N91192.AR.000034
NIROP FRIDLEY
5090.3a

RMT INC.

RMT, Inc.
Suite 124
1406 East Washington Ave.
Madison, WI 53703-3009
Phone: 608-255-2134

A-E QUALITY CONTROL SUMMARY REPORT FOR GROUND WATER SAMPLING AT THE NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT FRIDLEY, MINNESOTA

JULY 1987

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of ~~the State of~~ Minnesota.

Thomas P. Kunes

Date 7-10-87 Registration No. 013728

Thomas P. Kunes, P.E.
President, Northern Region

Thomas E. Koch

Thomas E. Koch
Hydrogeologist

Eric Gredell

Eric Gredell, P.E.
Project Manager

1120.09 926:RPT:frid0305

TABLE OF CONTENTS

Title	Page
1. PURPOSE AND SCOPE	1
2. PROJECT DESCRIPTION	2
2.1 Introduction	2
2.2 Background	2
3. SAMPLING PROCEDURES	6
3.1 Planned Procedures	6
3.1.1 Well Purging	6
3.1.2 Sampling of Wells	6
3.1.3 Filtering	7
3.1.4 Sample Containers, Preservatives, and Holding Times	7
3.1.5 Documentation	7
3.1.6 Sample Identification	8
3.1.7 Chain-of-Custody Procedures	8
3.1.8 Sample Transportation	8
3.1.9 Well Repairs	8
3.2 Implementation Problems	8
3.2.1 Sampling	9
3.2.2 Sample Containers, Preservatives, and Holding Times	9
3.2.3 Well Repairs	9
3.2.4 Laboratory Analyses	10
3.3 Corrective Actions Taken	10
3.3.1 Sampling	10
3.3.2 Sample Containers, Preservatives and Holding Times	10
3.3.3 Well Repairs	11
4. SUMMARY OF A-E DAILY QC REPORTS	12
4.1 Date: November 17, 1986 (Monday)	12
4.2 Date: November 18, 1986 (Tuesday)	13
4.3 Date: November 19, 1986 (Wednesday)	14
4.4 Date: November 20, 1986 (Thursday)	15
4.5 Date: November 21, 1986 (Friday)	16
5. FIELD ANALYTICAL PROCEDURES	18
5.1 Planned Procedures	18
5.1.1 Ground Water Level Measurement	18
5.1.2 Measurement of pH	18
5.1.3 Measurement of Conductivity	19
5.1.4 Measurement of Temperature	19
5.1.5 Measurement of Trace Gases	20
5.2 Implementation Problems	20
5.3 Corrective Actions Taken	20

TABLE OF CONTENTS (Cont'd)

Title	Page
6. DATA PRESENTATION	21
6.1 Ground Water Levels	21
6.2 Ground Water Quality	21
6.2.1 Major Ion Chemistry	21
6.2.2 Trace Inorganic Constituents	27
6.2.3 Organic Constituents	32
7. QUALITY CONTROL ACTIVITIES	38
7.1 Field Measurements	38
7.2 Laboratory Analytical Data	38
8. CONCLUSIONS	60
9. RECOMMENDATIONS	62
10. REFERENCES	63

List of Figures

Figure 1 - General Vicinities Map 3
Plate 1 - Monitoring Well Locations

List of Tables

Table 6-1 - Water Level Measurements and Well Purging Information 22
Table 6-2 - Summary of Field Measurements and Observations of Ground Water Samples 24
Table 6-3 - Summary of Major Ion Concentrations in November 1986 Ground Water Samples 26
Table 6-4 - Comparison of Filtered and Unfiltered Ground Water Samples 29

Table 7-1 - Summary of Field Instrument Checks 39
Table 7-2 - Analysis of Blanks for Organic Constituents 40
Table 7-3 - Analysis of Blanks for Filtered Inorganic Constituents 41
Table 7-4 - Matrix Spike Recoveries - Organic Constituents 43
Table 7-5 - Matrix Spike Recoveries - Inorganic Constituents 44
Table 7-6 - Surrogate Spike Recoveries - Organic Compounds 45

TABLE OF CONTENTS (Cont'd)

Title	Page
Table 7-7 - Recoveries for External QA Samples - Inorganic Constituents	47
Table 7-8 - Relative Percent Difference (RPD) For Intralaboratory Duplicate Samples - Organic Constituents	48
Table 7-9 - Relative Percent Difference (RPD) For Intralaboratory Duplicate Samples - Inorganic Constituents	49
Table 7-10 - Intralaboratory Comparison of Blind Duplicate Filtered Samples - Inorganic Constituents	51
Table 7-11 - Interlaboratory Comparison of Blind Duplicate Filtered Samples - Inorganic Constituents	52
Table 7-12 - Interlaboratory Comparison of Blind Duplicate Unfiltered Samples - Inorganic Constituents	53
Table 7-13 - Interlaboratory Comparison of Blind Duplicate Samples - Organic Constituents	55
Table 7-14 - Comparison of Intralaboratory Blind Duplicate Samples - Organics	56
Table 7-15 - Summary of Cation/Anion Balance Calculations	57

List of Appendices

Appendix A - Project Daily Log Book
Appendix B - Summary of Constituents Detected by Well As Reported by WES
Appendix C - Alphabetical Summary of Constituents Detected as Reported by WES
Appendix D - Original Laboratory Data from WES and MRD
Appendix E - Chain-of-Custody Forms
Appendix F - Calculations

1. PURPOSE AND SCOPE

This report summarizes the activities and findings of the November 1986 ground water sampling round conducted at the Naval Industrial Reserve Ordnance Plant (NIROP) in Fridley, Minnesota. The objectives of this report are to present the data obtained during the investigation, document the work performance, and evaluate the utility of the data collected.

This report includes the following:

- Field data collected by RMT during the week of November 17, 1986.
- Laboratory results of ground water samples analyzed by the U.S. Army Corps of Engineers Waterways Experiment Station and Missouri River Division Laboratories.
- Data presentations include listings of the laboratory data sheets and summaries of data using the presentation format from the Draft Interim Report.
- Quality control activities include the following:
  - recoveries of matrix and surrogate spike samples.
  - recoveries of external standard samples.
  - relative percent differences in duplicate samples.
  - analysis of rinsate and trip blanks.
- Discussion of the results of the November 1986 sample round relative to the Draft Conceptual Workplan and the overall data base with emphasis on previously undetected constituents and trends in constituent concentrations.

2. PROJECT DESCRIPTION

2.1 Introduction

The A-E Quality Control Summary Report has been prepared by RMT, Inc., of Madison, Wisconsin for the U.S. Army Corps of Engineers (COE) under Modification No. P00001 to Contract DACA45-86-C-0015 dated September 10, 1986. This report summarizes the activities and findings of the November 1986 sampling of the 34 ground water monitoring wells at the NIROP in Fridley, Minnesota (Figure 1 and Plate 1). In addition to samples from the 34 monitoring wells, blind duplicate samples, trip blanks, and rinsate blanks were submitted and analyzed for QA/QC purposes. Samples for volatile organic compound analyses were also split with the Minnesota Pollution Control Agency (MPCA) at 12 wells. Sampling was done in accordance with procedures outlined in the A-E Quality Control and Sampling Plan for Ground Water Sampling (RMT, 1986a).

2.2 Background

The NIROP is a Department of Defense-owned, contractor-operated facility. This project is part of the Department of Defense Installation Restoration Program (IRP). RMT, Inc.'s involvement at the NIROP began in June 1986. Primary objectives at that time were to: 1) summarize previous investigations and develop preliminary remedial alternatives in an Interim Report; 2) outline proposed activities and schedules in a Conceptual Workplan; and 3) complete a COE document regarding waste excavation. The issuance of Contract Modification P00001 to perform a comprehensive ground water sampling round was the

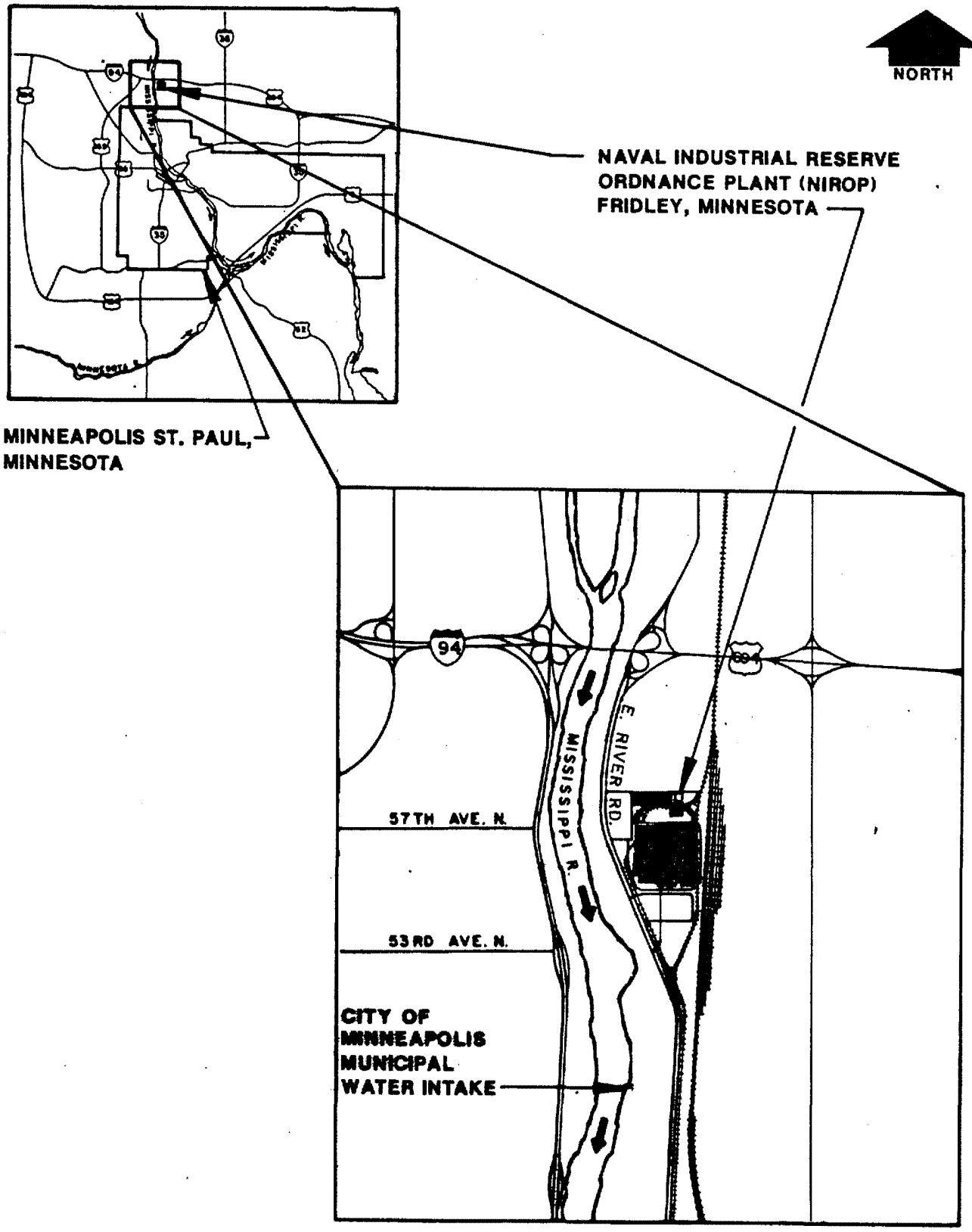


FIGURE 1

GENERAL VICINITIES MAP

RMT	DWN. BY: MDZ
	DATE: 4/15/87
	PROJ.# 1254.02

first step in meeting the major recommendations presented in the Draft Conceptual Workplan (RMT, 1986c).

Prior to November 1986, seven rounds of ground water sampling had been performed at the NIROP since October 1983. Results from those seven rounds were used to prepare a list of parameters for analysis as explained in the A-E Quality Control and Sampling Plan (RMT, 1986a). Analyses were to be performed for the following constituents:

1. Volatile Organics - EPA Method 8240 (plus quantitation of CIS-1,2-dichloroethylene, methyl ethyl ketone, total xylenes, and tentative identification and concentration estimation of the five (5) non-list peaks of greatest apparent concentration using a comparison of sample spectra and their nearest library matches).

2. Dissolved (filtered) major cations - calcium, magnesium, sodium, and potassium.

3. Anions (filtered) - alkalinity, sulfate, nitrate, and chloride.

4. Dissolved (filtered) trace elements - arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, copper, manganese, nickel, zinc.

5. Total (unfiltered) trace elements - arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, copper, manganese, nickel, zinc, from 3 monitoring wells.

6. Total cyanide.

The data gathered during this sampling round were intended to provide additional information for the following uses:

- Definition of contaminant migration.
- Identification of potential contaminant sources.
- Changes in contaminant concentrations with time.
- Evaluation of representativeness of well locations.

- Identification of specific chemical contaminants that may not have been detected or analyzed in previous phases of the site investigation.

- Analysis of partitioning of specific trace metals or elements between the dissolved and nondissolved phases.

3. SAMPLING PROCEDURES

3.1 Planned Procedures

This section outlines field procedures which were to be used by RMT personnel. Planned sampling procedures were presented in Section 2.3 of the A-E Quality Control and Sampling Plan for Ground Water Sampling (RMT, 1986a). Procedures used by RMT were developed based on USEPA methods (Gibb, et al., 1981; Scalf, et al., 1981; USEPA, 1976a; USEPA, 1976b; USEPA, 1977; USEPA, 1982).

3.1.1 Well Purging

Wells were purged to remove stagnant water from the well casing and to draw in water from the surrounding area. Purging was accomplished by one of two methods - bailing in small diameter wells or pumping at large diameter wells. Purging was continued until either 5 well volumes or until stable pH, conductivity, and temperature readings were reached.

3.1.2 Sampling of Wells

The following steps were taken to provide high-quality samples and to minimize the opportunity for cross-contamination between wells:

- Teflon bailers were used for sampling at all wells. The bailers were cleaned between wells with methanol and distilled water.
- New rope was used at each well.
- New, clean plastic dropcloth was used at each well to protect equipment from contact with soil around the well.

3.1.3 Filtering

Filtering in the field was required for some parameters to minimize the potential for chemical changes to the ground water samples and to collect a more representative sample of the water moving through the ground. Filtering was to be performed in the field because even short delays may significantly change the water chemistry.

Parameters to be field-filtered included the dissolved metals, cations, anions, and alkalinity. Samples collected for trace organic constituents or total trace elements were not to be filtered.

The USEPA method for preservation of cyanide in water required determination of the presence, and possible removal, of sulfide at the time of sample collection and before the addition of a preservative.

3.1.4 Sample Containers, Preservatives, and Holding Times

Sample containers for ground water samples, interlaboratory blind duplicates, and rinsate blanks were supplied by the Army Corps of Engineers Waterways Experiment Station (WES). Sample containers and analyses for intralaboratory blind duplicates, trip blanks, and rinsate blanks were supplied by the Army Corps of Engineers, Missouri River Division (MRD). Sample preservatives and holding times were outlined in Table 4 of the A-E Quality Control and Sampling Plan for Ground Water Sampling (RMT, 1986a).

3.1.5 Documentation

Field records of activities at the NIROP site were in the form of a daily log which also served as an A-E Daily Quality Control Report (A-E DQCR). Bound, serialized field notebooks were used for the daily logs.

3.1.6 Sample Identification

Each sample was identified as to its source (well or blank) using monitoring well designations as shown in Table 3 of the A-E Quality Control and Sampling Plan for Ground Water Sampling (RMT, 1986a).

3.1.7 Chain-of-Custody Procedures

Chain-of-custody forms accompanied sample shipping containers to document the transfer of the shipping containers and samples from the field collection location to the laboratory receiving the samples for analysis. The procedures were implemented as described in the A-E Quality Control and Sampling Plan (RMT, 1986a).

3.1.8 Sample Transportation

The coolers were sealed, dated, and shipped to the appropriate laboratories using an overnight delivery service. Samples were shipped to the WES in Vicksburg, Mississippi, and quality assurance samples were sent to the MRD laboratory in Omaha, Nebraska.

3.1.9 Well Repairs

Prior to sampling of wells 8-S and 4-PC, specific monitoring well repairs were to be completed. RMT personnel were to effect repairs to well 4-PC and oversee subcontractor repairs to well 8-S.

3.2 Implementation Problems

This section details specific problems encountered during sampling activities. The corrective actions taken in response to the problems are described in Section 3.3.

3.2.1 Sampling

A deviation to outlined sampling procedures was the addition of split samples with MPCA personnel. Approximately one week prior to the sampling round, MPCA representative Lonna Beilke notified RMT that she would be on-site to split volatile organic samples at several wells.

3.2.2 Sample Containers, Preservatives, and Holding Times

The 48-hour recommended holding time for samples analyzed for nitrates could not be met for all samples collected at the NIROP. After the sampling was begun, RMT was informed that the WES laboratory would not receive samples on Saturday. Samples collected for nitrates late Thursday or on Friday would therefore not be received by the WES until Monday, approximately 12 to 36 hours beyond the recommended holding time.

The samples shipped to the WES on Friday for Monday delivery were packed with twice the typical volume of ice. The WES laboratory noted that all the ice was melted upon receipt of the shipment. The temperature of the samples was not provided by the WES laboratory; therefore, it is not known whether the samples exceeded the recommended holding temperature.

3.2.3 Well Repairs

A problem developed when it became apparent that RMT personnel would complete sampling activities, except for well 8-S, on the day prior to scheduled repairs. Waiting for repairs would adversely affect successful completion of the schedule.

3.2.4 Laboratory Analyses

The A-E Field Quality Control and Sampling Plan (RMT, 1986a) specified that cis 1,2-dichloroethene was to be quantified separately from the trans 1,2-dichloroethene isomer. The WES laboratory data reports both isomers at identical concentrations (Appendix B). Concentrations shown represent the total dichloroethene concentration.

3.3 Corrective Actions Taken

3.3.1 Sampling

Upon notification from MPCA personnel regarding the request for split samples, RMT notified Tom Thiele, Army Corps of Engineers, Project Manager. Split samples were subsequently approved. Samples for volatile organic analysis were split at wells 6-D, 7-S, 8-D, 9-S, 9-D, 10-S, 11-S, 15-S, 16-S, 17-S, 18-S, and 19-S. Four 40-ml glass vials with Teflon-lined septums were provided by the MPCA for each of the above wells. The samples were collected and handled in the same manner as the VOC samples collected for the COE. The vials were filled by RMT personnel and picked up daily by MPCA personnel during the week of sampling.

3.3.2 Sample Containers, Preservatives and Holding Times

The nitrate holding time problem was solved through the cooperation of the MRD laboratory. Samples collected for nitrate analysis which would have exceeded the 48-hour holding time were shipped to the MRD laboratory for analysis. Samples collected late Thursday evening (November 20, 1986) were driven to RMT's office in Madison, Wisconsin,

on Friday (November 21, 1986). Samples for nitrate analysis were then shipped from Madison to the MRD laboratory for Saturday delivery. The remaining samples collected on November 20, were double-iced and shipped to the WES for Monday delivery.

The WES notified the COE Project Manager that samples received Monday, November 24, arrived with melted ice. The WES reportedly indicated that the samples exceeded the specified holding temperature. However, the actual temperature reading and measurement time were not reported. The situation was discussed by the COE Project Manager and RMT, and it was agreed that the samples would be analyzed as originally planned.

3.3.3 Well Repairs

The well repair scheduling problem was resolved with the aid of the U.S. Navy Plant representative. It was determined that the five-foot long Teflon bailer used by RMT would pass the bend in the casing of well 8-S. Therefore, well 8-S was sampled on Thursday, November 20, 1986.

4. SUMMARY OF A-E DAILY QC REPORTS

Section 4 has been divided into five subsections which include an A-E Daily QC Report for each sampling date. Information in this section was derived from the daily log book which has been included as Appendix A.

4.1 Date: November 17, 1986 (Monday)

a. Weather: At 9:30 a.m. the temperature was 22°F and the wind was from the north at 8 mph. By 4:25 p.m. winds had decreased.

b. RMT Personnel: Tom Koch and Jeff Chrisler were on site from 7:30 a.m. until 8:45 p.m.

c. Visitor Information: Lonna Beilke from the MPCA stopped by briefly to introduce herself and leave several 40-ml bottles for splitting samples. She arrived at 9:30 a.m. and departed by 9:45 a.m.

d. Work Performed: The equipment storage area and clean area were established in classroom 1. Equipment checks, purging, and sampling of wells was initiated.

e. Sampling Performed: Wells 3-S, FMC-33, 15-S, and 9-S were sampled. Duplicate samples 1, 2, and 3 were obtained from wells 3-S, 9-S, and 15-S, respectively, and a rinsate blank was prepared. Split samples for the MPCA were collected from wells 9-S and 15-S.

f. Field Analysis Performed: Air monitoring with an HNU photoionizer was performed at each well. Readings were obtained for background, before and during purging. Conductivity, pH, and temperature measurements of ground water were taken during purging and at the time of sampling.

g. Problems/Corrective Action: No problems noted.

h. QC Activities: Three separate instrument calibration checks of the pH meter, conductivity meter, and HNU were performed at 9:00 a.m., 3:00 p.m. and 6:30 p.m.

i. Samples Shipped: No samples were shipped on November 17. All samples were iced, sealed, initialed, and kept in the custody of Tom Koch and Jeff Chrisler.

4.2 Date: **November 18, 1986 (Tuesday)**

a. Weather: At 8:30 a.m. it was sunny, 22°F, and winds were from the north to northwest at 5 mph.

b. RMT Personnel: Tom Koch, Jeff Chrisler, and Karl Roovers were on site from 7:30 a.m. until 7:45 p.m.

c. Visitor Information: Tomiann McDaniel from the U.S. Army Corps of Engineers was on site from 9:19 a.m. until 4:00 p.m. to observe sampling procedures. Lonna Beilke from the MPCA was on site from 12:51 p.m. until 5:45 p.m. to obtain split samples.

d. Work Performed: Equipment checks, purging, and sampling continued.

e. Sampling Performed: The following wells were sampled on this date: 1-PC, 2-S, 7-D, 17-S, 18-S, 19-S, 8-D, and 9-D. Split samples for the MPCA were collected from wells 8-D, 9-D, 17-S, 18-S, and 19-S.

f. Field Analysis Performed: Air monitoring and pH, conductivity, and temperature measurements of ground water continued.

g. Problems/Corrective Action: No problems noted.

h. QC Activities: Three separate instrument calibration checks of the pH meter, conductivity meter, and HNU were performed at 8:50 a.m., 12:15 p.m., and 6:50 p.m.

i. Samples Shipped: Samples shipped on November 18, included the following:

- Duplicate 1 (3-S) to WES
- Duplicate 2 (9-S) to WES
- Duplicate 3 (15-S) to WES
- 3-S to WES and MRD
- 9-S to WES and MRD
- 15-S to WES and MRD
- FMC-33 to WES
- Rinsate Blank to WES and MRD
- Trip Blank to WES and MRD
- 8-D to WES
- 2-S to WES
- 17-S to WES
- 7-D to WES
- 1-PC to WES
- Trip Blank to WES

Split samples relinquished to the MPCA on November 18, 1986, included the following:

- 8-D
- 9-S
- 9-D
- 15-S
- 17-S
- 18-S
- 19-S

4.3 Date: November 19, 1986 (Wednesday)

a. Weather: At 7:15 a.m. the temperature was 21°F, the skies were overcast and wind was from the south at 20 mph. By 12:30 p.m. temperature had increased and it was snowing. By 5:30 p.m. winds had decreased to 5 to 10 mph from the south to southeast.

b. RMT Personnel: Jeff Chrisler and Karl Roovers were on site from 7:15 a.m. until 8:30 p.m.

c. Visitor Information: Lonna Beilke arrived at 1:30 p.m. to obtain split samples. She left at 4:46 p.m.

d. Work Performed: Equipment checks, purging, and sampling continued. Well repairs were completed on well 4-PC.

e. Sampling Performed: The following wells were sampled on this date: 2-PC, 3-PC, 4-S, 4-PC, 5-S, 16-S, 10-S, 13-S, 14-S, and 12-S. Split samples for the MPCA were collected from wells 10-S and 16-S.

f. Field Analysis Performed: Air monitoring and pH, conductivity and temperature measurements of ground water continued.

g. Problems/Corrective Action: Classroom 1 needed by NIROP personel. Moved clean area to classroom 2.

h. QC Activities: Three separate instrument calibration checks of the pH meter, conductivity meter, and HNU were performed at 7:15 a.m., 1:30 p.m., and 8:00 p.m.

i. Samples Shipped: Samples shipped on November 19 included the following:

- 2-PC to WES
- 3-PC to WES
- 4-S to WES
- 4-PC to WES
- 5-S to WES

- 16-S to WES
- Trip Blank to WES
- 18-S to WES
- 19-S to WES
- 9-D to WES

Split samples relinquished to the MPCA on November 19 included the following:

- 10-S
- 16-S

4.4 Date: November 20, 1986 (Thursday)

a. Weather: At 7:00 a.m. skies were overcast, the temperature was 20°, and wind was from the northwest at 25 mph. Winds decreased by 1:00 p.m. and by 7:30 p.m. temperature dropped to 18°.

b. RMT Personnel: Jeff Chrisler and Karl Roovers were on site from 7:00 a.m. until 1:00 a.m. (November 21).

c. Visitor Information: Lonna Beilke of the MPCA arrived at 8:30 a.m. and departed the site at 1:30 p.m.

d. Work Performed: Equipment checks, purging, and sampling continued.

e. Sampling Performed: The following wells were sampled on this date: 20-S, 11-S, 6-D, 7-S, 8-S, 1-S, 1-D, 5-D, 2-D, 4-D, 3-D, and 6-S. Split samples for the MPCA were collected from wells 6-D, 7-S, and 11-S.

f. Field Analysis Performed: Air monitoring and pH, conductivity, and temperature measurements of ground water continued.

g. Problems/Corrective Action: Classroom 2 needed for class. Moved clean area to far end of building. MW-8S not repaired yet; however, the crew was ready to sample. Found that 5-foot Teflon bailer would work in bent well. Sampled unrepaired well.

h. QC Activities: Three separate instrument calibration checks of the pH meter, conductivity meter, and HNU were performed at 7:00 a.m., 1:40 p.m., and 12:55 a.m. (November 21).

i. Samples Shipped: Samples shipped on November 20, included the following:

- 20-S to WES
- 11-S to WES
- 6-D to WES
- 7-S to WES
- 8-S to WES
- Trip Blank to WES
- 10-S to WES
- 13-S to WES
- 14-S to WES
- 12-S to WES

Split samples relinquished to the MPCA on November 20 included the following:

- 6-D
- 7-S
- 11-S

4.5 Date: November 21, 1986 (Friday)

a. Weather: Weather not reported (no sampling activity).

b. RMT Personnel: Jeff Chrisler and Karl Roovers arrived at the site at 7:00 a.m. and departed at 8:30 a.m.

c. Visitor Information: No visitors.

d. Work Performed: Packed equipment and drove to RMT in Madison, Wisconsin. Samples which were not shipped on November 20, were repackaged, new ice added (double ice for cooler to WES), and shipped.

e. Sampling Performed: None.

f. Field Analysis Performed: None.

g. Problems/Corrective Action: Samples for nitrate analysis would exceed 48-hour holding time limit since the WES would not receive samples on Saturday. Samples for nitrates were sent to the MRD Laboratory. All other samples were shipped to the WES for Monday delivery.

h. QC Activities: Cooler sent to the WES for Monday delivery received double ice to meet preservative requirements.

i. Samples Shipped: Samples shipped on November 21 included the following:

- 1-S to WES and MRD (nitrates only)
- 1-D to WES and MRD (nitrates only)

- 5-D to WES and MRD (nitrates only)
- 2-D to WES and MRD (nitrates only)
- 4-D to WES and MRD (nitrates only)
- 3-D to WES and MRD (nitrates only)
- 6-D to WES and MRD (nitrates only)
- Rinsate Blank to WES and MRD (nitrates only)

5. FIELD ANALYTICAL PROCEDURES

5.1 Planned Procedures

This section outlines procedures which were to be used by RMT personnel during field analysis of environmental conditions. Field measurements included airborne (volatile) organic gases, ground water levels, and pH, conductivity, and temperature of ground water samples. The planned field analytical procedures for ground water measurements were described in Section 2.3 of the A-E Quality Control and Sampling Plan for Ground Water Sampling (RMT, 1986a). Planned procedures for the HNU (airborne organic gas measurements) were described in the Site-Specific Health and Safety Plan for Ground Water Sampling (RMT, 1986b). The daily log book (Appendix A) contains calibration check information for the above procedures.

