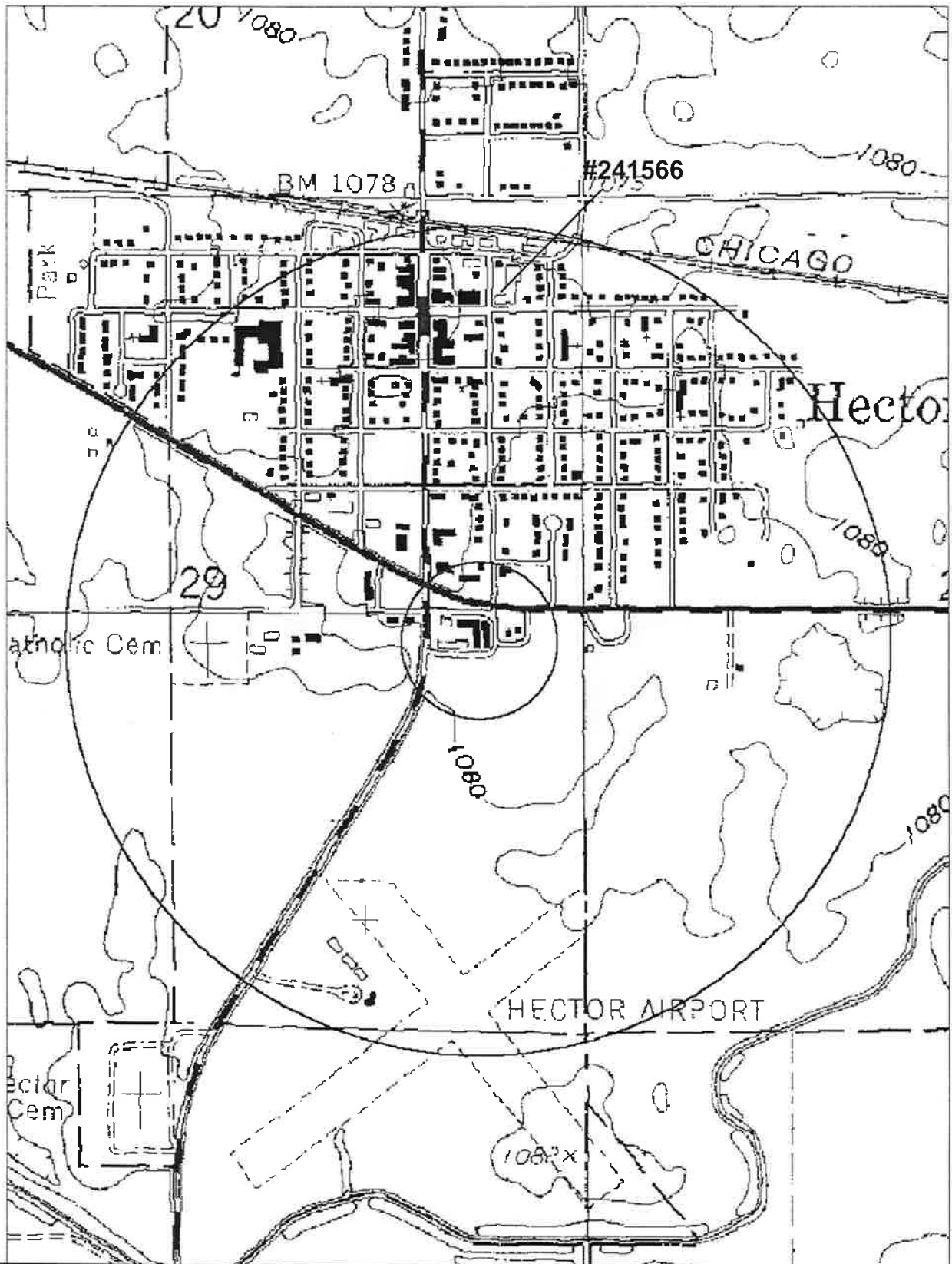


Hector
Tile Co.

Pinnacle Engineering
 101 Broadway Street, Suite 100
 MAPLE GROVE, MN 55369
 (763) 315-4501

FIGURE 2D
 Extent of GW Contamination
 Hector AST
 Hector, Minnesota

PREPARED BY:
 RH
 DATE:
 8/30/02
 File Name:
 area map



101 Broadway Street West
 MAINNEAPOLIS, MN 55369
 (763) 315-4501

Figure 3
 Well Receptor Survey Map
 Hector AST
 Blaine, MN

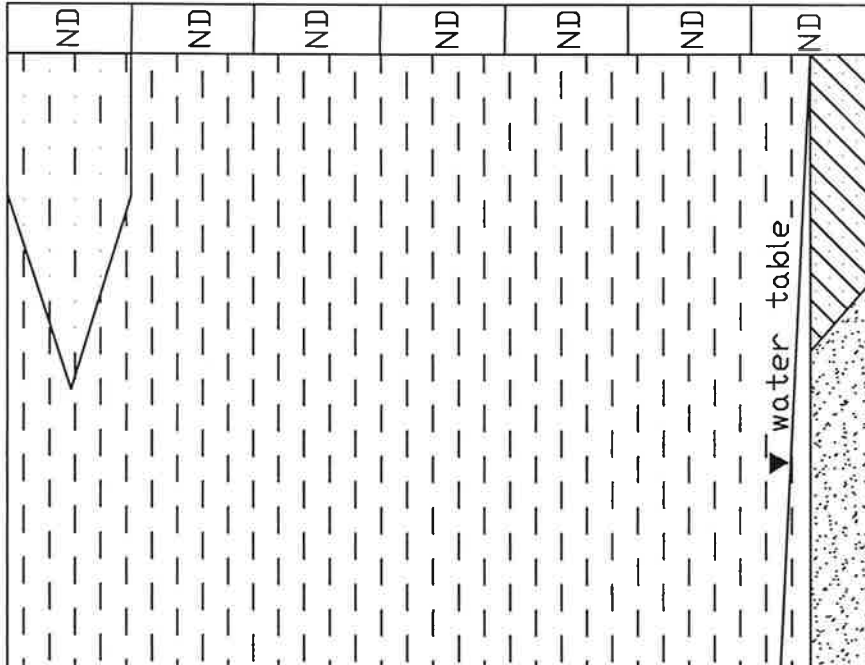
PREPARED BY:
 RH

DATE:
 8/30/02

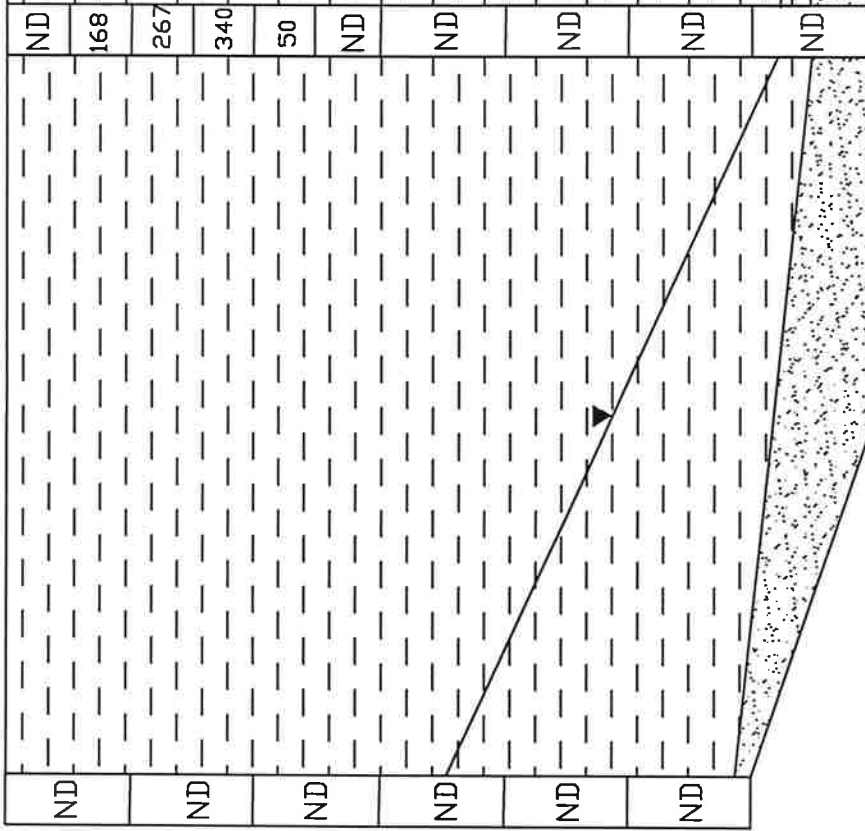
FILE NAME:
 siteloc

A'

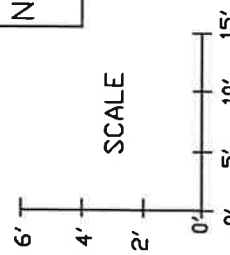
P-2








P-1



P-4

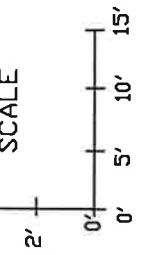
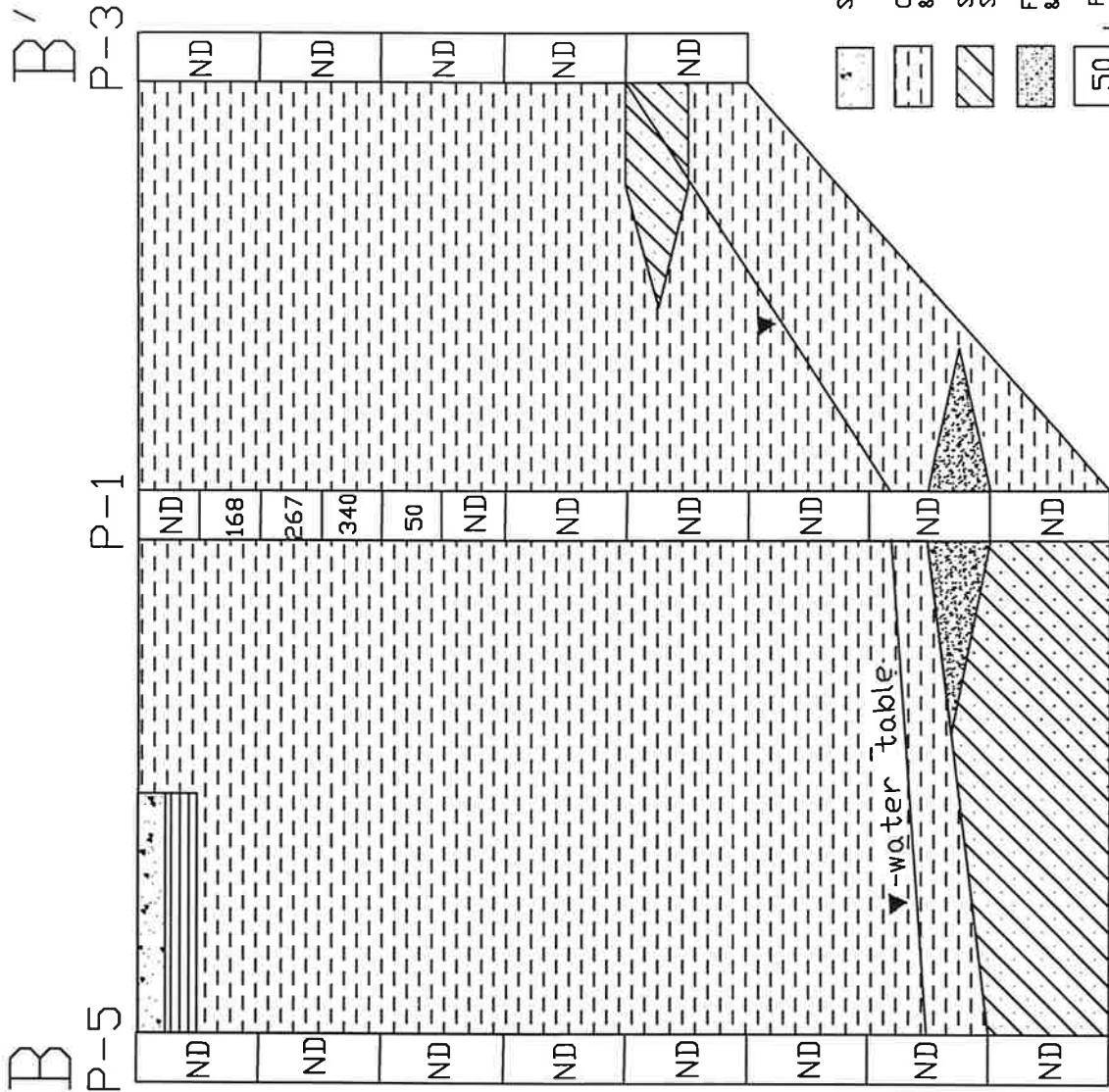


-  Silty Clay, Little Sand
-  Clay, Little Silt, Trace Sand & Gravel
-  Silt, Little to Trace Clay & Sand
-  Fine to Medium Sand, Little Silt & Clay
-  PID Reading
ND = Not Detected

Pinnacle Engineering
 101 BROADWAY STREET WEST
 MINNEAPOLIS, MN 55369
 (763) 315-4501

FIGURE 4A
 CROSS SECTION A-A'
 Hector AST
 Hector, MN

PREPARED BY: RH
 DATE: 5/9/02
 FILE NAME: xsection A



SCALE

PREPARED BY: RH
 DATE: 5/9/02
 FILE NAME: xsection_A

FIGURE 4B
 CROSS SECTION B-B'
 Hector AST
 Hector, MN

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 101 BROADWAY STREET WEST
 MINNEAPOLIS, MN 55369
 (763) 315-4501

Section 14: Tables

**Table 1
Tank Information**

Tank #	UST or AST	Capacity	Contents	Year Installed	Status*	Condition
001	AST	50,000	diesel	NA	removed, April 2002	good
002	AST	50,000	diesel	NA	removed, April 2002	good
003	AST	11,000	gasoline	NA	removed, April 2002	good
004	AST	11,000	gasoline	NA	removed, April 2002	good
005	AST	10,000	gasoline	NA	removed, April 2002	good

*Indicate: *removed (date), abandoned in place (date), or currently used*
Notes:

**Table 2
Results of Soil Headspace Screening**

Depth (ft)	Soil Boring								
	1	2	3	4	5	6	7	8	9
0-2	ND	ND	ND	ND	ND				
2-4	168	ND	ND	ND	ND				
4-6	267	ND	ND	ND	ND				
6-8	340	ND	ND	ND	ND				
8-10	50	ND	ND	ND	ND				
10-12	ND	ND	ND	ND	ND				
12-16	ND	ND	ND	ND	ND				
16-20	ND	ND	ND	ND	ND				
20-24	ND	ND		ND	ND				
24-28	ND	ND			ND				
28-32	ND				ND				

List instruments used and discuss field methods and procedures in Appendix C.
Notes:

Table 3
Analytical Results of Soil Samples

Boring, Depth(ft)	Date Sampled	Benzene	Toluene	Ethylbenzene	Xylenes	GRO	DRO	Lab Type
PP-1, 6-8'	8/5/02	<0.380	<0.380	2.5	6.79	680	1200	fixed
PP-1, 25'	8/5/02	<0.029	<0.029	<0.029	<0.029	<2.9	<4.1	fixed
PP-2, 26'	8/5/02	<0.028	<0.028	<0.028	<0.028	<2.8	<4.3	fixed
PP-3, 16'	8/5/02	<0.031	<0.031	<0.031	<0.031	<3.1	<4.7	fixed
PP-4, 14'	8/5/02	<0.030	<0.030	<0.030	<0.030	<3.0	<4.3	fixed
PP-5, 26'	8/5/02	<0.030	<0.030	<0.030	<0.030	<3.0	<4.2	fixed

Report results in mg/kg. Use less than symbols to show detection limit. Indicate mobile or fixed based in the lab type column.

Notes:

Table 4
Other Contaminants Detected in Soils (Petroleum or Non-petroleum Derived)

Boring, Depth (ft)	Date Sampled						Lab Type

Report results in mg/kg. Indicate other contaminants (either petroleum or non-petroleum derived) detected in soil collected from borings.

Notes:

Table 5
Water Level Measurements and Depths of Water Samples Collected from Borings

	Soil Boring									
	1	2	3	4	5	6	7	8	9	10
Static Water level depth (ft)	25	26	16	14	26					
Sampled Depth (ft)	27-31	25-29	16-20	15-19	NS					

Describe in Appendix C, the methods and procedures used to measure water levels in borings.

Notes: NS = not sampled

Table 6
Analytical Results of Water Samples Collected from Borings

Boring Number	Date Sampled	Sampled Depth	Benzene	Toluene	Ethyl benzene	Xylenes	MTBE	GRO	DRO	Lab Type
PP-1	8/5/02	27-31	2.1	4.4	7.9	15.7	<1.0	440	7500	fixed
PP-2	8/5/02	25-29	<1.0	1.2	<1.0	<3.0	<1.0	<50	180	fixed
PP-3	8/5/02	16-20	<1.0	<1.0	<1.0	<3.0	<1.0	<50	<120	fixed
PP-4	8/5/02	15-19	<1.0	<1.0	<1.0	<3.0	<1.0	<50	<110	fixed
Trip Blank										
Field Blank										
Lab Blank										
HRL			10	1000	700	10000				

Report results in ug/L. Use less than symbols to show detection limit. Indicate mobile or fixed based in the lab type column.

Notes

Table 7
Other Contaminants Detected in Water Samples
Collected from Borings (Petroleum or Non-petroleum Derived)

Boring Number	Date Sampled	Acetone	2-Butanone	s-Butylbenzene	Isopropyl benzene	p-isopropyl toluene	Naphthalene
PP-1	8/5/02	110	12	4.5	6.3	7.0	5.3
Trip Blank							
Field Blank							
Lab Blank							
HRL (ug/L)							

Report results in ug/L. Indicate other contaminants (either petroleum or non-petroleum derived) detected in water samples collected from the borings, temporary wells or push probes.

Notes:

Table 7
Other Contaminants Detected in Water Samples
Collected from Borings (Petroleum or Non-petroleum Derived)

Boring Number	Date Sampled	n-Propyl benzene	1,2,4-Trimethyl benzene	1,3,5-Trimethyl benzene			
P-1	8/5/02	7.5	12	12			
Trip Blank							
Field Blank							
Lab Blank							
HRL (ug/L)							

Report results in ug/L. Indicate other contaminants (either petroleum or non-petroleum derived) detected in water samples collected from the borings, temporary wells or push probes.

Notes:

TABLES 8 through 12 DO NOT APPLY AND HAVE NOT BEEN INCLUDED

Table 13
Properties Located Within 500 Feet of the Release Source.

# (From Map)	Property Address	Water Well (Y or N)	How Determined *	Well Use**	Public Water Supply (Y or N)	Confirmed By City (Y or N)	Basement Or Sumps (Y or N)	Possible Petroleum Sources (Y or N)	Comments (including property use)
1	212 Highway Ave. E.	N	personal contact		Y	Y	Y	N	residential
2	230 Highway Ave.	N	visual		Y	Y	Y	N	residential
3	721 S. Main St.	N	visual		Y	Y	N	N	Hector Tile Co.
4	200 Greenwood Ave. W.	N	visual		Y	Y	N	N	residential
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

*E.g., visual observation, personal contact, telephone, returned postcard, assumed (i.e., no postcard returned).

**E.g., domestic, industrial, municipal, livestock, lawn/gardening, irrigation.

Section 15: Appendices

Attach the following appendices.

- Appendix A* Excavation Report Worksheet for Petroleum Release Sites. . . .
- Appendix B* Laboratory Analytical Reports for Soil and Ground Water. Include laboratory QA/QC data and laboratory certification number.
- Appendix C* Methodologies and Procedures, Including Field Screening of Soil, Other Field Analyses, Soil Boring, Soil Sampling, Well Installation, and Water Sampling.
- Appendix D* Geologic Logs of Soil Borings, Including Construction Diagrams of Temporary and Permanent Wells, and Copies of the Minnesota Department of Health Well Record.
- Appendix E* Copies of Water Supply Well Logs With Legible Unique Numbers.
- Appendix F* Grain Size Analysis, Hydraulic Conductivity Measurements, and Other Calculations.

APPENDIX B

LABORATORY ANALYTICAL REPORTS

Corporate Office & Laboratory
1241 Bellevue Street
Green Bay, WI 54302
920-469-2436 • FAX: 920-469-8827
800-7-ENCHEM



Madison Office & Laboratory
525 Science Drive
Madison, WI 53711
608-232-3300 • FAX: 608-233-0502
888-5-ENCHEM

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Client: PINNACLE ENGINEERING


MDH LAB ID : 055-999-334

Sample No.	Field ID	Collection Date	Sample No.	Field ID	Collection Date
824617-001	P-1 (6-8')	8/5/02			
824617-002	P-1 (25')	8/5/02			
824617-003	P-1	8/5/02			
824617-004	P-2 (26')	8/5/02			
824617-005	P-2	8/5/02			
824617-006	P-3 (16')	8/5/02			
824617-007	P-3	8/5/02			
824617-008	P-4 (14')	8/5/02			
824617-009	P-4	8/5/02			
824617-010	P-5 (26')	8/5/02			

Please visit our Internet homepage at: www.enchem.com

Soil VOC detects are corrected for the total solids, unless otherwise noted.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and Laboratory Standard Operating Procedure. Exceptions, if any, are discussed in the accompanying sample comments. Release of this final report is authorized by Laboratory management, as is verified by the following signature. Reported results shall not be reproduced, except in full, without the written approval of the lab. The sample results relate only to the analytes of interest tested.


Approval Signature


Date

En Chem, Inc. Cooler Receipt Log

Batch No. 824617

Project Name or ID MN0222900

No. of Coolers: 1 Temps: 0°C

A. Receipt Phase: Date cooler was opened: 8/7/02 By: GD

- 1: Were samples received on ice? (Must be ≤ 6 C)..... YES NO²
- 2: Was there a Temperature Blank?..... YES NO
- 3: Were custody seals present and intact? (Record on COC)..... YES NO
- 4: Are COC documents present?..... YES NO²
- 5: Does this Project require quick turn around analysis?..... YES NO
- 6: Is there any sub-work?..... YES NO
- 7: Are there any short hold time tests?..... YES NO
- 8: Are any samples nearing expiration of hold-time? (Within 2 days)..... YES¹ NO Contacted by/Who _____
- 9: Do any samples need to be Filtered or Preserved in the lab?..... YES¹ NO Contacted by/Who _____

B. Check-in Phase: Date samples were Checked-in: 8/7/02 By: GD

- 1: Were all sample containers listed on the COC received and intact?..... YES NO² NA
- 2: Sign the COC as received by En Chem. Completed..... YES NO
- 3: Do sample labels match the COC? YES NO²
- 4: Check sample pH of preserved samples. (Not VOCs) Completed..... YES NO NA
- 5: Do samples have correct chemical preservation?..... YES NO² NA
- 6: Are dissolved parameters field filtered?..... YES NO² NA
- 7: Are sample volumes adequate for tests requested? YES NO²
- 8: Are VOC samples free of bubbles >6mm YES NO² NA
- 9: Enter samples into logbook. Completed..... YES NO
- 10: Place laboratory sample number on all containers and COC. Completed..... YES NO
- 11: Complete Laboratory Tracking Sheet (LTS). Completed..... YES NO NA
- 12: Start Nonconformance form. YES NO NA
- 13: Initiate Subcontracting procedure. Completed..... YES NO NA
- 14: Check laboratory sample number on all containers and COC. YES NO NA

Short Hold-time tests:

48 Hours or less Coliform (6 hrs) Hexavalent Chromium (24 Hrs) BOD Nitrite or Nitrate Low Level Mercury Ortho Phosphorus Turbidity Surfactants Sulfite En Core Preservation Color	7 days Flashpoint TSS Total Solids TDS Sulfide Free Liquids Total Volatile Solids Aqueous Extractable Organics- ALL Unpreserved VOC's Ash	Footnotes 1 Notify proper lab group immediately. 2 Complete nonconformance memo.
--	---	--

Rev. 9/5/2001, Attachment to 1-REC-5.
 Subject to QA Audit.

Reviewed by/date GD 8/7/02

Lab#:	TestGroupID:	Comment:
824617-001 P-1 (6-8')	GRO-S-ME	Late eluting peaks were present within and outside the window of analysis.
824617-003 P-1	DRO-W	Late eluting hump along with mainly diesel range peaks were present in the chromatogram.
	GRO-W	Late eluting peaks were present within and outside the window of analysis.

- Analytical Report -

Project Name : HECTOR-AST
Project Number : MN02229.00
Field ID : P-1 (6-8')
Lab Sample Number : 824617-001
MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING
Report Date : 8/13/02
Collection Date : 8/5/02
Matrix Type : SOIL

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Solids, percent	81.6		%		8/7/02	SM 2540G M	SM 2540G M

Organic Results

BTEX + MTBE - SOIL/METHANOL

Prep Method: 5030B/5035 Prep Date: 8/8/02 Analyst: SMT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	101	---	%Recov		8/9/02	SW846 M8021B
Benzene	< 380	380	ug/kg		8/9/02	SW846 M8021B
Ethylbenzene	2500	380	ug/kg		8/9/02	SW846 M8021B
Methyl-tert-butyl-ether	< 380	380	ug/kg		8/9/02	SW846 M8021B
Toluene	< 380	380	ug/kg		8/9/02	SW846 M8021B
Xylenes, -m, -p	6100	380	ug/kg		8/9/02	SW846 M8021B
Xylene, -o	690	380	ug/kg		8/9/02	SW846 M8021B

Organic Results

BTEX BLANK

Prep Method: Prep Date: 8/8/02 Analyst:

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
BTEX - Blank	1076-42					

Organic Results

Preservation Date: 8/9/02

DIESEL RANGE ORGANICS - SOIL

Prep Method: Wi MOD DRO Prep Date: 8/9/02 Analyst: KEG

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
DIESEL RANGE ORGANICS	1200	44	mg/kg		8/13/02	Wi MOD DRO
Blank spike	84.0	---	%Recov		8/13/02	Wi MOD DRO
Blank spike duplicate	75	---	%Recov		8/13/02	Wi MOD DRO
Blank	< 5.0	5.0	mg/kg		8/13/02	Wi MOD DRO

All soil results are reported on a dry weight basis unless otherwise noted.

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-1 (6-8')

Lab Sample Number : 824617-001

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : SOIL

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi MOD GRO Prep Date: 8/8/02 Analyst: SMT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	680	38	mg/kg		8/9/02	Wi MOD GRO
Blank Spike	103	—	%Recov		8/9/02	Wi MOD GRO
Blank Spike Duplicate	106	—	%Recov		8/9/02	Wi MOD GRO
Blank	< 2.5	2.5	mg/kg		8/9/02	Wi MOD GRO

All soil results are reported on a dry weight basis unless otherwise noted.

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-1 (25')

Lab Sample Number : 824617-002

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : SOIL

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Solids, percent	86.1		%		8/7/02	SM 2540G M	SM 2540G M

Organic Results

BTEX + MTBE - SOIL/METHANOL

Prep Method: 5030B/5035 Prep Date: 8/8/02 Analyst: SMT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	101	---	%Recov		8/8/02	SW846 M8021B
Benzene	< 29	29	ug/kg		8/8/02	SW846 M8021B
Ethylbenzene	< 29	29	ug/kg		8/8/02	SW846 M8021B
Methyl-tert-butyl-ether	< 29	29	ug/kg		8/8/02	SW846 M8021B
Toluene	< 29	29	ug/kg		8/8/02	SW846 M8021B
Xylenes, -m, -p	< 29	29	ug/kg		8/8/02	SW846 M8021B
Xylene, -o	< 29	29	ug/kg		8/8/02	SW846 M8021B

Organic Results

BTEX BLANK

Prep Method: Prep Date: 8/8/02 Analyst:

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
BTEX - Blank	1076-42					

Organic Results

Preservation Date: 8/9/02

DIESEL RANGE ORGANICS - SOIL

Prep Method: Wi MOD DRO Prep Date: 8/9/02 Analyst: KEG

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
DIESEL RANGE ORGANICS	< 4.1	4.1	mg/kg		8/13/02	Wi MOD DRO
Blank spike	84.0	---	%Recov		8/13/02	Wi MOD DRO
Blank spike duplicate	75	---	%Recov		8/13/02	Wi MOD DRO
Blank	< 5.0	5.0	mg/kg		8/13/02	Wi MOD DRO

All soil results are reported on a dry weight basis unless otherwise noted.

- Analytical Report -

Project Name : HECTOR-AST
Project Number : MN02229.00
Field ID : P-1 (25')
Lab Sample Number : 824617-002
MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING
Report Date : 8/13/02
Collection Date : 8/5/02
Matrix Type : SOIL

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi MOD GRO Prep Date: 8/8/02 Analyst: SMT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	< 2.9	2.9	mg/kg		8/8/02	Wi MOD GRO
Blank Spike	103	---	%Recov		8/8/02	Wi MOD GRO
Blank Spike Duplicate	106	---	%Recov		8/8/02	Wi MOD GRO
Blank	< 2.5	2.5	mg/kg		8/8/02	Wi MOD GRO

All soil results are reported on a dry weight basis unless otherwise noted.

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-1

Lab Sample Number : 824617-003

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

Organic Results

DIESEL RANGE ORGANICS - WATER

Prep Method: Wi MOD DRO Prep Date: 8/8/02 Analyst: KEG

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
DIESEL RANGE ORGANICS	7500	200	ug/l		8/12/02	Wi MOD DRO
Blank spike	88	---	%Recov		8/12/02	Wi MOD DRO
Blank spike duplicate	75	---	%Recov		8/12/02	Wi MOD DRO
Blank	< 50	50	ug/l		8/12/02	Wi MOD DRO

Organic Results

GASOLINE RANGE ORGANICS - WATER

Prep Method: Wi MOD GRO Prep Date: 8/8/02 Analyst: MSB

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
GASOLINE RANGE ORGANIC	440	50	ug/l		8/9/02	Wi MOD GRO
Blank Spike	92	---	%Recov		8/9/02	Wi MOD GRO
Blank Spike Duplicate	99	---	%Recov		8/9/02	Wi MOD GRO
Blank	< 50	50	ug/l		8/9/02	Wi MOD GRO

Organic Results

MDH 466 VOLATILES - WATER

Prep Method: SW846 5030B Prep Date: 8/8/02 Analyst: TLT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
Acetone	110	5.0	ug/L		8/8/02	SW846 8260B
Allyl Chloride	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Benzene	2.1	1.0	ug/L		8/8/02	SW846 8260B
Bromochloromethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromodichloromethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromoform	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromobenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromomethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
2-Butanone	12	5.0	ug/L		8/8/02	SW846 8260B

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-1

Lab Sample Number : 824617-003

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

s-Butylbenzene	4.5	1.0	ug/L	8/8/02	SW846 8260B
t-Butylbenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
n-Butylbenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Carbon tetrachloride	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chloroform	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chlorodibromomethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chloromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
2-Chlorotoluene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
4-Chlorotoluene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dibromo-3-chloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dibromoethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Dibromomethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,3-Dichlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,4-Dichlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dichloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dichlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1-Dichloroethene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
cis-1,2-Dichloroethene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Dichlorodifluoromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
trans-1,2-Dichloroethene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Dichlorofluoromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dichloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1-Dichloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,3-Dichloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
2,2-Dichloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1-Dichloropropene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
cis-1,3-Dichloropropene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
trans-1,3-Dichloropropene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Ethylbenzene	7.9	1.0	ug/L	8/8/02	SW846 8260B
Diethyl ether	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Fluorotrichloromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Hexachlorobutadiene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-1

Lab Sample Number : 824617-003

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

Isopropylbenzene	6.3	1.0	ug/L	8/8/02	SW846 8260B
p-Isopropyltoluene	7.0	1.0	ug/L	8/8/02	SW846 8260B
Methylene chloride	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
4-Methyl-2-pentanone	< 5.0	5.0	ug/L	8/8/02	SW846 8260B
Methyl-tert-butyl-ether	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Naphthalene	5.3	1.0	ug/L	8/8/02	SW846 8260B
n-Propylbenzene	7.5	1.0	ug/L	8/8/02	SW846 8260B
Styrene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1,2,2-Tetrachloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1,1,2-Tetrachloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Tetrachloroethene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Toluene	4.4	1.0	ug/L	8/8/02	SW846 8260B
1,2,3-Trichlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2,4-Trichlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1,1-Trichloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1,2-Trichloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1,2-Trichlorotrifluoroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2,4-Trimethylbenzene	12	1.0	ug/L	8/8/02	SW846 8260B
Trichloroethene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2,3-Trichloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Tetrahydrofuran	< 5.0	5.0	ug/L	8/8/02	SW846 8260B
1,3,5-Trimethylbenzene	12	1.0	ug/L	8/8/02	SW846 8260B
Vinyl chloride	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Xylenes, -m, -p	12	2.0	ug/L	8/8/02	SW846 8260B
Xylene, -o	3.7	1.0	ug/L	8/8/02	SW846 8260B
4-Bromofluorobenzene	86	---	%Recov	8/8/02	SW846 8260B
Dibromofluoromethane	94	---	%Recov	8/8/02	SW846 8260B
Toluene-d8	90	---	%Recov	8/8/02	SW846 8260B

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-1

Lab Sample Number : 824617-003

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

Organic Results

VOC-BLK-W

Prep Method:

Prep Date:

Analyst:

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
VOC-BLK	1081-43					

- Analytical Report -

Project Name : HECTOR-AST
Project Number : MN02229.00
Field ID : P-2 (26')
Lab Sample Number : 824617-004
MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING
Report Date : 8/13/02
Collection Date : 8/5/02
Matrix Type : SOIL

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Solids, percent	88.1		%		8/7/02	SM 2540G M	SM 2540G M

Organic Results

BTEX + MTBE - SOIL/METHANOL

Prep Method: 5030B/5035 Prep Date: 8/8/02 Analyst: SMT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	101	---	%Recov		8/8/02	SW846 M8021B
Benzene	< 28	28	ug/kg		8/8/02	SW846 M8021B
Ethylbenzene	< 28	28	ug/kg		8/8/02	SW846 M8021B
Methyl-tert-butyl-ether	< 28	28	ug/kg		8/8/02	SW846 M8021B
Toluene	< 28	28	ug/kg		8/8/02	SW846 M8021B
Xylenes, -m, -p	< 28	28	ug/kg		8/8/02	SW846 M8021B
Xylene, -o	< 28	28	ug/kg		8/8/02	SW846 M8021B

Organic Results

BTEX BLANK

Prep Method: Prep Date: 8/8/02 Analyst:

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
BTEX - Blank	1076-42					

Organic Results

Preservation Date: 8/9/02

DIESEL RANGE ORGANICS - SOIL

Prep Method: Wi MOD DRO Prep Date: 8/9/02 Analyst: KEG

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
DIESEL RANGE ORGANICS	< 4.3	4.3	mg/kg		8/13/02	Wi MOD DRO
Blank spike	84.0	---	%Recov		8/13/02	Wi MOD DRO
Blank spike duplicate	75	---	%Recov		8/13/02	Wi MOD DRO
Blank	< 5.0	5.0	mg/kg		8/13/02	Wi MOD DRO

All soil results are reported on a dry weight basis unless otherwise noted.

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-2 (26')

Lab Sample Number : 824617-004

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : SOIL

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL **Prep Method:** Wi MOD GRO **Prep Date:** 8/8/02 **Analyst:** SMT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	< 2.8	2.8	mg/kg		8/8/02	Wi MOD GRO
Blank Spike	103	---	%Recov		8/8/02	Wi MOD GRO
Blank Spike Duplicate	106	---	%Recov		8/8/02	Wi MOD GRO
Blank	< 2.5	2.5	mg/kg		8/8/02	Wi MOD GRO

All soil results are reported on a dry weight basis unless otherwise noted.

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-2

Lab Sample Number : 824617-005

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

Organic Results

DIESEL RANGE ORGANICS - WATER

Prep Method: Wi MOD DRO Prep Date: 8/8/02 Analyst: KEG

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
DIESEL RANGE ORGANICS	180	100	ug/l		8/8/02	Wi MOD DRO
Blank spike	88	---	%Recov		8/8/02	Wi MOD DRO
Blank spike duplicate	75	--	%Recov		8/8/02	Wi MOD DRO
Blank	< 50	50	ug/l		8/8/02	Wi MOD DRO

Organic Results

GASOLINE RANGE ORGANICS - WATER

Prep Method: Wi MOD GRO Prep Date: 8/8/02 Analyst: MSB

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
GASOLINE RANGE ORGANIC	< 50	50	ug/l		8/9/02	Wi MOD GRO
Blank Spike	92	---	%Recov		8/9/02	Wi MOD GRO
Blank Spike Duplicate	99	---	%Recov		8/9/02	Wi MOD GRO
Blank	< 50	50	ug/l		8/9/02	Wi MOD GRO

Organic Results

MDH 466 VOLATILES - WATER

Prep Method: SW846 5030B Prep Date: 8/8/02 Analyst: TLT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
Acetone	< 5.0	5.0	ug/L		8/8/02	SW846 8260B
Allyl Chloride	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Benzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromochloromethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromodichloromethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromoform	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromobenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromomethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
2-Butanone	< 5.0	5.0	ug/L		8/8/02	SW846 8260B

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-2

Lab Sample Number : 824617-005

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

s-Butylbenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
t-Butylbenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
n-Butylbenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Carbon tetrachloride	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chloroform	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chlorodibromomethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chloromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
2-Chlorotoluene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
4-Chlorotoluene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dibromo-3-chloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dibromoethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Dibromomethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,3-Dichlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,4-Dichlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dichloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dichlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1-Dichloroethene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
cis-1,2-Dichloroethene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Dichlorodifluoromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
trans-1,2-Dichloroethene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Dichlorofluoromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dichloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1-Dichloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,3-Dichloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
2,2-Dichloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1-Dichloropropene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
cis-1,3-Dichloropropene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
trans-1,3-Dichloropropene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Ethylbenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Diethyl ether	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Fluorotrichloromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Hexachlorobutadiene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-2

Lab Sample Number : 824617-005

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

Isopropylbenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
p-Isopropyltoluene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Methylene chloride	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
4-Methyl-2-pentanone	< 5.0	5.0	ug/L		8/8/02	SW846 8260B
Methyl-tert-butyl-ether	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Naphthalene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
n-Propylbenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Styrene	< 1.0	1.0	ug/L	&	8/8/02	SW846 8260B
1,1,2,2-Tetrachloroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,1,1,2-Tetrachloroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Tetrachloroethene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Toluene	1.2	1.0	ug/L		8/8/02	SW846 8260B
1,2,3-Trichlorobenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,2,4-Trichlorobenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,1,1-Trichloroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,1,2-Trichloroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,1,2-Trichlorotrifluoroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,2,4-Trimethylbenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Trichloroethene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,2,3-Trichloropropane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Tetrahydrofuran	< 5.0	5.0	ug/L		8/8/02	SW846 8260B
1,3,5-Trimethylbenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Vinyl chloride	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Xylenes, -m, -p	< 2.0	2.0	ug/L		8/8/02	SW846 8260B
Xylene, -o	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
4-Bromofluorobenzene	85	---	%Recov		8/8/02	SW846 8260B
Dibromofluoromethane	93	---	%Recov		8/8/02	SW846 8260B
Toluene-d8	92	---	%Recov		8/8/02	SW846 8260B

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-2

Lab Sample Number : 824617-005

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

Organic Results

VOC-BLK-W

Prep Method:

Prep Date:

Analyst:

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
VOC-BLK	1081-43					

- Analytical Report -

Project Name : HECTOR-AST
Project Number : MN02229.00
Field ID : P-3 (16')
Lab Sample Number : 824617-006
MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING
Report Date : 8/13/02
Collection Date : 8/5/02
Matrix Type : SOIL

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Solids, percent	79.7		%		8/7/02	SM 2540G M	SM 2540G M

Organic Results

BTEX + MTBE - SOIL/METHANOL

Prep Method: 5030B/5035 Prep Date: 8/8/02 Analyst: SMT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	101	---	%Recov		8/8/02	SW846 M8021B
Benzene	< 31	31	ug/kg		8/8/02	SW846 M8021B
Ethylbenzene	< 31	31	ug/kg		8/8/02	SW846 M8021B
Methyl-tert-butyl-ether	< 31	31	ug/kg		8/8/02	SW846 M8021B
Toluene	< 31	31	ug/kg		8/8/02	SW846 M8021B
Xylenes, -m, -p	< 31	31	ug/kg		8/8/02	SW846 M8021B
Xylene, -o	< 31	31	ug/kg		8/8/02	SW846 M8021B

Organic Results

BTEX BLANK

Prep Method: Prep Date: 8/8/02 Analyst:

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
BTEX - Blank	1076-42					

Organic Results

Preservation Date: 8/9/02

DIESEL RANGE ORGANICS - SOIL

Prep Method: Wi MOD DRO Prep Date: 8/9/02 Analyst: KEG

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
DIESEL RANGE ORGANICS	< 4.7	4.7	mg/kg		8/13/02	Wi MOD DRO
Blank spike	84.0	---	%Recov		8/13/02	Wi MOD DRO
Blank spike duplicate	75	---	%Recov		8/13/02	Wi MOD DRO
Blank	< 5.0	5.0	mg/kg		8/13/02	Wi MOD DRO

All soil results are reported on a dry weight basis unless otherwise noted.