5.1.1 Ground Water Level Measurement

The measurement of ground water levels in wells was conducted in conjunction with ground water sampling. Ground water level measurements were made from an established reference point on the well casing by a battery-operated water-level indicator. The water level indicator was decontaminated between each well by rinsing with methanol and rinsing several times with deionized water.

5.1.2 Measurement of pH

The pH measurements were made electrometrically using a combination electrode and portable pH meter (Orion, Model 399A/F). Measurements were recorded to the nearest 0.1 pH unit.

The meter was checked before leaving for the NIROP and daily while on the NIROP for mechanical or electrical failures, weak batteries, and cracked or fouled electrodes. The meter and electrode also were checked against standard buffer solutions of known pH values (e.g., 4, 7, and 10) three times per day. Replicate analyses were to agree within 0.1 pH units.

Decontamination of the measurement equipment was accomplished by rinsing three times with distilled water and rinsing three more times with the next sample prior to obtaining a reading.

5.1.3 Measurement of Conductivity

A portable specific conductance meter, wheatstone bridge equivalent, was used (Yellow Springs Instruments, Model 33). The meters were checked before leaving for the NIROP and three times per day while in the field for weak batteries and mechanical or electrical failures. The conductivity cells were cleaned and checked against potassium chloride standards. Replicate field analyses were to agree within ± 15 percent.

Results were expressed in micromhos/centimeter (umhos/cm) corrected to 25°C, and reported to the nearest ten units.

5.1.4 Measurement of Temperature

Field thermometers were calibrated against a National Bureau of Standards (NBS) certified thermometer before leaving for the NIROP. Field readings were recorded to the nearest 1°C.

5.1.5 Measurement of Trace Gases

Air monitoring for trace organic gases was performed with an HNU Systems Model PI 101 photoionization detector. The primary purpose of air monitoring was for health and safety reasons as described in Section 4 of the Site-Specific Health and Safety Plan for Ground Water Sampling (RMT, 1986b). The detector was checked three times per day for mechanical or electrical failures, battery condition and calibration (using a benzene span gas standard).

5.2 Implementation Problems

No problems were encountered during implementation of field analytical procedures.

5.3 Corrective Actions Taken

No corrective actions were necessary in regard to field analytical procedures.

6. DATA PRESENTATION

6.1 Ground Water Levels

Ground water levels were measured in the monitoring wells at the NIROP from November 17 through 20, 1986, immediately before each well was purged and sampled. The results are summarized in Table 6-1. There are no apparent measurement errors in the data set.

Water levels rose in all wells except 20-S since September 1986; with level increases ranging from 0.24 to 1.91 feet. In general, the greatest increases appeared in the deep alluvial and bedrock wells and in water table wells immediately southwest of the NIROP building. The flow directions represented by the November data are similar to those shown in the final Interim Report (RMT, 1987).

6.2 Ground Water Quality

6.2.1 Major Ion Chemistry

The field measurements are summarized in Table 6-2 and laboratory data are summarized by well and by constituent in Appendices B and C, respectively. Original laboratory data from the WES and MRD are included in Appendix D and the chain-of-custody records are in Appendix E.

The average ground water temperature was 10°C, regardless of sample depth or location. The pH increases with depth, from 7.2 S.U. in the water table wells to 7.8 S.U. in the bedrock piezometers. There is no apparent areal trend to the pH data. There is a small decrease in mean specific electrical conductance (SEC) with depth, from 1020 umhos/cm at the water table to 800 umhos/cm at the bedrock. The highest SEC values

TABLE 6-1

WATER LEVEL MEASUREMENTS AND WELL PURGING INFORMATION

Well No.	Purge Date	Top of Casing Elevation (MSL)	Depth to Water (Feet)	Water Elevation (MSL)	Measured Depth to Well Bottom (Feet)	Length of Water Column in Well (Feet)	Gallons of Water Per Well Volume	Gallons of Water Purged
1-S	11/20/86	837.14	20.89	816.25	34.63	13.74	2.0	6.7
1-D	11/20/86	836.75	20.65	816.10	114.87	94.22	15.3	46.1
1-PC	11/18/86	837.63	20.77	816.86	192.85	172.08	120.0	600.0
2-S	11/18/86	836.07	20.00	816.07	34.27	14.27	2.2	11.6
2-D	11/20/86	386.04	19.92	816.12	111.86	91.94	15.0	45.0
2-PC	11/19/86	838.05	21.70	816.35	161.83	140.13	92.0	500.0
3-S	11/17/86	836.75	20.75	816.00	34.96	14.21	2.3	11.5
3-D	11/20/86	837.48	21.91	815.57	79.95	58.04	9.4	47.3
3-PC	11/19/86	839.21	22.81	816.40	158.59	135.78	90.0	270.0
4-S	11/19/86	837.45	21.00	816.45	33.94	12.94	2.2	11.0
4-D	11/20/86	834.79	25.12	809.67	120.38	95.26	15.5	77.6
4-PC	11/19/86	834.75	18.78	815.97	161.20	142.42	93.0	280.0
5-S	11/19/86	835.06	19.97	815.09	33.87	13.90	2.2	6.8
5-D	11/20/86	836.00	19.88	816.12	116.05	96.17	15.6	78.4
6-S	11/20/86	835.73	20.86	814.87	34.55	13.69	2.2	6.7
6-D	11/20/86	835.69	25.81	809.88	129.75	103.94	17.0	51.0
7-S	11/20/86	835.97	19.80	816.17	29.34	9.54	1.6	7.8
7-D	11/18/86	835.63	28.45	807.18	110.46	82.01	54.0	270.0
8-S	11/20/86	835.76	19.69	816.07	29.51	9.82	1.6	4.8
8-D	11/18/86	834.02	25.12	808.90	127.65	102.53	67.0	270.0

1120.09 926:RPT:frid0305T

TABLE 6-1 (Cont'd)

WATER LEVEL MEASUREMENTS AND WELL PURGING INFORMATION

Well No.	Purge Date	Top of Casing Elevation (MSL)	Depth to Water (Feet)	Water Elevation (MSL)	Measured Depth to Well Bottom (Feet)	Length of Water Column in Well (Feet)	Gallons of Water Per Well Volume	Gallons of Water Purged
9-S	11/17/86	836.68	19.84	816.84	27.58	7.74	1.3	6.5
9-D	11/18/86	834.30	29.62	804.68	123.61	93.99	60.0	240.0
10-S	11/19/86	835.89	20.58	815.31	30.86	10.28	1.7	5.1
11-S	11/20/86	835.89	25.97	809.92	31.00	5.03	0.8	4.0
12-S	11/19/86	838.51	22.32	816.19	35.45	13.13	2.2	11.0
13-S	11/19/86	834.59	18.34	816.25	33.48	15.14	2.4	7.2
14-S	11/19/86	835.99	19.74	816.25	34.10	14.36	2.3	7.0
15-S	11/17/86	834.83	18.39	816.44	31.74	13.35	2.2	8.8
16-S	11/19/86	837.26	21.00	816.26	35.76	14.76	2.4	7.2
17-S	11/18/86	835.75	23.40	812.35	38.29	14.89	2.4	13.0
18-S	11/18/86	834.08	25.20	808.88	39.90	14.70	2.4	10.0
19-S	11/18/86	834.56	29.48	805.08	41.58	12.10	2.0	10.0
20-S	11/20/86	837.62	21.35	816.27	34.93	13.58	2.2	11.1
FMC-33	11/17/86	837.05	21.07	815.98	75.58	54.51	35.6	144.0

1120.09 926:RPT:frid0305T

TABLE 6-2

SUMMARY OF FIELD MEASUREMENTS AND OBSERVATIONS OF GROUND WATER SAMPLES

SAMPLE NUMBER	SAMPLING DATE	pH (S.U.)	TEMP (°C)	SEC (UMHO/CM)	COLOR	TURBIDITY*	ODOR
1-S	11/20/86	7.1	11	770	Dark Brown	Extreme	Sewer-like
1-D	11/20/86	7.6	10	680	Brown	Moderate	None
1-PC	11/18/86	7.6	9	790	None	None	None
2-S	11/18/86	7.0	10	1010	Brown	Moderate	None
2-D	11/20/86	7.7	10	840	Light Grey	Slight	None
2-PC	11/19/86	8.5	11	460	Light Tan	Slight	None
3-S	11/17/86	7.1	10	890	Grey	Moderate	Sewer-like
3-D	11/20/86	7.2	10	920	Grey	Extreme	Slight-undefined
3-PC	11/19/86	7.5	10	1040	None	None	None
4-S	11/19/86	7.5	11	570	Brown	Extreme	None
4-D	11/20/86	7.4	10	850	Light Brown	Moderate	None
4-PC	11/19/86	7.6	11	910	Light Grey	Slight	Slight sewer-like
5-S	11/19/86	7.0	11	1290	Dark Brown	Extreme	None
5-D	11/20/86	7.6	10	920	Dark Brown	Extreme	Sulfide
6-S	11/20/86	6.9	10	1180	Dark Brown	Extreme	Slight-undefined
6-D	11/20/86	7.5	11	900	Brown	Extreme	None
7-S	11/20/86	7.1	10	1170	Dark Brown	Extreme	None
7-D	11/18/86	7.4	11	1010	None	None	None
8-S	11/20/86	6.9	10	980	Brown	Extreme	None
8-D	11/18/86	7.5	11	960	None	None	None
9-S	11/17/86	7.2	11	910	Brown	Extreme	None
9-D	11/18/86	7.5	11	1000	None	None	None
10-S	11/19/86	7.0	10	1170	Dark Brown	Extreme	None
11-S	11/20/86	7.2	12	1260	Brown	Extreme	None
12-S	11/19/86	7.4	11	930	Dark Brown	Moderate	None
13-S	11/19/86	7.3	11	1000	Brown	Moderate	None
14-S	11/19/86	7.1	10	1170	Brown	Slight	None
15-S	11/17/86	7.0	10	1210	Dark Brown	Moderate	None
16-S	11/19/86	7.1	10	780	None	Slight	None
17-S	11/18/86	7.0	11	1330	Light Tan	Slight	None
18-S	11/18/86	7.5	9	1170	None	None	None
19-S	11/18/86	7.5	10	700	Light Brown	Moderate	None
20-S	11/20/86	7.5	12	520	Brown	Moderate	None
FMC-33	11/17/86	7.1	9	1310	Light Gray	Slight	Slight-undefined

* Turbidity prior to filtering

1120.09 926:RPT:frid0305T2

were found immediately southwest of the NIROP building and northeast of the NIROP northern property line. This generally corresponds to the location of TCE occurrence as shown in the final Interim Report (RMT, 1987), with the exception of well 9-S.

The concentration of major ions in ground water samples are summarized in Table 6-3. One concentration value for each of potassium, alkalinity, and nitrate may be outliers resulting from analytical or data transcription errors. The outliers were identified as being 2.5 to 22 times larger or smaller than the ranges of the remaining data.

Three of the major ions, calcium, potassium, and chloride have no clear areal distribution. The bedrock aquifer generally has the highest reported chloride and lowest reported calcium concentrations. The highest sodium concentrations are found immediately southwest of the plant building, along the East River Road, and at well 9-S. The magnesium concentrations are generally the highest deep in the alluvial and bedrock aquifers and southwest of the plant in the shallow alluvial aquifer.

In order to evaluate the potential for leaking sewers, the distribution of chloride was reviewed for shallow wells downgradient of the NIROP building. Shallow wells downgradient of the plant included 5-S, 6-S, 10-S, 11-S, and 17-S. The chloride concentrations in these wells were compared with background wells 1-S, 2-S, 7-S, 12-S, 13-S, 14-S, 15-S, and 16-S using Cochran's Approximation to the Behrens-Fisher T-Test as outlined in the RCRA Ground Water Monitoring Technical Enforcement Guidance Document (USEPA, 1985). Results showed that there was no significant statistical indication that chloride concentrations

TABLE 6-3

SUMMARY OF MAJOR ION CONCENTRATIONS IN NOVEMBER 1986 GROUND WATER SAMPLES

CONSTITUENT	RANGE (mg/L)	PROBABLE OUTLIER	MEAN (mg/L)	STANDARD DEVIATION	NUMBER OF VALUES
Calcium	21.1 - 216	--	126	43	34
Magnesium	10.7 - 61.4	--	40.7	13.3	34
Sodium	3.57 - 41.1	--	12.6	8.72	34
Potassium	1.92 - 5.49	36.8	3.36	0.90	33
Alkalinity	190 - 569	8.5	365	107	33
Sulfate	26.8 - 422	--	169	92	34
Chloride	3.2 - 422	--	31.9	21.7	34
Nitrate	0.016 - 6.56	17	1.42	1.84	26*
Cyanide	< 0.010	--	--	--	34

* Missing 7 values from MRD laboratory.

1120.09 926:RPT:frid0305T2

are larger in the downgradient wells than in the background wells at the 0.01 level of significance. Calculations are shown in Appedix F.

The highest sulfate and alkalinity values are generally found in samples from the shallow alluvial wells. The data suggests that there may be a relationship between the sulfate and alkalinity concentrations and the TCE occurrence shown on Figure 5-7 of the final Interim Report (RMT, 1987). The highest concentrations of all three constituents are southwest of the building, in the area of pits and trenches, and northeast of the NIROP property line. Nitrate concentrations are also highest in shallow well samples. The highest shallow well values are north and east of the NIROP, suggesting off-site sources of this compound. Several samples (12-S, 7-S, 4-S and 9-S) are close to the nitrate MCL of 10 mg/L. Cyanide was not present in any sample at concentrations above the 0.010 mg/L detection limit.

6.2.2 Trace Inorganic Constituents

Trace inorganic constituents have previously been analyzed only in unfiltered samples, yielding total concentrations that included both aqueous phases and some portion of the constituents associated with suspended sediment in the sample. Over 80 percent of the samples collected in November 1986 had suspended sediment visible to the sampling personnel (Table 6-2). Previous sampling probably yielded similar quality samples. Three samples (from wells 3-S, 9-S, and 15-S) were analyzed for both total concentrations, as had been done in the past, and dissolved concentrations. The dissolved concentrations were determined from samples that were filtered through 0.45 micron paper at

the well head, just prior to acidification. Table 6-4 summarizes the results of these split samples. Concentrations of arsenic, barium, cadmium, chromium, copper, lead, manganese, and zinc all experienced reductions upon filtering. In almost all cases, the dissolved concentrations were less than half of the total concentrations, and in 50 percent of the samples the dissolved concentrations were less than 10 percent of the total concentrations. Only barium in the sample from well 3-S has a higher dissolved than total concentration. This unlikely occurrence suggests a label transcription error in recording the analytical data. The reductions in reported concentrations are significant. Lead concentrations in all three unfiltered samples exceeded the lead MCL of 0.050 mg/L, while the filtered samples had concentrations of about 5 percent of the MCL.

Trace inorganic constituents were analyzed in filtered samples from all the wells. The November 1986 sampling round was the first to have included all constituents at all the wells (Appendix B and C). Previous rounds had included a limited number of wells and selected constituent analyses during each sampling round.

Arsenic was reported above detection limits in 1 sample (3%) from the November 1986 (0.014 mg/L, well 15-S) sampling round. Fourteen wells had previously been sampled for arsenic, with one well (1-S) having a measurable concentration (0.008 mg/l).

Barium was found in all the well samples at concentrations of 0.032 to 0.165 mg/L. All concentrations are below the MCL of 1.00 mg/L. Barium had not previously been analyzed at the NIROP.

TABLE 6-4

COMPARISON OF FILTERED AND UNFILTERED GROUND WATER SAMPLES

	Well No. 3-S			Well No. 9-S			Well No. 15-S		
	T[1]	D	R	T	D	R	T	D	R
Arsenic	< 0.005	< 0.005	—	0.023	< 0.005	< 0.22	0.045	0.014	0.31
Barium	0.088	0.165	1.88	0.986	0.109	0.11	0.172	0.136	0.79
Cadmium	0.0014	0.0003	0.21	0.0034	0.0006	0.18	0.0194	0.0008	0.04
Chromium	0.009	0.003	0.33	0.267	0.003	0.01	0.011	0.002	0.18
Copper	0.024	0.003	0.13	0.377	0.005	0.01	0.089	0.002	0.02
Lead	0.171	0.002	0.01	0.174	0.003	0.02	0.174	0.003	0.02
Manganese	1.56	1.04	0.67	2.54	0.026	0.10	2.46	1.96	0.80
Mercury	< 0.0004	< 0.0004	—	< 0.0004	< 0.0004	—	< 0.0004	< 0.0004	—
Nickel	0.018	< 0.001	< 0.06	0.332	< 0.001	< 0.001	0.039	< 0.001	< 0.003
Selenium	< 0.005	< 0.005	—	0.076	0.049	0.64	< 0.005	< 0.005	—
Silver	0.001	< 0.001	< 1.00	0.001	< 0.001	< 1.0	< 0.001	< 0.001	—
Zinc	1.52	0.131	0.09	3.15	0.184	0.06	25.4	1.84	0.07
TURBIDITY	MODERATE			EXTREME			MODERATE		

1120.09 926:RPT:frid0305T2

[1] T = Total concentration in unfiltered sample, mg/l

D = Dissolved concentration in filtered sample, mg/l

R = D/T

Measurable concentrations of cadmium were reported in 29 (85%) of the November 1986 samples, ranging from 0.0002 to 0.0024 mg/L. All concentrations were below the 0.010 mg/L MCL. Previous analyses of unfiltered samples from 15 wells ranged from 0.0010 to 0.0085 mg/L.

Chromium was reported in 28 (82%) of the November 1986 samples. Concentrations ranged from 0.002 to 0.005 mg/L. Only 12 (35%) samples had concentrations above the 0.002 mg/L reported in the trip blank. All samples were below the MCL of 0.050 mg/L. Chromium had been previously analyzed in unfiltered samples from 15 wells. The unfiltered concentrations ranged from 0.057 mg/L to 0.003 mg/L.

Copper was detected in 29 (85%) of the November 1986 samples at concentrations of 0.002 to 0.009 mg/L. All samples had copper concentrations below the SMCL of 1.0 mg/L. Previous analyses of unfiltered samples from 15 wells had detectable concentrations in 97 percent of the samples ranging from 0.004 to 0.214 mg/L.

Lead was detected in 23 (68%) of the November 1986 samples at concentrations between 0.001 to 0.011 mg/L. Only 13 (38%) of the samples had concentrations above the 0.002 mg/L reported in the trip blank. All concentrations were below the MCL of 0.050 mg/L. Previous analyses of unfiltered samples from the 34 wells had detectable concentrations in 99 percent of the samples, with concentrations ranging from 0.001 to 0.366 mg/L. Thirty-six percent of the unfiltered samples collected during previous rounds exceeded the MCL for lead.

Mercury was not observed above the 0.0004 mg/L detection limit in any November 1986 sample. Previous analyses of unfiltered samples from

14 wells had detectable concentrations in 50 percent of the samples, ranging from 0.0004 to 0.0013 mg/L.

Nickel was detected in 22 (65%) of the November 1986 samples at concentrations between 0.001 and 0.072 mg/L. Previous analyses of unfiltered samples from 14 wells had detectable concentrations in 100 percent of the samples with concentrations ranging from 0.003 to 0.107 mg/L. There is no MCL for nickel.

Selenium was detected in 2 (6%) of the November 1986 samples at concentrations of 0.008 mg/L (well 14-S) and 0.049 mg/L (well 9-S). The sample from well 9-S exceeds the MCL of 0.010 mg/L. Selenium has not previously been analyzed in NIROP ground water samples.

Silver was detected in 10 (29%) of the November 1986 well samples between concentrations of 0.001 and 0.005 mg/L. All concentrations were below the MCL of 0.050 mg/L. Previous analyses of unfiltered samples from 15 wells had detectable concentrations in 3 percent of the well samples, with concentrations at the 0.01 mg/L detection limit.

Zinc was detected in 33 (97%) of the November 1986 well samples between concentrations of 0.068 and 4.71 mg/L. All the reported concentrations were below the SMCL of 5.0 mg/L. Previous analyses of unfiltered samples from 34 wells had detectable concentrations of zinc in 96 percent of the samples with concentrations ranging from 0.143 to 29.8 mg/L. The SMCL was exceeded in 18 percent of the unfiltered samples.

6.2.3 Organic Constituents

A total of 34 volatile organic compounds (VOCs) were analyzed in ground water samples in accordance with the approved A-E Quality Control and Sampling Plan for Ground Water Sampling (RMT, 1986a). Nine of the 34 VOCs analyzed were detected in previous rounds and in the November 1986 samples. Six additional VOCs detected in previous sampling rounds were not detected in the November samples. One new compound (trichlorofluoromethane) not previously detected was found in the November 1986 samples. Analytical results for organic constituents can be found in Appendices B, C, and D.

Trichloroethene (TCE)

TCE continues to be the most prevalent organic compound detected in ground water samples at the NIROP. Measurable concentrations of TCE were reported in 21 of 34 well samples collected in November 1986. TCE again was detected primarily in the shallow and deep alluvial monitoring wells. One bedrock well (2-PC) showed a detectable TCE concentration of 0.0053 mg/L which is near the detection limit of 0.005 mg/L. Concentrations of TCE detected in well 2-PC have continued to drop since that well was first sampled in October 1983. The November 1986 TCE concentration in well 2-PC is the lowest to date.

Notable decreases of TCE also occurred at wells 9-S and FMC-33. TCE detected at well 9-S dropped from 4.2 mg/L (January 1986) to 1.8 mg/L in November 1986. TCE at well FMC-33 decreased from 2.6 mg/L (June 1985) to 1.3 mg/L in November 1986.

Twelve of thirty-four monitoring wells again showed no detectable TCE concentrations (1-S, 1-D, 1-PC, 4-D, 4-PC, 5-S, 5-D, 7-D, 12-S, 13-S, 14-S, and 20-S).

Detected TCE concentrations remained fairly constant in the following wells: 2-S, 2-D, 2-PC, 3-S, 3-D, 6-D, 7-S, 9-D, 10-S, 11-S, 15-S, 16-S, 17-S, 18-S, and 19-S. Two of the wells, 15-S and 16-S, are background wells.

Concentrations of TCE increased in three wells: 6-S (3.8 mg/L), 8-S (9.2 mg/L), and 8-D (10.7 mg/L). These values represent the highest detected TCE concentrations to date for these wells.

Results of TCE analyses for the November 1986 ground water sampling round continue to support the possibility of multiple sources presented in the final Interim Report (RMT, 1987).

Cis 1,2-Dichloroethene and Trans 1,2-Dichloroethene

The compounds cis 1,2-dichloroethene and trans 1,2-dichloroethene were to have been quantified individually. The reported concentrations for these isomers however, were for total 1,2-dichloroethene. Since only total 1,2-dichloroethene was reported, individual isomer distributions cannot be discussed.

1,2-dichloroethene isomers were detected in 11 of the 34 monitoring wells. All 11 wells were also found to contain TCE. Monitoring wells 6-S, 3-S, 9-S, FMC-33, 18-S, and 8-S had the highest detected concentrations of 1,2-dichloroethene as well as the highest concentrations of TCE. 1,2-dichloroethene analyses were included in only two previous sampling rounds (April and October 1984). Several monitoring wells

sampled in November 1986 were not in existence at that time. Thus, meaningful comparison with past results for these compounds is not possible.

Tetrachloroethene

Tetrachloroethene was detected in wells 6-S (0.20 mg/L), 9-S (0.12 mg/L), and 8-S (0.046 mg/L). Tetrachloroethene has been analyzed in all seven previous sampling rounds. Tetrachloroethene has been detected in wells 6-S, 9-S, and 8-S before at similar concentrations; it has also been previously detected in wells 1-PC, 3-S, and FMC-33. These three wells were found to have no detectable tetrachloroethene in November 1986.

1,1,1 Trichloroethane

1,1,1 trichloroethane was detected in November 1986 samples from wells 6-S (0.13 mg/L), 9-S (0.12 mg/L), 9-D (0.0086 mg/L), 7-S (0.0051 mg/L), and 8-S (0.018 mg/L). The concentrations of 1,1,1 trichloroethane detected in the November 1986 sampling round are less than those detected in previous rounds. Additionally, wells which had shown detected concentrations of 1,1,1 trichloroethane in previous sampling rounds (2-S and 4-S) had no detectable concentrations.

1,1 Dichloroethene

1,1 dichloroethene has been analyzed in some previous sampling rounds as well as the November 1986 round. It was detected once, in well 9-S, at a concentration of 0.005 mg/L. 1,1 dichloroethene was not

detected in any well during November 1986. The MCLG for this compound is 0.007 mg/L.

1,1 Dichloroethane

1,1 dichloroethane was detected in wells 6-S (0.019 mg/L), 9-S (0.035 mg/L), FMC-33 (0.0073 mg/L), and 8-S (0.0073 mg/L). 1,1 dichloroethane has been analyzed only once before from a limited number of wells. Well 9-S was the only well where 1,1 dichloroethane had been detected previously (January 1986 at 0.061 mg/L).

1,2 Dichloroethane

1,2 dichloroethane was not detected in any well during the November 1986 sampling round. 1,2 dichloroethane has been analyzed in the first seven sampling rounds and has been previously detected in wells 3-S, FMC-33, and 9-S at concentrations consistently above the MCLG of 0.005 mg/L.

Chloroform

Chloroform was not detected in any well in November 1986. Previous sampling rounds had reported detectable or quantifiable chloroform concentrations in 8 percent of the samples collected.

Ethyl Benzene

Ethyl benzene was not detected during the November 1986 sampling round. Ethyl benzene has been previously detected in only two wells (3-S and FMC-33), both of which had been exhibiting decreasing ethyl benzene concentrations.

Toluene

Toluene was not detected in any well during November 1986. Toluene has been analyzed during all sampling rounds and has been detected near its detection limit (0.020 to < 0.005 mg/l) in 18 percent of the samples collected.

Benzene

Benzene was detected in only one well (17-S) at a concentration of 0.0065 mg/L. Benzene has been detected previously in samples from wells 1-D, 1-PC, and 2-PC at low concentrations.

Methylene Chloride

Methylene chloride was detected in well 1-S at a concentration of 0.013 mg/L. Methylene chloride has been analyzed in all sampling rounds and detected at least one time in 16 of the 34 wells. It was previously detected in three trip blanks as well. The data suggested that methylene chloride may have entered the sample during sampling and/or analysis.

2-Butanone (Methyl Ethyl Ketone or MEK)

MEK has been listed as 2-butanone in the analytical results. MEK was not detected in any well during November 1986. MEK had not previously been analyzed.

Trichlorofluoromethane

The November 1986 sampling round was the first time trichlorofluoromethane has been detected (well 2-PC at 0.0077 mg/L). The detection limit for trichlorofluoromethane is 0.005 mg/L. This compound is also known as Freon-11. It was widely used as an aerosol propellant into the late 1970's and continues to be used in refrigeration and air conditioning systems.

7. QUALITY CONTROL ACTIVITIES

7.1 Field Measurements

The field instruments' performance and calibration were checked three times per day using the procedures described in the A-E Quality Control and Sampling Plan for Ground Water Sampling (RMT, 1986a) and the equipment manufacturers' User Manuals. The instrument checks are summarized in Table 7-1. The instruments met specifications for the entire sampling period.

7.2 Laboratory Analytical Data

Two types of field blanks were generated as part of the quality control program. A rinsate blank was generated in the field by passing deionized water through the sampling apparatus and handling the water in the same manner as a sample (i.e., filtering where appropriate). A trip blank was generated by adding deionized water to an empty sample container in the laboratory and transporting the sealed container with the other samples to the field and back to the laboratory for analysis.

Table 7-2 shows the results of analyses of the field blanks for organic compounds. All parameters were below detection limits in all blanks.