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-3 (16')

Lab Sample Number : 824617-006

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : SOIL

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi MOD GRO Prep Date: 8/8/02 Analyst: SMT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	< 3.1	3.1	mg/kg		8/8/02	Wi MOD GRO
Blank Spike	103	---	%Recov		8/8/02	Wi MOD GRO
Blank Spike Duplicate	106	---	%Recov		8/8/02	Wi MOD GRO
Blank	< 2.5	2.5	mg/kg		8/8/02	Wi MOD GRO

All soil results are reported on a dry weight basis unless otherwise noted.

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-3

Lab Sample Number : 824617-007

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

Organic Results**DIESEL RANGE ORGANICS - WATER**

Prep Method: Wi MOD DRO Prep Date: 8/8/02 Analyst: KEG

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
DIESEL RANGE ORGANICS	< 120	120	ug/l		8/8/02	Wi MOD DRO
Blank spike	88	---	%Recov		8/8/02	Wi MOD DRO
Blank spike duplicate	75	---	%Recov		8/8/02	Wi MOD DRO
Blank	< 50	50	ug/l		8/8/02	Wi MOD DRO

Organic Results**GASOLINE RANGE ORGANICS - WATER**

Prep Method: Wi MOD GRO Prep Date: 8/8/02 Analyst: MSB

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
GASOLINE RANGE ORGANIC	< 50	50	ug/l		8/9/02	Wi MOD GRO
Blank Spike	92	---	%Recov		8/9/02	Wi MOD GRO
Blank Spike Duplicate	99	---	%Recov		8/9/02	Wi MOD GRO
Blank	< 50	50	ug/l		8/9/02	Wi MOD GRO

Organic Results**MDH 466 VOLATILES - WATER**

Prep Method: SW846 5030B Prep Date: 8/8/02 Analyst: TLT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
Acetone	< 5.0	5.0	ug/L		8/8/02	SW846 8260B
Allyl Chloride	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Benzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromochloromethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromodichloromethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromoform	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromobenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromomethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
2-Butanone	< 5.0	5.0	ug/L		8/8/02	SW846 8260B

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-3

Lab Sample Number : 824617-007

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

s-Butylbenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
t-Butylbenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
n-Butylbenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Carbon tetrachloride	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chloroform	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chlorodibromomethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chloromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
2-Chlorotoluene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
4-Chlorotoluene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dibromo-3-chloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dibromoethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Dibromomethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,3-Dichlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,4-Dichlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dichloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dichlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1-Dichloroethene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
cis-1,2-Dichloroethene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Dichlorodifluoromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
trans-1,2-Dichloroethene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Dichlorofluoromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dichloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1-Dichloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,3-Dichloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
2,2-Dichloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1-Dichloropropene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
cis-1,3-Dichloropropene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
trans-1,3-Dichloropropene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Ethylbenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Diethyl ether	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Fluorotrichloromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Hexachlorobutadiene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-3

Lab Sample Number : 824617-007

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

Isopropylbenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
p-Isopropyltoluene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Methylene chloride	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
4-Methyl-2-pentanone	< 5.0	5.0	ug/L		8/8/02	SW846 8260B
Methyl-tert-butyl-ether	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Naphthalene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
n-Propylbenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Styrene	< 1.0	1.0	ug/L	&	8/8/02	SW846 8260B
1,1,2,2-Tetrachloroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,1,1,2-Tetrachloroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Tetrachloroethene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Toluene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,2,3-Trichlorobenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,2,4-Trichlorobenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,1,1-Trichloroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,1,2-Trichloroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,1,2-Trichlorotrifluoroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,2,4-Trimethylbenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Trichloroethene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,2,3-Trichloropropane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Tetrahydrofuran	< 5.0	5.0	ug/L		8/8/02	SW846 8260B
1,3,5-Trimethylbenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Vinyl chloride	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Xylenes, -m, -p	< 2.0	2.0	ug/L		8/8/02	SW846 8260B
Xylene, -o	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
4-Bromofluorobenzene	83	---	%Recov		8/8/02	SW846 8260B
Dibromofluoromethane	91	---	%Recov		8/8/02	SW846 8260B
Toluene-d8	91	---	%Recov		8/8/02	SW846 8260B

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-3

Lab Sample Number : 824617-007

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

Organic Results

VOC-BLK-W

Prep Method:

Prep Date:

Analyst:

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
VOC-BLK	1081-43					

- Analytical Report -

Project Name : HECTOR-AST
Project Number : MN02229.00
Field ID : P-4 (14')
Lab Sample Number : 824617-008
MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING
Report Date : 8/13/02
Collection Date : 8/5/02
Matrix Type : SOIL

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Solids, percent	83.8		%		8/7/02	SM 2540G M	SM 2540G M

Organic Results

BTEX + MTBE - SOIL/METHANOL

Prep Method: 5030B/5035 Prep Date: 8/8/02 Analyst: SMT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	101	---	%Recov		8/8/02	SW846 M8021B
Benzene	< 30	30	ug/kg		8/8/02	SW846 M8021B
Ethylbenzene	< 30	30	ug/kg		8/8/02	SW846 M8021B
Methyl-tert-butyl-ether	< 30	30	ug/kg		8/8/02	SW846 M8021B
Toluene	< 30	30	ug/kg		8/8/02	SW846 M8021B
Xylenes, -m, -p	< 30	30	ug/kg		8/8/02	SW846 M8021B
Xylene, -o	< 30	30	ug/kg		8/8/02	SW846 M8021B

Organic Results

BTEX BLANK

Prep Method: Prep Date: 8/8/02 Analyst:

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
BTEX - Blank	1076-42					

Organic Results

Preservation Date: 8/9/02

DIESEL RANGE ORGANICS - SOIL

Prep Method: Wi MOD DRO Prep Date: 8/9/02 Analyst: KEG

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
DIESEL RANGE ORGANICS	< 4.3	4.3	mg/kg		8/13/02	Wi MOD DRO
Blank spike	84.0	---	%Recov		8/13/02	Wi MOD DRO
Blank spike duplicate	75	---	%Recov		8/13/02	Wi MOD DRO
Blank	< 5.0	5.0	mg/kg		8/13/02	Wi MOD DRO

All soil results are reported on a dry weight basis unless otherwise noted.

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-4 (14')

Lab Sample Number : 824617-008

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : SOIL

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi MOD GRO Prep Date: 8/8/02 Analyst: SMT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	< 3.0	3.0	mg/kg		8/8/02	Wi MOD GRO
Blank Spike	103	---	%Recov		8/8/02	Wi MOD GRO
Blank Spike Duplicate	106	---	%Recov		8/8/02	Wi MOD GRO
Blank	< 2.5	2.5	mg/kg		8/8/02	Wi MOD GRO

All soil results are reported on a dry weight basis unless otherwise noted.

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-4

Lab Sample Number : 824617-009

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

Organic Results

DIESEL RANGE ORGANICS - WATER

Prep Method: Wi MOD DRO Prep Date: 8/8/02 Analyst: KEG

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
DIESEL RANGE ORGANICS	< 110	110	ug/l		8/8/02	Wi MOD DRO
Blank spike	88	---	%Recov		8/8/02	Wi MOD DRO
Blank spike duplicate	75	---	%Recov		8/8/02	Wi MOD DRO
Blank	< 50	50	ug/l		8/8/02	Wi MOD DRO

Organic Results

GASOLINE RANGE ORGANICS - WATER

Prep Method: Wi MOD GRO Prep Date: 8/8/02 Analyst: MSB

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
GASOLINE RANGE ORGANIC	< 50	50	ug/l		8/9/02	Wi MOD GRO
Blank Spike	92	---	%Recov		8/9/02	Wi MOD GRO
Blank Spike Duplicate	99	---	%Recov		8/9/02	Wi MOD GRO
Blank	< 50	50	ug/l		8/9/02	Wi MOD GRO

Organic Results

MDH 466 VOLATILES - WATER

Prep Method: SW846 5030B Prep Date: 8/8/02 Analyst: TLT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
Acetone	< 5.0	5.0	ug/L		8/8/02	SW846 8260B
Allyl Chloride	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Benzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromochloromethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromodichloromethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromoform	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromobenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Bromomethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
2-Butanone	< 5.0	5.0	ug/L		8/8/02	SW846 8260B

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-4

Lab Sample Number : 824617-009

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

s-Butylbenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
t-Butylbenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
n-Butylbenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Carbon tetrachloride	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chloroform	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chlorodibromomethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Chloromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
2-Chlorotoluene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
4-Chlorotoluene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dibromo-3-chloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dibromoethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Dibromomethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,3-Dichlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,4-Dichlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dichloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dichlorobenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1-Dichloroethene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
cis-1,2-Dichloroethene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Dichlorodifluoromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
trans-1,2-Dichloroethene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Dichlorofluoromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,2-Dichloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1-Dichloroethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,3-Dichloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
2,2-Dichloropropane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
1,1-Dichloropropene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
cis-1,3-Dichloropropene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
trans-1,3-Dichloropropene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Ethylbenzene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Diethyl ether	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Fluorotrichloromethane	< 1.0	1.0	ug/L	8/8/02	SW846 8260B
Hexachlorobutadiene	< 1.0	1.0	ug/L	8/8/02	SW846 8260B

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-4

Lab Sample Number : 824617-009

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

Isopropylbenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
p-Isopropyltoluene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Methylene chloride	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
4-Methyl-2-pentanone	< 5.0	5.0	ug/L		8/8/02	SW846 8260B
Methyl-tert-butyl-ether	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Naphthalene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
n-Propylbenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Styrene	< 1.0	1.0	ug/L	&	8/8/02	SW846 8260B
1,1,2,2-Tetrachloroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,1,1,2-Tetrachloroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Tetrachloroethene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Toluene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,2,3-Trichlorobenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,2,4-Trichlorobenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,1,1-Trichloroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,1,2-Trichloroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,1,2-Trichlorotrifluoroethane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,2,4-Trimethylbenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Trichloroethene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
1,2,3-Trichloropropane	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Tetrahydrofuran	< 5.0	5.0	ug/L		8/8/02	SW846 8260B
1,3,5-Trimethylbenzene	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Vinyl chloride	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
Xylenes, -m, -p	< 2.0	2.0	ug/L		8/8/02	SW846 8260B
Xylene, -o	< 1.0	1.0	ug/L		8/8/02	SW846 8260B
4-Bromofluorobenzene	84	---	%Recov		8/8/02	SW846 8260B
Dibromofluoromethane	91	---	%Recov		8/8/02	SW846 8260B
Toluene-d8	92	---	%Recov		8/8/02	SW846 8260B

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-4

Lab Sample Number : 824617-009

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : WATER

Organic Results

VOC-BLK-W

Prep Method:

Prep Date:

Analyst:

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
VOC-BLK	1081-43					

- Analytical Report -

Project Name : HECTOR-AST
Project Number : MN02229.00
Field ID : P-5 (26')
Lab Sample Number : 824617-010
MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING
Report Date : 8/13/02
Collection Date : 8/5/02
Matrix Type : SOIL

Inorganic Results

Test	Result	EQL	Units	Code	Analysis Date	Prep Method	Analysis Method
Solids, percent	84.0		%		8/7/02	SM 2540G M	SM 2540G M

Organic Results

BTEX + MTBE - SOIL/METHANOL

Prep Method: 5030B/5035 Prep Date: 8/8/02 Analyst: SMT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
a,a,a-Trifluorotoluene	101	---	%Recov		8/8/02	SW846 M8021B
Benzene	< 30	30	ug/kg		8/8/02	SW846 M8021B
Ethylbenzene	< 30	30	ug/kg		8/8/02	SW846 M8021B
Methyl-tert-butyl-ether	< 30	30	ug/kg		8/8/02	SW846 M8021B
Toluene	< 30	30	ug/kg		8/8/02	SW846 M8021B
Xylenes, -m, -p	< 30	30	ug/kg		8/8/02	SW846 M8021B
Xylene, -o	< 30	30	ug/kg		8/8/02	SW846 M8021B

Organic Results

BTEX BLANK

Prep Method: Prep Date: 8/8/02 Analyst:

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
BTEX - Blank	1076-42					

Organic Results

Preservation Date: 8/9/02

DIESEL RANGE ORGANICS - SOIL

Prep Method: Wi MOD DRO Prep Date: 8/9/02 Analyst: KEG

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
DIESEL RANGE ORGANICS	< 4.2	4.2	mg/kg		8/13/02	Wi MOD DRO
Blank spike	84	---	%Recov		8/13/02	Wi MOD DRO
Blank spike duplicate	75	---	%Recov		8/13/02	Wi MOD DRO
Blank	< 5.0	5.0	mg/kg		8/13/02	Wi MOD DRO

All soil results are reported on a dry weight basis unless otherwise noted.

- Analytical Report -

Project Name : HECTOR-AST

Project Number : MN02229.00

Field ID : P-5 (26')

Lab Sample Number : 824617-010

MDH LAB ID : 055-999-334

Client : PINNACLE ENGINEERING

Report Date : 8/13/02

Collection Date : 8/5/02

Matrix Type : SOIL

Organic Results

GASOLINE RANGE ORGANICS - SOIL/METHANOL Prep Method: Wi MOD GRO Prep Date: 8/8/02 Analyst: SMT

Analyte	Result	EQL	Units	Code	Analysis Date	Analysis Method
Gasoline Range Organics	< 3.0	3.0	mg/kg		8/8/02	Wi MOD GRO
Blank Spike	103	---	%Recov		8/8/02	Wi MOD GRO
Blank Spike Duplicate	106	---	%Recov		8/8/02	Wi MOD GRO
Blank	< 2.5	2.5	mg/kg		8/8/02	Wi MOD GRO

All soil results are reported on a dry weight basis unless otherwise noted.

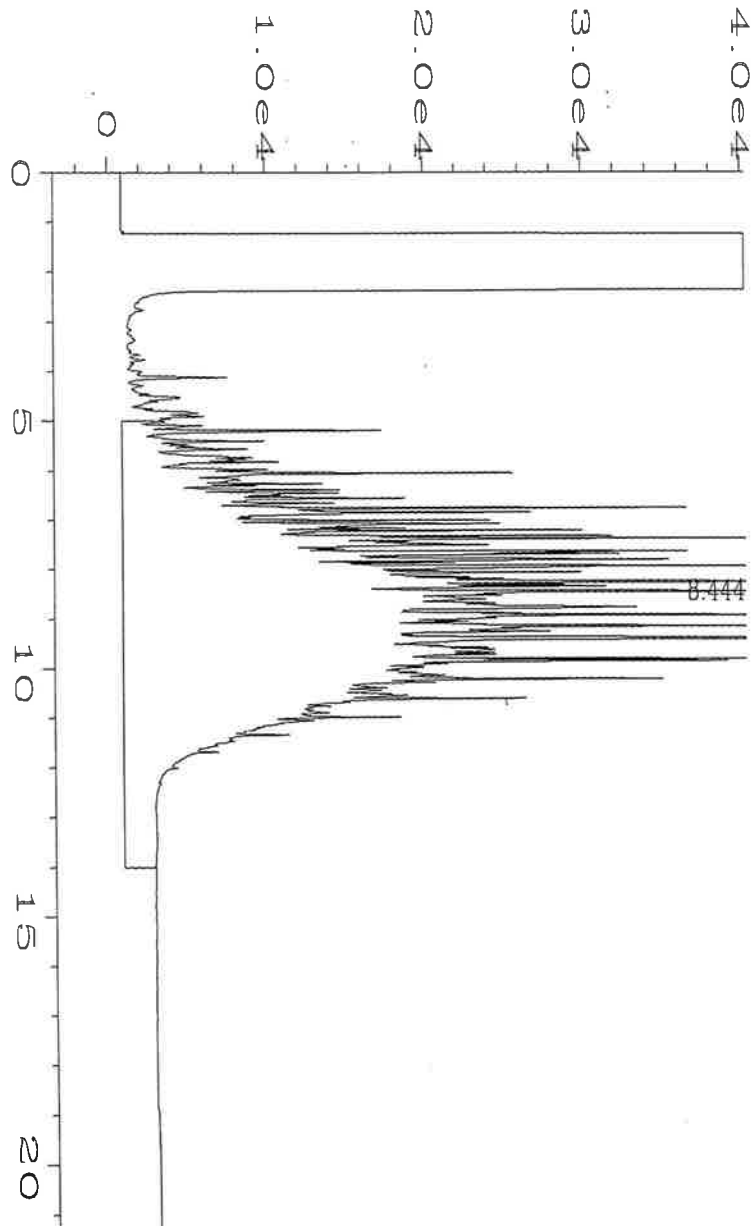
Surrogate - GC VOA	Aqueous		Low Level Solids		Methanol Solids	
	LCL	UCL	LCL	UCL	LCL	UCL
α,α,α -Trifluorotoluene	61	149	54	144	62	154

Surrogate - GCMS VOA	Aqueous		Low Level Solids		Methanol Solids	
	LCL	UCL	LCL	UCL	LCL	UCL
Dibromofluoromethane	61	136	51	127	57	118
Toluene-d ₈	63	140	62	126	72	115
4-Bromofluorobenzene	55	136	60	109	67	112

Surrogate - GCMS PAH	Aqueous		Solids	
	LCL	UCL	LCL	UCL
Nitrobenzene-d ₅	30	170	35	126
2-Fluorobiphenyl	30	126	44	110
Terphenyl-d ₁₄	56	148	38	145

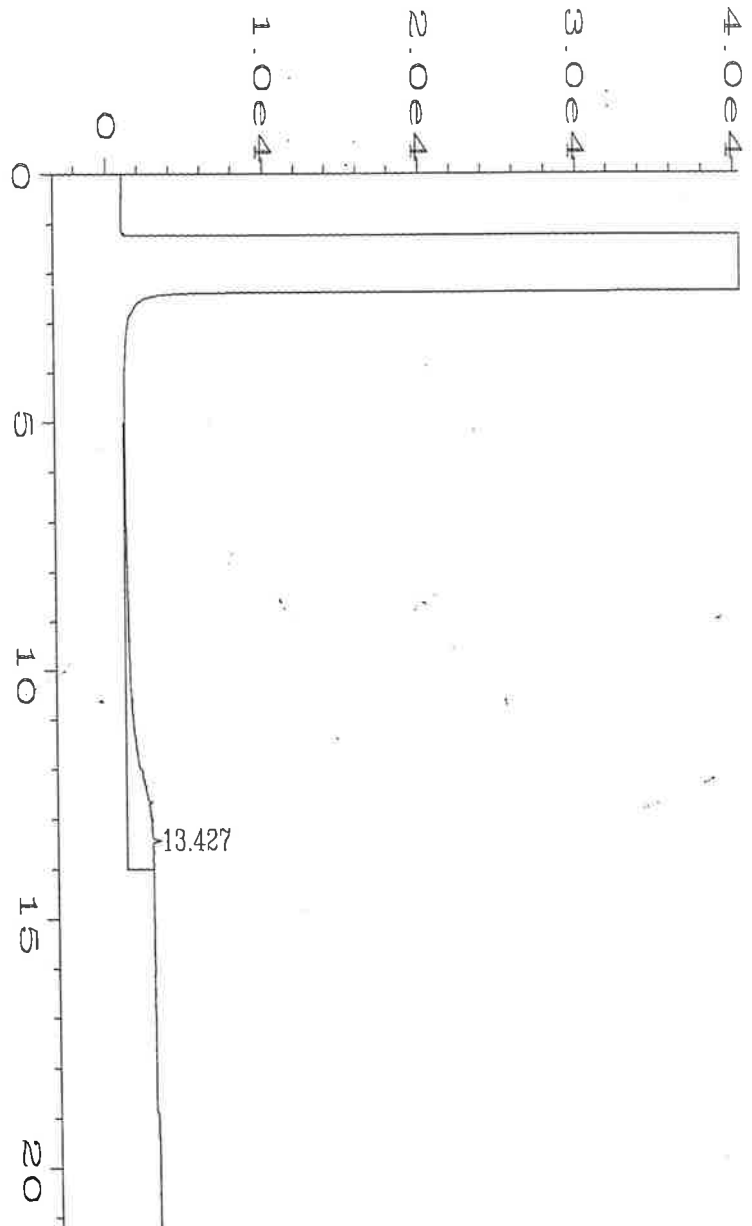
Surrogate - GCMS BNA	Aqueous		Solids	
	LCL	UCL	LCL	UCL
2-Fluorophenol	13	70	35	114
Phenol-d ₅	8	44	29	114
2-Chlorophenol-d ₄	29	104	34	107
1,2-Dichlorobenzene-d ₄	34	112	27	116
Nitrobenzene-d ₅	34	126	26	126
2-Fluorobiphenyl	36	126	26	126
2,4,6-Tribromophenol	39	133	17	129
Terphenyl-d ₁₄	56	139	23	141