Table 7-3 shows the results of analysis of the field blanks for inorganic constituents. The parameters which were consistently present above detection limits in both rinsate and trip blanks included cadmium, chromium, copper, lead, and nitrate. The levels in Table 7-3 for these parameters should be used to help identify false positive values measured in samples. The occurrence of these constituents in the trip

TABLE 7-1

SUMMARY OF FIELD INSTRUMENT CHECKS

DATE	17 November 1986						18 November 1986						19 November 1986						20 & 21 November 1986					
TIME	0900		1500		1830		0853		1215		1850		0715		1330		2000		0700		1340		0055	
FUNCTION[1]	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C
pH Meter	Y[2]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Conductivity Meter	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Photoionization Detector	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

1120.09 926:RPT:frid0305T

1 Functions include: B-Battery Status; C- Calibration

2 Y - Instrument meets specifications; N - Instrument did not meet specifications

TABLE 7-2

ANALYSIS OF FIELD BLANKS FOR ORGANIC CONSTITUENTS

Parameter	Rinsate Blank mg/L	Rinsate Blank #2 mg/L	Trip Blank #1 mg/L	Trip Blank #2 mg/L	Trip Blank #3 mg/L	Trip Blank #4 mg/L
Chloromethane	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Chloroethane	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
1,1-dichloroethane	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Bromomethane	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Methylene chloride	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Trans-1,2-dichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Vinyl chloride	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1-dichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chloroform	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-dichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Bromodichloromethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Trichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,1-trichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-dichloropropane	< 0.005	< 0.005	> 0.005	< 0.005	< 0.005	< 0.005
Dibromochloromethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Carbon tetrachloride	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Trans-1,3-dichloropropene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Cis-1,3-dichloropropene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,2-trichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Bromoform	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Toluene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Benzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,2,2-tetrachloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chlorobenzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
2-chloroethylvinylether	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Tetrachloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Acrolein	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Trichlorofluoromethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,4-dichlorobenzene	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total xylene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Acrylonitrile	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,3-dichlorobenzene	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
2-butanone	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
1,2-dichlorobenzene	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Cis-dichloroethylene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

TABLE 7-3

ANALYSIS OF FIELD BLANKS FOR FILTERED INORGANIC CONSTITUENTS

	Rinsate Blank #1 mg/L	Rinsate Blank #2 mg/L	Trip Blank mg/L
Arsenic	< 0.005	< 0.005	< 0.005
Cadmium	0.0004	< 0.0001	0.0002
Chromium	0.001	0.002	0.002
Copper	0.002	0.009	0.002
Lead	0.003	< 0.001	0.002
Mercury	< 0.0004	< 0.0004	< 0.0004
Nickel	< 0.001	0.001	< 0.001
Selenium	< 0.005	< 0.005	< 0.005
Silver	< 0.001	0.001	< 0.001
Zinc	< 0.030	< 0.030	< 0.030
Barium	< 0.010	< 0.010	< 0.010
Calcium	< 0.100	< 0.100	< 0.100
Magnesium	< 0.010	< 0.100	< 0.100
Mangenese	< 0.030	< 0.030	< 0.030
Potassium	< 0.100	< 0.100	< 0.100
Sodium	< 0.100	< 0.100	< 0.100
Sulfate	< 10.0	< 8.0	< 10.0
Chloride	< 1.0	< 1.0	< 1.0
Alkalinity	< 5.0	< 5.0	< 5.0
Cyanide	< 0.010	< 0.010	< 0.010
Nitrate	0.021	0.01*	0.023

* This sample was analyzed by the MRD laboratory.

blanks suggests that the rinsate blank concentrations are not the result of incomplete equipment decontamination. The low trip blank concentrations may be indicative of laboratory precision at low concentrations.

The WES laboratory analyzed two types of spiked samples as part of the quality control program. Matrix spikes were made up by adding known quantities of selected organic and inorganic constituents to sample aliquots. The analytically determined concentration was then compared to the calculated (expected) concentration. The laboratory also prepared surrogate spikes by adding three organic compounds to the samples immediately before the analyses were performed. These spikes are used to monitor the system (e.g., GC, MS) analytical performance.

Table 7-4 shows the results of the matrix spike recoveries for organics. All recoveries fell within the acceptance criteria as listed in 40 CFR Part 136 Appendix A.

Table 7-5 shows the results of the matrix spike recoveries for inorganic constituents. Mean recoveries for all constituents were within ± 10 percent of calculated concentrations.

Table 7-6 shows the surrogate spike recoveries for organic compounds. The mean recoveries fell within the acceptance criteria as listed in the USEPA Contract Laboratory Program statement of work for organic analyses.

The WES laboratory analyzed 3 to 4 external QC samples for 15 inorganic constituents. These samples are prepared with known concentrations outside of the WES laboratory. The concentrations determined by the WES laboratory are compared to the known concentrations and expressed as a percentage recovery.

TABLE 7-4

MATRIX SPIKE RECOVERIES - ORGANIC CONSTITUENTS

Parameter	No. of Samples	Range of Recovery (%)	Mean Recovery (%)	Recovery Acceptance Criteria (%)[a]
Chloromethane	2	90-103	96.3	D-273
Chloroethane	3	91-105	96.7	14-230
1,1-dichloroethane	3	94.5-98.5	96.3	59-155
Bromomethane	3	88.5-99.9	92.6	D-242
Methylene chloride	2	97.8-103	100.	D-221
1,2-Dichloroethene	3	94.5-109	101.	54-156
Vinyl chloride	3	90.3-104	95.9	D-251
1,1-dichloroethene	3	95-102	97.5	D-234
Chloroform	3	95.5-102	97.8	51-138
1,2-dichloroethane	3	90-105	97.2	49-155
Bromodichloromethane	3	71.8-93.5	85.4	35-155
Trichloroethene	3	95-120	108.	71-157
1,1,1-trichloroethane	3	74.1-91	84.5	52-162
1,2-dichloropropane	3	96-114	102.	D-210
Dibromochloromethane	3	97-133	110.	53-149
Carbon tetrachloride	3	71.3-94	85.1	70-140
Trans-1,3-dichloropropene	3	81.7-124	100.	17-183
Cis-1,3-dichloropropene	3	103-128	113.	D-227
1,1,2-trichloroethane	3	100-122	110.	52-150
Bromoform	3	94.4-102	97.6	45-169
Toluene	3	86.5-103	94.3	47-150
Benzene	3	96.5-121	106.	37-151
1,1,2,2-tetrachloroethane	3	93-102	97.2	46-157
Chlorobenzene	3	93.5-103	98.4	37-160
2-chloroethylvinylether	3	110-120	114.	D-305
Tetrachloroethene	3	83.5-104	95.8	64-148
Ethyl benzene	3	91.5-109	100.	37-162
Acrolein	3	95.8-134	109.	88-118
Trichlorofluoromethane	3	93-98.9	96.0	17-181
1,4-dichlorobenzene	--[b]	--	--	18-190
Total xylene	--	--	--	--
Acrylonitrile	3	101-111	107.	71-135
1,3-dichlorobenzene	--	--	--	59-156
2-butanone	--	--	--	--
1,2-dichlorobenzene	--	--	--	18-190

a) 40 CFR Part 136, App. A. pp. 396, 436 (D-indicates detection limit)
b) Not analyzed in this investigation

TABLE 7-5

MATRIX SPIKE RECOVERIES - INORGANIC CONSTITUENTS

Parameter	Number of Samples	Range of Recovery (%)	Mean Recovery (%)
Arsenic	9	94 - 108	103.
Cadmium	4	95 - 110	104.
Chromium	5	90 - 115	102.
Copper	5	90 - 115	97.0
Lead	5	90 - 95	93.0
Mercury	8	10.7 - 117	90.2
Nickel	6	90 - 115	100.
Selenium	8	86 - 138	101.
Silver	5	95 - 110	103.
Zinc	8	94.9 - 101	99.1
Barium	7	92 - 107	99.9
Calcium	6	89.5 - 112	101.
Manganese	6	98.6 - 106	102.
Sulfate	6	93.4 - 104	101.
Chloride	6	97.5 - 103.2	100.
Alkalinity	6	88 - 95.3	92.6
Cyanide	5	100 - 103	103.
Nitrate	5	99.5 - 101	100.

TABLE 7-6

SURROGATE SPIKE RECOVERIES - ORGANIC COMPOUNDS

Parameter	No. of Samples/ Spikes	Range of Recovery (%)	Mean Recovery (%)	Recovery Acceptance Criteria (%)[a]
Toluene-d_8	43/65	88.1-108.	98.6	88-110
4-bromofluorobenzene	43/66	83.3-113.	97.7	86-115
1,2-dichloroethane-d_4	43/66	73.2-106.	95.1	76-114

a USEPA, Contract Laboratory Program - Statement of Work for Organics Analysis - Multi-media, Multi-concentration.

Table 7-7 shows the recoveries of the external QA samples for inorganics constituents. Mean recoveries for all constituents were within ± 7 percent of calculated concentrations, except for potassium which exhibited a mean recovery of 88 percent (n = 3).

The WES laboratory produced intralaboratory duplicates to assess analytical precision by spliting selected samples into two replicates. The precision (as calculated by RMT) was presented in the form of relative percent differences (RPD):

$$RPD = \left| \frac{C_1 - C_2}{\left(\frac{C_1 + C_2}{2} \right)} \right| \times 100$$

where C_1 and C_2 are the concentrations reported for the two replicates. The RPD was not calculated if one or both of the replicate concentrations was reported as less than the detection limit.

Tables 7-8 and 7-9 show the results of analyses for organic and inorganic constituents from intralaboratory duplicates, respectively. Criteria for the evaluation of this data have not been established. The RPDs are comparable to those obtained by commercial laboratories participating in the CLP.

RMT personnel produced two types of blind duplicates in the field. The first type, intralaboratory blind duplicates, were made by splitting three samples in the field and sending both replicates to the WES laboratory. One member of each pair was given an arbitrary designation (e.g., D-1, D-2, D-3) known only to the field personnel. The second set of blind duplicates were split between the WES and MRD laboratories. The MRD laboratory in turn, subcontracted the volatile

TABLE 7-7

RECOVERIES FOR EXTERNAL QA SAMPLES - INORGANIC CONSTITUENTS

	Number of Samples	Range of Recovery (%)	Mean Recovery (%)
Arsenic	3	102-106	103.
Cadmium	3	94-104	99.7
Chromium	3	94-101	98.0
Copper*	--	--	--
Lead	3	100-103	101.
Mercury	4	97-104	101.
Nickel	3	89-100	96.0
Selenium	4	93-102	99.8
Silver	3	97-99	98.0
Zinc	4	97-102	99.5
Barium	4	92-97	94.5
Calcium	4	90-103	93.3
Magnesium	3	101	101.
Manganese	4	94-99	97.5
Potassium	3	88	88.0
Sodium	3	98-100	98.7

* No data reported.

TABLE 7-8

RELATIVE PERCENT DIFFERENCE (RPD) FOR INTRALABORATORY DUPLICATE SAMPLES - ORGANIC CONSTITUENTS

	Number of Duplicate Pairs	Range of RPD	Mean of RPD
Chloromethane	0	--	--
Chloroethane	0	--	--
1,1-dichloroethane	0	--	--
Bromomethane	0	--	--
Methylene chloride	0	--	--
1,2-dichloroethene	10	0 - 9.0	3.90
Vinyl chloride	0	--	--
1,1-dichloroethene	0	--	--
Chloroform	0	--	--
1,2-dichloroethane	0	--	--
Bromodichloromethane	0	--	--
Trichloroethene	9	0 - 53.3	14.8
1,1,1-trichloroethane	2	15.3 - 19.1	17.2
1,2-dichloropropane	0	--	--
Dibromochloromethane	0	--	--
Carbon tetrachloride	0	--	--
Trans-1,3-dichloropropene	0	--	--
Cis-1,3-dichloropropene	0	--	--
1,1,2-trichloroethane	0	--	--
Bromoform	0	--	--
Toluene	0	--	--
Benzene	1	25.7	25.7
1,1,2,2-tetrachloroethane	0	--	--
Chlorobenzene	0	--	--
2-chloroethylvinylether	0	--	--
Tetrachloroethene	4	0 - 8.0	5.55
Ethylbenzene	0	--	--
Acrolein	0	--	--
Trichlorofluoromethane	0	--	--
1,4-dichlorobenzene	0	--	--
Total xylene	0	--	--
Acrylonitrile	0	--	--
1,3-dichlorobenzene	0	--	--
2-butanone	0	--	--
1,2-dichlorobenzene	0	--	--

TABLE 7-9

RELATIVE PERCENT DIFFERENCE (RPD) FOR INTRALABORATORY DUPLICATE SAMPLES - INORGANIC CONSTITUENTS

Parameter	Number of Duplicate Pairs	Range of RPD	Mean RPD
Arsenic	0	--	--
Cadmium	0	--	--
Chromium	0	--	--
Copper	0	--	--
Lead	0	--	--
Mercury	0	--	--
Nickel	1	7.69	7.69
Selenium	0	--	--
Silver	0	--	--
Zinc	7	0.6 - 3.7	1.20
Barium	7	1.2 - 10.9	4.10
Calcium	6	2.2 - 8.5	4.37
Magnesium	4	0.2 - 4.6	2.93
Manganese	6	0.4 - 5.1	1.73
Potassium	5	0.2 - 3.9	2.00
Sodium	4	2.5 - 5.1	3.95
Sulfate	5	0 - 10.3	4.00
Chloride	5	0.2 - 2.1	0.940
Alkalinity	5	0.2 - 0.6	0.500
Cyanide	0	--	--
Nitrate	5	0.4 - 19	5.08

organics analyses to the Tennessee Valley Authority Laboratory (TVA). These are identified as interlaboratory blind duplicates. Three samples were split in this manner. The comparison of duplicates is again presented in terms of relative percent differences (RPD).

Table 7-10 shows the results of the analyses of blind intra-laboratory duplicates for inorganic constituents in filtered samples. The results for cadmium, chromium, copper, and lead indicate large percentage differences between duplicates. However, all the measured values were near the detection limits and the absolute magnitude of the differences (in terms of mg/L) is small. There appears to be one aberrant measured value for sulfate. Two of the three duplicate pairs exhibited RPDs below 1 percent. The third sulfate duplicate pair included one replicate which was reported at less than one half the concentration of the other replicate.

Table 7-11 shows the results of blind interlaboratory duplicate inorganic analyses of filtered samples. Differences in the detection limits reported by the two laboratories prevented meaningful comparisons for most of the trace metals. The MRD report also had missing values for arsenic and selenium. The differences between laboratories was equal to or greater than the differences within the WES laboratory. The barium results were consistently lower at the MRD laboratory. Since the WES laboratory recovered an average of 94.5 percent barium from external QA samples, the MRD results for barium may be suspect.

Table 7-12 shows the results of blind interlaboratory duplicate inorganic analyses of unfiltered samples. There does not appear to be a consistent difference between the two labs for any constituent.

TABLE 7-10

INTRALABORATORY COMPARISON OF BLIND
DUPLICATE FILTERED SAMPLES - INORGANIC CONSTITUENTS

Parameter	Pairs	Range of RPD	Mean RPD
Arsenic	1[a]	7.4	7.4
Cadmium	3	0-40	13.
Chromium	3	0-40	27.
Copper	3	0-40	27.
Lead	3	0-40	13.
Mercury	ND[b]	--	--
Nickel	ND	--	--
Selenium	1[a]	2	2
Silver	ND	--	--
Zinc	3	1.1-6.7	3.1
Barium	3	5.4-8.2	7.1
Calcium	3	0-3.8	1.7
Magnesium	3	0.61-11.	4.5
Manganese	3	1.0-3.8	2.2
Potassium	3	0	0
Sodium	3	0-22.	11.
Sulfate	3	0.31-72	24.
Chloride	3	0.66-4.3	1.9
Alkalinity	3	0.21-0.62	0.35
Cyanide	ND	--	--
Nitrate	3	0-2.3	1.1

a) 2 of 3 pairs exhibited nondetectable concentrations.

b) ND indicates that all three pairs were reported to have nondetectable concentrations.

TABLE 7-11

INTERLABORATORY COMPARISON OF BLIND DUPLICATE
FILTERED SAMPLES - INORGANIC CONSTITUENTS

Parameter	Pairs	Range of RPD	Mean RPD
Arsenic	ND	--	--
Chromium	*	--	--
Copper	*	--	--
Lead	*	--	--
Mercury	ND	--	--
Nickel	**	--	--
Selenium	ND	--	--
Silver	ND	--	--
Zinc	3	5.6-16.	9.65
Barium	3	52.-76.	63.7
Calcium	3	5.1-19.	10.2
Magnesium	3	6.1-11.	9.16
Manganese	3	5.0-17.	8.91
Potassium	3	21.-25.	23.2
Sodium	3	4.4-27.	14.4
Sulfate	3	8.2-30.	22.1
Chloride	3	6.5-22.	14.1
Alkalinity	3	1.9-2.7	2.24
Cyanide	*	--	--
Nitrate	3	28.-95.	68.1

ND - Indicates that most reported values were below detection limits at both labs.

* - Indicates that one lab reported measurable concentrations and the other lab reported nondetectable concentrations at a detection limit greater than the measured values.

** - Indicates that one laboratory reported measurable concentrations and the other lab reported nondetectable concentrations at a detection limit less than the measured values.

TABLE 7-12
INTERLABORATORY COMPARISON OF BLIND DUPLICATE
UNFILTERED SAMPLES - INORGANIC CONSTITUENTS

Parameter	Pairs	Range of RPD	Mean RPD
Arsenic	*	--	--
Barium	3	16.-41.	32.1
Cadmium	**	--	--
Calcium	3	3.5-67.	25.0
Chromium	3	7.4-80.	36.3
Copper	3	4.7-53.	32.4
Lead	3	3.5-164.	67.3
Manganese	3	2.3-26.	11.2
Mercury	ND	--	--
Nickel	4	0.0-83.	29.1
Selenium	ND	--	--
Silver	ND	--	--
Zinc	3	8.3-28.	15.6

ND - Indicates that most reported values were below detection limits at both labs.

* - Indicates that one lab reported measurable concentrations and the other lab reported nondetectable concentrations at a detection limit greater than the measured values.

** - Indicates that one lab reported measurable concentrations and the other lab reported nondetectable concentrations at a detection limit less than the measured values.

However, several errors are apparent on individual analysis. The lead value reported by MRD for sample 3-S appears to be low by an order of magnitude. Also, one of the two labs seems to have made a calculation or dilution error in reporting calcium in the sample from 9-S.

Table 7-13 shows the results of blind interlaboratory duplicate organic analyses of samples. Only a few of the organic constituents were analyzed by both labs. TVA did not analyze for acetone, hexane, or bromochlorodifluoromethane in the blanks, which were the only constituents detected by the WES lab. Hence, there are no comparisons of blank values included in Table 7-13. In the samples (non-blank), only 8 pairs of results were reported. In 7 of 8 instances the WES lab reported a higher value than the TVA lab.

The results of the intralaboratory blind duplicates for organic constituents are summarized on Table 7-14. The RPD is similar to those for the laboratory-generated duplicates (Table 7-8). The sightly higher RPD for blind duplicates probably reflects variability introduced during sample collection.

Cation/anion balances were calculated for 37 filtered water samples (Table 7-15). The balance provides a qualitative measure of the accuracy of the major ion analyses since the sample should be electrochemically neutral (i.e., 0 percent difference between the cations and anions). The major ions included in the calculation were: calcium, magnesium, potassium, sodium, sulfate, chloride, alkalinity (expressed as bicarbonate) and nitrate. Nitrate comprised 2 percent or less of the total anions in every case. Typically, the effect of nitrate concentrations was negligible in the calculations.

TABLE 7-13

INTERLABORATORY COMPARISON OF BLIND DUPLICATE SAMPLES - ORGANIC CONSTITUENTS

	Number of Duplicate Pairs	Range of RPD	Mean of RPD
Chloromethane	ND	--	--
Chloroethane	ND	--	--
1,1-dichloroethane	1	33.	33.
Bromomethane	ND	--	--
Methylene chloride	ND	--	--
1,2-dichloroethene	2	23.-56.	39.5
Vinyl chloride	ND	--	--
1,1-dichloroethene	ND	--	--
Chloroform	ND	--	--
1,2-dichloroethane	ND	--	--
Bromodichloromethane	ND	--	--
Trichloroethene	3	7.5-59.	38.
1,1,1-trichloroethane	2	17.	17.2
1,2-dichloropropane	ND	--	--
Dibromochloromethane	ND	--	--
Carbon tetrachloride	ND	--	--
Trans-1,3-dichloropropene	ND	--	--
Cis-1,3-dichloropropene	ND	--	--
1,1,2-trichloroethane	ND	--	--
Bromoform	ND	--	--
Toluene	ND	--	--
Benzene	ND	--	--
1,1,2,2-tetrachloroethane	ND	--	--
Chlorobenzene	ND	--	--
2-chloroethylvinylether	ND	--	--
Tetrachloroethene	1	19.	19.2
Ethyl benzene	ND	--	--
Acrolein	ND	--	--
Trichlorofluoromethane	ND	--	--
1,4-dichlorobenzene	ND	--	--
Total xylene	ND	--	--
Acrylonitrile	ND	--	--
1,3-dichlorobenzene	ND	--	--
2-butanone	ND	--	--
1,2-dichlorobenzene	ND	--	--

TABLE 7-14

COMPARISON OF INTRALABORATORY BLIND DUPLICATE SAMPLES - ORGANIC CONSTITUENTS

	Number of Duplicate Pairs	Range of RPD	Mean of RPD
Chloromethane	ND	--	--
Chloroethane	ND	--	--
1,1-dichloroethane	1	33.	33.
Bromomethane	ND	--	--
Methylene chloride	ND	--	--
1,2-dichloroethene	2	0.0-42.	21.
Vinyl chloride	ND	--	--
1,1-dichloroethene	ND	--	--
Chloroform	ND	--	--
1,2-dichloroethane	ND	--	--
Bromodichloromethane	ND	--	--
Trichloroethene	3	18.-38.	27.
1,1,1-trichloroethane	1	25.	25.
1,2-dichloropropane	ND	--	--
Dibromochloromethane	ND	--	--
Carbon tetrachloride	ND	--	--
Trans-1,3-dichloropropene	ND	--	--
Cis-1,3-dichloropropene	ND	--	--
1,1,2-trichloroethane	ND	--	--
Bromoform	ND	--	--
Toluene	ND	--	--
Benzene	ND	--	--
1,1,2,2-tetrachloroethane	ND	--	--
Chlorobenzene	ND	--	--
2-chloroethylvinylether	ND	--	--
Tetrachloroethene	1	15.	15.
Ethyl benzene	ND	--	--
Acrolein	ND	--	--
Trichlorofluoromethane	ND	--	--
1,4-dichlorobenzene	ND	--	--
Total xylene	ND	--	--
Acrylonitrile	ND	--	--
1,3-dichlorobenzene	ND	--	--
2-butanone	ND	--	--
1,2-dichlorobenzene	ND	--	--

TABLE 7-15

SUMMARY OF CATION/ANION BALANCE CALCULATIONS

Sample Number		Cations*	% Difference Anions*	Cations-Anions
Dupl 1	11/17/86	10.7	11.8	-5.28
Dupl 2	11/17/86	10.3	10.1	+ 1.00
Dupl 3	11/17/86	12.7	16.6	- 13.1
3S	11/17/86	10.8	11.79	- 4.55
9S	11/17/86	10.7	11.1	- 1.76
15S	11/17/86	12.9	16.6	- 12.4
FMC 33	11/17/86	15.2	17.1	- 5.96
8-D	11/18/86	10.8	12.3	- 6.84
2-S	11/18/86	12.0	12.7	- 2.91
17-S	11/18/86	13.8	16.8	- 9.75
7-B	11/18/86	10.5	12.3	- 7.92
1 PC	11/18/86	8.42	8.33	+ 0.577
18-S	11/18/86	12.7	15.6	- 10.0
19-S	11/18/86	6.63	7.42	- 5.66
9-D	11/18/86	11.1	12.4	- 5.53
2-PC	11/19/86	4.35	4.55	- 2.28
3-PC	11/19/86	10.3	12.0	- 7.46
4-S	11/19/86	5.59	6.00	- 3.60
4-PC	11/19/86	9.18	8.58	+ 3.37
5-S	11/19/86	13.8	15.4	- 5.50
16-S	11/19/86	8.05	9.27	- 7.03
10-S	11/19/86	12.1	15.6	- 12.3
13-S	11/19/86	11.1	12.4	- 5.68
14-S	11/19/86	12.6	13.0	- 1.64
12-S	11/19/86	9.92	10.9	- 4.70
20-S	11/20/86	5.18	5.74	- 5.13
11-S	11/20/86	13.1	16.7	- 12.2
6-D	11/20/86	9.73	10.8	- 5.41
7-S	11/20/86	13.4	14.3	- 3.26
8-S	11/20/86	9.81	13.4	- 15.4
1-S	11/20/86	7.43	8.82	- 8.53
1-D	11/20/86	7.80	8.17	- 2.32
5-D	11/20/86	11.1	11.6	- 1.98
2-D	11/20/86	10.1	10.4	- 1.39
4-D	11/20/86	9.60	10.3	- 3.46
3-D	11/20/86	9.60	10.9	- 6.36
6-S	11/20/86	11.7	13.6	- 7.47

* Concentrations expressed at equivalents per liter.

More than 86 percent (32 of 37) of the samples exhibited ion balances within ± 10 percent. The highest imbalance was -15.4 percent (relative excess of anions over cations). The data is comparable to commercial and research laboratories and indicates that no large errors were made in the analysis of the major ions. However, there was a small systematic charge imbalance. The average charge imbalance was -5.67 percent. In 92 percent of the cases (34 of 37) reported, anions exceeded the cations. This is due to a systematic error in the analysis of one or more of the major ions measured or it is due to the presence of a cation which was not used in the calculation, but which contributes a small but significant charge to the sum. The remaining cations that were included in the laboratory analyses were not observed at concentrations great enough to change the charge balance.

Iron (in the +2 state) is often found in ground water under chemically reducing conditions; however, it was not analyzed in these samples. In order to make up the charge imbalance, an average of 15-20 mg/L Fe^{+2} is needed. Although this concentration is within the realm of possibility for ground water, it is not probable at the NIROP site. At concentrations of 15-20 mg/L Fe, it is likely that a brown or reddish-brown iron precipitate would have formed during sample handling, especially when filtering. The field personnel did not observe this phenomenon.

The recovery data for external QA samples of calcium and potassium show a consistent pattern of low recovery. For calcium, the average recovery is 93 percent (n = 4) at the WES laboratory. The blind interlaboratory duplicates of three filtered water samples also had

an average calcium concentration 11 percent higher in the MRD results than the measured concentrations at the WES lab. For potassium, the average recovery is 88 percent (n = 3). The potassium concentration in the NIROP samples is too small to have an impact on the charge balance. However, a 7 percent error in the calcium analysis could account for a significant portion of the charge imbalance.

There is no external QA data for the major anions (bicarbonate and sulfate). The charge imbalance was correlated against the anion concentrations in an attempt to determine if anions contributed the differences. The magnitude of the imbalance correlated positively with the sulfate concentration. This is consistent with a systematic error in the sulfate analysis.

Based on the limited information available, it is not possible to verify if low calcium recoveries or high sulfate data were generated at the WES lab. Recoveries for matrix spikes of calcium and sulfate averaged 101 percent. This would indicate that laboratory standards would have to be inaccurate to account for the inaccuracies in the calcium and sulfate measurements. In any case, the charge imbalance is not a serious enough problem to cause difficulties in interpreting the chemical data.

8. CONCLUSIONS

1. Thirty-four monitoring wells were sampled in accordance with procedures outlined in the A-E Field Quality Control and Sampling Plan for Ground Water Sampling (RMT, 1986a).

2. Field procedures were in conformance with the Sampling Plan, with the following exceptions:

   - Additional samples were collected and split with MPCA personnel from 12 wells.

   - Since the WES would not receive samples on Saturday, samples collected for nitrate analysis on the last sampling day were sent to the MRD laboratory in order to meet the 48-hour holding time.

   - Samples shipped to the WES for Monday delivery were received with melted ice and, thus, may have exceeded required temperature limits. Sample temperatures at time of receipt were unknown, therefore analyses proceeded as planned.

   - Repairs to well 8-S were found to be unnecessary to allow sampling. Well 8-S was repaired after the sampling was complete.

3. The QC review of the data indicated no significant sampling or analytical problems. The data generated can be used to evaluate environmental concerns at the NIROP.

4. Ground water elevations were higher than those obtained in September 1986; however, flow patterns were generally unchanged.

5. There were no temperature differences between ground water samples. pH was observed to increase with depth from 7.2 standard units to 7.8 standard units and SEC was observed to decrease with depth from 1020 to 800 umhos/cm.

6. Concentrations of sodium, magnesium, sulfate, and alkalinity were highest near the southwest corner of the building. These constituents apparently affect electrical conductivity which was also highest in the southwest area.

7. Areal distribution of elevated nitrate concentrations suggests a potential off-site source north and east of the NIROP.

8. Total trace inorganic constituent (unfiltered samples) concentrations were approximately the same as those detected in previous rounds. However, analyses for dissolved trace inorganic constituents (filtered samples) indicated that all trace inorganics except selenium (0.049 mg/l in well 9-S) were below MCLs and SMCLs.

9. TCE and its breakdown products (1,2 dichloroethene isomers) continued to be the most prevalent VOCs. Generally, areal distribution of TCE was similar to past sampling results with most concentrations remaining fairly consistent. However, TCE concentrations increased in wells 6-S, 8-S, and 8-D.

10. Several VOCs (tetrachloroethene, 1,1,1 trichloroethane, 1,1 dichlorothene, 1,2 dichloroethane, and ethyl benzene) decreased in concentration in wells where previously detected.

11. Several VOCs (chloroform, benzene, and methylene chloride) continued their trend of being detected at low concentrations. No apparent spatial or temporal trends were noted for these compounds.

12. Trichlorofluoromethane was detected for the first time during this sample round at a concentration of 0.0077 ug/l in well 2-PC. The significance of this single occurrence is not known.

13. In general, the conclusions drawn in the final Interim Report (RMT, 1987) remain unchanged.

9. RECOMMENDATIONS

A draft Conceptual Workplan for Remedial Investigation/Feasibility Study was prepared by RMT (1986c) to outline activities proposed for completion of the RI/FS at the NIROP. Proposed activities outlined in Section 2 of the draft Conceptual Workplan included two comprehensive rounds of ground water sampling. The November 1986 ground water sampling round, for which this report has been prepared, is the first result of the two recommended sampling rounds. The following recommendations have been prepared with emphasis on intended uses of ground water data as outlined in the draft Conceptual Workplan:

1. Discontinue analysis of metals (total or dissolved) in future sampling except where necessary for potential source identification.

2. Since distribution patterns of VOCs have remained the same over the last 4 years, it is recommended that a second comprehensive sampling round is not necessary at this time. However, selective sampling may be necessary in areas where trends may have reversed (6-S, 8-S, and 8-D); where source identification is necessary (9-S, 3-S, 15-S, 16-S); and, in critical areas near the Mississippi River (17-S, 7-D, 18-S, 8-D, 19-S, and 9-D).

3. Results of major ion analyses should be used to evaluate ground water chemistry between aquifers and in downgradient areas with possible emphasis on the impacts the building sewer system may have on ground water quality.

4. Results of sample data should be used to re-evaluate the incremental risk levels for the No-Action Alternative.

10. REFERENCES

Gibb, J.P., R.M. Schuller and R.A. Griffin. 1981. Procedures for the collection of representative water quality data from monitoring wells. Illinois State Water Survey-Illinois State Geological Survey Cooperative Ground Water Report 7.

RMT, Inc. 1986a. A-E quality control and sampling plan for ground water sampling at the Naval Industrial Reserve Ordnance Plant, Fridley, Minnesota. Prepared under modification No. P000001 to Contract No. DACA45-86-C-0015 for the U.S. Army Corps of Engineers. November 1986.

RMT, Inc. 1986b. Site-specific health and safety plan for ground water sampling at the Naval Industrial Reserve Ordnance Plant, Fridley, Minnesota. Prepared under Modification No. P000001 to Contract No. DACA45-86-C-0015 for the U.S. Army Corps of Engineers. November 1986.

RMT, Inc. 1987. Interim report for remedial investigation/feasibility study at Naval Industrial Reserve Ordnance Plant, Fridley, Minnesota. Prepared under Contract No. DACA45-86-C-0015 for the U.S. Army Corps of Engineers. May 1987.

RMT, Inc. 1986c. Draft conceptual workplan for remedial investigation/feasibility study at Naval Industrial Reserve Ordnance Plant, Fridley, Minnesota. Prepared under Contract No. DACA45-86-C-0015 for the U.S. Army Corps of Engineers. August 1986.

Scalf, M.R., J.F. McNabb, W.F. Dunlap, R.L. Crosby, and J. Fryberger. 1981. Manual of ground water sampling procedures. NWWA/EPA Series.

U.S. Army Corps of Engineers. Undated. A-E guidance for developing A-E quality management procedures for site investigative activities.

U.S. Environmental Protection Agency. 1976. Monitoring ground water quality: monitoring methodology. EPA/530/SW-611.

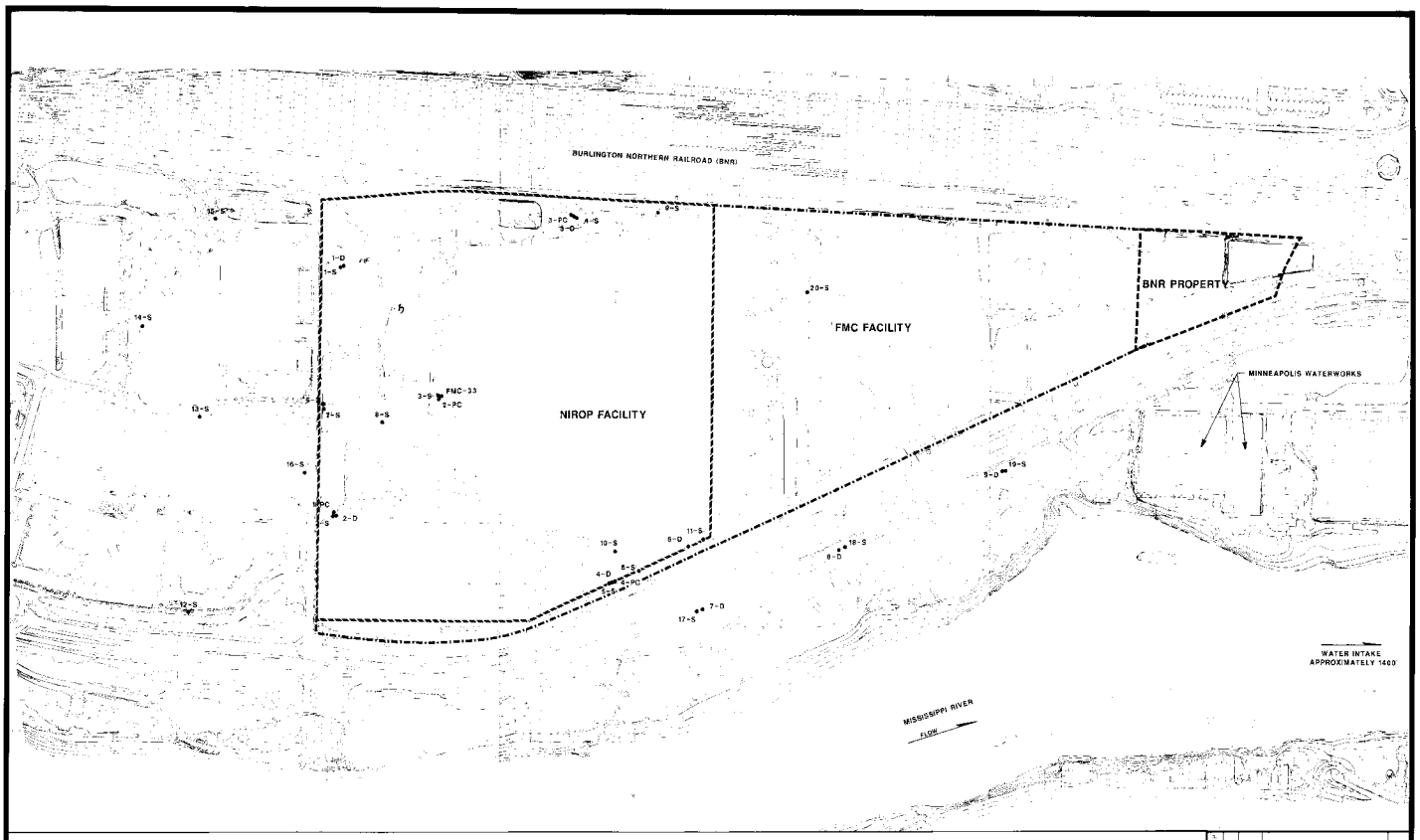
U.S. Environmental Protection Agency. 1981. The analysis of aromatic chemicals in water by the purge and trap method, method 503.1. EPA-600/4-81-057.

U.S. Environmental Protection Agency. 1982. Handbook for sampling and sample preservation of water and wastewater. EPA-600/4-82-029.

U.S. Environmental Protection Agency. 1979. Methods for chemical analysis of water and wastes. EPA-600/4-79-020.

U.S. Environmental Protection Agency. 1977. Procedures manual for ground water monitoring at solid waste disposal facilities. EPA/530/SW-611.

U.S. Environmental Protection Agency. 1985. RCRA ground water monitoring technical enforcement guidance document. Office of Waste Programs Enforcement Office of Solid Waste and Emergency Response. August 1985.



LEGEND

- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING 5' CONTOUR
- EXISTING 1' CONTOUR
- x 865 EXISTING SPOT ELEVATION
- TREES AND / OR BRUSH
- EDGE OF WATER
- WET AREA
- 16-S MONITORING WELL LOCATION
- NIROP PROPERTY LINE (APPROXIMATE)
- FMC PROPERTY LINE (APPROXIMATE)
- BNR PROPERTY LINE (APPROXIMATE)

SCALE 1" 200'

0 200 400 800 FEET

NO.	BY	DATE	REVISION	APPD
1.				
2.				
3.				

PROJECT: A-E QCSR
RI/FS AT NIROP
FRIDLEY, MINNESOTA

SHEET TITLE: MONITORING WELL LOCATIONS

DRAWN BY: BSZ	SCALE: 1" = 200'	PROJ. NO. 1120.09	
CHECKED BY:		DWG. NO.	
APPROVED BY:	DATE PRINTED:	SHEET OF	
DATE: 10/13/86			

RMT

PLATE 1

APPENDIX A

PROJECT DAILY LOG BOOK

Project Name	NIROP
Site Location	Fridley, MN
RMT Project No	1120.09
COE Contract No	DACA45-86-C-005
Date of Issue	Sept 10, 1986
Book Issued To	J. Christer

Project Name	NIROP
Site Location	Fridley, MN
RMT Project No	1120.09
COE Contract No	DACA45-86-C-005
Date of Issue	Sept 10, 1986
Book Issued To	J. Chrisler

2.3

	11-17-86		3-5			11-17-86		
	DTW			DTB				
	20.75 + .000 T/pipe			34.96 + .000 T/pipe		Sample:	10:58	
			2"					
Initial								
	pH	7.4						
	Cond	69x10						
	Temp	9°						
Purging				10:00 AM				
		pH	Cond	Temp			pH	Cond	T
1		7.3	65x10	9°			7.1	69x10	/
2		7.2	67x10	10°			7.1	69x10	/
3		7.1	69x10	10°					
4		7.2	67x10	9°			Sewer	odor,	Gr
5		7.2	67x10	9°					
							No	sulfide	
						Filtrate	11:04 Am		
Total Vol Purged			11.5	gals				No odor	
								No Turb.	

35.0

11-17-86 FMC-33

DTW DTB

21.07 75.58

4"

Intial

pH 8.3

Cond 252x1

Temp ~~252x1~~ JSC 11°

Purging:	pH	Cond	Temp 11:30 AM
1	7.3	81x10	10°
2	7.1	101x10	10°
3	7.1	102x10	10°
4	7.1	102x10	10°
5			

Total Vol purged 144 gals

11-17-86

Sample 12:40 pm

pH	Cond	T
7.1	99x10	
7.1	99x10	

Comments

Slight odor, pH 7

No sulfide

Filtered

2.2

	11-17-86		15-S		11-17-86		
	DTW		DTB		Sample	3:37 p	
	18.39 T/ppe		31.747/ppe				
Initial			2"				
	pH	7.3				pH	Cond 7
	Cond	69x10				7.0	93x10
	Temp	11°				7.0	93x10
Purging			2:56pm		Comments		
	pH	Cond	Temp			No odor, DK B	
1	7.2	91x10	11°				
2	7.0	95x10	11°			No Sulfide	
3	7.0	95x10	11°				
4	7.0	95x10	11°		Filtrate	3:	
5						No odor, No	
Total Vol purged			8.8 gals				
Comments							

1.3

11-17-86 9-S

DTW DTB

19.84 27.58

2"

Initial 1

pH 7.4

Cond 68x10

Temp 11°

Purging 1:26 pm

	pH	cond	Temp
1	7.3	70x10	12°
2	7.3	70x10	12°
3	7.2	74x10	12°
4	7.2	74x10	12°
5	7.2	73x10	12°

11-17-86

Sample 4:49 p

pH	Cond
7.2	71x10
7.2	71x10

Comments

No odor, Mild Bro

No Sulfide

Filtrate 4:58 p

No odor, No

120

11-18-86 1-PC

DTW DTB

20.77 192.85

~~[illegible]~~ 4"

Initial pH 7.4

Cond 63x10

Temp 11°

Purging 09:17AM (Sub pump)

10 gals/min

	pH	Cond	Temp
1	7.5	71x10	10°
2	7.3	71x10	9°
3	7.3	71x10	10°
4	7.3	71x10	10°
5	7.3	71x10	10°

Total Vol purged 600 gals

Comments

Sulfide odor, lt Gray, Slight [illegible]

11-18-86 1-PC

Sample 11:11 Am

pH	Cond	Temp
7.5	60x10	9°
7.6	60x10	9°

Comments

No odor, No color, No Turbidity

No sulfide

Filtrate 11:15 Am

No odor, No color

No Turbidity

[illegible] Chinda

2.2

11-18-86 2-S

DTW DTB

20.00 34.27

2"

Initial pH 7.1

cond 80x10

Temp 9°

Purging 9:44 am

	pH	Cond	Temp
1	7.1	79x10	9°
2	7.2	75x10	10°
3	7.1	78x10	10°
4	7.1	79x10	10°
5	7.1	79x10	10°

Total Vol purged 11.6 gals

Comments

No odor, Muddy Brown, very Turbid

11-18-86 2-S

Sample 10:30 am

pH	cond	Temp
7.0	78x10	10°
7.0	78x10	10°

Comments

No odor, Brown, Moderate Turbidity

No sulfide

Filtrate 10:36 am

No odor, No color

No Turbidity

11-18-86 7-D

DTW DTB
28.45 110.46

4"

Initial

pH 8.0
cond 59 x10
Temp 12°

Purging (Subpump) 12:51 pm

	pH	Cond	Temp
1	7.8	69x10	10°
2	7.6	78x10	11°
3	7.5	79x10	11°
4	7.4	82x10	10°
5	7.5	82x10	10°

Total Vol purged 270 gals

Comments

No odor, No color No Turbidity

Sara Chrisl

11-18-86 7-D

Sample 2:15 pm

pH	Cond	Temp
7.4	79x10	11°
7.4	79x10	11°

Comments

No odor, No color, No Turbidity

No sulfide

Filtrate 2:20 pm

No odor, No color, No Turbidity

Sara Chrisl

11-18-86 17-S

DTW DTB
23.40 38.29
2"

Inital

pH 7.2
Cond 101x10
Temp 12°

Purging 1:12 p

	pH	Cond	Temp
1	7.2	102x10	11°
2	7.1	107x10	12°
3	6.9	107x10	12°
4	7.0	104x10	12°
5	7.0	104x10	12°

Total Vol purged 13 gals

Comments
No odor, Lt Tan, Slight Turbidity

JSC

11-18-86 17-S

Sample 1:44 p

pH	Cond	Temp
7.0	104x10	11°
7.0	104x10	11°

Comments
~~Alec~~ JSC
No odor, Lt Tan, Slight Turbidity

No Sulfide

Filtrate 1:52 p

No color, No odor, No Turbidity

11-18-86 18-S

DTW DTB

25.20 39.90

2"

Initial

pH	7.4
Cond	92x10
Temp	11°

purging

	pH	Cond	Temp
1	7.4	83x10	11°
2	7.4	89x10	10°
3	7.4	90x10	10°
4	7.4	95x10	10°
5			

TOT VOL. PURGED 16 gal

COMMENTS: DARK BROWN, NO ODOR, VERY TURBID

Joe Christie

11-18-86 18-S

SAMPLE 4:05 pm

pH	Cond.	Temp
7.5	90x10	10°
7.5	90x10	10°

COMMENTS: NO COLOR, NO ODOR, NO TURBIDITY

No sulfide

FILTRATE 4:13 pm

COMMENTS: NO COLOR, NO ODOR, NO TURBIDITY

Joe Christie

11-18-86 8-D

DTW DTB

25.12 127.65

41

Initial

pH	~~45x1~~ JSC	8.9
cond.	459x1	
Temp	11°	

purging (Sub pump) 2:50 p

	pH	Cond	Temp
1	7.9	75x10	11°
2	7.5	79x10	11°
3	7.5	80x10	11°
4	7.4	79x10	11°
5			

Total Vol purged 270 gals

comments

Sulfide odor, Lt Tan-Gray

Slight Turbidity

TOTAL VOLUME PURGED:

11-18-86 8-D

Sample 4:40

pH	COND.	Temp
7.5	75x10	11°
7.5	75x10	11°

COMMENTS

NO ODOR, NO COLOR,

NO TURBIDITY

No sulfide

FILTRATE 4:55 p

COMMENTS: NO COLOR,

NO ODOR, NO TURBIDITY

[illegible signature]

Weather

11-17-86

9:30 am 22° 8 mph Wind N

4:25 pm Slight N wind

11-18-86

8:30 22° Sunny 5 mph Wind N-NW

11-19-86

7:15 21° overcast 20 mph S

12:30 27° Snow 20 mph S

5:30 27° Snow 5-10 mph S-SE

11-20-86

7:00 am 20° overcast 25 mph NW

Wind decreased after 1:00 pm

Lt winds 7:30 pm 18°

Air Monitoring Data

11-17-86

Well	Reading	
3S	2.0	Backgrd
	2.0	Before Purging
	2.0	During Purging
FMC-33	2.1	Backgrd
	2.1	Before Purging
	2.1	During Purging
15-S	2.2	Backgrd
	2.2	Before Purging
	2.2	During Purging
9-S	1.4	Backgrd
	1.4	Before Purging
	0.0	During Purging

AIR MONITORING DATA

11-18-86

WELL	READING	
1-PC	0.0	BACKGROUND
	0.0	BEFORE PURGE
	0.0	During purge
2-S	0.0	Backgrd
	0.0	Before Purge
	0.0	During Purge
7-D	0.2	Backgrd
	0.2	Before Purge
	0.2	During Purging
17-S	0.2	Backgrd
	0.2	Before Purge
	0.2	During purge

AIR MONITORING

WELL	READING		11-19-86
2-PC	0.2	Backgr	
	0.2	Before Purge	
	0.2	During Purge	
3 PC	0.2	BACKGROUND	
	0.2	BEFORE PURGE	
	0.2	DURING PURGE	
4-S	0.2	BACKGROUND	
	0.2	BEFORE PURGE	
	0.2	DURING PURGE	
4-PC	0.1	BACKGROUND	
	0.1	BEFORE PURGE	
	0.1	DURING PURGE	
5-S	0.1	BACKGROUND	
	0.1	BEFORE PURGE	
	0.1	DURING PURGE	

Air Monitoring

11-18-86

Well	Reading	
18-S	0.0	Backgrd
	0.0	Before Purge
	0.0	During Purge
8-D	0.0	Backgrd
	0.0	Before Purge
	0.0	During Purge
9-D	0.2	Backgrd
	0.2	Before Purge
	0.2	During Purge
19-S	0.2	Backgrd
	0.2	Before Purge
	0.2	During Purge

AIR MONITORING

WELL	READING	11-19-86
2-PC	0.2	Backgr
	0.2	Before Purge
	0.2	During Purge
3 PC	0.2	BACKGROUND
	0.2	BEFORE PURGE
	0.2	DURING PURGE
4-S	0.2	BACKGROUND
	0.2	BEFORE PURGE
	0.2	DURING PURGE
4-PC	0.1	BACKGROUND
	0.1	BEFORE PURGE
	0.1	DURING PURGE
5-S	0.1	BACKGROUND
	0.1	BEFORE PURGE
	0.1	DURING PURGE

AIR MONITORING

11-19-96

WELL	READING	
16-S	0.1	BACKGROUND
	0.1	BEFORE PURGE
	0.1	DURING PURGE
10-S	0.2	BACKGROUND
	0.2	BEFORE PURGE
	0.2	DURING PURGE
13-S	0.1	Backgrd
	0.1	Before purge
	0.1	During purge
12-S	0.2	Backgrd
	0.2	Before purge
	0.2	During purge
14-S	0.2	Backgrd
	0.2	Before purge
	0.3	During purge

AIR MONITORING

11-20-90

WELL	READING
20S	0.1 BACKGROUND
	0.0 BEFORE PURGE
	0.2 DURING PURGE
11-S	0.1 Backgrd
	0.2 Before Purge
	0.0 During Purge
6-D	0.1 Backgrd
	0.2 Before Purge
	0.1 During Purge
7-S	0.1 Backgrd
	0.1 Before purge
	0.1 During purge

A.R MONITORING

11:20 96

WELL		READING		
8 S			0.1	BACKGROUND
			0.2	BEFORE PURGE
			0.2	During Purge
1-S			0.1	Background
			0.1	Before Purge
			0.2	During Purge
1-D			0.2	Background
			0.2	Before Purge
			0.2	During Purge
~~7-D~~	KPR 5-D		0.1	BACKGROUND
			0.2	BEFORE PURGE
			0.2	DURING PURGE
4-D			0.3	Background
			0.3	Before Purge
			0.3	During Purge

AIR MONITORING

11-20-86

WELL	READING	
2-D	0.2	BACKGROUND
	0.2	BEFORE PURGE
	0.2	During Purge
3-D	0.2	Backgnd
	0.3	Before Purge
	0.2	During Purge
6-S	0.1	BACKGROUND
	0.1	BEFORE PURGE
	0.1	DURING PURGE

Equip Logs

11-17-86

pH meter S/N 083471

9:00 AM 7, 4, 10.1 OK

3:00 PM 7, 4, 10.1 OK

6:30 pm 7, 4, 10.1 OK

Conduct. Meter S/N 12288

9:00 AM Cal.brate* OK

3:00 pm Calibrate* OK

6:30 pm Calibrate* OK

HNU

9:15 AM Span 9.80 Batt OK

3:00 pm Span -9.80 OK

4:15 pm Span -9.80 OK

* Red line, check using KCl Standard

EQUIP. LOGS

11-19-86

pH METER S/N 08347/

8:50am 4,7,10 OK

12:15pm 4,7,10 OK

6:50pm 4,7,10 OK

CONDUCT. METER S/N 12288

8:50AM cal. OK

12:15pm Cal. OK

6:50pm cal. OK

H/M4

8:53am SPAN: 9.5 / BATT: OK

12:15pm Span 9.8 / Batt - OK

6:50pm Span 9.8 / Batt - OK

Equip Logs

11-19-86

pH meter S/N 083471

7:15AM 4,7,10 OK

1:30pm 4,7,10 OK

8.00pm 4,7,10 OK

Conduct meter S/N 12288

7:15AM OK Cal.

1.30pm OK Cal.

8:00pm OK Cal.

HNU

7:15 Span 9.8 Batt-OK

1:30pm Span 9.8 Batt-OK

8:00pm Span 9.8 Batt-OK

Equip Logs

11-20-86 & 11-21-86

pH meter S/N 083471

7:00Am 4,7,10 OK

1:40 Pm 4,7,10 OK

12:55 Am 4,7,10 OK

Cond. meter S/N 12288

7:00Am OK cal.

1:40 Pm OK cal.

12:55 Am OK cal

HNU

7:00AM Span 9.8 Batt OK

1:40 Pm SPAN 9.8 BATT OK

12:55AM Span 9.8 Batt OK

11-20-86

Lonna Reilke MPCA arrived onsite to do Sampling (Split) 8:30AM Went to Lunch then She left site 1:30 pm after Check 8-5

11-17-86

1. Arrived on site 7:30AM
2. Met w/ Mel
3. Unloaded Sub into Classroom 1
4. Left Bldg to begin Sampling
5. Lunch at 12:55 - 1:00
6. Finished Sampling 6:30
7. Packed coolers - left site at 8:45 pm

11-18-86

1. Arrived on site 7:30 Am
2. Began Sampling @ 9:00 Am Met w/ Army Corp 9:19 Am
3. Lunch 11:30 - 12:15
4. Sampling off site 12:15
5. 12:51 MPCA arrived to Split Samples
6. 1:15 Army Corp arrived to observe

(7) ARmy corps
left site 4:00pm
(8) MPCA
left site 5:45pm. Left
VOC vials for RMT to fill 9D, 19S
(9) Finished sampling, packed
bottles left site 7:45pm

11-19-86

(1) Arrived on site 7:15am
(2) lunch & call RMT
1:00 CAK TEK
(3) Back to site 2:00
Split 16S, 10S MPCA
(4) Left site 8:30

11-20-86

(1) Arrived on Site 7:00 Am
(2) Lunch 12:00 w/ MPCA Rep
(3) 12:49, 2:20, 4:10 call RMT
TEK re: 8-S repair
(4) Left Site 1:00 Am (11-21)

11-21-86

(1) Arrived on Site 7:00 to Pack Equip &
Sub. Left Site ~ 8:30 am Returned RMT

Visitors

11-17-86

Lonna Beilke from MPCA
arrived at 9:30-9:45
Left Voc vials w/ RMT
4 Voc vials per well

11-18-86 Lonna Beilke MPCA
arrived at 12:55 15-5 a 9-5
were used for Split Sampling

Lonna Beilke left at
5:00 pm

Tommy from Army
Corps to observe. She left
at 11:20

11-19-86

Lonna Beilke MPCA arrive
at Site at 1:30 Split samples 16-5 10-5
left Site at 4:46

11-18-86 19.5

DTW DTB

29.48 41.58

2"

INITAL

pH: 7.4

COND: 440 x1

TEMP: 10°C

PURGING: 5:53 pm

	pH	COND	TEMP
1	7.3	485 x1	9°
2	7.5	50 x10	10°
3	7.6	50 x10	10°
4	7.5	30 x10	10°
5			

TOTAL VOLUME PURGED 10 gl.