Surrogate - GC PCB	Aqueous		Solids	
	LCL	UCL	LCL	UCL
Decachlorobiphenyl	22	133	11	142



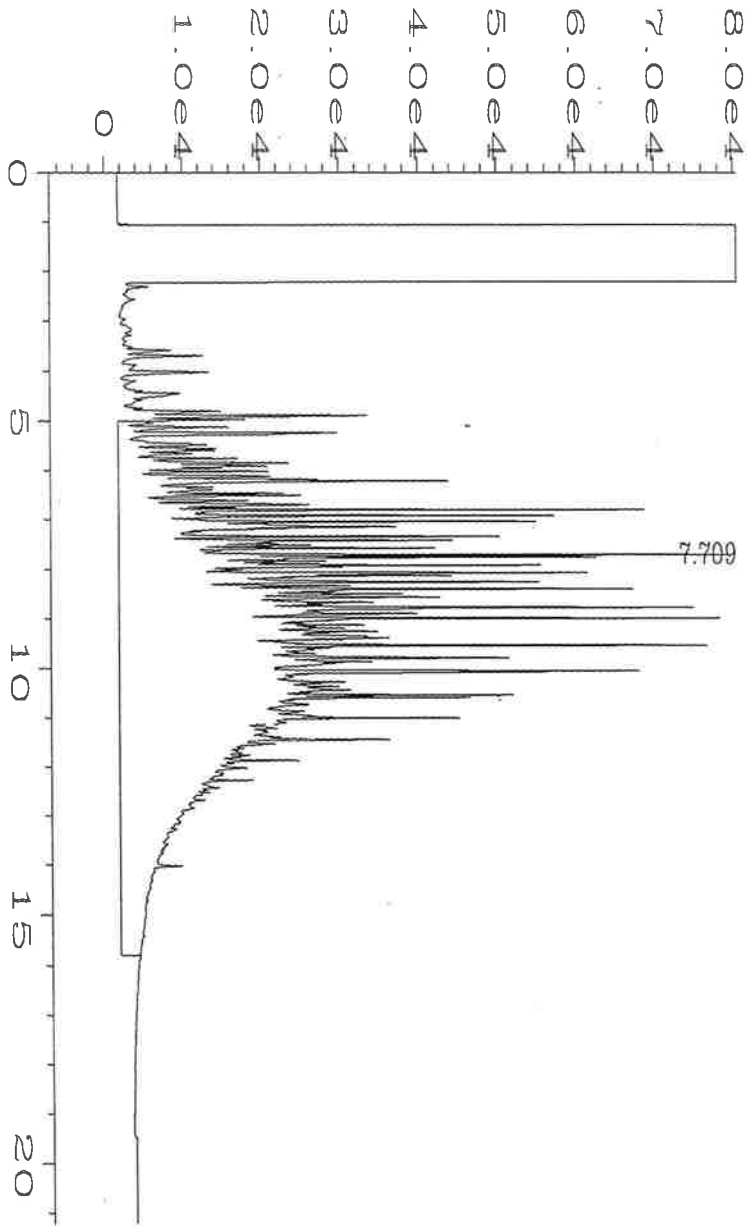
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Operator	: KEG	Vial Number	: 5
Instrument	: DRO	Injection Number	: 1
Sample Name	: 24617D001SXR10	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	1QUICK.MTH
Acquired on	: 13 Aug 02 02:27 PM	Analysis Method	: 1QUICK.MTH
Report Created on:	13 Aug 02 02:53 PM	Sample Amount	: 0
Last Recalib on	: 20 JUN 93 01:52 PM	ISTD Amount	:
Multiplier	: 1		

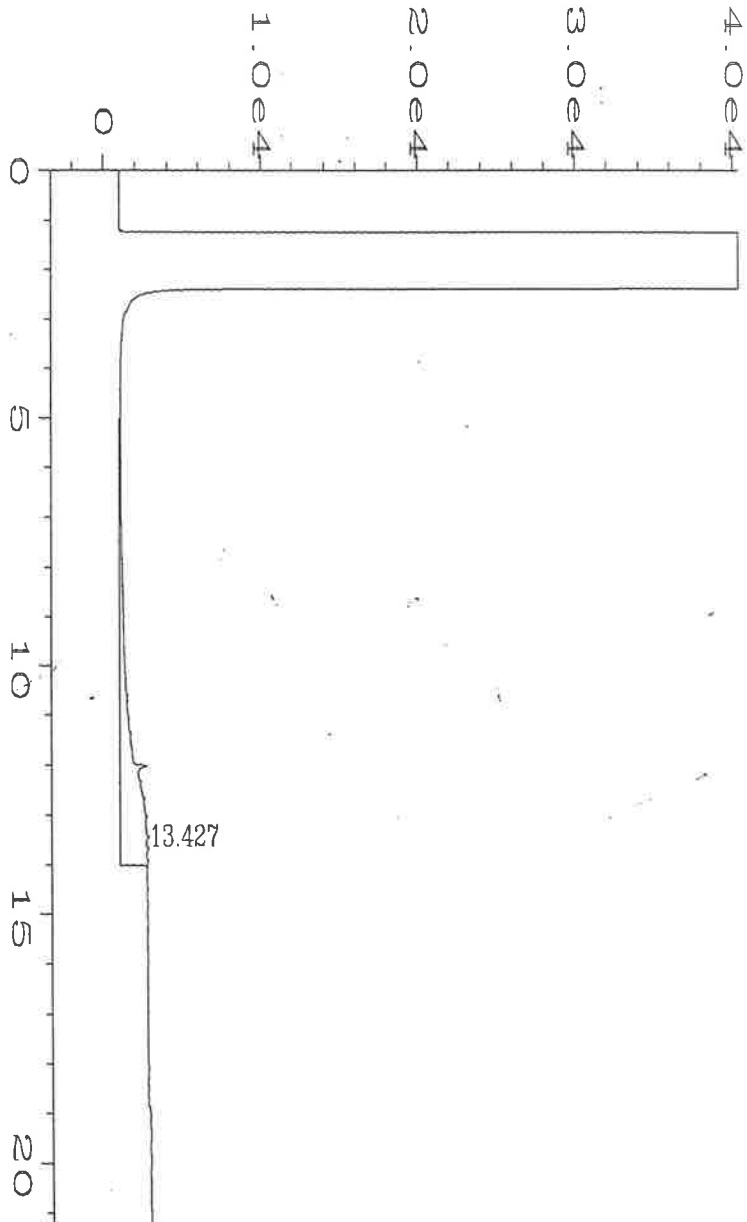


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Instrument	: DRO	Injection Number	: 1
Sample Name	: 24617D002SXX1	Sequence Line	: 8
Run Time Bar Code:		Instrument Method:	1QUICK.MTH
Acquired on	: 13 Aug 02 01:43 AM	Analysis Method	: 1QUICK.MTH
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Last Recalib on	: 20 JUN 93 01:52 PM	ISTD Amount	:
Multiplier	: 1		

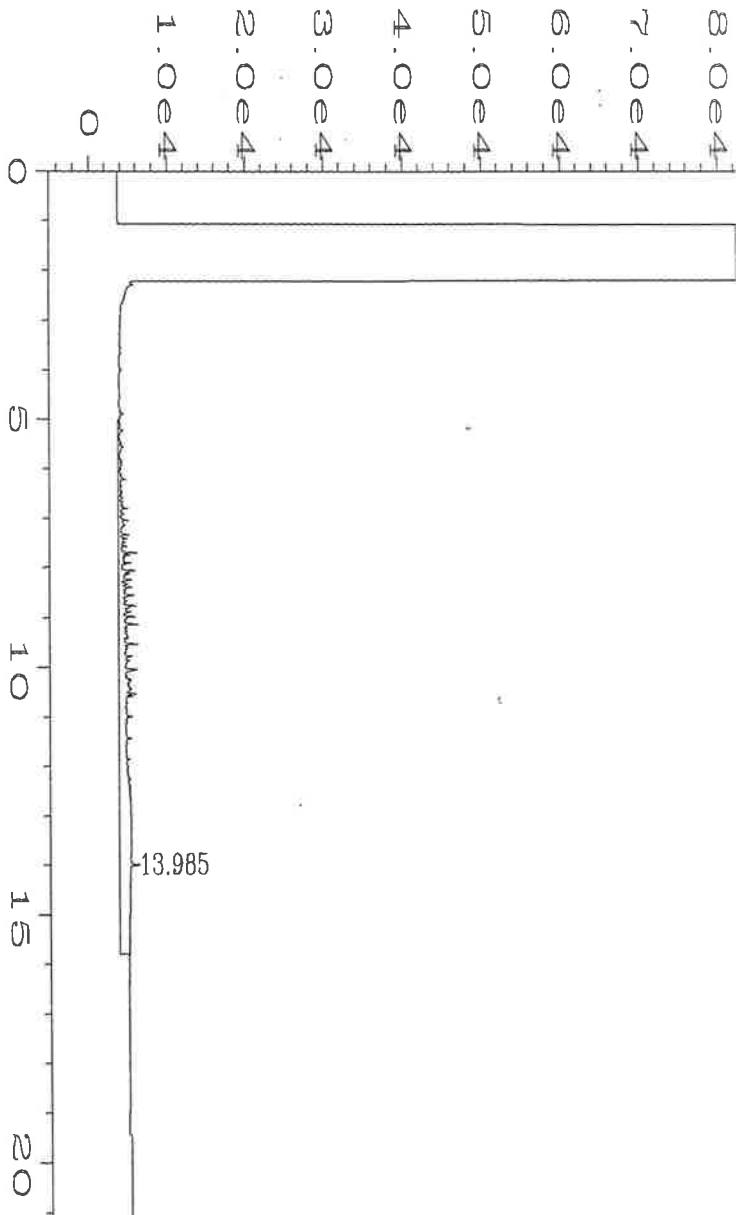


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Operator	: KEG	Vial Number	: 3
Instrument	: DRO3	Injection Number	: 1
Sample Name	: 24617D003WTR2	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	3QUICK.MTH
Acquired on	: 12 Aug 02 09:56 AM	Analysis Method	: 3QUICK.MTH
Report Created on:	12 Aug 02 10:22 AM	Sample Amount	: 0
Last Recalib on	: 20 JUN 93 01:52 PM	ISTD Amount	:
Multiplier	: 1		



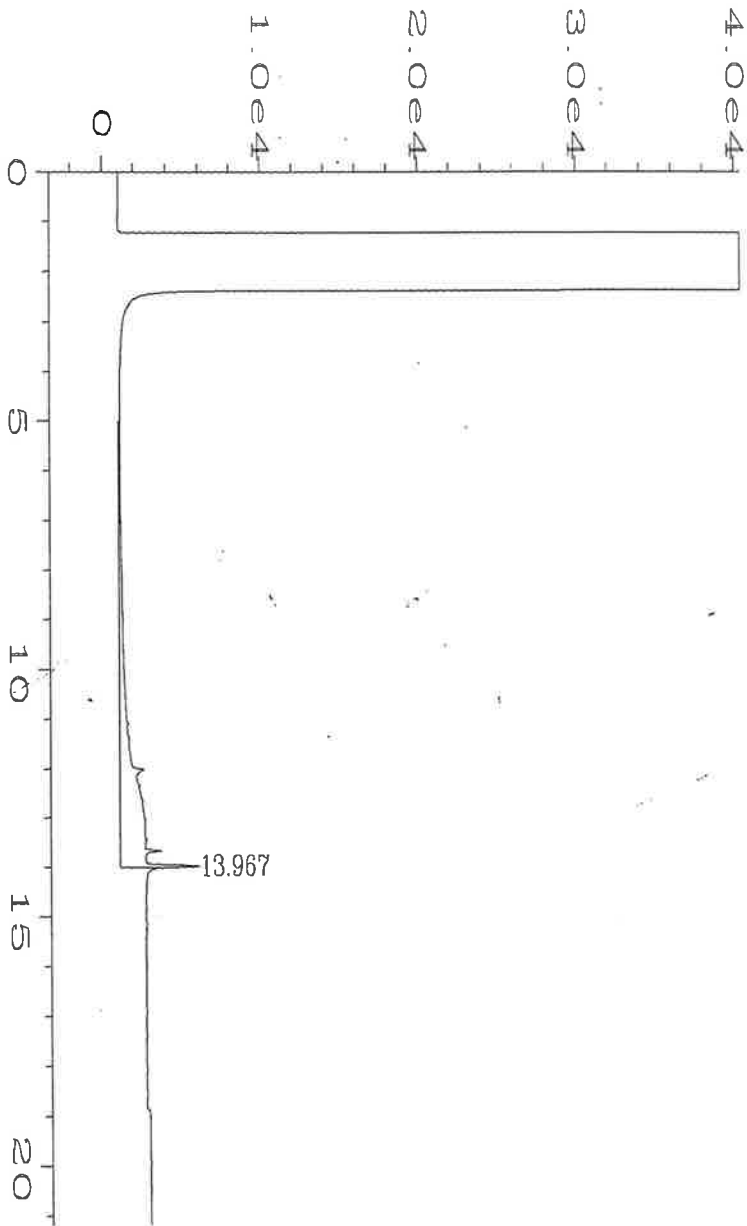
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Operator	: KEG	Vial Number	: 24
Instrument	: DRO	Injection Number	: 1
Sample Name	: 24617D004SXX1	Sequence Line	: 8
Run Time Bar Code:		Instrument Method:	1QUICK.MTH
Acquired on	: 13 Aug 02 02:09 AM	Analysis Method	: 1QUICK.MTH
Report Created on:	13 Aug 02 08:41 AM	Sample Amount	: 0
Last Recalib on	: 20 JUN 93 01:52 PM	ISTD Amount	:
Multiplier	: 1		

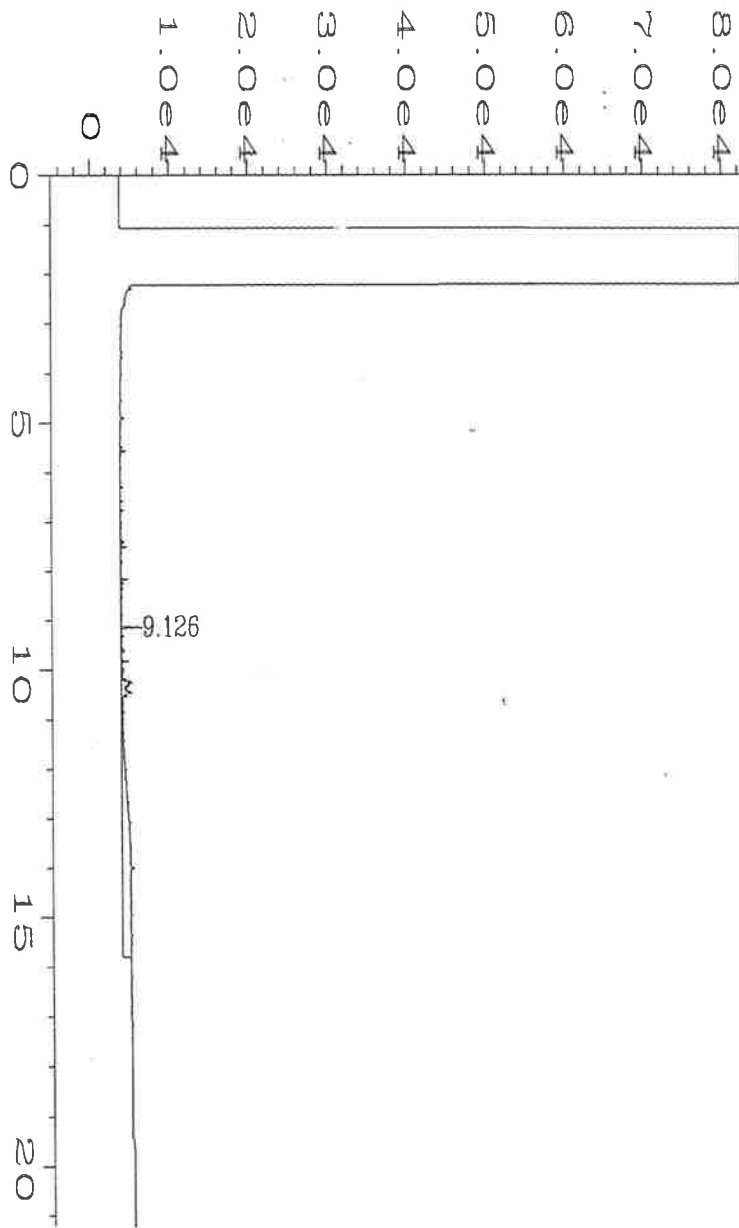


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Instrument	: DRO3	Injection Number	: 1
Sample Name	: 24617D005WTX1	Sequence Line	: 3
Run Time Bar Code:		Instrument Method:	3QUICK.MTH
Acquired on	: 08 Aug 02 05:03 PM	Analysis Method	: 3QUICK.MTH
Report Created on:	08 Aug 02 05:29 PM	Sample Amount	: 0
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Multiplier	: 1		

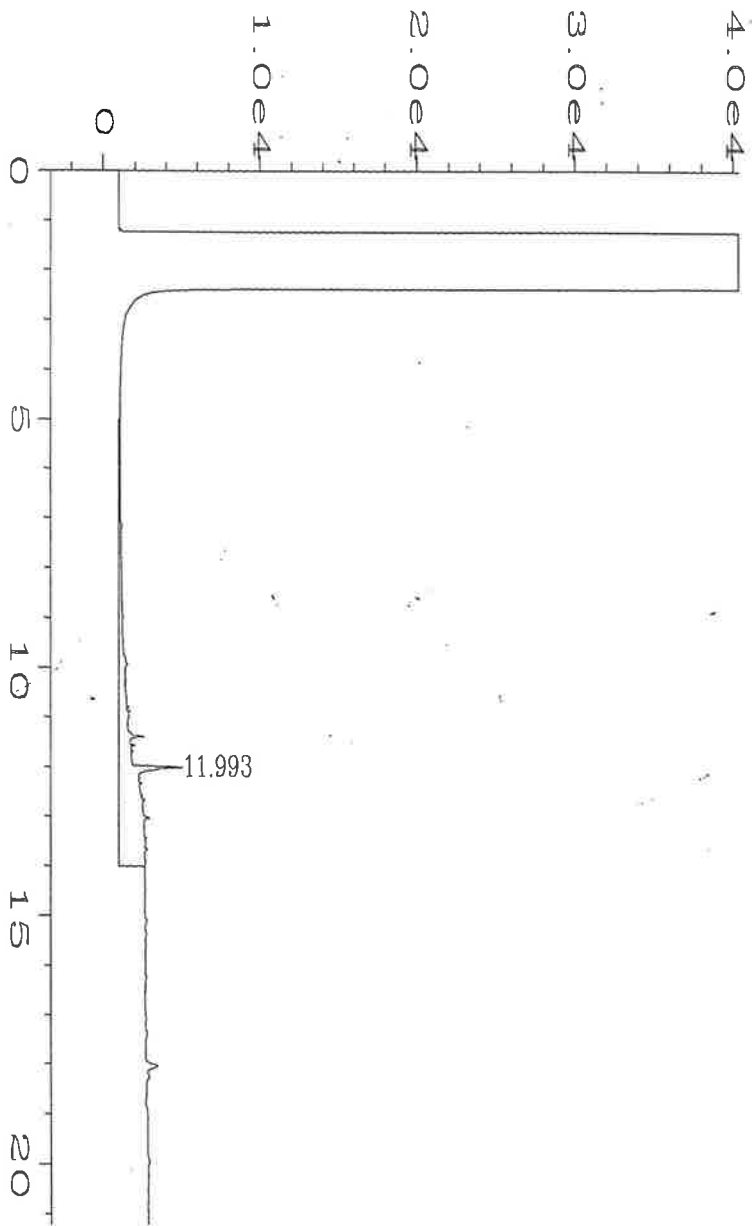


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Instrument	: DRO	Injection Number	: 1
Sample Name	: 24617D006SXX1	Sequence Line	: 8
Run Time Bar Code:		Instrument Method:	1QUICK.MTH
Acquired on	: 13 Aug 02 02:36 AM	Analysis Method	: 1QUICK.MTH
Report Created on:	13 Aug 02 08:42 AM	Sample Amount	: 0
Last Recalib on	: 20 JUN 93 01:52 PM	ISTD Amount	:
Multiplier	: 1		