N

Comments

No odor, Brown Very Turbid

Jeff Chinde

11-18-86 19.5

SAMPLE 6:35 pm

pH	COND	TEMP
7.5	54 x10	10°
7.5	54 x10	10°

Comments

No odor, Lt Brown, Slight-moderate Turbidity

No Sulfide

Filtrate 6:40 pm

No Odor, No Color, No Turbidity

Well located near highway

Vehicle emissions noticeable

Jeff Chinde

60

11-18-86 9-D

DTW DTB

29.60 123.61

4"

Intial

pH 7.8

Cond 61x10

Temp 11°

Purging (sub pump) 5:30 p

	pH	Cond	Temp
1	7.6	75x10	11°
2	7.5	70x10	11°
3	7.5	70x10	11°
4	7.5	70x10	11°
5			

Total Vol purged ~ 240 gal

Comments: LIGHT TAN, SLIGHTLY TURBID, NO ODOR

11-18-86 9-D

SAMPLE 6:45 p

pH	COND	TEMP
7.5	78x10	11°
7.5	78x10	11°

COMMENTS: NO COLOR, NO ODOR, NO TURBIDITY

No sulfide

FILTRATE 6:50 p

COMMENTS: NO COLOR, NO ODOR, NO TURBIDITY

Well located near Highway

Vehicle emissions noticeable

JGO Chmiele

11-19-86 13-5

DTW DTB
18.34 33.48
2"

Initial

pH	7.2
Cond	75x10
Temp	11°

Purging 6:14pm

	pH	Cond	Temp
1	7.2	79x10	11°
2	7.3	79x10	11°
3	7.3	79x10	11°
4			
5			

Total Vol purged 7.3 gals

Comments

No odor, DK Brown, Moderate Turbidity

Deep Creek

11-19-86 13-5

Sample 6:29pm

pH	Cond	Temp
7.2	78x10	11°
7.3	78x10	11°

Comments: BROWN, NO ODOR
TURBIDITY MODERATE

No sulfide

Filtrate: 6:33 pm

COMMENTS, IVU COLOR,
NO ODOR, NO TURBIDITY

Jeff Chmielk

11-19-86 2-PC

DTW DTB

21.70 ~~161.83~~ ~~142.95~~ 161.83

4'

Initial

pH 10.1

cond 373x'

Temp 10°

During (Subpump) 7:30 AM

	pH	Cond	Temp
1	9.3	~~373x'~~ 53x10	10°
2	8.2	69x10	10°
3	7.6	68x10	11°
4	7.5	69x10	11°
5	7.5	69x10	11°

Total Vol purged 500 gals

Comments

No odor, No color No Turbidity

Jeff Chinch

11-19-86 2-PC

Sample 8:35 AM

	pH	Cond	Temp
	8.4	361x'	11°
8.5	~~8.5~~	361x'	11°

Comments

No odor, Very LT Tan, Very Slight Turbidity

No Sulfide

Filtrate 8:40 AM

No odor, No color, No Turbidity

Jeff Chinch

11-19-86 3-PC

DTW DTB

22.81 158.59

4"

INITIAL

pH 7.5

COND 55 x10

TEMP 11°

PURGING (Sub pump) 9.12 Am

	pH	COND.	TEMP
1	7.5	80 x10	10°
2	7.5	80 x10	10°
3	7.5	80 x10	10°
4			
5			

TOTAL VOLUME PURGED: 270 gal

COMMENTS: NO COLOR, NO ODOR, NO TURBIDITY

Jeo Chinle

11-19-86 3-PC

SAMPLE 10:10 Am

pH	COND	TEMP
7.5	80 x10	10°
7.5	80 x10	10°

COMMENTS: NO COLOR, NO ODOR, NO TURBIDITY

No Sulfide

FILTRATE: 10:15 Am

COMMENTS: NO COLOR, NO ODOR, NO TURBIDITY

Jeo Chinle

11-19-86 4-5

DTW DTB

21.00 33.94

2"

INITIAL

pH 7.6

COND 430 x'

TEMP 11°

PURGING 9:35 AM

	pH	COND	TEMP
1	7.5	460 x'	11°
2	7.5	470 x'	11°
3	7.5	440 x'	11°
4	7.5	450 x'	11°
5	7.5	450 x'	11°

TOTAL VOLUME PURGED: 11 gals

COMMENTS; BROWN, NO ODOR, VERY TURBID

JEB Chinda

11-19-86
~~8-19-86~~ KPR 4-5

SAMPLE 10:22 AM

pH	COND	TEMP
7.5	450 x'	11°
7.5	450 x'	11°

COMMENTS: BROWN, NO ODOR, VERY TURBID

No sulfide

FILTRATE: 10:26 AM

COMMENTS: NO COLOR, NO ODOR NO TURBIDITY, FILTERS SLOW

JEB Chinda

11-19-86 4-PC

DTW DTB

18.78 161.20

4"

INITIAL

pH 7.5

COND 80 x 10

TEMP 10°

PURGING: (Sub pump) 10:48 am

	pH	COND	TEMP
1	7.5	70 x 10	10°
2	7.4	70 x 10	10°
3	7.4	70 x 10	10°
4			
5			

TOTAL VOLUME PURGED: 280 gals

COMMENTS: LIGHT GREY, SEWER ODOR, SLIGHTLY TURBID

Jeff Christe

11-19-86 4-PC

SAMPLE 12:08 pm

pH 7.6 7.6

COND 71 x 10 71 x 10

TEMP 11°

COMMENTS

Slight sewer odor, very Lt Grey-Tan

very slight Turbidity

No sulfide

FILTRATE 12:12 pm

COMMENTS

No odor, No color, No Turbidity

Jeff Christe

11-19-86 5-S

DTW DTB
19.97 33.87
2"

INITIAL
pH 7.1
COND 100x10
TEMP 10°

PURGING: 11:05am

	pH	COND	TEMP
1	7.0	100x10	10°
2	7.0	100x10	10°
3	7.0	100x10	10°
4			
5			

TOTAL VOLUME PURGED: 6.8gals

COMMENTS
No odor, DK Brown, Very turbid

Jeff Christie

11-19-86 5-S

SAMPLE 12:30 pm

pH	COND	TEMP
7.0	101x10	11°
7.0	101x10	11°

COMMENTS
No odor, DK Brown, Moderate - very Turbid

No Sulfide

Filtrate 12:34pm

No odor, No color, No Turbidity

Jeff Christie

11-19-86 16-5

DTW DTB
21.00 35.76
2"

INITIAL
pH 7.7
COND 55 x10
TEMP 10°

PURGING: 2:58 p.m.

	pH	COND	TEMP
1	7.0	60 x10	10°
2	7.0	60 x10	10°
3	7.1	60 x10	10°
4			
5			

TOTAL VOLUME PURGED: 7.2 gal
COMMENTS: LIGHT GREY, NO ODOR, SLIGHTLY TURBID.
Jeff Christ

11-19-86 16-5

SAMPLE: 3:15 p.m.

pH	COND	TEMP
7.1	60 x10	10°
7.1	60 x10	10°

COMMENTS: NO COLOR, NO ODOR, VERY SLIGHTLY TURBID
No sulfide

FILTRATE 3:24 p.m.
COMMENTS: NO COLOR, NO ODOR, NO TURBIDITY

Jeff Christ

11-19-86 10.5

DTW DTB
20.58 30.86
2"

INITIAL
pH 7.2
COND 87X10
TEMP 11°

PURGING 4:00 pm

	pH	COND	TEMP.
1.	7.1	90X10	11°
2	7.1	90X10	11°
3	7.1	90X10	11°
4			
5			

TOTAL VOLUME PURGED: 5 gal gals

COMMENTS
No odor, DK Brown, very Turbid

Jeff Chinik

11-19-86 10.5

SAMPLE: 4:40 pm

pH	COND	TEMP
7.0	90X10	15°
7.0	90X10	10°

COMMENTS:
No odor, DK Brown, very Turbid

No sulfide

FILTRATE 4:46 pm

COMMENTS:
No odor, No color, No Turbidity

Jeff Chinik

11-19-86 14-S

DTW DTB
19.74 34.10
2"

INITIAL
pH 7.2
COND 90x10
TEMP 10°

PURGING 642 pm

	pH	COND	TEMP
1	7.1	90x10	10°
2	7.1	90x10	10°
3	7.1	90x10	10°
4			
5			

TOTAL VOLUME PURGED 7 gals
COMMENTS: BROWN, NO ODOR, TURBIDITY MODERATE
JCC

11-19-86 14-S

SAMPLE 659 pm

pH	COND	TEMP
7.1	90x10	10°
7.1	90x10	10°

COMMENTS: BROWN, NO ODOR, TURBIDITY SLIGHT
No sulfide
FILTRATE: 7:03 pm
COMMENTS: NO COLOR, NO ODOR, NO TURBIDITY
DIESEL EXHAUST ODOR AT WELL FROM SEMI ~100 YDS AWAY - CROSS WIND
JCC

11-19-86	12-5
DTW	DTB
22.32	35.45
2"	

Intial

pH	7.5
cond	71x10
Temp	10°

Purging 7:57 pm

	pH	cond	Temp
1	7.5	70x10	11°
2	7.4	70x10	11°
3	7.4	74x10	11°
4	7.4	73x10	11°
5	7.4	73x10	11°

Total Vol purged 11 gals

Comments

No odor, DK Brown, moderate Turbidity

Joe Chinler

11-19-86	12-5
Sample	7:50 pm

pH	Cond	Temp
7.4	73x10	11°
7.4	73x10	11°

Comments

No odor, DK Brown Turbidity moderate

No sulfide

Filtrate 7:55 pm

No odor, No color, No Turbidity

Joe Chinler

11-20-86 20.5

DTW DTB
21.35 34.93
2"

INITIAL
pH 8.5
COND 220 x1
TEMP 13°

PURGING 7:46 am

	pH	COND	TEMP
1	7.6	410 x1	12°
2	7.6	415 x1	13°
3	7.6	430 x1	13°
4	7.6	430 x1	13°
5	7.5	430 x1	13°

TOTAL VOLUME PURGED: 11 gals
COMMENTS: BROWN, NO ODOR, VERY TURBID
Joe Christe

11-20-86 20.5

SAMPLE 8:14 AM

pH	COND	TEMP
7.5	410 x1	12°
7.5	410 x1	12°

COMMENTS: BROWN, TURBIDITY MODERATE, NO ODOR
No sulfide
FILTRATE: 8:18 AM
COMMENTS: NO COLOR, NO ODOR, NO TURBIDITY

.8

11-20-86 11-5

DTW DTB

25.97 31.00

2"

Intial

	pH	Cond	Temp
	7.4	89×10	12°

Purging 9:19 Am

	pH	Cond	Temp
1	7.4	99×10	14°
2	7.2	107×10	14°
3	7.2	105×10	14°
4	7.2	108×10	14°
5	7.2	108×10	14°

Total Vol Purged 4.0 gals

Comments

No odor, Dk Muddy Brown, Very Turbid

* Large amt of sediment present

11-20-86 11-5

Sample 9:37 Am

pH	Cond	Temp
7.2	100×10	12°
7.2	100×10	12°

Comments

No odor, Muddy Brown, Very Turbid

Mosulfide

Filtrate 9:42 Am

No odor, No color, No Turbidity

JCC

17

11-20-86 6-D

DTW DTB

25.81 129.75

21

Intial

pH 7.4

cond 68x10

Temp 130

Purge 9:58 am

	pH	Cond	Temp
1	7.5	70x10	12°
2	7.5	70x10	120
3	7.5	70x10	11.5°
4			
5			

Total Vol purged 51 gals

Comments

No odor, Brown, very Turbid

Slight oily Film

Jeff Chmiel

11-20-86 6-D

SAMPLE 10:45 am

pH	COND	TEMP
7.5	70x10	11°
7.5	70x10	11°

COMMENTS:

No odor, Brown Moderate - very Turbid

Slight Oily Film

No Sulfide

FILTRATE 10:50 Am

No color, No odor, No Turbidity

Jeff Chmiel

1.6

11-20-86 7-5

DTW DTB

19.80 29.34

2"

Intial

pH 7.0

Cond 70 x10

Temp 11°

Purge 11:12 Am

	pH	Cond	Temp
1	7.0	70 x10	10°
2	7.0	85 x10	10°
3	7.1	90 x10	10°
4	7.1	90 x10	10°
5	7.1	90 x10	10°

Total Vol purged 7.8 gals

Comments: DARK BROWN, NO ODOR, VERY TURBID

JCC Chinale

11-20-86 7-5

Sample 11:29 Am

pH	Cond	Temp
7.1	90 x10	10°
7.0	90 x10	10°

Comments: DARK BROWN, NO ODOR, VERY TURBID

No sulfide

Filtrate: 11:33 Am

COMMENTS: NO COLOR, NO ODOR, NO TURBIDITY

JCC Chinale

1:16

11-20-86 | 8-5 ~~8-5~~ JSC

DTW 19.69 | DTB 29.51

2"

INITIAL

pH 6.8

COND 75 x10

TEMP 10°

PURGING 1:41P

	pH	COND	TEMP
1	6.9	75 x10	10°
2	6.9	75 x10	10°
3	6.9	75 x10	10°
4			
5			

TOTAL VOLUME PURGED: 4.8 gals

COMMENTS: BROWN, NO ODOR, VERY TURBID. WELL BENT @ ~4' - TEFLON BAILER WOULD PASS BEND EASLY

Jeff Chinula

11-20-86 | 8-5

SAMPLE: 2:02 pm

pH	COND	TEMP
6.9	75 x10	10°
6.9	75 x10	10°

COMMENTS: BROWN, NO ODOR, VERY TURBID

No sulfide

FILTRATE: 2:06 pm

NO COLOR, NO ODOR, NO TURBIDITY

Jeff Chinula

2.

11-20-86 1-S

DTW DTB
20.89 34.63
2"

Initial

	pH	Cond	Temp
	7.4	54x10	10°

Purge 5:05 pm

	pH	Cond	Temp
1	7.2	60x10	11°
2	7.2	57x10	11°
3	7.2	60x10	11°
4			
5			

Total Vol purged 6.7 gals

Comments Large amt. of Sediment
Sulfide - Sewer odor, Muddy DK Brown
Very Turbid

Jeff Chmielk

11-20-86 1-S

Sample 5:30 pm

pH	Cond	Temp
7.1	60x10	11°
7.1	60x10	11°

Comments
Sewer odor, Muddy DK Brown, very Turbid

No sulfide

Filtrate 5:35 pm
No odor, No color, No Turbidity

Diesel Truck Exhaust noticeable

Jeff Chmielk

11-20-86 1-D

DTW DTB

20.65 114.87

2"

Initial

pH	7.6	~~6~~
Cond	52x10	52
Temp	11°	

Purge 6:20 pm

	pH	Cond	Temp
1	7.6	52x10	10°
2	7.6	52x10	10°
3	7.6	52x10	10°
4			
5			

Total Vol purged 46.1 gals

Comments

Sulfide odor, Brown, very Turbid

Jeff Christe

11-20-86 1-D

Sample 6:47 pm

pH	Cond	Temp
7.6	52x10	10°
7.6	52x10	10°

Comments: Brown, No odor, moderately turbid

No sulfide

Filtrate 6:53 pm

No color, no odor, no turbidity

Jeff Christe

11-20-86 5-D

DTW DTB

19.88 116.05

2"

INITIAL

pH 7.6

COND 60x10

TEMP 10°

PURGING 7:14 pm

	pH	COND	TEMP
1	7.8	60x10	10°
2	7.6	70x10	10°
3	7.6	71x10	10°
4	7.6	71x10	10°
5	7.6	71x10	10°

TOTAL VOLUME PURGED: 78.4 gal

COMMENTS:

Sulfide odor, DARK BROWN, VERY TURBID

Jeff Christe

11-20-86 5-D

Sample 7:45 pm

pH	Cond	Temp
7.6	71x10	10°
7.6	71x10	10°

Comments: DARK BROWN, Sulfide ODOR, VERY TURBID

No sulfide

Filtrate 7:47 pm

No COLOR, NO ODOR, NO TURBIDITY

FILTERS SLOW

Jeff Christe

11-20-86 2-D

DTW DTB

19.92 111.86

2"

INITIAL

pH 7.8

COND 60^{x10}

TEMP 10°

PURGING 8:06 P

	pH	COND	TEMP
1	~~7.8~~ 7.7	64^{x10}	10°
2	7.7	64^{x10}	10°
3	7.7	64^{x10}	10°
4			
5			

TOTAL VOLUME PURGED 45 gal

COMMENTS: DARK GREY, SULFIDE ODOR, VERY TURBID

Joe Chinde

11-20-86 2-D

SAMPLE 8:39 P

pH	Cond	Temp
7.7	64^{x10}	10°
7.7	65^{x10}	10°

Comments: LIGHT GREY, NO ODOR, SLIGHTLY TURBID

No sulfide

Filtrate 8:44 P

NO COLOR, NO ODOR, NO TURBIDITY

Joe Chinde

11-20-86 4-D

DTW	DTB
25.12	120.38

2"

Initial

pH	11.7
Cond	70x10
Temp	10°

Purge 9:38 pm

	pH	Cond	Temp
1	11.9	100x10	10°
2	8.3	69x10	10°
3	7.4	69x10	10°
4	7.5	69x10	10°
5	7.5	68x10	10°

Total Vol purged 77.6 gals

Comments

Slight odor, Brown, Moderate Turbidity

Possable joint open

@ ~21'. Bailer hangs up.

11-20-86 4-D

Sample 10:30 pm

pH	Cond	Temp
7.4	65x10	10°
7.4	65x10	10°

Comments

No odor, Lt Brown, Moderate Turbidity

No sulfide

Filtrate 10:34 pm

No odor, No color, No Turbidity

Filters slow

11-20-86 3-D

DTW DTB

21.91 79.95

2"

Intial

pH	10.0	
Cond	430x1	
Temp	11°	

Purge 10:50pm

	pH	Cond	Temp
1	11.0	50x10	10°
2	8.0	70x10	10°
3	7.5	70x10	10°
4	7.4	72x10	10°
5	7.3	72x10	10°

Total Vol purged 47.3 gals

Comments

Waste oil odor, Grey, very Turbid
(petroleum)

Joe Chinda

11-20-86 3-D

Sample 11:27pm

pH	Cond	Temp
7.2	71x10	10°
7.2	71x10	10°

Comments

Slight odor, Tan-Grey, very Turbid

No Sulfide

Filtrate: 11:32pm

No odor, No color, No Turbidity

Filters very slow

Joe Chinda

11-20-86 6-5

DTW DTB

JSC ~~28.60~~ 20.86 34.55

Intial

pH 7.1

Cond 90x10

Temp 10°

11:39

Purge ~~11:49~~ JSC pm

	pH	Cond	Temp
1	7.0	95x10	11°
2	7.0	95x10	11°
3	7.0	95x10	11°
4			
5			

Total Vol purged : 6.7 gals

Comments

Organics odor, DK Brown, very Turbid

Jeff Chinle

11-20-86 6-5

Sample 11:50 pm

pH	Cond	Temp
6.9	91 x10	10°
6.9	91 x10	10°

Comments:

Slight odor, DK Brown, very Turbid

No sulfide

Filtrate 11:54 pm

COMMENTS: NO COLOR, NO ODOR, NO TURBIDITY, FILTERS VERY SLOW

Jeff Chinle

APPENDIX B

SUMMARY OF CONSTITUENTS DETECTED BY WELL AS REPORTED BY WES

Summary of Constituents Detected by Well
As Reported by WES

1120.07 Fridley/NIROP Water Quality Data

Concentration mg/l

Date	Parameter	1-S	1-D	1-PC	2-S	2-D	2-PC	3-S	3-D	3-PC	4-S	4-D	4-PC	5-S	5-D	6-S	6-D	7-S
Nov-86	Arsenic, Total							< 0.005										
Nov-86	Cadmium, Total							0.0014										
Nov-86	Chromium, Total							0.009										
Nov-86	Copper, Total							0.024										
Nov-86	Lead, Total							0.171										
Nov-86	Manganese, Total							1.56										
Nov-86	Mercury, Total							< 0.0004										
Nov-86	Nickel, Total							0.018										
Nov-86	Silver, Total							0.001										
Nov-86	Zinc, Total							1.52										
Nov-86	TOC																	
Nov-86	PCB 1242																	
Nov-86	PCB 1248																	
Nov-86	PCB 1254																	
Nov-86	PCB 1260																	
Nov-86	Methylene Chloride	0.013	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	1,1-Dichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	1,1-Dichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.019	< 0.005	< 0.005
Nov-86	Trans 1,2-Dichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.29	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.58	< 0.005	< 0.005
Nov-86	1,1,1-Trichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.12	< 0.005	0.0051
Nov-86	Trichloroethene	< 0.005	< 0.005	< 0.005	0.065	0.0092	0.0053	0.88	0.012	< 0.005	0.019	< 0.005	< 0.005	< 0.005	0.05	7.8	0.011	0.17
Nov-86	Benzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Tetrachloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.23	< 0.005	< 0.005
Nov-86	Toluene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Ethylbenzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Chloroform	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Bis(2ethylhexyl)Phthalate																	
Nov-86	Cis 1,2-Dichloroethene(et	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.29	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.58	< 0.005	< 0.005
Nov-86																		
Nov-86	Selenium, Total							< 0.005										
Nov-86	Barium, Total							0.088										
Nov-86	Calcium, Total							169										
Nov-86	Arsenic, Diss.	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Cadmium, Diss.	< 0.0001	< 0.0004	0.0008	0.0006	0.0004	0.0005	0.0003	0.0004	0.0005	0.0006	0.0002	0.0005	0.0009	< 0.0001	0.0004	< 0.0001	0.0008
Nov-86	Chromium, Diss.	0.005	0.002	0.002	0.003	0.001	0.002	0.003	0.001	0.002	0.002	0.001	< 0.001	0.002	0.002	< 0.001	< 0.001	0.002
Nov-86	Copper, Diss.	0.004	< 0.001	0.005	0.008	< 0.001	0.003	0.003	0.006	0.003	0.009	< 0.001	0.002	0.004	< 0.001	< 0.001	0.009	0.003
Nov-86	Lead, Diss.	< 0.001	< 0.001	0.002	0.001	< 0.001	0.003	0.002	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	0.003	0.002
Nov-86	Mercury, Diss.	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Nov-86	Nickel, Diss.	0.009	0.002	< 0.001	0.005	0.002	0.007	< 0.001	0.004	< 0.001	0.009	< 0.001	0.014	0.012	0.001	0.027	0.042	0.072
Nov-86	Selenium, Diss.	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Silver, Diss.	0.005	0.003	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Nov-86	Zinc, Diss.	0.133	1.25	0.068	0.051	0.660	< 0.030	0.131	0.842	0.357	0.634	0.492	0.086	0.601	0.697	0.909	0.822	1.05
Nov-86	Barium, Diss.	0.080	0.040	0.119	0.105	0.075	0.051	0.165	0.074	0.034	0.058	0.099	0.093	0.081	0.080	0.077	0.052	0.060
Nov-86	Calcium, Diss.	101	86.0	81.5	169	110	21.1	157	115	110	64.9	99.3	90.4	186	117	145	102	216
Nov-86	Magnesium, Diss.	29.2	38.8	45.0	38.6	51.6	10.7	30.1	43.5	54.9	21.5	48.4	45.9	43.5	51.4	38.4	47.6	27.3
Nov-86	Manganese, Diss.	1.07	0.090	0.046	0.198	0.392	0.002	1.04	0.076	0.052	0.005	0.362	0.210	0.593	0.100	0.564	0.330	1.01
Nov-86	Potassium, Diss.	3.93	2.20	3.28	3.69	2.67	36.8	3.85	2.20	2.62	2.79	2.43	3.52	4.67	2.74	4.00	2.34	2.63
Nov-86	Sodium, Diss.	14.3	5.85	12.9	5.99	6.06	34.0	7.83	4.81	5.68	11.5	13.5	13.2	18.0	3.57	36.3	15.0	6.77
Nov-86	Sulfates	77.5	129	96.0	56.3	184	130	97.0	203	304	45.2	148	85.9	192	154	172	178	148
Nov-86	Chloride	19.5	30.9	58.4	4.5	41.7	59.7	4.8	22.6	31.7	4.2	72.6	75.6	50.0	3.2	32.7	72.5	18.7

F means "Present but below the detection limit; < means "not detected with detection limit shown"

Summary of Constituents Detected by Well
As Reported by WES

1120.09 Fridley/NIROP Water Quality Data

Concentration mg/l

Date	Parameter	1-S	1-D	1-PC	2-S	2-D	2-PC	3-S	3-D	3-PC	4-S	4-D	4-PC	5-S	5-D	6-S	6-D	7-S
Nov-86	Alkalinity	333	231	234	569	286	8.5	481	302	239	242	258	233	497	383	456	260	507
Nov-86	Cyanide	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Nov-86	Nitrate-Nitrogen			0.289	1.37		0.160	1.17		0.060	6.56		1.06	2.66			0.436	3.29
Nov-86	Trichlorofluoromethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0077	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	2-Butanone	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Nov-86	1,2-Dichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		

T means "Present but below the detection limit; < means "not detected with detection limit shown"

Summary of Constituents Detected by Well
As Reported by WES

1123.09 Fridley/MIROP Water Quality

Concentration mg/l

Date	Parameter	7-D	8-S	8-D	9-S	9-D	10-S	11-S	12-S	13-S	14-S	15-S	16-S	17-S	18-S	19-S	20-S	FWC-32
Nov-86	Arsenic, Total				0.023							0.045						
Nov-86	Cadmium, Total				0.0034							0.0194						
Nov-86	Chromium, Total				0.267							0.011						
Nov-86	Copper, Total				0.377							0.089						
Nov-86	Lead, Total				0.174							0.174						
Nov-86	Manganese, Total				2.54							2.46						
Nov-86	Mercury, Total				< 0.0004							< 0.0004						
Nov-86	Nickel, Total				0.332							0.039						
Nov-86	Silver, Total				0.001							< 0.001						
Nov-86	Zinc, Total				3.15							25.4						
Nov-86	TOC																	
Nov-86	PCB 1242																	
Nov-86	PCB 1248																	
Nov-86	PCB 1254																	
Nov-86	PCB 1260																	
Nov-86	Methylene Chloride	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	1,1-Dichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	1,1-Dichloroethane	< 0.005	0.0073	< 0.005	0.035	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0073
Nov-86	Trans 1,2-Dichloroethene	< 0.005	0.24	0.048	0.34	0.028	0.036	0.022	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.027	0.33	< 0.005	< 0.005	0.11
Nov-86	1,1,1-Trichloroethane	< 0.005	0.018	< 0.005	0.12	0.0066	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Trichloroethene	< 0.005	9.2	10.7	1.8	0.65	0.21	0.032	< 0.005	< 0.005	< 0.005	0.0071	0.17	0.097	1.53	< 0.005	< 0.005	1.3
Nov-86	Benzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0065	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Tetrachloroethene	< 0.005	0.046	< 0.005	0.12	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Toluene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Ethylbenzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Chloroform	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Bis(2ethylhexyl)Phthalate																	
Nov-86	Cis 1,2-Dichloroethenelet	< 0.005	0.24	0.048	0.34	0.028	0.036	0.022	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.027	0.33	< 0.005	0.005	0.11
Nov-86																		
Nov-86	Selenium, Total				0.076							< 0.005						
Nov-86	Barium, Total				0.986							0.172						
Nov-86	Calcium, Total				154							207						
Nov-86	Arsenic, Diss.	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.014	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Cadmium, Diss.	0.0002	0.0009	0.0003	0.0006	0.0007	0.0006	< 0.0001	0.0010	0.0011	0.0021	0.0008	0.0010	0.0006	0.0005	0.0024	0.0009	0.0004
Nov-86	Chromium, Diss.	0.002	0.002	0.002	0.003	0.002	0.003	0.001	< 0.001	< 0.001	< 0.001	0.002	0.001	0.002	0.002	0.002	0.001	0.001
Nov-86	Copper, Diss.	0.004	0.003	0.002	0.005	0.002	0.005	0.002	0.002	0.006	0.002	0.002	0.004	0.003	0.003	0.004	0.004	0.002
Nov-86	Lead, Diss.	0.002	< 0.001	0.002	0.003	0.011	0.005	< 0.001	0.001	0.005	0.004	0.003	0.003	0.005	0.004	0.002	0.002	0.002
Nov-86	Mercury, Diss.	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Nov-86	Nickel, Diss.	< 0.001	0.054	< 0.001	< 0.001	0.001	0.032	0.004	0.006	0.013	0.037	< 0.001	0.005	0.003	0.001	< 0.001	< 0.001	< 0.001
Nov-86	Selenium, Diss.	< 0.005	< 0.005	< 0.005	0.049	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.008	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Silver, Diss.	< 0.001	0.002	< 0.001	< 0.001	0.002	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	0.002	0.001	0.002	0.002	0.001	0.001
Nov-86	Zinc, Diss.	1.23	4.42	1.03	0.184	1.07	0.733	0.246	3.81	3.03	3.25	1.84	2.87	2.21	4.73	2.78	2.19	0.526
Nov-86	Barium, Diss	0.111	0.072	0.090	0.109	0.061	0.079	0.106	0.064	0.093	0.093	0.136	0.062	0.050	0.095	0.022	0.055	0.129
Nov-86	Calcium, Diss.	113	134	112	123	122	143	158	126	154	190	159	108	170	157	66.6	66.0	208
Nov-86	Magnesium, Diss.	52.4	33.0	54.7	33.0	49.2	50.8	58.1	33.8	36.9	33.8	53.4	29.0	54.9	54.1	18.3	17.2	57.4
Nov-86	Manganese, Diss.	0.403	1.94	0.700	0.026	0.142	1.58	0.003	1.20	1.50	0.876	1.96	1.04	0.388	0.920	0.034	0.058	1.03
Nov-86	Potassium, Diss.	4.73	3.74	4.51	5.49	3.52	3.67	3.97	3.67	3.36	1.92	4.92	3.28	3.25	3.87	2.22	2.22	3.76
Nov-86	Sodium, Diss.	9.36	6.89	11.0	28.2	19.5	16.3	7.44	17.1	6.50	5.77	10.6	4.14	16.9	6.16	41.1	9.45	7.19
Nov-86	Sulfates	251	183	272	91.7	189	224	363	56.4	218	164	318	59.5	333	422	26.9	72.4	321
Nov-86	Chloride	36.0	5.9	47.7	15.2	42.9	36.6	23.2	45.7	13.7	58.8	15.0	4.6	22.6	26.6	54.6	15.2	17.9

P means "Present but below the detection limit; < means "not detected with detection limit shown"

Summary of Constituents Detected by Well
As Reported by WES

1120.07 Fridley/NIROP Water Quality

Concentration mg/l

Date	Parameter	7-D	8-S	8-D	9-S	9-D	10-S	11-S	12-S	13-S	14-S	15-S	16-S	17-S	18-S	19-S	20-S	FMC-27
Nov-86	Alkalinity	302	469	267	436	362	493	426	417	374	383	477	395	458	332	144	156	504
Nov-86	Cyanide	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Nov-86	Nitrate-Nitrogen	0.031	1.49	0.022	3.92	0.221	0.205	0.803	6.05	2.09	17.0	0.028	0.110	1.02	0.016	2.74	0.474	0.022
Nov-86	Trichlorofluoromethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	2-Butanone	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Nov-86	1,2-Dichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		

P means "Present but below the detection limit; < means "not detected with detection limit shown"

Summary of Constituents Detected by Well
As Reported by WES

1120.09 Fridley/NIROP Water Quality

Concentration mg/l

Date	Parameter	RinBlk1	RinBlk2	TrpBlk1	Trp Blk2	TrpBlk3	TrpBlk4	Dupl 1	Dupl 2	Dupl 3
Nov-86	Arsenic, Total	< 0.005	< 0.0050	< 0.005				< 0.005	0.006	0.043
Nov-86	Cadmium, Total	0.0002	0.0003	0.0005				0.0010	0.0019	0.0159
Nov-86	Chromium, Total	0.004	0.007	0.002				0.009	0.123	0.009
Nov-86	Copper, Total	0.005	0.004	0.007				0.019	0.181	0.046
Nov-86	Lead, Total	0.009	< 0.001	0.007				0.033	0.049	0.048
Nov-86	Manganese, Total	< 0.030	< 0.030	< 0.030				1.55	1.13	2.49
Nov-86	Mercury, Total	< 0.0004	< 0.0004	< 0.0004				< 0.0004	< 0.0004	< 0.0004
Nov-86	Nickel, Total	0.017	0.003	0.010				0.035	0.155	0.033
Nov-86	Silver, Total	< 0.001	< 0.001	< 0.001				0.003	< 0.001	< 0.001
Nov-86	Zinc, Total	< 0.020	< 0.03	< 0.030				1.43	1.19	20.7
Nov-86	TOC									
Nov-86	PCB 1242									
Nov-86	PCB 1248									
Nov-86	PCB 1254									
Nov-86	PCB 1260									
Nov-86	Methylene Chloride	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	1,1-Dichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	1,1-Dichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.025	< 0.005
Nov-86	Trans 1,2-Dichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	0.19	0.34	< 0.005
Nov-86	1,1,1-Trichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	9.2	< 0.005	0.093	< 0.005
Nov-86	Trichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.60	1.5	0.009
Nov-86	Benzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Tetrachloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.14	< 0.005
Nov-86	Toluene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Ethylbenzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Chloroform	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Bis(2ethylhexyl)Phthalate									
Nov-86	Cis 1,2-Dichloroethene(et	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.19	0.34	< 0.005
Nov-86										
Nov-86	Selenium, Total	< 0.005	< 0.0050	< 0.005				< 0.005	0.035	< 0.005
Nov-86	Barium, Total	< 0.010	< 0.010	< 0.010				0.194	0.514	0.160
Nov-86	Calcium, Total	< 1.00		< 1.00				173	86.5	380
Nov-86	Arsenic, Diss.	< 0.005	< 0.005	< 0.005				< 0.005	< 0.005	0.013
Nov-86	Cadmium, Diss.	0.0004	< 0.0001	0.0002				0.0003	0.0004	0.0008
Nov-86	Chromium, Diss.	0.001	0.002	0.002				0.002	0.002	0.002
Nov-86	Copper, Diss.	0.003	0.009	0.002				0.002	0.004	0.002
Nov-86	Lead, Diss.	0.002	< 0.001	0.002				0.003	0.003	0.003
Nov-86	Mercury, Diss.	< 0.0004	< 0.0004	< 0.0004				< 0.0004	< 0.0004	< 0.0004
Nov-86	Nickel, Diss.	< 0.001	0.001	< 0.001				< 0.001	< 0.001	< 0.001
Nov-86	Selenium, Diss.	< 0.005	< 0.005	< 0.005				< 0.005	0.051	< 0.005
Nov-86	Silver, Diss.	< 0.001	< 0.001	< 0.001				< 0.001	< 0.001	< 0.001
Nov-86	Zinc, Diss.	< 0.030	< 0.030	< 0.030				0.129	0.172	1.86
Nov-86	Barium, Diss	< 0.010	0.010	< 0.010				0.152	0.115	0.147
Nov-86	Calcium, Diss.	< 0.100	0.100	< 0.100				157	128	157
Nov-86	Magnesium, Diss.	< 0.010	< 0.100	< 0.100				29.5	32.8	52.4
Nov-86	Manganese, Diss.	< 0.030	< 0.030	< 0.030				1.02	0.027	1.98
Nov-86	Potassium, Diss.	< 0.100	< 0.100	< 0.100				3.35	5.49	4.92
Nov-86	Sodium, Diss.	< 0.100	< 0.100	< 0.100				6.27	25.1	10.6
Nov-86	Sulfates	< 10.0	< 8.0	10.0				96.5	43.0	319
Nov-86	Chloride	< 1.0	1.0	< 1.0				4.6	15.3	15.1

F means "Present but below the detection limit, < means "not detected with detection limit shown"

Summary of Constituents Detected by Well
As Reported by WES

1120.49 Fridley/NIROP Water Quality

Concentration mg/l

Date	Parameter	RinBlk1	RinBlk2	TrpBlk1	Trp Blk2	TrpBlk3	TrpBlk4	Dupl 1	Dupl 2	Dupl 3
Nov-86	Alkalinity	< 5.0	< 5.0	< 5.0				484	437	476
Nov-86	Cyanide	< 0.010	< 0.010	< 0.010				< 0.010	< 0.010	< 0.010
Nov-86	Nitrate-Nitrogen	0.021		0.023				1.16	3.83	0.028
Nov-86	Trichlorofluoromethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	2-Butanone	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Nov-86	1 2-Dichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86										
Nov-86										
Nov-86										
Nov-86										
Nov-86										
Nov-86										
Nov-86										
Nov-86										

P means "Present but below the detection limit; < means "not detected with detection limit shown"

APPENDIX C

ALPHABETICAL SUMMARY OF CONSTITUENTS DETECTED AS REPORTED BY WES

Alphabetical Summary of Constituents Detected
As Reported by WES

1120.39 Fridley/NIPCF Water Quality Data

Concentration mg/l

Date	Parameter	1-S	1-D	1-PC	2-S	2-D	2-PC	3-S	3-D	3-PC	4-S	4-D	4-PC	5-S	5-D	6-S	o-D	7-S
Nov-86	2-Dichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	1,1,1-Trichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.12	< 0.005	< 0.0005
Nov-86	1,1-Dichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.019	< 0.005	< 0.005
Nov-86	1,1-Dichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	2-Butanone	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Nov-86	Alkalinity	333	231	234	569	286	8.5	481	302	239	242	258	233	497	387	456	262	531
Nov-86	Arsenic, Diss.	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Arsenic, Total							< 0.005										
Nov-86	Barium, Diss	0.080	0.040	0.117	0.165	0.075	0.051	0.165	0.074	0.034	0.058	0.099	0.093	0.061	0.080	0.077	0.072	0.090
Nov-86	Barium, Total							0.088										
Nov-86	Benzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Bis(2ethylhexyl)Pthalate																	
Nov-86	Cadmium, Diss.	< 0.0001	0.0004	0.0008	0.0006	0.0004	0.0005	0.0003	0.0004	0.0005	0.0006	0.0002	0.0005	0.0009	< 0.0001	0.0004	< 0.0001	0.0005
Nov-86	Cadmium, Total							0.0014										
Nov-86	Calcium, Diss.	101	86.0	81.5	167	110	21.1	157	115	110	64.9	99.3	90.4	186	117	115	102	216
Nov-86	Calcium, Total							169										
Nov-86	Chloride	18.5	30.9	58.1	4.5	41.7	59.7	4.8	22.6	31.7	4.2	72.6	75.6	50.0	7.0	33.7	72.5	18.7
Nov-86	Chloroform	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	0.005	< 0.005
Nov-86	Chromium, Diss.	0.005	0.002	0.002	0.003	0.001	0.002	0.003	0.001	0.002	0.002	0.001	< 0.001	0.002	0.002	0.001	0.001	0.002
Nov-86	Chromium, Total							0.009										
Nov-86	Cis 1,2-Dichloroethenelet	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.29	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.58	< 0.005	< 0.005
Nov-86	Copper, Diss.	0.004	< 0.001	0.005	0.008	< 0.001	0.003	0.003	0.006	0.003	0.009	< 0.001	0.002	0.004	< 0.001	< 0.001	0.005	0.007
Nov-86	Copper, Total							0.024										
Nov-86	Cyanide	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Nov-86	Ethylbenzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Lead, Diss.	< 0.001	< 0.001	0.002	0.001	< 0.001	0.003	0.002	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	0.002	0.002
Nov-86	Lead, Total							0.171										
Nov-86	Magnesium, Diss.	20.2	38.8	45.0	38.6	51.6	10.7	30.1	43.5	54.9	21.5	48.4	45.9	43.5	51.4	39.4	47.6	27.7
Nov-86	Manganese, Diss.	1.07	0.099	0.048	0.198	0.392	0.002	1.04	0.076	0.052	0.005	0.362	0.210	0.592	0.170	0.564	0.570	1.01
Nov-86	Manganese, Total							1.56										
Nov-86	Mercury, Diss.	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Nov-86	Mercury, Total							< 0.0004										
Nov-86	Methylene Chloride	0.013	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Nickel, Diss.	0.009	0.003	< 0.001	0.005	0.002	0.007	< 0.001	0.004	< 0.001	0.009	< 0.001	0.014	0.012	< 0.001	0.005	0.003	0.072
Nov-86	Nickel, Total							0.018										
Nov-86	Nitrate-Nitrogen			0.209	1.37		0.160	1.17		0.060	6.56		1.06	2.66			0.026	3.29
Nov-86	PCB 1242																	
Nov-86	PCB 1248																	
Nov-86	PCB 1254																	
Nov-86	PCB 1260																	
Nov-86	Potassium, Diss.	3.93	2.20	3.28	3.69	2.67	36.6	3.85	2.20	2.62	2.79	2.43	3.52	4.67	2.74	4.02	3.72	2.82
Nov-86	Selenium, Diss.	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Selenium, Total							< 0.005										
Nov-86	Silver, Diss.	0.005	0.003	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.003	< 0.001	< 0.001	< 0.001
Nov-86	Silver, Total							0.001										
Nov-86	Sodium, Diss.	14.3	5.85	12.9	5.99	6.06	34.0	7.83	4.81	5.68	11.5	13.5	10.2	12.0	3.57	26.0	15.0	6.77
Nov-86	Sulfates	73.5	129	96.0	56.3	184	130	97.0	203	304	45.2	146	85.9	170	184	172	176	149
Nov-86	Tetrachloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	TOC																	
Nov-86	Toluene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

" means "Present but below the detection limit; < means "not detected with detection limit shown"

Alphabetical Summary of Constituents Detected
As Reported by WES

1120.19 Fridley/NIRDP Water Quality Data

Concentration mg/l

Date	Parameter	1-S	1-D	1-PC	2-S	2-D	2-PC	3-S	3-D	3-PC	4-S	4-D	4-PC	5-S	5-D	6-S	6-D	7-S
Nov-86	Trans 1,2-Dichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.29	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.58	0.005	0.005
Nov-86	Trichloroethene	< 0.005	< 0.005	< 0.005	0.065	0.0092	0.0053	0.88	0.012	< 0.005	0.019	< 0.005	< 0.005	< 0.005	< 0.005	3.8	0.011	0.17
Nov-86	Trichlorofluoromethane	< 0.005	< 0.005	< 0.005	0.005	< 0.005	0.0077	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005
Nov-86	Zinc, Diss.	0.133	1.25	0.068	0.851	0.660	< 0.030	0.131	0.842	0.357	0.634	0.492	0.086	0.601	0.667	0.909	0.823	1.05
Nov-86	Zinc, Total							1.52										
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		

T means "Present but below the detection limit; < means "not detected with detection limit shown"

Alphabetical Summary of Constituents Detected
As Reported by WES

1120.23 Fridley/NIRCF Water Quality

Concentration mg/l

Date	Parameter	7-D	8-S	8-D	9-S	9-D	10-S	11-S	12-S	13-S	14-S	15-S	16-S	17-S	18-S	19-S	20-S	TMW-32
Nov-86	1,2-Dichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	1,1,1-Trichloroethane	< 0.005	0.018	< 0.005	0.12	0.0086	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	1,1-Dichloroethane	< 0.005	0.0073	< 0.005	0.035	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.0073
Nov-86	1,1-Dichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	2-Butanone	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Nov-86	Alkalinity	303	469	267	436	362	493	426	417	374	383	477	395	458	302	264	199	594
Nov-86	Arsenic, Diss.	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.014	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Arsenic, Total				0.023							0.045						
Nov-86	Barium, Diss	0.111	0.072	0.090	0.109	0.061	0.079	0.106	0.064	0.093	0.093	0.136	0.068	0.050	0.093	0.077	0.055	0.128
Nov-86	Barium, Total				0.986							0.172						
Nov-86	Benzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Bis(Ethylhexyl)Phthalate																	
Nov-86	Cadmium, Diss.	0.0012	0.0009	0.0007	0.0006	0.0007	0.0006	< 0.0001	0.0010	0.0011	0.0021	0.0008	0.0010	0.0004	0.0015	0.0020	0.0009	0.0004
Nov-86	Cadmium, Total				0.0034							0.0194						
Nov-86	Calcium, Diss.	112	134	113	133	122	143	158	126	154	190	159	198	170	157	66.0	81.0	268
Nov-86	Calcium, Total				154							207						
Nov-86	Chloride	36.0	5.9	47.7	15.2	42.9	36.6	23.2	45.7	13.7	58.8	15.0	4.6	25.6	26.6	54.9	15.0	12.9
Nov-86	Chloroform	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Chromium, Diss.	0.002	0.002	0.002	0.003	0.002	0.003	0.001	< 0.001	< 0.001	< 0.001	0.002	0.001	0.003	0.003	0.002	0.001	0.001
Nov-86	Chromium, Total				0.267							0.011						
Nov-86	Cis 1,2-Dichloroethene(et	< 0.005	0.24	0.048	0.34	0.028	0.036	0.022	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.027	0.33	0.005	< 0.005	0.11
Nov-86	Copper, Diss.	0.004	0.003	0.002	0.005	0.002	0.005	0.002	0.002	0.006	0.002	0.002	0.004	0.003	0.003	0.004	0.004	0.002
Nov-86	Copper, Total				0.377							0.039						
Nov-86	Cyanide	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Nov-86	Ethylbenzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Lead, Diss.	0.002	< 0.001	0.002	0.003	0.011	0.005	< 0.001	0.001	0.005	0.004	0.003	0.003	0.005	0.004	0.005	0.004	0.002
Nov-86	Lead, Total				0.174							0.174						
Nov-86	Magnesium, Diss.	52.4	33.0	54.9	33.0	49.2	50.8	58.1	33.8	36.9	33.6	53.4	29.0	54.5	54.1	18.0	17.7	53.4
Nov-86	Manganese, Diss.	0.403	1.94	0.700	0.026	0.142	1.58	0.093	1.20	1.50	0.876	1.96	1.04	0.388	0.920	1.734	0.089	1.03
Nov-86	Manganese, Total				2.54							2.46						
Nov-86	Mercury, Diss.	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004	< 0.0004
Nov-86	Mercury, Total				< 0.0004							< 0.0004						
Nov-86	Methylene Chloride	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.005	< 0.005	< 0.005
Nov-86	Nickel, Diss.	< 0.001	0.054	< 0.001	< 0.001	0.001	0.032	0.004	0.006	0.013	0.037	< 0.001	0.005	0.003	< 0.001	< 0.001	0.004	< 0.001
Nov-86	Nickel, Total				0.332							0.029						
Nov-86	Nitrate-Nitrogen	0.031	1.69	0.022	3.92	0.221	0.205	0.803	6.05	2.09	17.0	0.028	0.110	2.02	0.016	2.74	0.424	0.02
Nov-86	PCB 1242																	
Nov-86	PCB 1249																	
Nov-86	PCB 1254																	
Nov-86	PCB 1260																	
Nov-86	Potassium, Diss.	4.75	3.74	4.51	5.49	3.52	3.67	3.97	3.67	3.06	1.92	4.92	3.23	3.83	2.97	2.22	2.92	3.76
Nov-86	Selenium, Diss.	< 0.005	< 0.005	< 0.005	0.049	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.008	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Selenium, Total				0.076							< 0.005						
Nov-86	Silver, Diss	< 0.001	0.002	< 0.001	< 0.001	0.002	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	0.003	< 0.001	0.002	0.002	< 0.001	0.001
Nov-86	Silver, Total				0.001							< 0.001						
Nov-86	Sodium, Diss.	9.36	6.89	11.0	28.2	15.5	16.5	7.44	17.1	6.50	5.77	10.6	4.14	16.8	8.18	41.1	9.43	7.19
Nov-86	Sulfates	251	183	272	91.7	189	224	363	56.4	218	164	318	59.5	333	422	24.9	72.4	321
Nov-86	Tetrachloroethene	< 0.005	0.046	< 0.005	0.12	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	TOC																	
Nov-86	Toluene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

P means "Present but below the detection limit; < means "not detected with detection limit shown"

Alphabetical Summary of Constituents Detected
As Reported by WES

1120.65 Fridley/NIROP Water Quality

Concentration mg/l

Date	Parameter	7-D	8-S	8-D	9-S	9-D	10-S	11-S	12-S	13-S	14-S	15-S	16-S	17-S	18-S	19-S	20-S	FMC-07
Nov-86	Trans 1,2-Dichloroethene	< 0.005	0.24	0.048	0.34	0.028	0.036	0.022	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.027	0.33	0.005	< 0.005	0.11
Nov-86	Trichloroethene	< 0.005	9.2	10.7	1.8	0.65	0.21	0.032	< 0.005	< 0.005	< 0.005	0.0071	0.17	0.097	1.53	0.035	< 0.005	1.2
Nov-86	Trichlorofluoromethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Zinc, Diss.	1.23	4.42	1.03	0.184	1.07	0.735	0.246	3.81	3.03	3.25	1.84	2.87	2.21	4.71	3.78	3.11	0.526
Nov-86	Zinc, Total				3.15							25.4						
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		
Nov-86																		

? means "Present but below the detection limit; < means "not detected with detection limit shown"

Alphabetical Summary of Constituents Detected
As Reported by WES

1121.05 Fridley/NIROP Water Quality

Concentration mg/l

Date	Parameter	RinBlk1	RinBlk2	TrpBlk1	Trp Blk2	TrpBlk3	TrpBlk4	Dupl 1	Dupl 2	Dupl 3
Nov-86	1,2-Dichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	1,1,1-Trichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	9.2	< 0.005	0.093	< 0.005
Nov-86	1,1-Dichloroethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.025	< 0.005
Nov-86	1,1-Dichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	2-Butanone	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Nov-86	Alkalinity	< 5.0	< 5.0	< 5.0				484	437	476
Nov-86	Arsenic, Diss.	< 0.005	< 0.005	< 0.005				< 0.005	< 0.005	0.013
Nov-86	Arsenic, Total	< 0.005	< 0.0050	< 0.005				< 0.005	0.006	0.043
Nov-86	Barium, Diss	< 0.010	< 0.010	< 0.010				0.152	0.115	0.147
Nov-86	Barium, Total	< 0.010	< 0.010	< 0.010				0.194	0.514	0.160
Nov-86	Benzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Bis(2ethylhexyl)Phthalate									
Nov-86	Cadmium, Diss.	0.0004	< 0.0001	0.0002				0.0003	0.0004	0.0008
Nov-86	Cadmium, Total	0.0002	0.0003	0.0005				0.0010	0.0019	0.0159
Nov-86	Calcium, Diss.	< 0.100	< 0.100	< 0.100				157	128	157
Nov-86	Calcium, Total	< 1.00		< 1.00				173	86.5	380
Nov-86	Chloride	< 1.0	< 1.0	< 1.0				4.6	15.3	15.1
Nov-86	Chloroform	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Chromium, Diss.	0.001	0.002	0.002				0.002	0.002	0.002
Nov-86	Chromium, Total	0.004	0.007	0.002				0.009	0.123	0.009
Nov-86	Cis 1,2-Dichloroethene(et	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	3.19	0.34	< 0.005
Nov-86	Copper, Diss.	0.003	0.009	0.002				0.002	0.004	0.002
Nov-86	Copper, Total	0.005	0.004	0.007				0.019	0.181	0.046
Nov-86	Cyanide	< 0.010	< 0.010	< 0.010				< 0.010	< 0.010	< 0.010
Nov-86	Ethylbenzene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Lead, Diss.	0.002	< 0.001	0.002				0.003	0.003	0.003
Nov-86	Lead, Total	0.009	< 0.001	0.007				0.033	0.049	0.048
Nov-86	Magnesium, Diss.	< 0.010	< 0.100	< 0.100				29.5	32.8	52.4
Nov-86	Manganese, Diss.	< 0.030	< 0.030	< 0.030				1.02	0.027	1.98
Nov-86	Manganese, Total	< 0.030	< 0.030	< 0.030				1.55	1.13	2.49
Nov-86	Mercury, Diss.	< 0.0004	< 0.0004	< 0.0004				< 0.0004	< 0.0004	< 0.0004
Nov-86	Mercury, Total	< 0.0004	< 0.0004	< 0.0004				< 0.0004	< 0.0004	< 0.0004
Nov-86	Methylene Chloride	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Nickel, Diss.	< 0.001	0.001	< 0.001				< 0.001	< 0.001	< 0.001
Nov-86	Nickel, Total	0.017	0.003	0.010				0.035	0.155	0.033
Nov-86	Nitrate-Nitrogen	0.021		0.023				1.16	3.83	0.028
Nov-86	PCB 1242									
Nov-86	PCB 1248									
Nov-86	PCB 1254									
Nov-86	PCB 1260									
Nov-86	Potassium, Diss.	< 0.100	< 0.100	< 0.100				3.85	5.49	4.92
Nov-86	Selenium, Diss.	< 0.005	< 0.005	< 0.005				< 0.005	0.051	< 0.005
Nov-86	Selenium, Total	< 0.005	< 0.0050	< 0.005				< 0.005	0.035	< 0.005
Nov-86	Silver, Diss.	< 0.001	< 0.001	< 0.001				< 0.001	< 0.001	< 0.001
Nov-86	Silver, Total	< 0.001	< 0.001	< 0.001				0.003	< 0.001	< 0.001
Nov-86	Sodium, Diss.	< 0.100	< 0.100	< 0.100				6.27	25.1	10.6
Nov-86	Sulfates	< 10.0	< 8.0	< 10.0				96.5	43.0	319
Nov-86	Tetrachloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.14	< 0.005
Nov-86	TOC									
Nov-86	Toluene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

I means "Present but below the detection limit; < means "not detected' with detection limit shown"

Alphabetical Summary of Constituents Detected
As Reported by WES

11211.09 Fridley/NIROP Water Quality

Concentration mg/l

Date	Parameter	RinBlk1	RinBlk2	TrpBlk1	Trp BlK2	TrpBlk3	TrpBlk4	Dupl 1	Dupl 2	Dupl 3
Nov-86	Trans 1,2-Dichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.19	0.34	< 0.005
Nov-86	Trichloroethene	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.60	1.5	0.009
Nov-86	Trichloromethane	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Nov-86	Zinc, Diss.	< 0.030	< 0.030	< 0.030				0.129	0.172	1.86
Nov-86	Zinc, Total	< 0.030	0.03	< 0.030				1.43	1.19	22.7
Nov-86										
Nov-86										
Nov-86										
Nov-86										
Nov-86										
Nov-86										
Nov-86										
Nov-86										
Nov-86										

F means "Present but below the detection limit; < means "not detected with detection limit shown"

APPENDIX D

ORIGINAL LABORATORY DATA FROM WES AND MRD

ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 2)

UNFILTERED SAMPLES-TOTAL METALS

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 HN03 JOB FILE:95140

REPORT DATE:27 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:05 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 1	2	3	4	5	6	7	8	9	ROW
			ANALYSIS.. 2	5	6	7	9	10	11	12	13	
		PPM.....	AS	CD	CR	CU	PB	HG	NI	SE	AG	
95140	DUPL 1 11-17-86	CONC	<0.005	0.0010	0.009	0.019	0.033	<0.0004	0.035	<0.005	0.003	
		%REC	94					99		138		1
		DUPL	<0.005					<0.0008		<0.005		
		OID	01307007	20557027 HGA AUTH	20556356 HGA AUTH	20556356 HGA AUTH	20556364 HGA AUTH	09656329	20556353 HGA AUTH	01307013	20567005 HGA AUTH	
95141	DUPL 2 11-17-86	CONC	0.006	0.0019	0.123	0.181	0.049	<0.0004	0.155	0.035	<0.001	
		%REC										2
		DUPL										
		OID	01307007	20557027 HGA AUTH	51206357 HGA AUTH	51206356 HGA AUTH	20556364 HGA AUTH	09656329	51206357 HGA AUTH	01307013	20567005 HGA AUTH	
95142	DUPL 3 11-17-86	CONC	0.043	0.0159	0.009	0.046	0.048	<0.0004	0.033	<0.005	<0.001	
		%REC										3
		DUPL										
		OID	01307007	20557027 HGA AUTH	20556356 HGA AUTH	20556356 HGA AUTH	20556364 HGA AUTH	09656329	51206357 HGA AUTH	01307013	20567005 HGA AUTH	
95143	3-S 11-17-86 1058	CONC	<0.005	0.0014	0.009	0.024	0.171	<0.0004	0.018	<0.005	0.001	
		%REC										4
		DUPL										
		OID	01307007	20557027 HGA AUTH	20556356 HGA AUTH	20556356 HGA AUTH	20556364 HGA AUTH	09656329	20557007 HGA AUTH	01307013	20567005 HGA AUTH	
95144	9-S 11-17-86 1649	CONC	0.023	0.0034	0.267	0.377	0.174	<0.0004	0.332	0.076	0.001	
		%REC										5
		DUPL										
		OID	01307007	20557027 HGA AUTH	51206356 HGA AUTH	51206356 HGA AUTH	20556364 HGA AUTH	09656329	51206357 HGA AUTH	01307013	20567005 HGA AUTH	
95145	15-S 11-17-86 1537	CONC	0.045	0.0194	0.011	0.089	0.174	<0.0004	0.039	<0.005	<0.001	
		%REC										6
		DUPL										
		OID	01307007	20557027 HGA AUTH	20556356 HGA AUTH	20556356 HGA AUTH	20556364 HGA AUTH	09656329	51206357 HGA AUTH	01307013	20567005 HGA AUTH	
95146	RINSATE BLK 11-17-86 1821	CONC	<0.005	0.0002	0.004	0.005	0.009	<0.0004	0.017	<0.005	<0.001	
		%REC			110	90	95		95		105	7
		DUPL										
		OID	01307007	20557027 HGA AUTH	20556356 HGA AUTH	20556356 HGA AUTH	20556364 HGA AUTH	09656329	20557007 HGA AUTH	01307013	20567005 HGA AUTH	
95147	TRIP BLANK 11-17-86	CONC	<0.005	0.0005	0.002	0.007	0.007	<0.0004	0.010	<0.005	<0.001	
		%REC										8
		DUPL										
		OID	01307007	20557027 HGA AUTH	20556356 HGA AUTH	20556356 HGA AUTH	20556364 HGA AUTH	09656329	20557007 HGA AUTH	01307013	20567005 HGA AUTH	
	EXTERNAL QA SAMPLE	%REC	106%	101%	101%	105%	103%	104%	89%	102%	98%	

AS	ARSENIC	CD	CADMIUM	CR	CHROMIUM
CU	COPPER	PB	LEAD	HG	MERCURY
NI	NICKEL	SE	SELENIUM	AG	SILVER

INMAC

*** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 2 OF 2) *****************

UNFILTERED SAMPLES-TOTAL METALS

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) R06E444E1100000 HNO3 JOB FILE:95140
REPORT DATE:27 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID	COLUMN.... / ANALYSIS.. / PPM.......	ZN (10 / 15)	BA (11 / 17)	CA (12 / 19)	MN (13 / 23)	ROW
95140	DUPL 1 11-17-86	CONC	1.43 *	0.194 *	173.0 *	1.55 *	
		%REC	97.3 *	97 *	89.5 *	106 *	1
		DUPL	1.44 *	0.197 *	177.0 *	1.58 *	
		OID	51206357*	51207007*	51806356*	51206357* HGA AUTH	
95141	DUPL 2 11-17-86	CONC	1.19 *	0.514 *	86.5 *	1.13 *	
		%REC	*	*	*	*	2
		DUPL	*	*	*	*	
		OID	51206357*	51207007*	51806356*	51206357* HGA AUTH	
95142	DUPL 3 11-17-86	CONC	20.7 *	0.160 *	380 *	2.49 *	
		%REC	100 *	*	*	*	3
		DUPL	20.9 *	*	*	*	
		OID	51207005*	51207007*	51806356*	51206357* HGA AUTH	
95143	3-S 11-17-86 1058	CONC	1.52 *	0.088 *	169 *	1.56 *	
		%REC	*	*	*	*	4
		DUPL	*	*	*	*	
		OID	51206357*	51207007*	51806356*	51206357* HGA AUTH	
95144	9-S 11-17-86 1649	CONC	3.15 *	0.986 *	154 *	2.54 *	
		%REC	*	*	*	*	5
		DUPL	*	*	*	*	
		OID	51206357*	51207007*	51806356*	51206357* HGA AUTH	
95145	15-S 11-17-86 1537	CONC	25.4 *	0.172 *	207 *	2.46 *	
		%REC	*	*	*	*	6
		DUPL	*	*	*	*	
		OID	51207005*	51207007*	51806356*	51206357* HGA AUTH	
95146	RINSATE BLK 11-17-86 1821	CONC	<0.030 *	<0.010 *	<0.100 *	<0.030 *	
		%REC	*	*	*	*	7
		DUPL	*	*	*	*	
		OID	51206357*	51207007*	51207005*	51206357* HGA AUTH	
95147	TRIP BLANK 11-17-86	CONC	<0.030 *	<0.010 *	<0.100 *	<0.030 *	
		%REC	*	*	*	*	8
		DUPL	*	*	*	*	
		OID	51206357*	51207007*	51207005*	51206357* HGA AUTH	