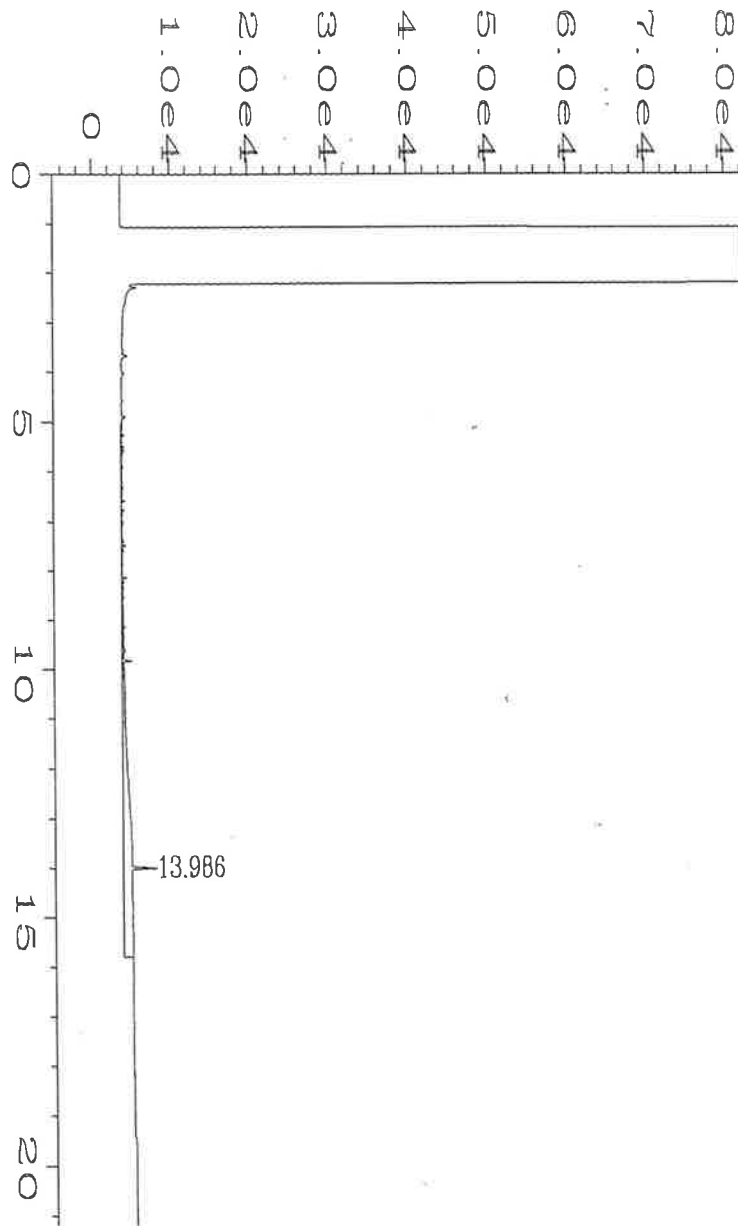
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Operator	: KEG	Vial Number	: 20
Instrument	: DRO3	Injection Number	: 1
Sample Name	: 24617D007WTX1	Sequence Line	: 3
Run Time Bar Code:		Instrument Method:	3QUICK.MTH
Acquired on	: 08 Aug 02 05:29 PM	Analysis Method	: 3QUICK.MTH
Report Created on:	08 Aug 02 05:56 PM	Sample Amount	: 0
Last Recalib on	: 20 JUN 93 01:52 PM	ISTD Amount	:
Multiplier	: 1		

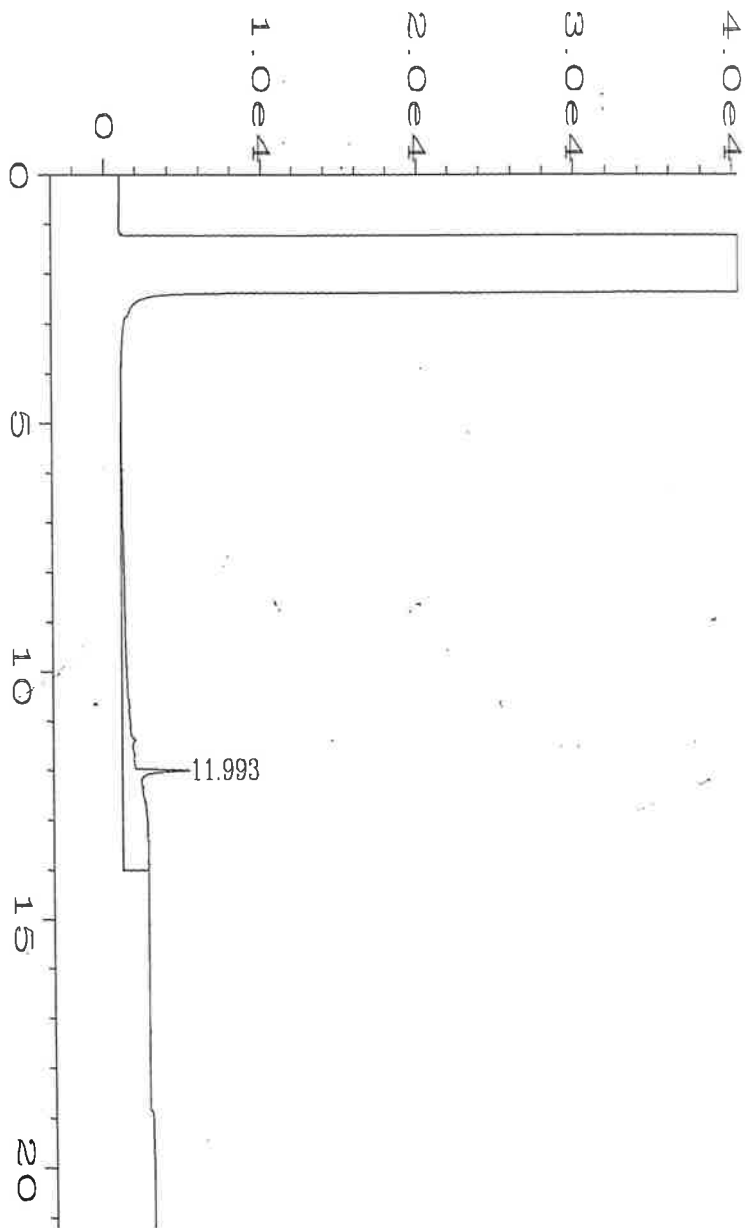


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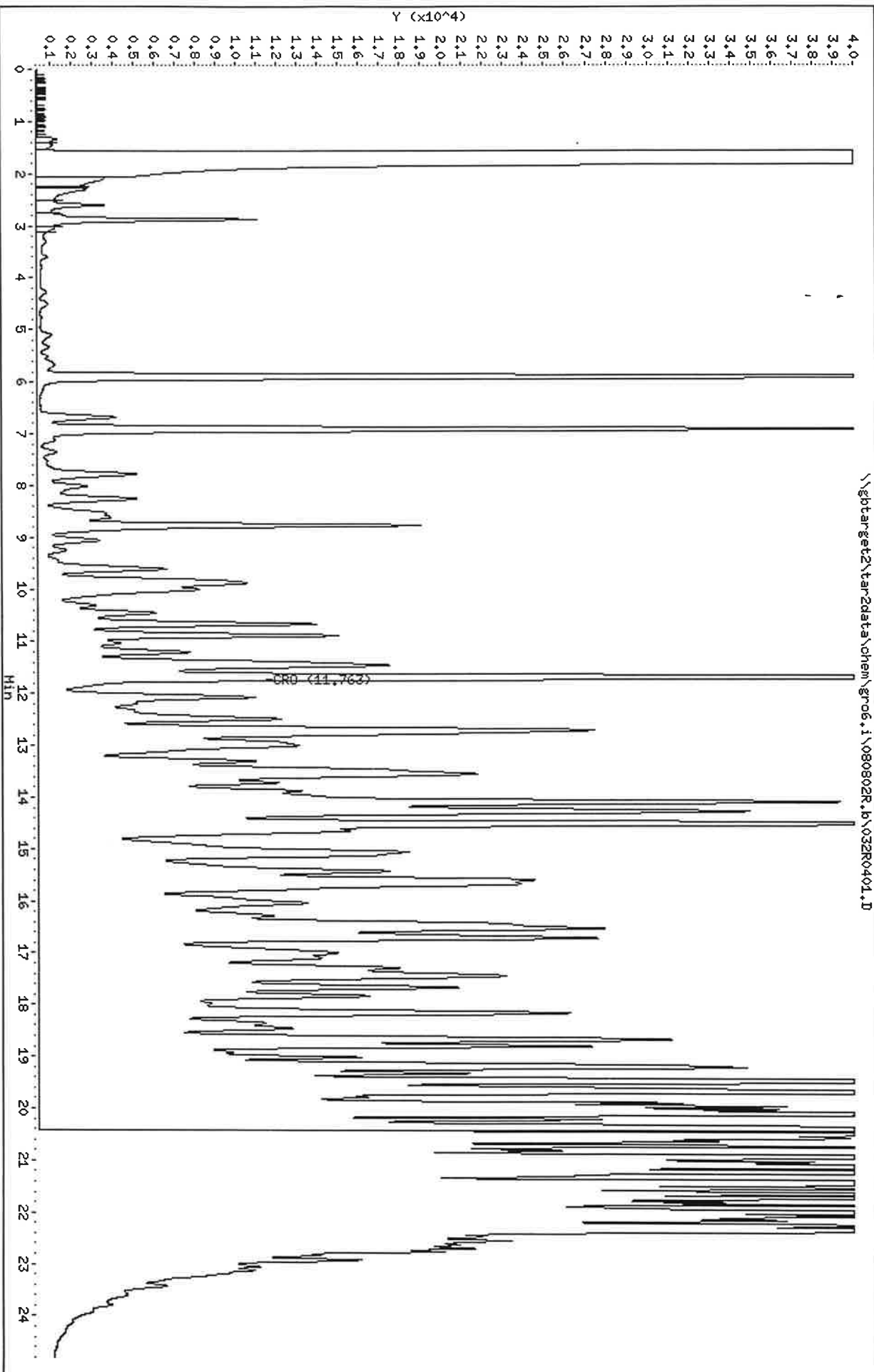
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Instrument	: DRO	Injection Number	: 1
Sample Name	: 24617D008SXX1	Sequence Line	: 8
Run Time Bar Code:		Instrument Method:	1QUICK.MTH
Acquired on	: 13 Aug 02 04:21 AM	Analysis Method	: 1QUICK.MTH
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Multiplier	: 1		

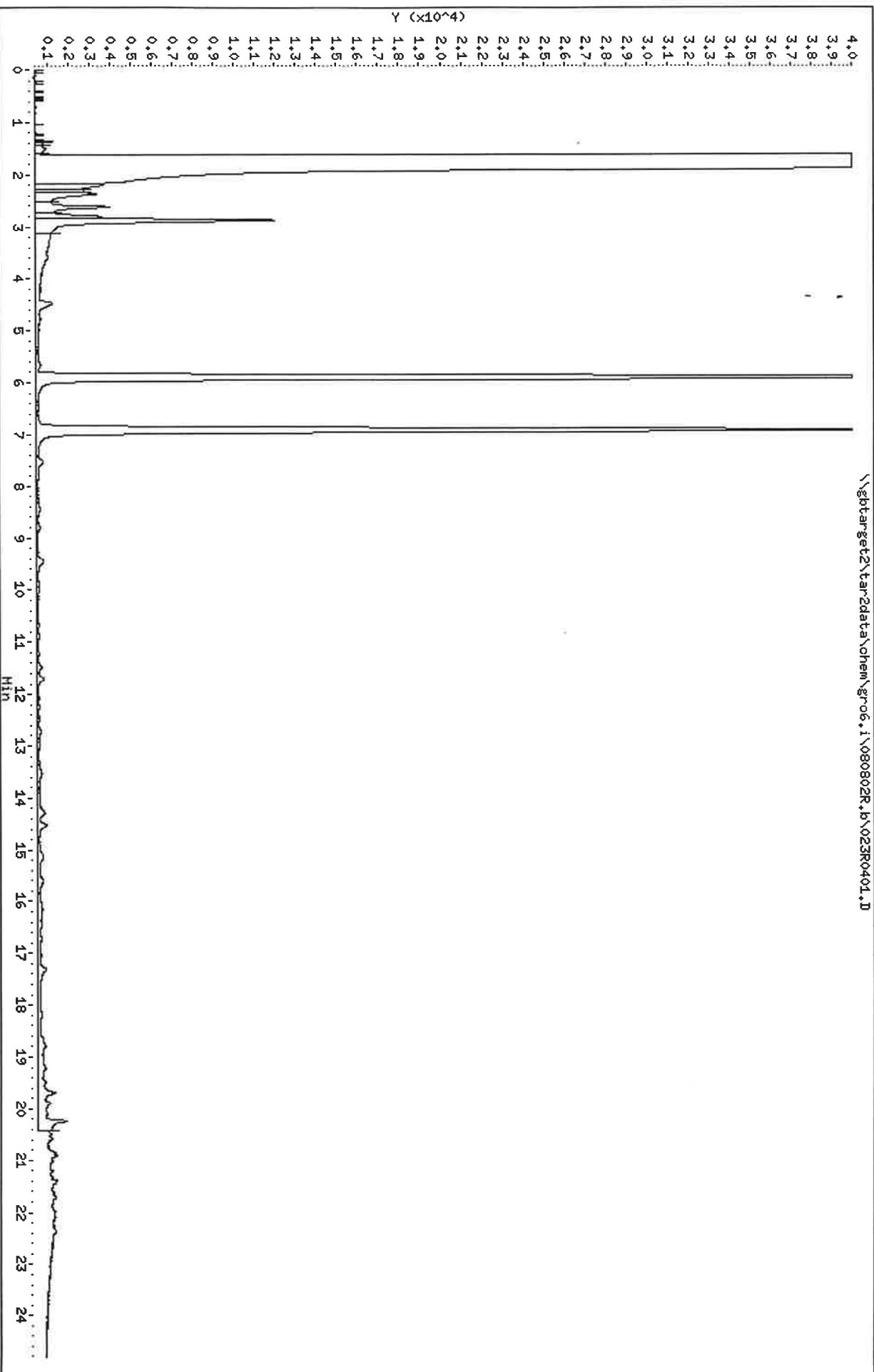


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Instrument	: DRO3	Injection Number	: 1
Sample Name	: 24617D009WTX1	Sequence Line	: 3
Run Time Bar Code:		Instrument Method:	3QUICK.MTH
Acquired on	: 08 Aug 02 05:56 PM	Analysis Method	: 3QUICK.MTH
Report Created on:	08 Aug 02 06:22 PM	Sample Amount	: 0
Last Recalib on	: 20 JUN 93 01:52 PM	ISTD Amount	:
Multiplier	: 1		



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Operator	: KEG	Vial Number	: 26
Instrument	: DRO	Injection Number	: 1
Sample Name	: 24617D010SSX1	Sequence Line	: 8
Run Time Bar Code:		Instrument Method:	1QUICK.MTH
Acquired on	: 13 Aug 02 03:02 AM	Analysis Method	: 1QUICK.MTH
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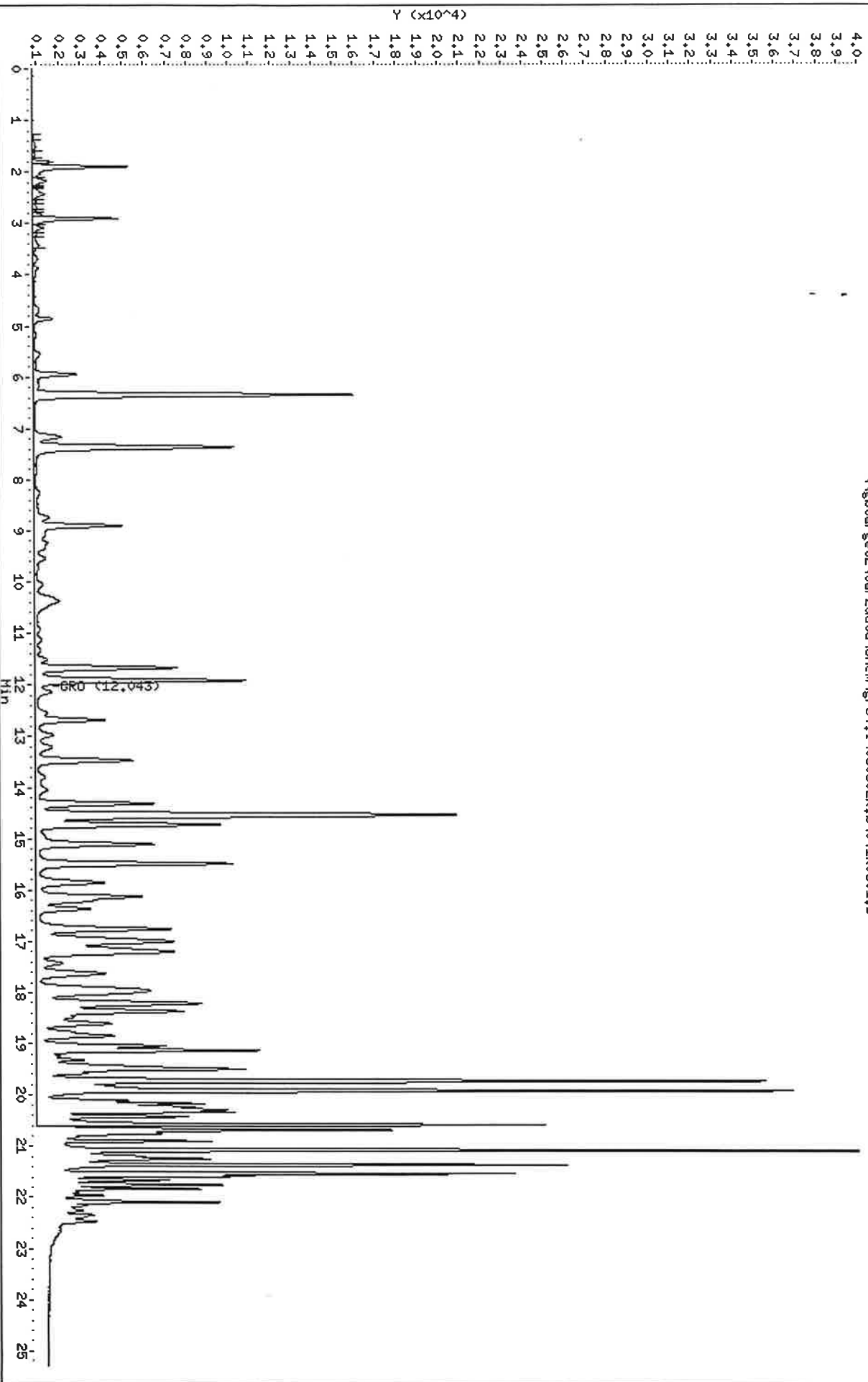




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Date : 09-AUG-2002 10:04
Client ID: 824617-003
Sample Info: 24617B003MH1
Purge Volume: 5.0
Column phase: DB-624