ZN ZINC BA BARIUM CA CALCIUM
MN MANGANESE

EXTERNAL QA SAMPLE %REC 100% 95% 103% 98%

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 2) **********

UNFILTERED SAMPLE _TOTAL METALS

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) R06E444E1100000 HN03 JOB FILE:95234

REPORT DATE:15 JAN 87 RECEIPT DATE:25 NOV 86 EST. COMP. DATE:07 JAN 87

	COLUMN....	1	2	3	4	5	6	7	8	9	
	ANALYSIS..	2	5	6	7	9	10	11	12	13	
B : DENOTES PPB	PPM.....AS		CD	CR	CU	PB	HG	NI	SE	AG	
LAB ID PROJECT ID											ROW
95234 RINSATE BLK	CONC	<0.005	* 0.0003	* 0.007	* 0.004	* <0.001	* <0.0004	* 0.003	* <0.005	* <0.001	*
11-20-86 1159	%REC	100	* 100	* 90	* 115	* 95	* 10.7	* 90	* 108	* 110	* 1
	DUPL	<0.005	*	*	*	*	* <0.0008	*	* <0.005	*	*
	OID	01907007	* 20557005	* 20557006	* 20557006	* 20556964	* 09656929	* 20557006	* 01907013	* 20567006	*
			HOA AUTH	HOA AUTH	HOA AUTH	HOA AUTH		HOA AUTH		HOA AUTH	

AS	ARSENIC	CD	CADMIUM	CR	CHROMIUM
CU	COPPER	PB	LEAD	HG	MERCURY
NI	NICKEL	SE	SELENIUM	AG	SILVER

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 2 OF 2) **********

JOB DESCRIPTION:NIROP (CHAIN OF CUSTODY) RDGE444E110000 HN03 JOB FILE:95234
REPORT DATE:15 JAN 87 RECEIPT DATE:25 NOV 86 EST. COMP. DATE:07 JAN 87

		COLUMN....	10	11	12	
		ANALYSIS..	15	17	23	
B : DENOTES PPB		PPM.....	ZN	BA	MN	
LAB ID	PROJECT ID					ROW
95234	RINSATE BLK	CONC	<0.030 *	<0.010 *	<0.030 *	
	11-20-86 1159	%REC	*	*	*	1
		DUPL	*	*	*	
		OID	51206357*	51207006*	51206357*	
				HGA AUTH		

ZN ZINC BA BARIUM MN MANGANESE

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 6) **********

FILTERED SAMPLES-DISSOLVED METALS

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 HN03 JOB FILE:95117

REPORT DATE:16 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	1	2	3	4	5	6	7	8	9	ROW
		ANALYSIS..	2	5	6	7	9	10	11	12	13	
		PPM.....AS		CD	CR	CU	PB	HG	NI	SE	AG	
95117	DUPL 1 11-17-86	CONC	<0.005	0.0003	0.002	0.002	0.003	<0.0004	<0.001	<0.005	<0.001	
		%REC	106					117		92		1
		DUPL	<0.005					<0.0008		<0.005		
		OID	01307006	20566364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	
95118	DUPL 2 11-17-86	CONC	<0.005	0.0004	0.002	0.004	0.003	<0.0004	<0.001	0.051	<0.001	
		%REC										2
		DUPL										
		OID	01307006	20566364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	
95119	DUPL 3 11-17-86	CONC	0.019	0.0008	0.002	0.002	0.003	<0.0004	<0.001	<0.005	<0.001	
		%REC										3
		DUPL										
		OID	01307006	20566364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	
95120	3-S 11-17-86 1058	CONC	<0.005	0.0003	0.003	0.003	0.002	<0.0004	<0.001	<0.005	<0.001	
		%REC										4
		DUPL										
		OID	01307006	20566364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	
95121	9-S 11-17-86 1649	CONC	<0.005	0.0006	0.003	0.005	0.003	<0.0004	<0.001	0.049	<0.001	
		%REC										5
		DUPL										
		OID	01307006	20566364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	
95122	15-S 11-17-86 1537	CONC	0.014	0.0008	0.002	0.002	0.003	<0.0004	<0.001	<0.005	<0.001	
		%REC										6
		DUPL										
		OID	01307006	20566364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	
95123	FMC-33 11-17-86 1240	CONC	<0.005	0.0004	0.001	0.002	0.003	<0.0004	<0.001	<0.005	<0.001	
		%REC										7
		DUPL										
		OID	01307006	20566364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	
95124	RINSATE BLK 11-17-86 1821	CONC	<0.005	0.0004	0.001	0.003	0.002	<0.0004	<0.001	<0.005	<0.001	
		%REC										8
		DUPL										
		OID	01307006	20566364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	

AS	ARSENIC	CD	CADMIUM	CR	CHROMIUM
CU	COPPER	PB	LEAD	HG	MERCURY
NI	NICKEL	SE	SELENIUM	AG	SILVER

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 2 OF 6) **********

FILTERED SAMPLES-DISSOLVED METALS

JOB DESCRIPTION:NIROP (CHAIN OF CUSTODY) RD6E444E1100000 HNO3 JOB FILE:95117

REPORT DATE:16 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		AS	CD	CR	CU	PB	HG	NI	SE	AG	ROW
		COLUMN....	1	2	3	4	5	6	7	8	9	
		ANALYSIS..	2	5	6	7	9	10	11	12	13	
		PPM.....										
95125	TRIP BLK 11-17-86	CONC	<0.005	0.0002	0.002	0.002	0.002	<0.0004	<0.001	<0.005	<0.001	
		%REC	106	110	115	100	95	99	105	102	100	9
		DUPL	<0.005					<0.0008		<0.005		
		OID	01307006	20566364 HGA AUTH	20556358 HGA AUTH	20556353 HGA AUTH	20556364 HGA AUTH	09656329	20566353 HGA AUTH	01307008	20567005 HGA AUTH	
95126	8-D 11-18-86 1640	CONC	<0.005	0.0003	0.002	0.002	0.002	<0.0004	<0.001	<0.005	<0.001	
		%REC										10
		DUPL										
		OID	01307006	20566364 HGA AUTH	20556358 HGA AUTH	20556353 HGA AUTH	20556364 HGA AUTH	09656329	20566353 HGA AUTH	01307008	20567005 HGA AUTH	
95127	2-S 11-18-86 1030	CONC	<0.005	0.0006	0.003	0.008	0.001	<0.0004	0.005	<0.005	<0.001	
		%REC										11
		DUPL										
		OID	01307006	20566364 HGA AUTH	20556358 HGA AUTH	20556353 HGA AUTH	20556364 HGA AUTH	09656329	20566353 HGA AUTH	01307008	20567005 HGA AUTH	
95128	17-S 11-18-86 1344	CONC	<0.005	0.0006	0.003	0.003	0.005	<0.0004	0.003	<0.005	<0.001	
		%REC										12
		DUPL										
		OID	01307006	20566364 HGA AUTH	20556358 HGA AUTH	20556353 HGA AUTH	20556364 HGA AUTH	09656329	20566353 HGA AUTH	01307008	20567005 HGA AUTH	
95129	7-D 11-18-86 1415	CONC	<0.005	0.0002	0.002	0.004	0.002	<0.0004	<0.001	<0.005	<0.001	
		%REC										13
		DUPL										
		OID	01307006	20566364 HGA AUTH	20556358 HGA AUTH	20556353 HGA AUTH	20556364 HGA AUTH	09656329	20566353 HGA AUTH	01307008	20567005 HGA AUTH	
95130	1-PC 11-18-86 1111	CONC	<0.005	0.0008	0.002	0.005	0.002	<0.0004	<0.001	<0.005	0.002	
		%REC										14
		DUPL										
		OID	01307006	20566364 HGA AUTH	20556358 HGA AUTH	20556353 HGA AUTH	20556364 HGA AUTH	09656329	20566353 HGA AUTH	01307008	20567005 HGA AUTH	
95131	18-S 11-18-86 405P	CONC	<0.005	0.0005	0.002	0.003	0.004	<0.0004	<0.001	<0.005	0.002	
		%REC										15
		DUPL										
		OID	01307006	20566364 HGA AUTH	20556358 HGA AUTH	20556353 HGA AUTH	20556364 HGA AUTH	09656329	20566353 HGA AUTH	01307008	20567005 HGA AUTH	
95132	19-S 11-18-86 635P	CONC	<0.005	0.0024	0.002	0.004	0.009	<0.0004	<0.001	<0.005	0.002	
		%REC										16
		DUPL										
		OID	01307006	20566364 HGA AUTH	20556358 HGA AUTH	20556353 HGA AUTH	20556364 HGA AUTH	09656329	20566353 HGA AUTH	01307008	20567005 HGA AUTH	

AS	ARSENIC	CD	CADMIUM	CR	CHROMIUM
CU	COPPER	PB	LEAD	HG	MERCURY
NI	NICKEL	SE	SELENIUM	AG	SILVER

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 3 OF 6) **********

FILTERED SAMPLES-DISSOLVED METALS

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 HNO3 JOB FILE:95117

REPORT DATE:16 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 1	2	3	4	5	6	7	8	9	ROW
			ANALYSIS.. 2	5	6	7	9	10	11	12	13	
			PPM.....AS	CD	CR	CU	PB	HG	NI	SE	AG	
95133	2-D 11-18-86 645P	CONC	<0.005	0.0007	0.002	0.002	0.011	<0.0004	0.001	<0.005	0.002	
		%REC	103					96		94		17
		DUPL	<0.005					<0.0008		<0.005		
		OID	01307006	20556364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	
95134	2-PC 11-19-86 835A	CONC	<0.005	0.0005	0.002	0.003	0.003	<0.0004	0.007	<0.005	<0.001	
		%REC										18
		DUPL										
		OID	01307006	20556364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	
95135	3-PC 11-19-86 1010A	CONC	<0.005	0.0005	0.002	0.003	0.001	<0.0004	<0.001	<0.005	<0.001	
		%REC										19
		DUPL										
		OID	01307006	20556364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	
95136	4-S 11-19-86 1022A	CONC	<0.005	0.0006	0.002	0.009	<0.001	<0.0004	0.009	<0.005	<0.001	
		%REC										20
		DUPL										
		OID	01307006	20556364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	
95137	4-PC 11-19-86 1200P	CONC	<0.005	0.0005	<0.001	0.002	<0.001	<0.0004	0.014	<0.005	<0.001	
		%REC										21
		DUPL										
		OID	01307006	20556364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	
95138	5-S 11-19-86 1230P	CONC	<0.005	0.0009	0.002	0.004	<0.001	<0.0004	0.012	<0.005	<0.001	
		%REC										22
		DUPL										
		OID	01307006	20556364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	
95139	16-S 11-19-86 315P	CONC	<0.005	0.0010	0.001	0.004	0.003	<0.0004	0.005	<0.005	0.003	
		%REC										23
		DUPL										
		OID	01307006	20556364	20556358	20556353	20556364	09656329	20566353	01307008	20567005	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		HGA AUTH		HGA AUTH	

AS	ARSENIC	CD	CADMIUM	CR	CHROMIUM
CU	COPPER	PB	LEAD	HG	MERCURY
NI	NICKEL	SE	SELENIUM	AG	SILVER

EXTERNAL QA SAMPLE	%REC	103%	93%

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 4 OF 6) **********

FILTERED SAMPLES-DISSOLVED METALS

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) R06E444E1100000 HNO3 JOB FILE:95117

REPORT DATE:16 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

LAB ID	PROJECT ID	COLUMN....	10	11	12	13	14	15	16	ROW
		ANALYSIS..	15	17	19	22	23	25	26	
B : DENOTES PPB		PPM.....	ZN	BA	CA	MG	MN	K	NA	
95117	DUPL 1 11-17-86	CONC	0.129	0.152	157	29.5	1.02	3.85	6.27	
		%REC	101	105	111	107	102	102	109	1
		DUPL	0.132	0.156	163	30.9	1.03	4.00	6.60	
		OID	51206356	51207006	51806352	51806350	51206346	51806356	51806350	
							HGA AUTH			
95118	DUPL 2 11-17-86	CONC	0.172	0.115	128	32.8	0.027	5.49	25.1	
		%REC	*	*	*	*	*	*	*	2
		DUPL	*	*	*	*	*	*	*	
		OID	51206356	51207006	51806352	51806350	20557008	51806356	51806350	
							HGA AUTH			
95119	DUPL 3 11-17-86	CONC	1.06	0.147	157	52.4	1.98	4.92	10.6	
		%REC	*	*	*	*	*	*	*	3
		DUPL	*	*	*	*	*	*	*	
		OID	51206356	51207006	51806352	51806350	51206346	51806356	51806350	
							HGA AUTH			
95120	3 S 11-17-86 1050	CONC	0.131	0.165	157	30.1	1.04	3.85	7.03	
		%REC	*	*	*	*	*	*	*	4
		DUPL	*	*	*	*	*	*	*	
		OID	51206356	51207006	51806352	51806350	51206346	51806356	51207005	
							HGA AUTH			
95121	9 S 11-17-86 1649	CONC	0.184	0.109	139	33.0	0.026	5.49	28.2	
		%REC	*	*	*	*	*	*	*	5
		DUPL	*	*	*	*	*	*	*	
		OID	51206356	51207006	51806352	51806350	20557008	51806356	51806350	
							HGA AUTH			
95122	15 S 11-17-86 1537	CONC	1.84	0.136	159	53.4	1.96	4.92	10.6	
		%REC	*	*	*	*	*	*	*	6
		DUPL	*	*	*	*	*	*	*	
		OID	51206356	51207006	51806352	51806350	51206346	51806356	51806350	
							HGA AUTH			
95123	FNC 33 11-17-86	CONC	0.526	0.128	208	53.4	1.00	3.36	7.19	
	1240	%REC	*	*	*	*	*	*	*	7
		DUPL	*	*	*	*	*	*	*	
		OID	51206356	51207006	51806352	51806350	51206346	51806356	51806350	
							HGA AUTH			
95124	RINSATE BLK	CONC	<0.030	<0.010	<0.100	<0.010	<0.030	<0.100	<0.100	
	11-17-86 1821	%REC	*	*	*	*	*	*	*	8
		DUPL	*	*	*	*	*	*	*	
		OID	51206356	51207006	51207005	51806350	51206346	51207005	51207005	
							HGA AUTH			

ZN	ZINC	BA	BARIUM	CA	CALCIUM
MG	MAGNESIUM	MN	MANGANESE	K	POTASSIUM
NA	SODIUM				

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 5 OF 6) **********

FILTERED SAMPLES-DISSOLVED METALS

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 HNO3 JOB FILE:95117

REPORT DATE:16-JAN-87 RECEIPT DATE:19-NOV-86 EST. COMP. DATE:07-JAN-87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 10	11	12	13	14	15	16	ROW
			ANALYSIS.. 15	17	19	22	23	25	26	
			PPM.....ZN	BA	CA	MG	MN	K	NA	
95125	TRIP BLK 11-17-86	CONC	<0.030	<0.010	<0.100	<0.100	<0.030	<0.100	<0.100	
		%REC	100							9
		DUPL	<0.030							
		OID	51206356	51207006	51207005	51806350	51206346	51207005	51207005	
							HGA AUTH			
95126	8-D 11-18-86 1640	CONC	1.03	0.090	113	54.9	0.700	4.51	11.0	
		%REC		104						10
		DUPL		0.094						
		OID	51206356	51207006	51207005	51806350	51206346	51206357	51806350	
							HGA AUTH			
95127	2-S 11-18-86 1030	CONC	0.851	0.105	169	38.6	0.198	3.69	5.99	
		%REC								11
		DUPL								
		OID	51206356	51207006	51207005	51806350	51206346	51206357	51806350	
							HGA AUTH			
95128	17-S 11-18-86 1344	CONC	2.21	0.050	170	54.9	0.388	3.85	16.8	
		%REC								12
		DUPL								
		OID	51206356	51207006	51207005	51806350	51206346	51206357	51806350	
							HGA AUTH			
95129	7-D 11-18-86 1415	CONC	1.23	0.111	113	52.4	0.403	4.75	9.36	
		%REC								13
		DUPL								
		OID	51206356	51207006	51207005	51806350	51206346	51206357	51806350	
							HGA AUTH			
95130	1-PC 11-18-86 1111	CONC	0.068	0.119	81.5	45.0	0.046	3.28	12.9	
		%REC								14
		DUPL								
		OID	51206356	51207006	51207005	51806350	51206346	51206357	51806350	
							HGA AUTH			
95131	18-S 11-18-86 405P	CONC	4.71	0.095	157	54.1	0.920	2.87	6.18	
		%REC								15
		DUPL								
		OID	51206356	51207006	51207005	51806350	51206346	51206357	51806350	
							HGA AUTH			
95132	19-S 11-18-86 635P	CONC	3.78	0.032	66.0	18.0	0.094	2.22	41.1	
		%REC								16
		DUPL								
		OID	51206356	51207006	51207005	51806350	51206346	51206357	51806350	
							HGA AUTH			

ZN ZINC BA BARIUM CA CALCIUM
MG MAGNESIUM MN MANGANESE K POTASSIUM
NA SODIUM

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 6 OF 6) **********

FILTERED SAMPLES-DISSOLVED METALS

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 HN03 JOB FILE:95117

REPORT DATE:16 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

LAB ID	PROJECT ID	COLUMN....	10	11	12	13	14	15	16	ROW
		ANALYSIS..	15	17	19	22	23	25	26	
0 - DENOTES PPB		PPM.....	ZN	BA	CA	MG	MN	K	NA	
95133	9-0 11-18-86 645P	CONC	1.07	0.061	122	49.2	0.142	3.52	19.5	
		%REC	99.5	92	112	97.2	98.6	102.8	102	17
		DUPL	1.07	0.068	128	49.3	0.138	3.53	20.0	
		OID	51206357	51207006	51806352	51806350	51206346 HGA AUTH	51206357	51806350	
95134	2-PC 11-19-86 805A	CONC	<0.030	0.051	21.1	10.7	0.002	36.8	34.0	
		%REC								18
		DUPL								
		OID	51206357	51207006	51806352	51806350	20557008 HGA AUTH	51206357	51806350	
95135	3-PC 11-19-86 1010A	CONC	0.957	0.034	110	54.9	0.052	2.62	5.68	
		%REC								19
		DUPL								
		OID	51206357	51207006	51806352	51806350	51206346 HGA AUTH	51206357	51806350	
95136	4-S 11-19-86 1022A	CONC	0.694	0.058	64.9	21.5	0.005	2.79	11.5	
		%REC								20
		DUPL								
		OID	51206357	51207006	51806352	51806350	20557008 HGA AUTH	51206357	51806350	
95137	4-PC 11-19-86 1208P	CONC	0.086	0.093	90.4	45.9	0.210	3.52	18.2	
		%REC								21
		DUPL								
		OID	51206357	51207006	51806352	51806350	51206346 HGA AUTH	51206357	51806350	
95138	5-S 11-19-86 1230P	CONC	0.601	0.061	186	43.5	0.593	4.67	18.0	
		%REC								22
		DUPL								
		OID	51206357	51207006	51806352	51806350	51206346 HGA AUTH	51206357	51806350	
95139	16-S 11-19-86 315P	CONC	2.87	0.068	108	29.0	1.04	3.28	4.14	
		%REC								23
		DUPL								
		OID	51206357	51207006	51806352	51806350	51206346 HGA AUTH	51206357	51806350	

ZN	ZINC	BA	BARIUM
MG	MAGNESIUM	MN	MANGANESE
NA	SODIUM		
		CA	CALCIUM
		K	POTASSIUM

EXTERNAL QA SAMPLE	%REC	99%	97%	90%	101%	94%	88%	98%

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 4) **********

FILTERED SAMPLES-DISSOLVED METALS

JOB DESCRIPTION:NIROP (CHAIN OF CUSTODY) RD6E444E1100000 HNO3 JOB FILE:95185

REPORT DATE:13 JAN 87 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		AS	CD	CR	CU	PB	HG	NI	SE	AG	ROW
		COLUMN....	1	2	3	4	5	6	7	8	9	
		ANALYSIS..	2	5	6	7	9	10	11	12	13	
		PPM.....										
95185	10-S 11-19-86 440P	CONC	<0.005	0.0006	0.003	0.005	0.005	<0.0004	0.032	<0.005	<0.001	1
		%REC	104					99		86		
		DUPL	<0.005					<0.0008		<0.005		
		OID	01307007	20556364 HGA AUTH	20557007 HGA AUTH	20557007 HGA AUTH	20556364 HGA AUTH	09656329	20557007 HGA AUTH	0130779	20567007 HGA AUTH	
95186	13-S 11-19-86 629P	CONC	<0.005	0.0011	<0.001	0.006	0.005	<0.0004	0.013	<0.005	<0.001	2
		%REC										
		DUPL										
		OID	01307007	20556364 HGA AUTH	20557007 HGA AUTH	20557007 HGA AUTH	20556364 HGA AUTH	09656329	20557007 HGA AUTH	0130779	20567007 HGA AUTH	
95187	14-S 11-19-86 659P	CONC	<0.005	0.0021	<0.001	0.002	0.004	<0.0004	0.037	0.008	<0.001	3
		%REC										
		DUPL										
		OID	01307007	20556364 HGA AUTH	20557007 HGA AUTH	20557007 HGA AUTH	20556364 HGA AUTH	09656329	20557007 HGA AUTH	0130779	20567007 HGA AUTH	
95188	12-S 11-19-86 750P	CONC	<0.005	0.0010	<0.001	0.002	0.001	<0.0004	0.006	<0.005	0.001	4
		%REC										
		DUPL										
		OID	01307007	20556364 HGA AUTH	20557007 HGA AUTH	20557007 HGA AUTH	20556364 HGA AUTH	09656329	20557007 HGA AUTH	0130779	20567007 HGA AUTH	
95189	20-S 11-20-86 814A	CONC	<0.005	0.0009	0.001	0.004	0.004	<0.0004	0.004	<0.005	<0.001	5
		%REC										
		DUPL										
		OID	01307007	20556364 HGA AUTH	20557007 HGA AUTH	20557007 HGA AUTH	20556364 HGA AUTH	09656329	20557007 HGA AUTH	0130779	20567007 HGA AUTH	
95190	11-S 11-20-86 937A	CONC	<0.005	<0.0001	0.001	0.002	<0.001	<0.0004	0.004	<0.005	<0.001	6
		%REC		95	105	90	90		115		105	
		DUPL										
		OID	01307007	20556364 HGA AUTH	20557007 HGA AUTH	20557007 HGA AUTH	20556364 HGA AUTH	09656329	20557007 HGA AUTH	0130779	20567007 HGA AUTH	
95191	6-D 11-20-86 1045A	CONC	<0.005	<0.0001	<0.001	0.009	0.003	<0.0004	0.043	<0.005	<0.001	7
		%REC										
		DUPL										
		OID	01307007	20556364 HGA AUTH	20557007 HGA AUTH	20557007 HGA AUTH	20556364 HGA AUTH	09656329	20557007 HGA AUTH	0130779	20567007 HGA AUTH	
95192	7-S 11-20-86 1129A	CONC	<0.005	0.0008	0.002	0.003	0.002	<0.0004	0.072	<0.005	<0.001	8
		%REC										
		DUPL										
		OID	01307007	20556364 HGA AUTH	20557007 HGA AUTH	20557007 HGA AUTH	20556364 HGA AUTH	09656329	20557007 HGA AUTH	0130779	20567007 HGA AUTH	
	EXTERNAL QA SAMPLE	%REC	102%	94%	99%	98%	100%	101%	100%	102%	99%	

AS	ARSENIC	CD	CADMIUM
CU	COPPER	PB	LEAD
NI	NICKEL	SE	SELENIUM
CR	CHROMIUM		
HG	MERCURY		
AG	SILVER		

INMAG

**********ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 2 OF 4) **********

FILTERED SAMPLES-DISSOLVED METALS

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 HNO3 JOB FILE:95185

REPORT DATE:13 JAN 87 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	1	2	3	4	5	6	7	8	9	ROW
		ANALYSIS..	2	5	6	7	9	10	11	12	13	
		PPM.....	AS	CD	CR	CU	PB	HG	NI	SE	AG	
95193	B-S 11-20-86 202P	CONC	<0.005	0.0009	0.002	0.003	<0.001	<0.0004	0.054	<0.005	0.002	
		%REC	104					96	102	90		9
		DUPL	<0.005					<0.0008	0.050	<0.005		
		OID	01307007	20557005 HGA AUTH	20557007 HGA AUTH	20557007 HGA AUTH	20556364 HGA AUTH	09656329	51206957 HGA AUTH	01307009	20567007 HGA AUTH	

AS	ARSENIC	CD	CADMIUM	CR	CHROMIUM
CU	COPPER	PB	LEAD	HG	MERCURY
NI	NICKEL	SE	SELENIUM	AG	SILVER

INMAC

**********ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 3 OF 4) **********

FILTERED SAMPLES-DISSOLVED METALS

JOB DESCRIPTION:NIROF (CHAIN-OF-CUSTODY) RDGE444E1100000 HNO3 JOB FILE:25185

REPORT DATE:13 JAN 87 RECEIPT DATE:21 NOV 86 EST. CONP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		ZN	BA	CA	MG	MN	K	NA	ROW
		COLUMN....	10	11	12	13	14	15	16	
		ANALYSIS..	15	17	19	22	23	25	26	
		PPM.....								
95185	10-S 11-19-86 440P	CONC	0.735	0.079	143	50.8	1.58	3.67	16.5	
		%REC	94.9	107	96.2	92	101	94.2	110	1
		DUPL	0.742	0.080	148	52.9	1.60	3.69	17.1	
		OID	51206357	51207007	51206352	51280635	51206357 HGA AUTH	51806357	51806350	
95186	13-S 11-19-86 629P	CONC	3.03	0.093	154	36.9	1.50	3.06	6.50	
		%REC								2
		DUPL								
		OID	51206357	51207007	51206352	51280635	51206357 HGA AUTH	51806357	51806350	
95187	14-S 11-19-86 659P	CONC	3.25	0.093	190	33.8	0.876	1.92	5.77	
		%REC								3
		DUPL								
		OID	51206357	51207007	51206352	51280635	51206357 HGA AUTH	51806357	51806350	
95188	12-S 11-19-86 750P	CONC	3.81	0.064	126	33.8	1.20	3.67	17.1	
		%REC								4
		DUPL								
		OID	51206357	51207007	51206352	51280635	51206357 HGA AUTH	51806357	51806350	
95189	20-S 11-20-86 814A	CONC	3.10	0.055	66.0	17.2	0.088	2.22	9.45	
		%REC								5
		DUPL								
		OID	51206357	51207007	51206352	51280635	51206357 HGA AUTH	51806357	51806350	
95190	11-S 11-20-86 937A	CONC	0.246	0.106	158	58.1	0.003	3.97	7.44	
		%REC								6
		DUPL								
		OID	51206357	51207007	51206352	51280635	20557008 HGA AUTH	51806357	51806350	
95191	6-D 11-20-86 1045A	CONC	0.823	0.092	102	47.6	0.330	2.34	15.0	
		%REC								7
		DUPL								
		OID	51206357	51207007	51206352	51280635	20557008 HGA AUTH	51806357	51806350	
95192	7-S 11-20-86 1129A	CONC	1.05	0.060	216	27.3	1.01	2.83	6.77	
		%REC								8
		DUPL								
		OID	51206357	51207007	51206352	51280635	20557008 HGA AUTH	51806357	51806350	
	EXTERNAL QA SAMPLE	%REC	97%	94%	90%	101%	99%	88%	100%	

ZN ZINC BA BARIUM CA CALCIUM
MG MAGNESIUM MN MANGANESE K POTASSIUM
NA SODIUM

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 4 OF 4) **********

FILTERED SAMPLES-DISSOLVED METALS

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 HNO3 JOB FILE:95185

REPORT DATE:13 JAN 87 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	10	11	12	13	14	15	16	ROW
		ANALYSIS..	15	17	19	22	23	25	26	
		PPM.....	ZN	BA	CA	MG	MN	K	NA	
95193	8-S 11-20-86 202P	CONC	4.42	* 0.072	* 134	* 33.0	* 1.94	* 3.74	* 6.89 *	
		XREC	100	* 93	* 101	*	* 103	* 95	* *	9
		DUPL	4.42	* 0.071	* 139	*	* 1.95	* 3.84	* *	
		OID	51206357*	51207007*	51207005*	51806350*	51206357* HGA AUTH	51806357*	51806350*	