Instrument: gro4.i
Operator: MSB
Column diameter: 0.53

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Date : 08-AUG-2002 20:16

Client ID: 824617-004

Sample Info: 24617F004SCH50

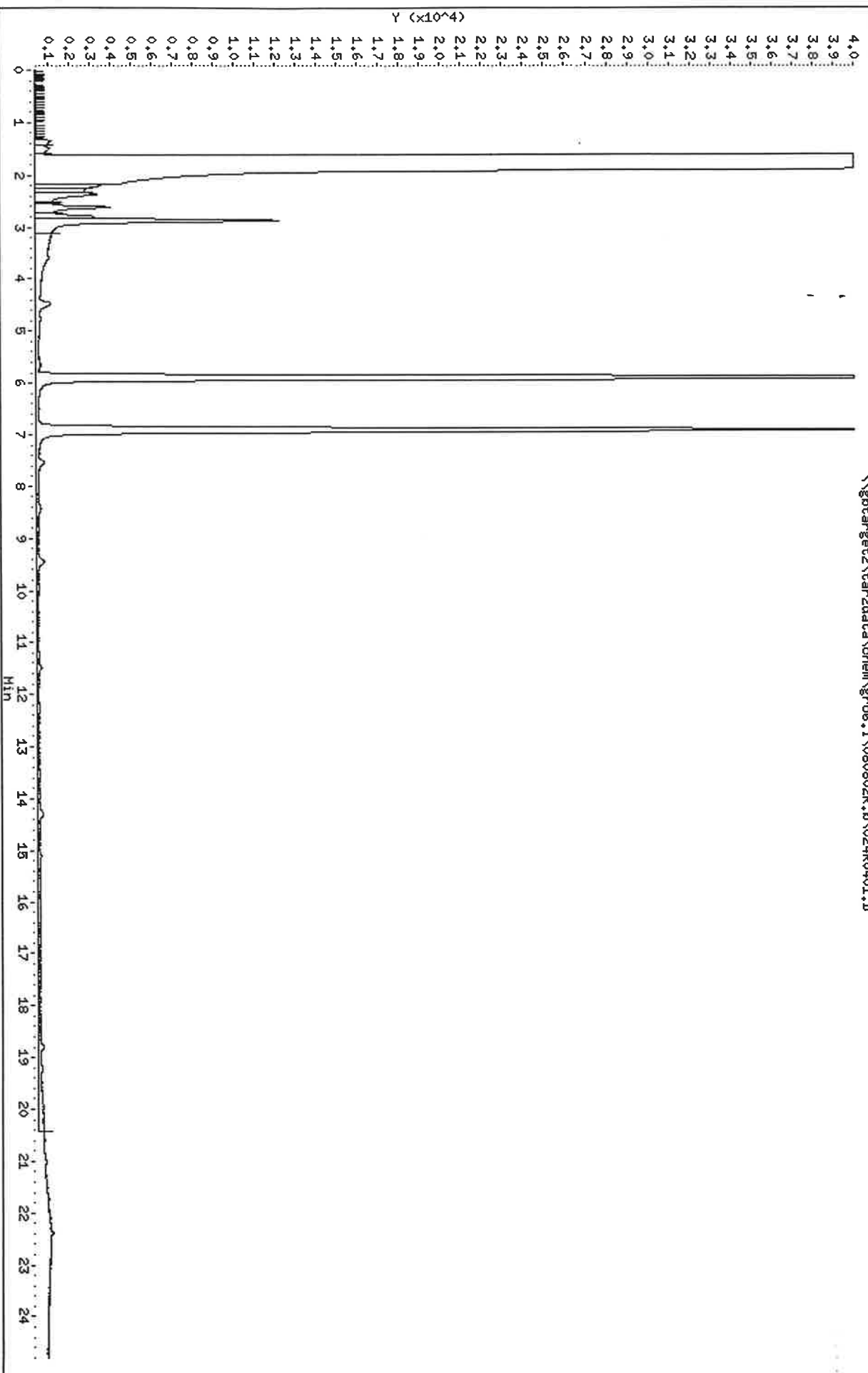
Instrument: gro6.i

Operator: SMT

Column diameter: 0.53

Column phase: DB-624

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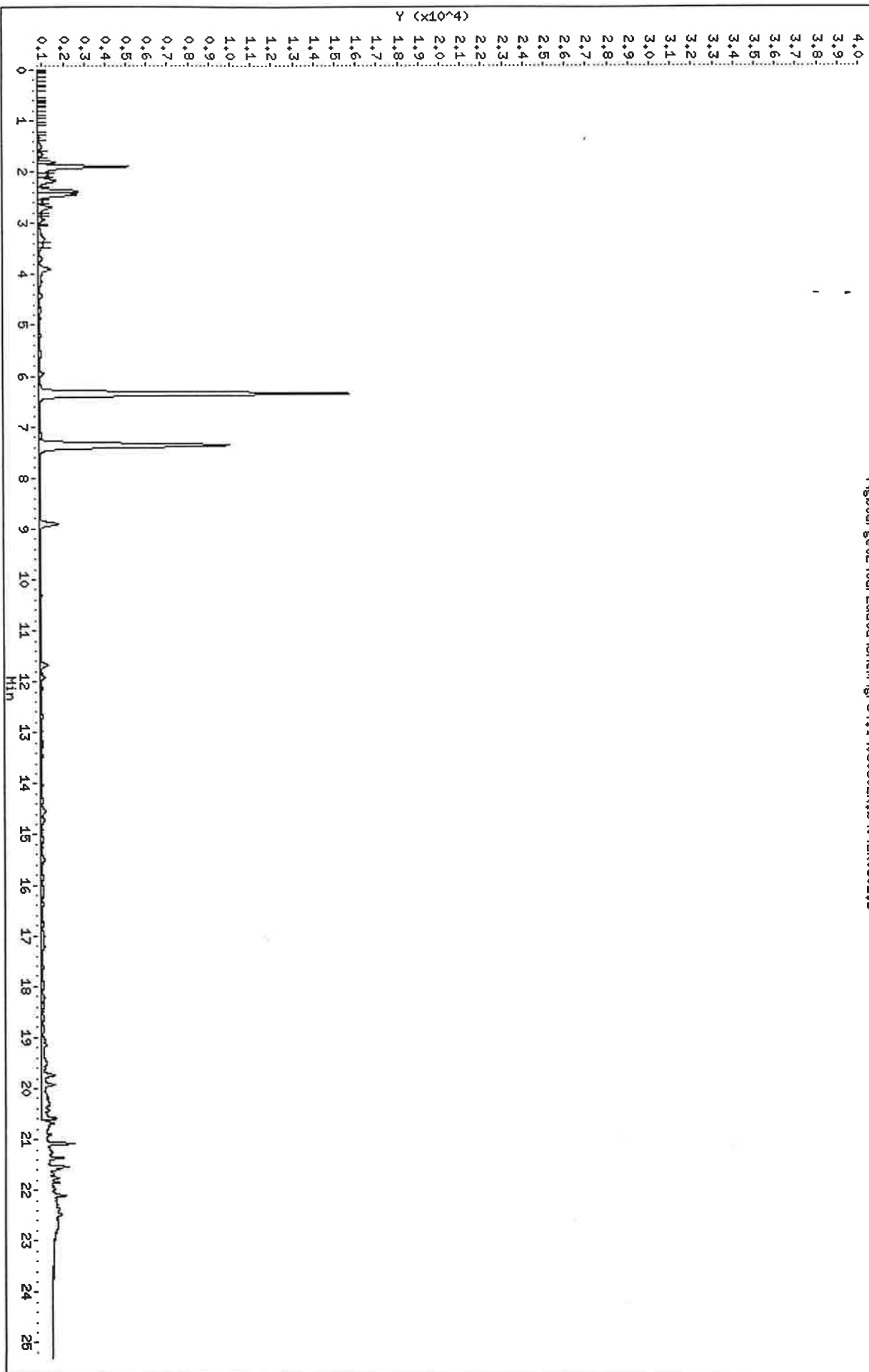


Date: 09-AUG-2002 10:37
Client ID: 824617-005

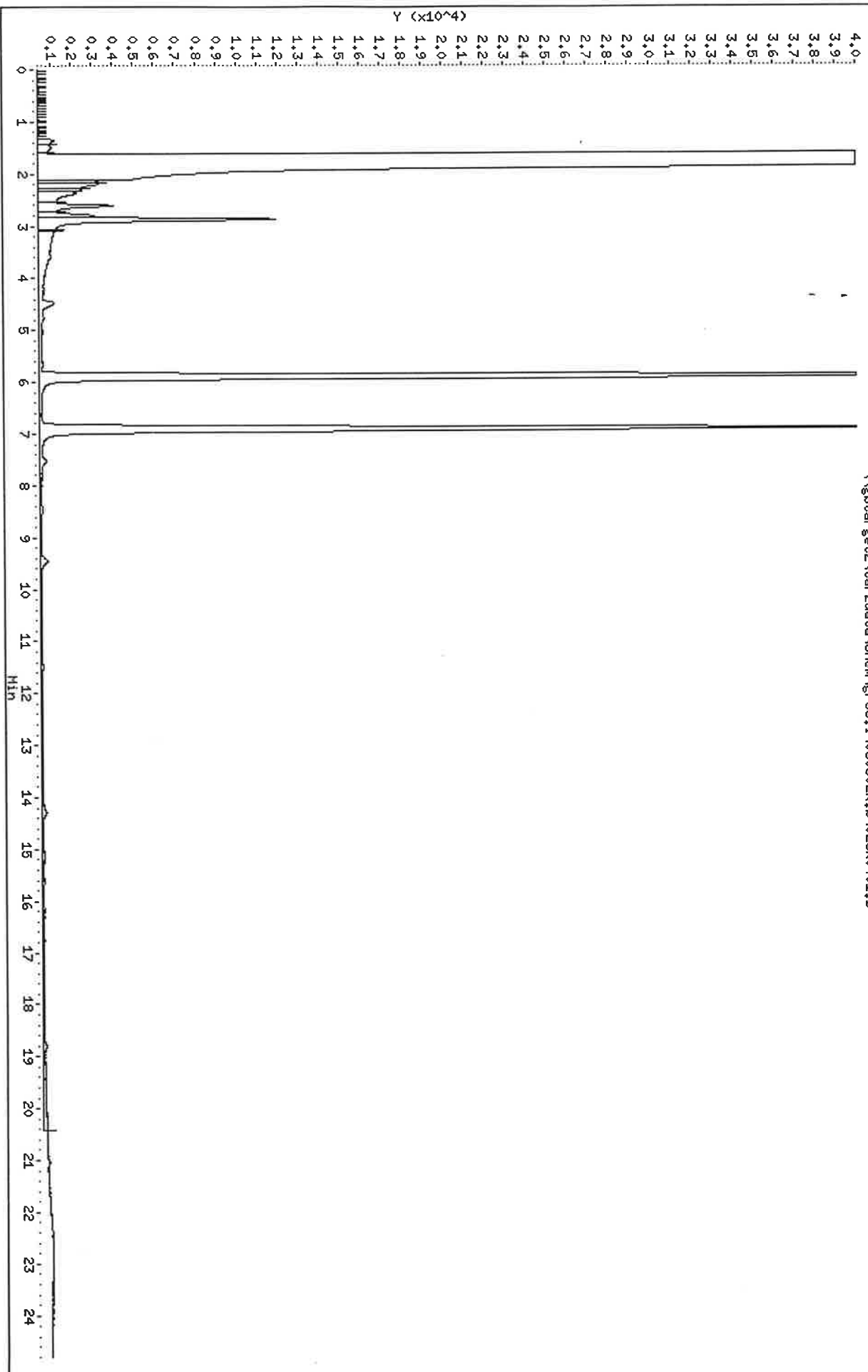
Sample Info: 24617B005M1H1
Purge Volume: 5.0
Column Phase: IB-624

Instrument: gro4.i
Operator: MSB
Column diameter: 0.53

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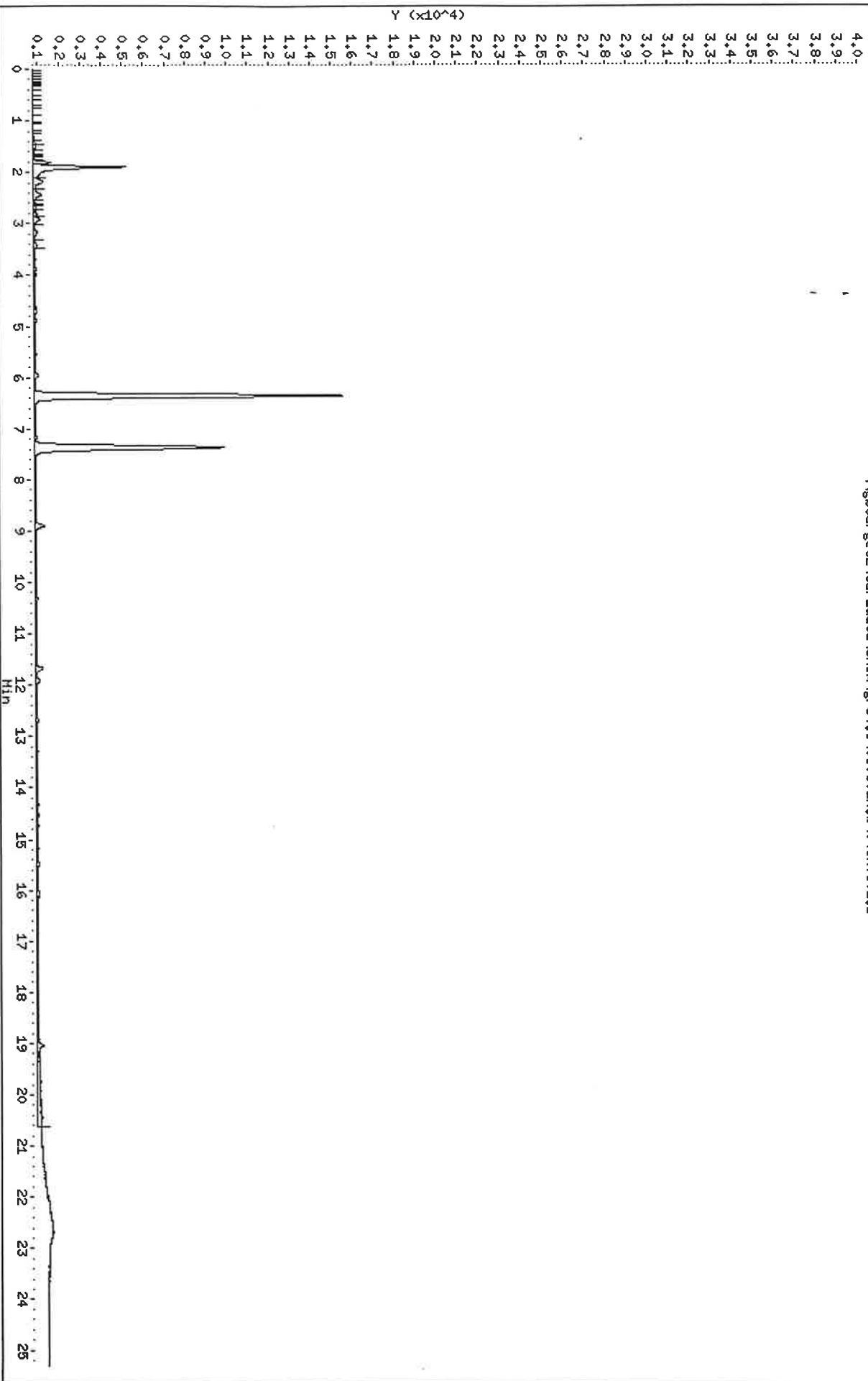


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Client ID: 824617-007

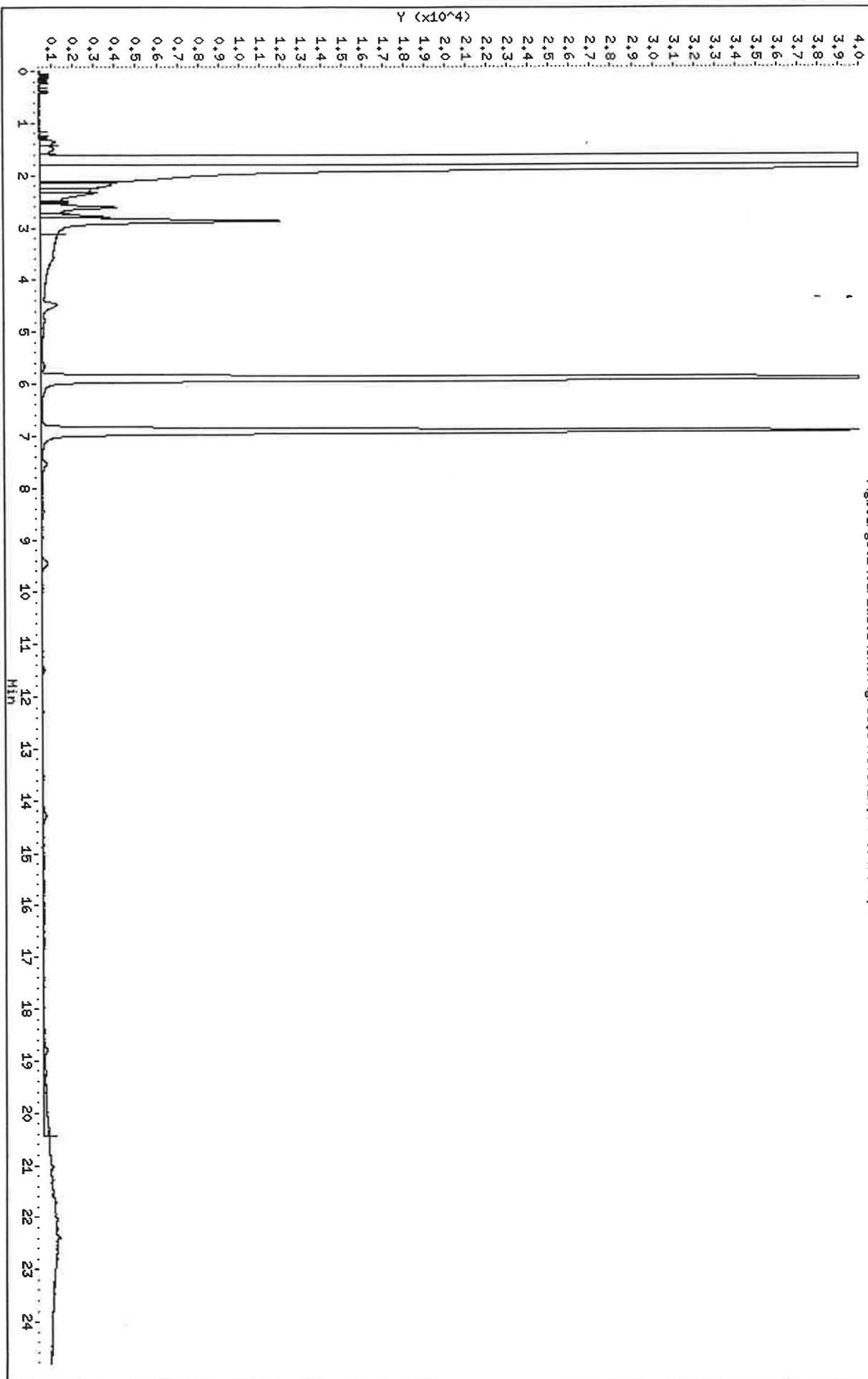
Sample Info: 24617B007\WPH1
Purge Volume: 5.0
Column phase: DB-624

Instrument: gro4.i
Operator: HSB
Column diameter: 0.53

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Date : 09-AUG-2002 11:43

Client ID: 824617-009

Sample Info: 24617B009MH1

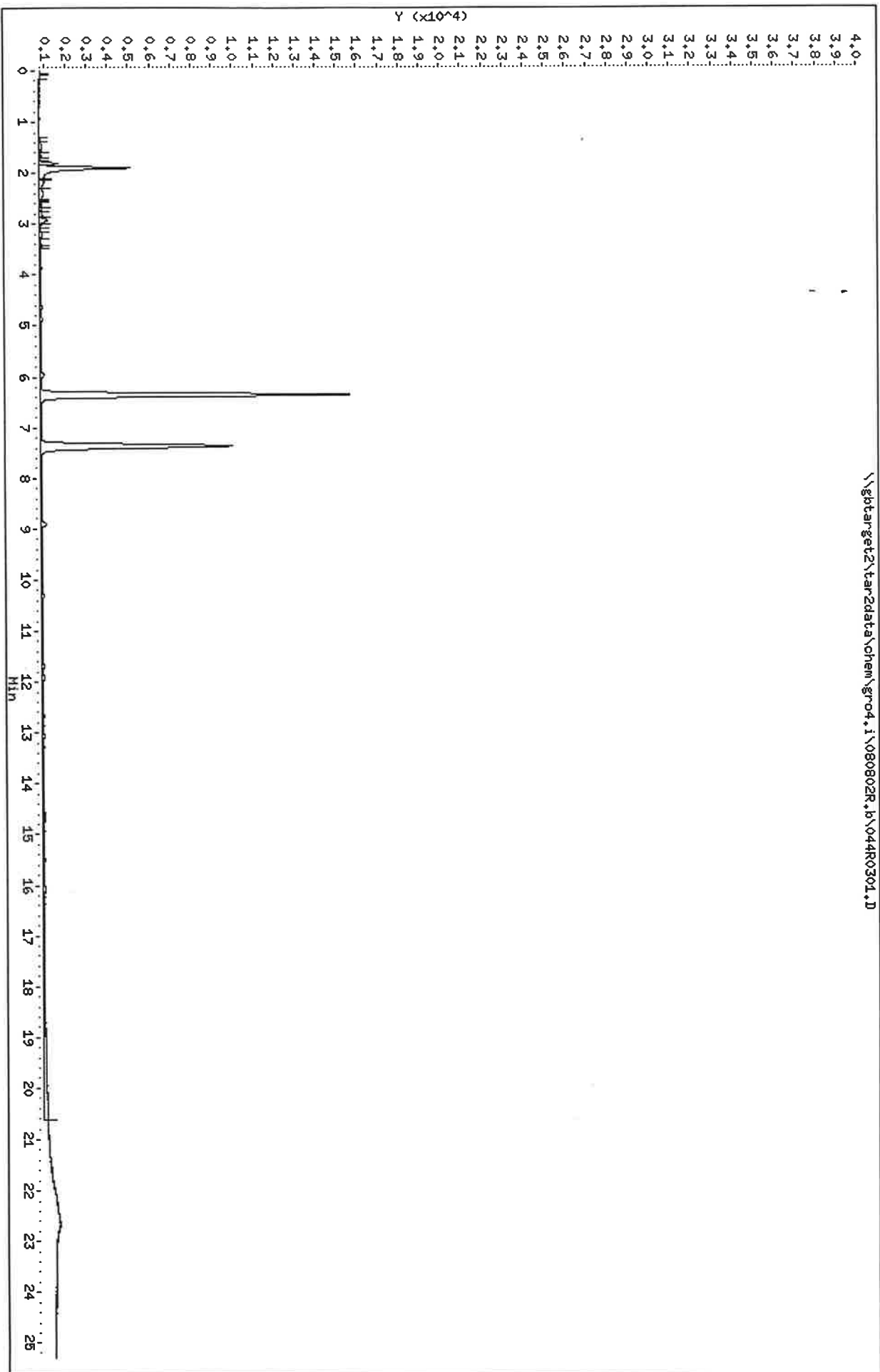
Purge Volume: 5.0

Column phase: DB-624

Instrument: gro4.i

Operator: HSB

Column diameter: 0.53



Date : 08-AUG-2002 13:45

Client ID: 824617-010

Sample Info: 24617F010SCH50

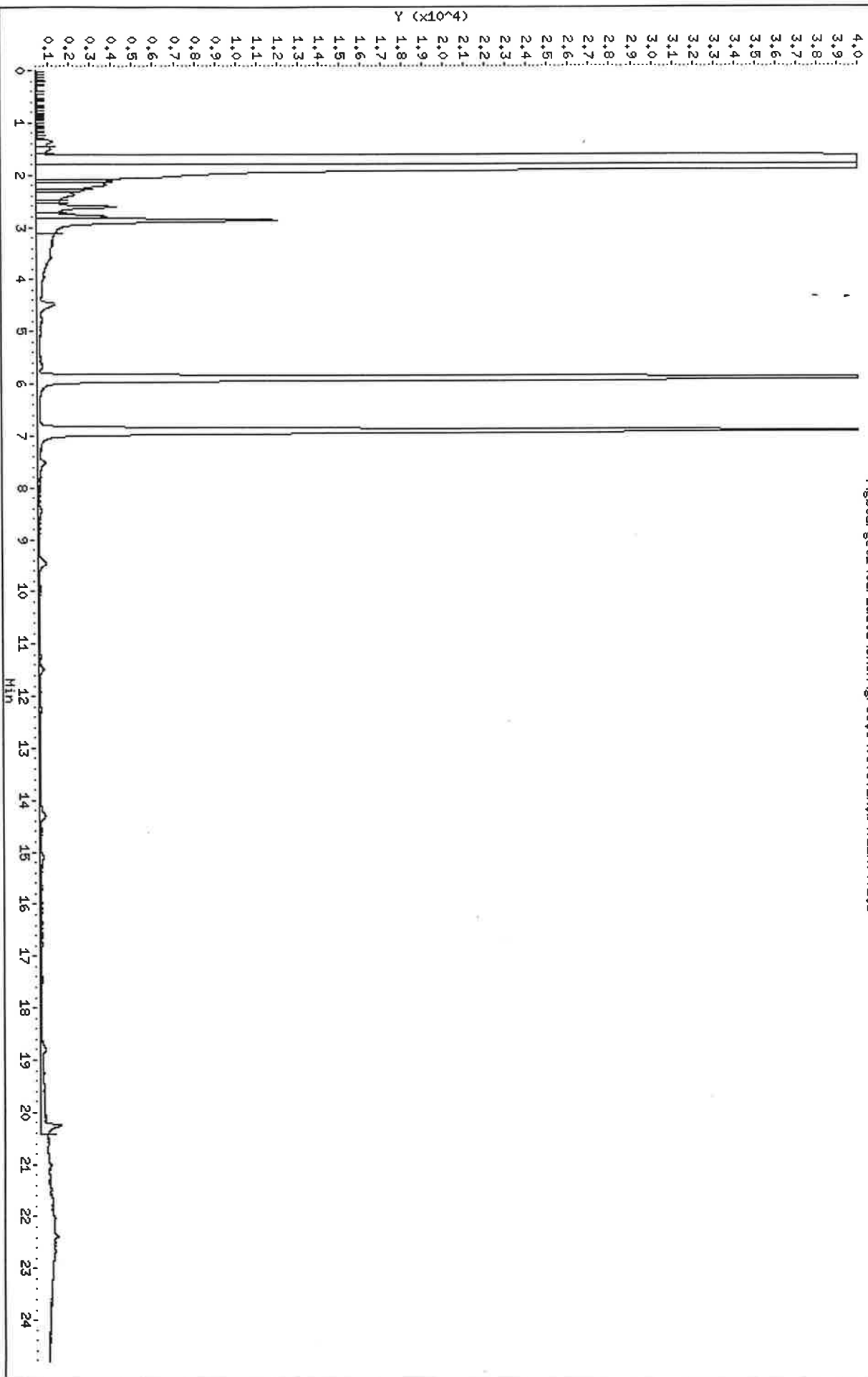
Instrument: gro6.i

Operator: SMT

Column diameter: 0.53

Column phase: DB-624

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FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

BLKH 1076-42

Lab Name: ENCHEM INC. - GREEN BAY Contract: _____
 Lab Code: ENCHEMGB Case No.: _____ SAS No.: _____ SDG No.: GRO6-080802
 Matrix: (soil/water) SOIL Lab Sample ID: BLKH 1076-42
 Sample wt/vol: _____ (g/mL) G Lab File ID: 010F0401
 Level: (low/med) MED Date Received: _____
 % Moisture: not dec. _____ Date Analyzed: 08/08/02
 GC Column: DB-624 ID: 0.53 (mm) Dilution Factor: 50.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
1634-04-4	Methyl tert-butyl ether	25.000		U
71-43-2	Benzene	25.000		U
108-88-3	Toluene	25.000		U
100-41-4	Ethylbenzene	25.000		U
108-38-3	m/p-Xylene	25.000		U
95-47-6	o-Xylene	25.000		U
108-67-8	1,3,5-Trimethylbenzene	18.124		J
95-63-6	1,2,4-Trimethylbenzene	9.013		J
91-20-3	Naphthalene	25.000		U
	Total Xylenes	50.000		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLK1081-43

Lab Name: EN CHEM - GREEN BAY

Contract:

Lab Code: ENCHEMGB

Case No.:

SAS No.:

SDG No.: MS208082002A

Matrix: (soil/water) WATER

Lab Sample ID: VBLK1081-43

Sample wt/vol: 5.000 (g/mL) ML

Lab File ID: 08080223

Level: (low/med) LOW

Date Received: _____

% Moisture: not dec. _____

Date Analyzed: 08/08/02

GC Column: DB-624 ID: 0.18 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q
74-83-9-----	DICHLORODIFLUOROMETHANE	1.00	U	
74-87-3-----	CHLOROMETHANE	1.00	U	
75-01-4-----	VINYL CHLORIDE	1.00	U	
74-83-9-----	BROMOMETHANE	1.00	U	
75-00-3-----	CHLOROETHANE	1.00	U	
75-43-4-----	DICHLOROFLUOROMETHANE	1.00	U	
75-69-4-----	TRICHLOROFLUOROMETHANE	1.00	U	
60-29-7-----	DIETHYL ETHER	1.00	U	
75-35-4-----	1 1-DICHLOROETHENE	1.00	U	
76-13-1-----	1 1 2-TRICHLOROTRIFLUOROETHA	1.00	U	
67-64-1-----	ACETONE	5.00	U	
107-05-1-----	ALLYL CHLORIDE	1.00	U	
75-09-2-----	METHYLENE CHLORIDE	1.00	U	
156-60-5-----	TRANS-1 2-DICHLOROETHENE	1.00	U	
1634-04-4-----	METHYL T-BUTYL ETHER	1.00	U	
75-34-3-----	1 1-DICHLOROETHANE	1.00	U	
590-20-7-----	2 2-DICHLOROPROPANE	1.00	U	
156-59-2-----	CIS-1 2-DICHLOROETHENE	1.00	U	
78-93-3-----	2-BUTANONE	5.00	U	
74-97-5-----	BROMOCHLOROMETHANE	1.00	U	
109-99-9-----	TETRAHYDROFURAN	5.00	U	
67-66-3-----	CHLOROFORM	1.00	U	
71-55-6-----	1 1 1-TRICHLOROETHANE	1.00	U	
56-23-5-----	CARBON TETRACHLORIDE	1.00	U	
563-58-6-----	1 1-DICHLOROPROPENE	1.00	U	
71-43-2-----	BENZENE	1.00	U	
107-06-2-----	1 2-DICHLOROETHANE	1.00	U	
79-01-6-----	TRICHLOROETHENE	1.00	U	
78-87-5-----	1 2-DICHLOROPROPANE	1.00	U	
74-95-3-----	DIBROMOMETHANE	1.00	U	
75-27-4-----	BROMODICHLOROMETHANE	1.00	U	
10061-01-5-----	CIS-1 3-DICHLOROPROPENE	1.00	U	
108-10-1-----	4-METHYL-2-PENTANONE	5.00	U	

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLK1081-43

Lab Name: EN CHEM - GREEN BAY

Contract:

Lab Code: ENCHEMGB

Case No.:

SAS No.:

SDG No.: MS208082002A

Matrix: (soil/water) WATER

Lab Sample ID: VBLK1081-43

Sample wt/vol: 5.000 (g/mL) ML

Lab File ID: 08080223

Level: (low/med) LOW

Date Received: _____

% Moisture: not dec. _____

Date Analyzed: 08/08/02

GC Column: DB-624 ID: 0.18 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

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

CAS NO.	COMPOUND	Q
108-88-3	TOLUENE	1.00 U
10061-02-6	TRANS-1 3-DICHLOROPROPENE	1.00 U
79-00-5	1 1 2-TRICHLOROETHANE	1.00 U
127-18-4	TETRACHLOROETHENE	1.00 U
142-28-9	1 3-DICHLOROPROPANE	1.00 U
124-48-1	DIBROMOCHLOROMETHANE	1.00 U
106-93-4	1 2-DIBROMOETHANE	1.00 U
108-90-7	CHLOROBENZENE	1.00 U
630-26-6	1 1 1 2-TETRACHLOROETHANE	1.00 U
100-41-4	ETHYL BENZENE	1.00 U
108-38-3	M- P-XYLENE	2.00 U
95-47-6	O-XYLENE	1.00 U
100-42-5	STYRENE	1.00 U
75-25-2	BROMOFORM	1.00 U
98-82-8	ISOPROPYLBENZENE	1.00 U
108-86-1	BROMOBENZENE	1.00 U
79-34-5	1 1 2 2-TETRACHLOROETHANE	1.00 U
96-18-4	1 2 3-TRICHLOROPROPANE	1.00 U
103-65-1	N-PROPYLBENZENE	1.00 U
95-49-8	2-CHLOROTOLUENE	1.00 U
106-43-4	4-CHLOROTOLUENE	1.00 U
108-67-8	1 3 5-TRIMETHYLBENZENE	1.00 U
98-06-6	TERT-BUTYLBENZENE	1.00 U
95-63-6	1 2 4-TRIMETHYLBENZENE	1.00 U
135-98-8	SEC-BUTYLBENZENE	1.00 U
541-73-1	1 3-DICHLOROBENZENE	1.00 U
99-878-6	P-ISOPROPYLTOLUENE (CYMENE)	1.00 U
106-46-7	1 4-DICHLOROBENZENE	1.00 U
95-50-1	1 2-DICHLOROBENZENE	1.00 U
104-51-8	N-BUTYLBENZENE	1.00 U
96-12-8	1 2-DIBROMO-3-CHLOROPROPANE	1.00 U
95-63-6	1 2 4-TRICHLOROBENZENE	1.00 U
87-68-3	HEXACHLOROBUTADIENE	1.00 U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

VBLK1081-43

Lab Name: EN CHEM - GREEN BAY

Contract:

Lab Code: ENCHEMGB

Case No.:

SAS No.:

SDG No.: MS208082002A

Matrix: (soil/water) WATER

Lab Sample ID: VBLK1081-43

Sample wt/vol: 5.000 (g/mL) ML

Lab File ID: 08080223

Level: (low/med) LOW

Date Received: _____

% Moisture: not dec. _____

Date Analyzed: 08/08/02

GC Column: DB-624 ID: 0.18 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

91-20-3-----	NAPHTHALENE	1.00	U
96-18-4-----	1 2 3-TRICHLOROBENZENE	1.00	U

FORM 3
WATER VOLATILE BLANK SPIKE RECOVERY

Lab Name: EN CHEM - GREEN BAY

Contract:

Lab Code: ENCHEMGB

Case No.:

SAS No.:

SDG No.: MS208082002A

Matrix Spike - Sample No.: VBLK1081-43

COMPOUND	SPIKE ADDED (ug/L)	BLANK AMOUNT (ug/L)	BS AMOUNT (ug/L)	BS % REC #	QC. LIMITS REC.
CHLOROMETHANE	50.00	0.00	58.11	116	48-134
VINYL CHLORIDE	50.00	0.00	61.62	123	61-134
BROMOMETHANE	50.00	0.00	58.43	117	53-137
CHLOROETHANE	50.00	0.00	59.40	119	73-127
1 1-DICHLOROETHENE	50.00	0.00	63.21	126	82-127
ACETONE	50.00	0.00	45.98	92	42-120
CARBON DISULFIDE	50.00	0.00	59.67	119	78-130
METHYLENE CHLORIDE	50.00	0.00	54.25	108	77-117
TRANS-1 2-DICHLOROETHEN	50.00	0.00	53.24	106	70-130
1 1-DICHLOROETHANE	50.00	0.00	51.05	102	80-120
CIS-1 2-DICHLOROETHENE	50.00	0.00	48.38	97	70-130
2-BUTANONE	50.00	0.00	41.20	82	59-122
CHLOROFORM	50.00	0.00	50.03	100	80-120
1 1 1-TRICHLOROETHANE	50.00	0.00	52.98	106	80-120
CARBON TETRACHLORIDE	50.00	0.00	52.81	106	85-128
BENZENE	50.00	0.00	52.10	104	80-120
1 2-DICHLOROETHANE	50.00	0.00	51.26	102	80-120
TRICHLOROETHENE	50.00	0.00	51.35	103	80-120
1 2-DICHLOROPROPANE	50.00	0.00	49.55	99	80-120
BROMODICHLOROMETHANE	50.00	0.00	49.18	98	80-120
CIS-1 3-DICHLOROPROPENE	50.00	0.00	45.73	91	78-120
4-METHYL-2-PENTANONE	50.00	0.00	41.32	83	69-119
TOLUENE	50.00	0.00	50.09	100	80-120
TRANS-1 3-DICHLOROPROPE	50.00	0.00	44.33	89	80-120
1 1 2-TRICHLOROETHANE	50.00	0.00	46.05	92	80-120
TETRACHLOROETHENE	50.00	0.00	51.98	104	80-120
2-HEXANONE	50.00	0.00	42.64	85	60-123
DIBROMOCHLOROMETHANE	50.00	0.00	44.02	88	80-120

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

* Values outside of QC limits

COMMENTS:

FORM 3
WATER VOLATILE BLANK SPIKE RECOVERY

Lab Name: EN CHEM - GREEN BAY

Contract:

Lab Code: ENCHEMGB

Case No.:

SAS No.:

SDG No.: MS208082002A

Matrix Spike - Sample No.: VBLK1081-43

COMPOUND	SPIKE ADDED (ug/L)	BLANK AMOUNT (ug/L)	BS AMOUNT (ug/L)	BS % REC #	QC. LIMITS REC.
CHLOROBENZENE	50.00	0.00	49.30	99	80-120
ETHYL BENZENE	50.00	0.00	51.09	102	80-120
M- P-XYLENE	100.00	0.00	104.00	104	70-130
O-XYLENE	50.00	0.00	50.66	101	70-130
STYRENE	50.00	0.00	38.27	76*	80-120
BROMOFORM	50.00	0.00	41.75	84	66-123
1 1 2 2-TETRACHLOROETHA	50.00	0.00	45.43	91	74-115

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

* Values outside of QC limits

COMMENTS:

FORM 3
WATER VOLATILE BLANK SPIKE RECOVERY

Lab Name: EN CHEM - GREEN BAY

Contract:

Lab Code: ENCHEMGB

Case No.:

SAS No.:

SDG No.: MS208082002A

Matrix Spike - Sample No.: VBLK1081-43

COMPOUND	SPIKE ADDED (ug/L)	BSD AMOUNT (ug/L)	BSD % REC #	% RPD #	QC LIMITS	
					RPD	REC.
CHLOROMETHANE	50.00	57.96	116	0	20	48-134
VINYL CHLORIDE	50.00	61.24	122	1	20	61-134
BROMOMETHANE	50.00	62.70	125	7	20	53-137
CHLOROETHANE	50.00	58.21	116	2	20	73-127
1 1-DICHLOROETHENE	50.00	61.95	124	2	20	82-127
ACETONE	50.00	51.64	103	11	33	42-120
CARBON DISULFIDE	50.00	58.31	117	2	20	78-130
METHYLENE CHLORIDE	50.00	54.74	109	1	20	77-117
TRANS-1 2-DICHLOROETHEN	50.00	53.46	107	1	20	70-130
1 1-DICHLOROETHANE	50.00	51.72	103	1	20	80-120
CIS-1 2-DICHLOROETHENE	50.00	49.29	98	1	20	70-130
2-BUTANONE	50.00	45.94	92	11	27	59-122
CHLOROFORM	50.00	50.09	100	0	20	80-120
1 1 1-TRICHLOROETHANE	50.00	53.98	108	2	20	80-120
CARBON TETRACHLORIDE	50.00	54.20	108	2	20	85-128
BENZENE	50.00	51.98	104	0	20	80-120
1 2-DICHLOROETHANE	50.00	52.35	105	3	20	80-120
TRICHLOROETHENE	50.00	51.11	102	1	20	80-120
1 2-DICHLOROPROPANE	50.00	50.06	100	1	20	80-120
BROMODICHLOROMETHANE	50.00	50.26	100	2	20	80-120
CIS-1 3-DICHLOROPROPENE	50.00	46.83	94	3	20	78-120
4-METHYL-2-PENTANONE	50.00	47.24	94	12	20	69-119
TOLUENE	50.00	49.94	100	0	20	80-120
TRANS-1 3-DICHLOROPROPE	50.00	45.26	90	1	20	80-120
1 1 2-TRICHLOROETHANE	50.00	48.57	97	5	20	80-120
TETRACHLOROETHENE	50.00	53.48	107	3	20	80-120
2-HEXANONE	50.00	48.57	97	13	20	60-123
DIBROMOCHLOROMETHANE	50.00	45.77	92	4	20	80-120

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

* Values outside of QC limits

COMMENTS:

FORM 3
WATER VOLATILE BLANK SPIKE RECOVERY

Lab Name: EN CHEM - GREEN BAY

Contract:

Lab Code: ENCHEMGB

Case No.:

SAS No.:

SDG No.: MS208082002A

Matrix Spike - Sample No.: VBLK1081-43

COMPOUND	SPIKE ADDED (ug/L)	BSD AMOUNT (ug/L)	BSD % REC #	% RPD #	QC LIMITS	
					RPD	REC.
CHLOROBENZENE	50.00	50.13	100	1	20	80-120
ETHYL BENZENE	50.00	51.81	104	2	20	80-120
M- P-XYLENE	100.00	104.56	104	0	20	70-130
O-XYLENE	50.00	50.16	100	1	20	70-130
STYRENE	50.00	38.55	77*	1	20	80-120
BROMOFORM	50.00	44.61	89	6	20	66-123
1 1 2 2-TETRACHLOROETHA	50.00	48.84	98	7	20	74-115

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

* Values outside of QC limits

RPD: 0 out of 35 outside limits

Spike Recovery: 2 out of 70 outside limits

COMMENTS:

1241 Bellevue St., Suite 9
Green Bay, WI 54302
920-469-2436
FAX: 920-469-8927



Company Name: Rinnacle Eng.
Branch or Location: Maple Grove
Project Contact: Roy Hill
Telephone: 763-315-4501
Project Number: MND02229.00
Project Name: Hector - AST
Project State: MN
Sampled By (Print): Roy Hill

525 Science Drive
Madison, WI 53711
608-232-3300
FAX: 608-233-0502

Page 1 of 1
R.O. # _____
Quote # _____
Mail Report To: _____
Company: _____
Address: _____
Invoice To: _____
Company: _____
Address: _____
Mail Invoice To: _____

Preservation Codes
D-HM03 E-EnCore
F-Methanol G-NaOH
I-Other

A=None B-HCL C-H2SO4
H = Sodium Bisulfate Solution
I = Other

ANALYSES REQUESTED
DRO (BTEX) MTBE
% Solids
Gro Vols List

PRESERVATION (CODE)*
F A B B B

Matrix Codes
W-Water S-Soil A-Air C-Charcoal B-Biota SI-Sludge

Regulatory Program
UST RCRA SDWA NPDES CERCLA

LABORATORY ID (Lab Use Only)

LABORATORY ID (Lab Use Only)	FIELD ID	COLLECTION DATE	TIME	MATRIX	ANALYSES REQUESTED	% Solids	Gro Vols List	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)
001	P-1 (6-8')	8/5/02	10:15	S	X		X	1-2oz F 1-4oz	
002	P-1 (25')		10:45	S	X		X		
003	P-1		11:15	W	X	X	X	3-4oz 1 Amber B	
004	P-2 (26')		12:15	S	X		X	1-2oz 1-2oz F 1-4oz	
005	P-2		12:30	W	X	X	X	3-4oz 1 Amber B	
006	P-3 (16')		13:15	S	X		X	1-2oz 1-2oz F 1-4oz	
007	P-3		13:30	W	X	X	X	3-4oz 1 Amber	
008	P-4 (14')		14:15	S	X		X	1-2oz 1-2oz F 1-4oz	
009	P-4		14:30	W	X	X	X	3-4oz 1 Amber	
010	P-5 (26')		15:30	S	X		X	1-2oz 1-2oz F 1-4oz	

TOTAL # OF BOTTLES SENT

1430 No Meter / Trip BK
824617

Received By: Aubrey F-l Date/Time: _____
Received By: 1400 Dink Date/Time: _____
Received By: Slow Update Date/Time: 8/7/02 0910
Received By: _____ Date/Time: _____

Relinquished By: Roy Hill Date/Time: 8/16/02 9:30
Relinquished By: Aubrey Date/Time: _____
Relinquished By: William Date/Time: _____
Relinquished By: _____ Date/Time: _____

Rush Turnaround Time Requested (TAT) - Prelim
(Rush TAT subject to approval/surcharge)
Date Needed: _____
Transmit Prelim Rush Results by (Circle):
Phone Fax E-Mail
Phone #: _____
Fax #: _____
E-Mail Address: _____
Samples on HOLD are subject to special pricing and release of liability

APPENDIX C

METHODOLOGIES AND PROCEDURES

METHODOLOGIES

I. SOIL SAMPLING

A. Push Probe Methodology

Soil borings were advanced at the Site under the supervision of Pinnacle. Push probes were advanced using a two-inch diameter rod. Soil samples were collected at continuous intervals with a 48" long, 2" diameter, plastic liner tube encased in a stainless steel sampling tube driven ahead of the drive rod. The sampling tube was advanced at a minimum of four-foot intervals from the initial sampling depth to the boring terminus.

Soil samples were collected from the sampling tube immediately upon retrieval from the borehole and split for field classification/screening and laboratory analysis. Soil samples were collected from the sampling tube while wearing a pair of single-use latex gloves and placed in the appropriate container.

All down hole equipment was steam cleaned prior to use on the Site and the sampling tube was cleaned with Alconox and tap water rinse between sample locations. Boreholes were abandoned following completion in accordance with Minnesota Department of Health (MDH) regulations.

B. Field Classification and Screening.

Environmental data such as visual and olfactory indications of contamination were noted on the field boring log. Field screening procedures were conducted in general accordance with MPCA guidance document "Field Screening Procedure, Fact Sheet #3.22". Soil samples were field screened for the presence of organic vapors using a Thermo Environmental Organic Vapor Monitor (OVM) model 580B equipped with a 11.7 eV lamp source. The OVM was calibrated to ensure reliable results. Each soil sample was placed in a zippered plastic bag and the soil clumps manually broken up and shaken for at least 15 seconds. After headspace development, the soil sample was shaken for another 15 seconds and the OVM probe tip was inserted into the bag. The highest OVM reading in a period of two to five seconds was recorded on the field boring log.

C. Soil Sample Collection

Soil samples were collected wearing disposable gloves and placed in the appropriate, laboratory-supplied sample jars. Soil samples for BTEX analysis were collected utilizing using Terra Core™ samplers by placing 20 grams of soil in a two-ounce soil jar and adding 20 ml of methanol for preservative. A

moisture sample was collected in a five-ounce plastic container. Soil samples for DRO analysis were collected utilizing Terra Core™ samplers by placing 20 grams of soil in a two-ounce soil jar with no preservative. The soil samples for lab analysis were placed in the sample containers immediately and stored on ice in a cooler with chain-of-custody documentation. DRO samples were prepped and analyzed with the WI modified DRO method. BTEX samples were analyzed with Method M8021B. Laboratory analysis was performed by En Chem, Inc. of Madison, Wisconsin. En Chem is certified by the Minnesota Department of Health, certification #055-999-107.

D. Groundwater Sample Collection

Groundwater samples were extracted from directly beneath the water table using a PVC screen attached to PVC riser pipe. The screen and riser pipe were decontaminated with Alconox and tap water rinse between sample locations. Dedicated polyethylene tubing was utilized to withdraw the samples. The samples were collected wearing disposable gloves and placed in the appropriate, laboratory-supplied sample containers. Groundwater samples for VOC analysis were placed in HCL-preserved, 40-ml vials, which were filled until a positive meniscus was observed to eliminate headspace. Groundwater samples for DRO analysis were collected in HCL-preserved, one-liter, amber bottles. The samples were placed in the sample containers immediately and stored on ice in a cooler with chain-of-custody documentation. DRO samples were prepped and analyzed with the WI modified DRO method. VOC samples were analyzed with MDH Method 465F. Laboratory analysis was performed by En Chem, Inc. of Madison, Wisconsin.

II. FIELD DOCUMENTATION

All activities associated with the field work were documented on the appropriate field forms. Information recorded included soil sample information, including sample location and depth, sampling date and time, and sampling problems. In addition, soil samples were described, and descriptions from each sample including the observed depth of the collected soil samples was placed on log forms. A site map indicating the sampling locations and the presence of any additional possible sources of contamination was prepared in the field at the time of sampling.

APPENDIX D
SOIL BORING LOGS



LOG OF TEST BORING

PROJECT : Hector - AST 100 Highway Avenue Pinnacle Project No. MN02230.00 LOGGED BY: Roy Hill DRILLING METHOD: Push Probe DRILLING DATE: August 5, 2002	BORING NAME/LOCATION: PP-1 See attached site map SURFACE ELEV: not available DRILLING CONTRACTOR: Bergerson-Caswell	SCALE: 1 in. = 5ft. PAGE 1 OF 1
---	--	---

Sample Depth	Graphic Int. log	Description - ASTM D:2488	PID ppm	Water Level	Moist. Content	Comments
10'	[Cross-hatched pattern]	Clay, little silt, trace sand & gravel, gray	ND			
			168			
			267			
			340			
			50			
18'	[Cross-hatched pattern]	Same but brown	ND			
			ND			
			ND			
26'	[Cross-hatched pattern]	Same but gray	ND			
			ND	▼		
28'	[Solid gray pattern]	3" medium sand lense, then fine sand with little silt & clay	ND	25'		
32'	[Vertical lines pattern]	Silt, trace clay & sand, gray, dry	ND			

Remarks:

- Boring was advanced to 32.0 feet below grade. No refusal
- Boring was abandoned with bentonite on 8/5/02.
- PID is the headspace organic vapor concentration in parts per million.
- ND means not detected



LOG OF TEST BORING

PROJECT : Hector - AST 100 Highway Avenue Pinnacle Project No. MN02230.00 LOGGED BY: Roy Hill DRILLING METHOD: Push Probe DRILLING DATE: August 5, 2002	BORING NAME/LOCATION: PP-2 See attached site map SURFACE ELEV: not available DRILLING CONTRACTOR: Bergerson-Caswell	SCALE: 1 in. = 5ft. PAGE 1 OF 1
---	--	---

Depth	Sample Int.	Graphic log	Description - ASTM D:2488	PID ppm	Water Level	Moist. Content	Comments
4'			Silty clay, little sand, brown	ND			
18'			Clay, little silt, trace sand & gravel, brown	ND			
				ND			
				ND			
26'			Same but gray	ND			
				ND	▼		
28'			Silt, little clay, trace sand	ND	26'		

Remarks: Boring was advanced to 28.0 feet below grade. No refusal
 Boring was abandoned with bentonite on 8/5/02.
 PID is the headspace organic vapor concentration in parts per million.
 ND means not detected



LOG OF TEST BORING

PROJECT : Hector - AST 100 Highway Avenue Pinnacle Project No. MN02230.00 LOGGED BY: Roy Hill DRILLING METHOD: Push Probe DRILLING DATE: August 5, 2002	BORING NAME/LOCATION: PP-3 See attached site map SURFACE ELEV: not available DRILLING CONTRACTOR: Bergerson-Caswell	SCALE: 1 in. = 5ft. PAGE 1 OF 1
---	--	---

Depth	Sample Int.	Graphic log	Description - ASTM D:2488	PID ppm	Water Level	Moist. Content	Comments
16'	X	[Hatched Pattern]	Clay, little silt, trace sand & gravel, brown	ND			
18'	X	[Hatched Pattern]	Silt, little clay, trace sand	ND			
20'	X	[Hatched Pattern]	Clay, little silt, trace sand & gravel, brown	ND	▼		
				ND	16'		

Remarks:

- Boring was advanced to 20.0 feet below grade. No refusal
- Boring was abandoned with bentonite on 8/5/02.
- PID is the headspace organic vapor concentration in parts per million.
- ND means not detected

LOG OF TEST BORING

PROJECT : Hector - AST 100 Highway Avenue Pinnacle Project No. MN02230.00 LOGGED BY: Roy Hill DRILLING METHOD: Push Probe DRILLING DATE: August 5, 2002	BORING NAME/LOCATION: PP-4 See attached site map SURFACE ELEV: not available DRILLING CONTRACTOR: Bergerson-Caswell	SCALE: 1 in. = 5ft. PAGE 1 OF 1
---	--	---

Depth	Sample Int.	Graphic log	Description - ASTM D:2488	PID ppm	Water Level	Moist. Content	Comments
18'	X	[Hatched pattern]	Clay, little silt, trace sand & gravel, brown	ND	▼ 14'		
			Clay, little silt, trace sand & gravel, brown	ND			
			Clay, little silt, trace sand & gravel, brown	ND			
			Clay, little silt, trace sand & gravel, brown	ND			
			Clay, little silt, trace sand & gravel, brown	ND			
24'	X	[Hatched pattern]	Same but gray	ND			
			Fine sand & silt, little clay	ND			

Remarks: Boring was advanced to 24.0 feet below grade. No refusal
 Boring was abandoned with bentonite on 8/5/02.
 PID is the headspace organic vapor concentration in parts per million.
 ND means not detected



LOG OF TEST BORING

PROJECT : Hector - AST 100 Highway Avenue Pinnacle Project No. MN02230.00 LOGGED BY: Roy Hill DRILLING METHOD: Push Probe DRILLING DATE: August 5, 2002	BORING NAME/LOCATION: PP-5 See attached site map SURFACE ELEV: not available DRILLING CONTRACTOR: Bergerson-Caswell	SCALE: 1 in. = 5ft. PAGE 1 OF 1
---	--	---

Sample Depth	Int.	Graphic log	Description - ASTM D:2488	PID ppm	Water Level	Moist. Content	Comments
1'			Sand & gravel fill	ND			
2'			Black clay, little silt				
			Clay, little silt, trace sand & gravel, brown	ND			
				ND			
				ND			
				ND			
17'				ND			
			Same but gray	ND			
				ND			
				ND			
				ND	▼ 26'		
28'			Silt, little clay, gray, dry	ND			
				ND			
32'				ND			

Remarks: Boring was advanced to 32.0 feet below grade. No refusal
 Boring was abandoned with bentonite on 8/5/02.
 PID is the headspace organic vapor concentration in parts per million.
 ND means not detected

Appendix F
Grain Size Analysis, Hydraulic Conductivity
Measurements, and other Calculations

Grain Size Analysis (20 - 24 feet)

A grain-size analysis was done in accordance with ASTM Method D422, with the exception that a column test was not needed due to the lack of fines.

- 1% Gravel (retained on #2 screen)
- 5% Coarse Grained Sand (retained on #10 screen)
- 10% Medium Grained Sand (retained on # 40 screen)
- 31% Fine Grained Sand (retained on # 200 screen)
- 53% Silt and Clay (< #200 screen)

Description: Sandy Clay.

Hydraulic Conductivity Measurements

The Hazen method was utilized to estimate the hydraulic conductivity of the saturated soils.

$$K = C(D_{10})^2$$

$K = 4.00 \text{ ft/day}$

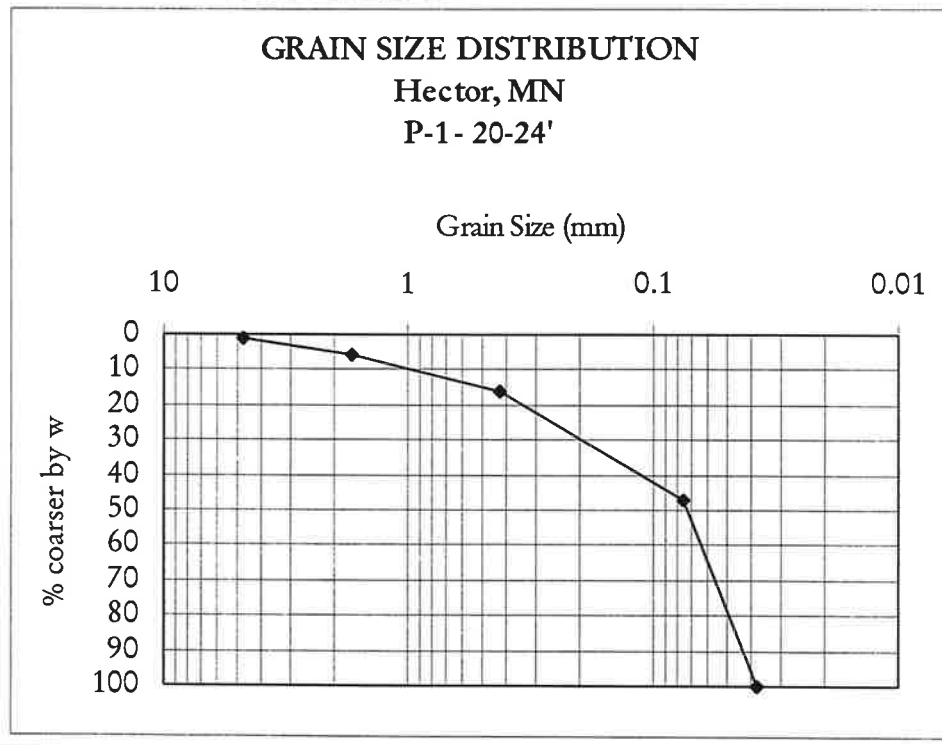
$C = 80$ (constant)

$D_{10} = 90\%$ coarser by wt. (from graph)

$$D_{10} = 0.0042 \text{ cm}$$

1 cm/sec = 2835 ft/day (conversion value)

$$K = 80 \times (0.0042 \text{ cm})^2 = 0.0014 \text{ cm/sec} \times 2835 \text{ ft/day} = 4.00 \text{ ft/day}$$



Grain Size Analysis (24 - 26 feet)

A grain-size analysis was done in accordance with ASTM Method D422, with the exception that a column test was not needed due to the lack of fines.

- 3% Gravel (retained on #2 screen)
- 7% Coarse Grained Sand (retained on #10 screen)
- 15% Medium Grained Sand (retained on # 40 screen)
- 37% Fine Grained Sand (retained on # 200 screen)
- 38% Silt and Clay (< #200 screen)

Description: Sand and clay.

Hydraulic Conductivity Measurements

The Hazen method was utilized to estimate the hydraulic conductivity of the saturated soils.

$$K = C(D_{10})^2$$

K = 4.80 ft/day

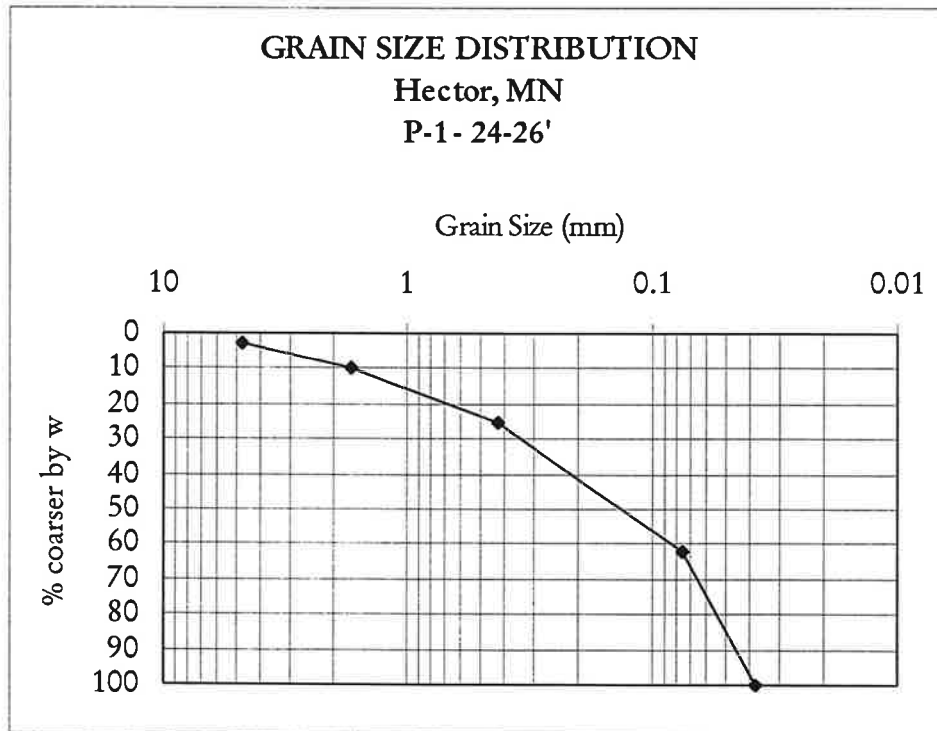
C = 80 (constant)

D₁₀ = 90% coarser by wt. (from graph)

$$D_{10} = 0.0046 \text{ cm}$$

1 cm/sec = 2835 ft/day (conversion value)

$$K = 80 \times (0.0046 \text{ cm})^2 = 0.0017 \text{ cm/sec} \times 2835 \text{ ft/day} = \mathbf{4.80 \text{ ft/day}}$$



Aquifer Transmissivity

$$T = Kb$$

$$T = 12.0 \text{ (low)}$$

$$b = 3 \text{ feet (aquifer thickness)}$$

$$K = 4.00 \text{ feet/day (hydraulic conductivity)}$$

$$T = 14.4 \text{ (high)}$$

$$b = 3 \text{ feet (aquifer thickness)}$$

$$K = 4.80 \text{ feet/day (hydraulic conductivity)}$$

Section 16: Consultant (or other) Information

By signing this document, I/we acknowledge that we are submitting this document on behalf of and as agents of the responsible person or volunteer for this leak site. I/we acknowledge that if information in this document is inaccurate or incomplete, it will delay the completion of remediation and may harm the environment and may result in reduction of reimbursement awards. In addition, I/we acknowledge on behalf of the responsible person or volunteer for this leak site that if this document is determined to contain a false material statement, representation, or certification, or if it omits material information, the responsible person or volunteer may be found to be in violation of Minn. Stat. § 115.075 (1994) or Minn. R. 7000.0300 (Duty of Candor), and that the responsible person or volunteer may be liable for civil penalties.

MPCA staff are instructed to reject unsigned investigation reports or if the report form has been altered.

Name and Title:

Signature:

Date signed:

Roy L. Hill

Geologist

Mike Hultgren, CPG

Manager - Environmental Engineering

Roy L Hill

12/12/02

Mike Hultgren

12/12/02

Company and mailing address:

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101 Broadway Street W.

Suite 100

Minneapolis, MN55369

Phone:

763-315-4501

Fax:

763-315-4507

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