ZN	ZINC	BA	BARIUM	CA	CALCIUM
MG	MAGNESIUM	MN	MANGANESE	K	POTASSIUM
NA	SODIUM				

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 2) **********

FILTERED SAMPLES-DISSOLVED METALS

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 N JOB FILE:95218

REPORT DATE:13 JAN 87 RECEIPT DATE:24 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 1	2	3	4	5	6	7	8	9	ROW
			ANALYSIS.. 2	5	6	7	9	10	11	12	13	
			PPM.....AS	CD	CR	CU	PB	HG	NI	SE	AG	
95218	1-S 11-20-86 505P	CONC	<0.005	<0.0001	0.005	0.004	<0.001	<0.0004	0.009	<0.005	0.005	1
		%REC	102	110	90	90	90	105	95	94	95	
		DUPL	<0.005					<0.0008		<0.005		
		OID	01307007	20557005 HGA AUTH	20557006 HGA AUTH	20557006 HGA AUTH	20556364 HGA AUTH	09656342	20557006 HGA AUTH	01307009	20567008 HGA AUTH	
95219	1-D 11-20-86 647P	CONC	<0.005	0.0004	0.002	<0.001	<0.001	<0.0004	0.003	<0.005	0.003	2
		%REC										
		DUPL										
		OID	01307007	20557005 HGA AUTH	20557006 HGA AUTH	20557006 HGA AUTH	20556364 HGA AUTH	09656342	20557006 HGA AUTH	01307009	20567008 HGA AUTH	
95220	5-D 11-20-86 745P	CONC	<0.005	<0.0001	0.002	<0.001	<0.001	<0.0004	<0.001	<0.005	0.003	3
		%REC										
		DUPL										
		OID	01307007	20557005 HGA AUTH	20557006 HGA AUTH	20557006 HGA AUTH	20556364 HGA AUTH	09656342	20557006 HGA AUTH	01307009	20567008 HGA AUTH	
95221	2-D 11-20-86 839P	CONC	<0.005	<0.0001	0.001	<0.001	<0.001	<0.0004	0.002	<0.005	<0.001	4
		%REC										
		DUPL										
		OID	01307007	20557005 HGA AUTH	20557006 HGA AUTH	20557006 HGA AUTH	20556364 HGA AUTH	09656342	20557006 HGA AUTH	01307009	20567008 HGA AUTH	
95222	4-D 11-20-86 1030P	CONC	<0.005	0.0002	0.001	<0.001	<0.001	<0.0004	<0.001	<0.005	<0.001	5
		%REC										
		DUPL										
		OID	01307007	20557005 HGA AUTH	20557006 HGA AUTH	20557006 HGA AUTH	20556364 HGA AUTH	09656342	20557006 HGA AUTH	01307009	20567008 HGA AUTH	
95223	3-D 11-20-86 1127P	CONC	<0.005	0.0004	0.001	0.006	<0.001	<0.0004	0.004	<0.005	<0.001	6
		%REC										
		DUPL										
		OID	01307007	20557005 HGA AUTH	20557006 HGA AUTH	20557006 HGA AUTH	20556364 HGA AUTH	09656342	20557006 HGA AUTH	01307009	20567008 HGA AUTH	
95224	6-S 11-20-86 1150P	CONC	<0.005	0.0004	<0.001	<0.001	0.002	<0.0004	0.025	<0.005	<0.001	7
		%REC										
		DUPL										
		OID	01307007	20557005 HGA AUTH	20557006 HGA AUTH	20557006 HGA AUTH	20556364 HGA AUTH	09656342	20557006 HGA AUTH	01307009	20567008 HGA AUTH	
95225	RINSATE BLK 11-20-86 1159	CONC	<0.005	<0.0001	0.002	0.009	<0.001	<0.0004	0.001	<0.005	0.001	8
		%REC										
		DUPL										
		OID	01307007	20557005 HGA AUTH	20557006 HGA AUTH	20557006 HGA AUTH	20556364 HGA AUTH	09656342	20557006 HGA AUTH	01307009	20567008 HGA AUTH	
	EXTERNAL QA SAMPLE	%REC	102%	104%	94%	96%	102%	97%	99%	102%	98%	

AS	ARSENIC	CD	CADMIUM
CR	CHROMIUM	CU	COPPER
PB	LEAD	HG	MERCURY
NI	NICKEL	SE	SELENIUM
AG	SILVER		

INMAG

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 2 OF 2) **********

FILTERED SAMPLES-DISSOLVED METALS

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 N JOB FILE:95218

REPORT DATE:13 JAN 87 RECEIPT DATE:24 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		ZN	BA	CA	MG	MN	K	NA	ROW
		COLUMN....	10	11	12	13	14	15	16	
		ANALYSIS..	15	17	19	22	23	25	26	
		PPM.....	ZN	BA	CA	MG	MN	K	NA	
95218	1-S 11-20-86 505P	CONC	0.133	0.080	101	20.2	1.07	3.92	14.3	
		%REC	99.9	101	96.3	110	98.7	100	103	1
		DUPL	0.138	0.086	110	20.8	1.08	3.93	15.0	
		OID	51206357	51207007	51206352	51806350	51206357 HGA AUTH	51806357	51806350	
95219	1-D 11-20-86 647P	CONC	1.25	0.040	86.0	38.8	0.090	2.20	5.85	
		%REC								2
		DUPL								
		OID	51206357	51207007	51206352	51806350	51206357 HGA AUTH	51806357	51806350	
95220	5-D 11-20-86 748P	CONC	0.687	0.080	117	61.4	0.100	2.74	3.57	
		%REC								3
		DUPL								
		OID	51206357	51207007	51206352	51806350	51206357 HGA AUTH	51806357	51806350	
95221	2-D 11-20-86 839P	CONC	0.660	0.075	110	51.6	0.392	2.67	6.06	
		%REC								4
		DUPL								
		OID	51206357	51207007	51206352	51806350	51206357 HGA AUTH	51806357	51806350	
95222	4-D 11-20-86 1030P	CONC	0.492	0.099	99.3	48.4	0.362	2.43	13.5	
		%REC								5
		DUPL								
		OID	51206357	51207007	51206352	51806350	51206357 HGA AUTH	51806357	51806350	
95223	3-D 11-20-86 1127P	CONC	0.842	0.074	115	43.5	0.076	2.20	4.81	
		%REC								6
		DUPL								
		OID	51206357	51207007	51206352	51806350	51206357 HGA AUTH	51806357	51806350	
95224	6-S 11-20-86 1150P	CONC	0.909	0.077	145	39.4	0.564	4.00	26.0	
		%REC								7
		DUPL								
		OID	51206357	51207007	51206352	51806350	51206357 HGA AUTH	51806357	51806350	
95225	RINSATE BLK 11-20-86 1159	CONC	<0.030	<0.010	<0.100	<0.100	<0.030	<0.100	<0.100	
		%REC								8
		DUPL								
		OID	51206357	51207007	51207005	51207005	51206357 HGA AUTH	51207005	51207005	

ZN ZINC BA BARIUM CA CALCIUM
MG MAGNESIUM MN MANGANESE K POTASSIUM
NA SODIUM

EXTERNAL QA SAMPLE	%REC	102%	92%	90%	101%	99%	88%	98%

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 3) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE:95048
REPORT DATE:04 DEC 86 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

		COLUMN....	1	2	3	
		ANALYSIS..	148	149	156	
D : DENOTES PPB		PPM.....	SO-4	CL	ALK	
LAB ID	PROJECT ID					ROW
95048	DUPL 1 11-17-86	CONC	96.5	4.6	484	
		%REC	104	97.5	91.6667	1
		DUPL	87	4.5	481	
		OID	01406324	01406337	01406330	
95049	DUPL 2 11-17-86	CONC	43.0	15.3	437	
		%REC				2
		DUPL				
		OID	01406324	01406337	01406330	
95050	DUPL 3 11-17-86	CONC	319	15.1	476	
		%REC				3
		DUPL				
		OID	01406324	01406337	01406330	
95051	3-S 11-17-86 1058	CONC	97.0	4.8	481	
		%REC				4
		DUPL				
		OID	01406324	01406337	01406330	
95052	9-S 11-17-86 1649	CONC	91.7	15.2	436	
		%REC				5
		DUPL				
		OID	01406324	01406337	01406330	
95053	15-S 11-17-86 1537	CONC	318	15.0	477	
		%REC				6
		DUPL				
		OID	01406324	01406337	01406330	
95054	FMC-33 11-17-86 1240	CONC	321	12.9	504	
		%REC				7
		DUPL				
		OID	01406324	01406337	01406330	
95055	RINSATE BLK 11-17-86 1821	CONC	<10.0	<1.0	<5.0	
		%REC				8
		DUPL				
		OID	01406324	01406337	01406330	

SO-4 SULFATE CL CHLORIDES
ALK ALKALINITY

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 2 OF 3) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) R06E444E1100000 JOB FILE:95048
REPORT DATE:04 DEC 86 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 1	2	3	ROW
			ANALYSIS.. 148	149	156	
			PPM.....SO-4	CL	ALK	
95056	TRIP BLK 11-17-86	CONC	<10.0	<1.0	<5.0	9
		%REC	100.6	98.5	94.7	
		DUPL	<10.0	<1.0	<5.0	
		OID	01406324	01406337	01406330	
95057	8-D 11-18-86 1640	CONC	272	47.7	267	10
		%REC				
		DUPL				
		OID	01406324	01406337	01406330	
95058	2-S 11-18-86 1030	CONC	56.3	4.5	569	11
		%REC				
		DUPL				
		OID	01406324	01406337	01406330	
95059	17-S 11-18-86 1344	CONC	333	25.6	458	12
		%REC				
		DUPL				
		OID	01406324	01406337	01406330	
95060	7-D 11-18-86 1415	CONC	251	36.0	303	13
		%REC				
		DUPL				
		OID	01406324	01406337	01406330	
95061	1-PC 11-18-86 1111	CONC	96.0	58.4	234	14
		%REC				
		DUPL				
		OID	01406324	01406337	01406330	
95062	18-S 11-18-86 405P	CONC	422	26.6	302	15
		%REC				
		DUPL				
		OID	01406324	01406337	01406330	
95063	19-S 11-18-86 635P	CONC	26.8	54.6	264	16
		%REC				
		DUPL				
		OID	01406324	01406337	01406330	

SO-4 SULFATE
ALK ALKALINITY
CL CHLORIDES

**********ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 3 OF 3) **********

JOB DESCRIPTION:NIROP-(CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE:95048
REPORT DATE:04 DEC 86 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 1 ANALYSIS.. 148 PPM.....SO-4	2 149 CL	3 156 ALK	ROW
95064	9-D 11-18-86 645P	CONC	189	42.9	362	
		%REC	104	102.2	92.3333	17
		DUPL	189	43.0	360	
		OID	01406324	01406337	01406330	
95065	2-PC 11-19-86 835A	CONC	130	59.7	8.5	
		%REC				18
		DUPL				
		OID	01406324	01406337	01406330	
95066	3-PC 11-19-86 1010A	CONC	304	31.7	239	
		%REC				19
		DUPL				
		OID	01406324	01406337	01406330	
95067	4-S 11-19-86 1022A	CONC	45.2	4.2	242	
		%REC				20
		DUPL				
		OID	01406324	01406337	01406330	
95068	4-PC 11-19-86 1208P	CONC	85.9	75.6	233	
		%REC				21
		DUPL				
		OID	01406324	01406337	01406330	
95069	5-S 11-19-86 1230P	CONC	192	50.0	497	
		%REC				22
		DUPL				
		OID	01406324	01406337	01406330	
95070	16-S 11-19-86 315P	CONC	59.5	4.6	395	
		%REC				23
		DUPL				
		OID	01406324	01406337	01406330	

SO-4 SULFATE CL CHLORIDES
ALK ALKALINITY

ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 2)

JOB DESCRIPTION:NIROP (CHAIN OF CUSTODY) R06E444E1100000 JOB FILE:95158
REPORT DATE:03 DEC 86 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 1		2		3		1000
			ANALYSIS.. 148		149		156		
			PPM.....SO-4		CL		ALK		
95158	10-S 11-19-86 440P	CONC	224	*	36.6	*	493	*	1
		%REC	101.4	*	103.2	*	93.3333	*	
		DUPL	211	*	36.7	*	490	*	
		OID	01406325	*	01406337	*	01406330	*	
95159	13-S 11-19-86 659P	CONC	218	*	13.7	*	374	*	2
		%REC		*		*		*	
		DUPL		*		*		*	
		OID	01406325	*	01406337	*	01406330	*	
95160	14-S 11-19-86 659P	CONC	164	*	58.8	*	383	*	3
		%REC		*		*		*	
		DUPL		*		*		*	
		OID	01406325	*	01406337	*	01406330	*	
95161	12-S 11-19-86 750P	CONC	56.4	*	45.7	*	417	*	4
		%REC		*		*		*	
		DUPL		*		*		*	
		OID	01406325	*	01406337	*	01406330	*	
95162	20-S 11-20-86 814A	CONC	72.4	*	15.3	*	190	*	5
		%REC		*		*		*	
		DUPL		*		*		*	
		OID	01406325	*	01406337	*	01406330	*	
95163	11-S 11-20-86 937A	CONC	363	*	23.2	*	426	*	6
		%REC		*		*		*	
		DUPL		*		*		*	
		OID	01406325	*	01406337	*	01406330	*	
95164	6-D 11-20-86 1045A	CONC	176	*	72.5	*	260	*	7
		%REC		*		*		*	
		DUPL		*		*		*	
		OID	01406325	*	01406337	*	01406330	*	
95165	7-S 11-20-86 1129A	CONC	148	*	18.7	*	533	*	8
		%REC		*		*		*	
		DUPL		*		*		*	
		OID	01406325	*	01406337	*	01406330	*	

SO-4 SULFATE CL CHLORIDES
ALK ALKALINITY

R3MAC

*** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET SHEET 2 OF 2 ***

JOB DESCRIPTION:NIROP (CHAIN-OF CUSTODY) KOGE44AE100000 JOB TITE:95158
REPORT DATE:03 DEC 86 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

		COLUMN....	1	2	3	
		ANALYSIS..	148	149	156	
B : DENOTES PPB		PPM.....	SO-4	CL	ALK	
LAB ID	PROJECT ID					ROW
95166	8-S 11-20-86 202P	CONC	183	* 5.9	* 469	*
		%REC	101.4	* 100.5	* 88	* 9
		DUPL	178	* 5.8	* 468	*
		OID	01406325*	01406337*	01406330*	

SO-4 SULFATE
ALK ALKALINITY
CL CHLORIDES

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 1) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE:95202
REPORT DATE:08 DEC 86 RECEIPT DATE:24 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	1	2	3	ROW
		ANALYSIS..	148	149	156	
		PPM.....	SO-4	CL	ALK	
95202	1-S 11-20-86 505P	CONC	77.5	19.5	333	1
		%REC	93.4	99.5	95.3399	
		DUPL	78.4	19.6	331	
		OID	01406338	01406337	01406330	
95203	1-D 11-20-86 647P	CONC	129	30.9	231	2
		%REC				
		DUPL				
		OID	01406338	01406337	01406330	
95204	5-D 11-20-86 745P	CONC	184	3.2	383	3
		%REC				
		DUPL				
		OID	01406338	01406337	01406330	
95205	2-D 11-20-86 839P	CONC	184	41.7	268	4
		%REC				
		DUPL				
		OID	01406338	01406337	01406330	
95206	4-D 11-20-86 1030P	CONC	148	72.6	258	5
		%REC				
		DUPL				
		OID	01406338	01406337	01406330	
95207	3-D 11-20-86 1127P	CONC	203	22.6	302	6
		%REC				
		DUPL				
		OID	01406338	01406337	01406330	
95208	6-S 11-20-86 1150P	CONC	172	32.7	456	7
		%REC				
		DUPL				
		OID	01406338	01406337	01406330	
95209	RINSATE BLK 11-20-86 1159	CONC	<8.0	<1.0	<5.0	8
		%REC				
		DUPL				
		OID	01406338	01406337	01406330	

SO-4 SULFATE CL CHLORIDES
ALK ALKALINITY

ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 1)

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) R06E444E1100000 NAOH JOB FILE:95071
REPORT DATE:02 DEC 86 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

COLUMN.... 1
ANALYSIS.. 8
PPM.....CN

B : DENOTES MB

LAB ID	PROJECT ID				ROW
95071	DUPL 1 11-17-86	CONC	<0.010	*	1
		%REC	101.5	*	
		DUPL	<0.010	*	
		OID	49406320	*	
95072	DUPL 2 11-17-86	CONC	<0.010	*	2
		%REC		*	
		DUPL		*	
		OID	49406320	*	
95073	DUPL 3 11-17-86	CONC	<0.010	*	3
		%REC		*	
		DUPL		*	
		OID	49406320	*	
95074	3-S 11-17-86 1058	CONC	<0.010	*	4
		%REC		*	
		DUPL		*	
		OID	49406320	*	
95075	9-S 11-17-86 1649	CONC	<0.010	*	5
		%REC		*	
		DUPL		*	
		OID	49406320	*	
95076	15-S 11-17-86 1537	CONC	<0.010	*	6
		%REC		*	
		DUPL		*	
		OID	49406320	*	
95077	FMC-33 11-17-86 1240	CONC	<0.010	*	7
		%REC		*	
		DUPL		*	
		OID	49406320	*	
95078	RINSATE BLK 11-17-86 1821	CONC	<0.010	*	8
		%REC		*	
		DUPL		*	
		OID	49406320	*	

CN CYANIDE

ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 2 OF 3)

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY)
REPORT DATE:02 DEC 86

RD6E444E1100000 NAOH
RECEIPT DATE:19 NOV 86

JOB FILE:95071
EST. COMP. DATE:07 JAN 87

COLUMN.... 1
ANALYSIS.. 8
PPM.....CN

B : DENOTES PPB

LAB ID	PROJECT ID				ROW
95079	TRIP BLK 11-17-86	CONC	<0.010	*	
		%REC		*	9
		DUPL		*	
		OID	49406320	*	
95080	8-D 11-18-86 1640	CONC	<0.010	*	
		%REC		*	10
		DUPL		*	
		OID	49406320	*	
95081	2-S 11-18-86 1030	CONC	<0.010	*	
		%REC		*	11
		DUPL		*	
		OID	49406320	*	
95082	17-S 11-18-86 1344	CONC	<0.010	*	
		%REC		*	12
		DUPL		*	
		OID	49406320	*	
95083	7-D 11-18-86 1415	CONC	<0.010	*	
		%REC		*	13
		DUPL		*	
		OID	49406320	*	
95084	1-PC 11-18-86 1111	CONC	<0.010	*	
		%REC		*	14
		DUPL		*	
		OID	49406320	*	
95085	18-S 11-18-86 405P	CONC	<0.010	*	
		%REC		*	15
		DUPL		*	
		OID	49406320	*	
95086	19-S 11-18-86 635P	CONC	<0.010	*	
		%REC		*	16
		DUPL		*	
		OID	49406320	*	

CN CYANIDE

**********ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 3 OF 3) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 NAOH JOB FILE:95071
REPORT DATE:02 DEC 86 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

COLUMN.... 1
ANALYSIS.. 8
S : REPORTED PPB PPM.....CN

LAB ID	PROJECT ID				ROW
95087	9-D 11-18-86 645P	CONC	<0.010	*	
		%REC	100	*	17
		DUPL	<0.010	*	
		OID	49406320	*	
95088	2-PC 11-19-86 835A	CONC	<0.010	*	
		%REC		*	18
		DUPL		*	
		OID	49406320	*	
95089	3-PC 11-19-86 1010A	CONC	<0.010	*	
		%REC		*	19
		DUPL		*	
		OID	49406320	*	
95090	4-S 11-19-86 1022A	CONC	<0.010	*	
		%REC		*	20
		DUPL		*	
		OID	49406320	*	
95091	4-PC 11-19-86 1208P	CONC	<0.010	*	
		%REC		*	21
		DUPL		*	
		OID	49406320	*	
95092	5-S 11-19-86 1230P	CONC	<0.010	*	
		%REC		*	22
		DUPL		*	
		OID	49406320	*	
95093	16-S 11-19-86 315P	CONC	<0.010	*	
		%REC		*	23
		DUPL		*	
		OID	49406320	*	

CN CYANIDE

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 2) **********

JOB DESCRIPTION:NIROP (CHAIN OF CUSTODY)
REPORT DATE:02 DEC 86

RD6F444E1100000 NACH
RECEIPT DATE:21 NOV 86

JOB FILE:95167
EST. COMP. DATE:06 JAN 87

COLUMN..... 1
ANALYSIS.. 153
PPM.....CN

B : DENOTES PPB

LAB ID	PROJECT ID				
95167	10-S 11-19-86 440P	CONC	<0.010	*	1
		%REC	105	*	
		DUPL	<0.010	*	
		OID	01406335	*	
95168	13-S 11-19-86 629P	CONC	<0.010	*	2
		%REC		*	
		DUPL		*	
		OID	01406335	*	
95169	14-S 11-19-86 659P	CONC	<0.010	*	3
		%REC		*	
		DUPL		*	
		OID	01406335	*	
95170	12-S 11-19-86 750P	CONC	<0.010	*	4
		%REC		*	
		DUPL		*	
		OID	01406335	*	
95171	20-S 11-20-86 814A	CONC	<0.010	*	5
		%REC		*	
		DUPL		*	
		OID	01406335	*	
95172	11-S 11-20-86 937A	CONC	<0.010	*	6
		%REC		*	
		DUPL		*	
		OID	01406335	*	
95173	6-D 11-20-86 1045A	CONC	<0.010	*	7
		%REC		*	
		DUPL		*	
		OID	01406335	*	
95174	7-S 11-20-86 1129A	CONC	<0.010	*	8
		%REC		*	
		DUPL		*	
		OID	01406335	*	

CN CYANIDE

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 2 OF 2) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RDGE444E1100000 NAOH JOB FILE:95167
REPORT DATE:02 DEC 86 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

COLUMN.... 1
ANALYSIS.. 153
B : DENOTES PPB PPM.....CN

LAB ID	PROJECT ID				ROW
95175	B-S 11-20-86 202P	CONC	<0.010	*	
		%REC	103	*	9
		DUPL	<0.010	*	
		OID	01406335	*	

CN CYANIDE

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 1) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 NA001 JOB FILE:95210
REPORT DATE:02 DEC 86 RECEIPT DATE:24 NOV 86 EST. COMP. DATE:06 JAN 87

COLUMN.... 1
ANAL.[illegible].. 8
B : DENOTES PPB PPM.....CN

LAB ID	PROJECT ID				NOTE
95210	1-S 11-20-86 505P	CONC	<0.010	*	
		%REC	103	*	1
		DUPL	<0.010	*	
		OID	01406335	*	
95211	1-D 11-20-86 647P	CONC	<0.010	*	
		%REC		*	2
		DUPL		*	
		OID	01406335	*	
95212	5-D 11-20-86 745P	CONC	<0.010	*	
		%REC		*	3
		DUPL		*	
		OID	01406335	*	
95213	2-D 11-20-86 839P	CONC	<0.010	*	
		%REC		*	4
		DUPL		*	
		OID	01406335	*	
95214	4-D 11-20-86 1030P	CONC	<0.010	*	
		%REC		*	5
		DUPL		*	
		OID	01406335	*	
95215	3-D 11-20-86 1127P	CONC	<0.010	*	
		%REC		*	6
		DUPL		*	
		OID	01406335	*	
95216	6-S 11-20-86 1150P	CONC	<0.010	*	
		%REC		*	7
		DUPL		*	
		OID	01406335	*	
95217	RINSATE BLK 11-20-86 1159	CONC	<0.010	*	
		%REC		*	8
		DUPL		*	
		OID	01406335	*	

CN CYANIDE

INMAC

**********ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 3) **********

JOB DESCRIPTION:NITROP (CHAIN-OF-CUSTODY) RD6E44E1100000 H2S04 JOB FILE:95094
REPORT DATE:15 DEC 86 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

COLUMN.... 1
ANALYSIS.. 31
B : DENOTES PPB PPM.....NO3-N

LAB ID	PROJECT ID				ROW
95094	DUPL 1 11-17-86	CONC	1.16	*	1
		%REC	101	*	
		DUPL	1.13	*	
		OID	01406346	*	
95095	DUPL 2 11-17-86	CONC	3.83	*	2
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95096	DUPL 3 11-17-86	CONC	0.028	*	3
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95097	3-S 11-17-86 1058	CONC	1.17	*	4
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95098	9-S 11-17-86 1649	CONC	3.92	*	5
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95099	15-S 11-17-86 1537	CONC	0.028	*	6
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95100	FMC-33 11-17-86 1240	CONC	0.020	*	7
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95101	RINSATE BLK 11-17-86 1821	CONC	0.021	*	8
		%REC		*	
		DUPL		*	
		OID	01406346	*	

NO3-N NITRATE NITROGEN

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 2 OF 3) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 H2SO4 JOB FILE:95094
REPORT DATE:15 DEC 86 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

COLUMN.... 1
ANALYSIS.. 31
B : DENOTES PPB PPM.....NO3-N

LAB ID	PROJECT ID				ROW
95102	TRIP BLK 11-17-86	CONC	0.023	*	9
		%REC	100	*	
		DUPL	0.019	*	
		OID	01406346	*	
95103	8-D 11-18-86 1640	CONC	0.022	*	10
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95104	2-S 11-18-86 1030	CONC	1.37	*	11
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95105	17-S 11-18-86 1344	CONC	2.02	*	12
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95106	7-D 11-18-86 1415	CONC	0.031	*	13
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95107	1-PC 11-18-86 1111	CONC	0.209	*	14
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95108	18-S 11-18-86 405P	CONC	0.016	*	15
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95109	19-S 11-18-86 635P	CONC	2.74	*	16
		%REC		*	
		DUPL		*	
		OID	01406346	*	

NO3-N NITRATE NITROGEN

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 3 OF 3) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 H2604 JOB FILE:95094
REPORT DATE:15 DEC 86 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

COLUMN.... 1
ANALYSIS... 31
B : DENOTES PPB PPM.....NO3-N

LAB ID	PROJECT ID				ROW
95110	9-D 11-18-86 645P	CONC	0.221	*	17
		%REC	99.75	*	
		DUPL	0.220	*	
		OID	01406346	*	
95111	2-PC 11-19-86 835A	CONC	0.160	*	18
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95112	3-PC 11-19-86 1010A	CONC	0.060	*	19
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95113	4-S 11-19-86 1022A	CONC	6.56	*	20
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95114	4-PC 11-19-86 1028P	CONC	0.106	*	21
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95115	5-S 11-19-86 1230P	CONC	2.66	*	22
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95116	16-S 11-19-86 315P	CONC	0.110	*	23
		%REC		*	
		DUPL		*	
		OID	01406346	*	

NO3-N - NITRATE NITROGEN

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 2) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 H2SO4 JOB FILE:95176
REPORT DATE:22 DEC 86 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

COLUMN.... 1
ANALYSIS.. 31
B : DENOTES PPB PPM.....NO3-N

LAB ID	PROJECT ID				ROW
95176	10-S 11-19-86 440P	CONC	0.205	*	1
		%REC	101	*	
		DUPL	0.204	*	
		OID	01406345	*	
95177	13-S 11-19-86 629P	CONC	2.09	*	2
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95178	14-S 11-19-86 659P	CONC	17.0	*	3
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95179	12-S 11-19-86 750P	CONC	6.05	*	4
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95180	20-S 11-20-86 814A	CONC	0.434	*	5
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95181	11-S 11-20-86 937A	CONC	0.803	*	6
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95182	6-D 11-20-86 1045A	CONC	0.036	*	7
		%REC		*	
		DUPL		*	
		OID	01406346	*	
95183	7-S 11-20-86 1129A	CONC	3.29	*	8
		%REC		*	
		DUPL		*	
		OID	01406346	*	

NO3-N NITRATE NITROGEN

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 2 OF 2) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 H2SO4 JOB FILE:95176
REPORT DATE:22 DEC 86 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

COLUMN.... 1
ANALYSIS.. 31
B : DENOTES PPB PPM.....NO3-N

LAB ID	PROJECT ID				ROW
95184	8-S 11-20-86 202P	CONC	1.69	*	
		%REC	99.5	*	9
		DUPL	1.64	*	
		OID	01406346*		

NO3-N NITRATE NITROGEN

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 20) **********

RK

JOB DESCRIPTION:*NITROP (CHAIN OF CUSTODY) RD6E444E1100000 JOB FILE:95023
REPORT DATE:07 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN....	1	2	3	4	5	6	7	8	9	ROW
			ANALYSIS..	72	73	74	75	76	77	78	79	80	
			PPM.....	CLME	BRME	VICL	CLET	MECL	DCLETE	11DCE	+DICLE	CHCL3	
95023	DUPL 1 11-17-86	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	0.19	<0.005	
		%REC											1
		DUPL									0.19		
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95024	DUPL 2 11-17-86	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	0.025	0.34	<0.005	
		%REC											2
		DUPL									0.32		
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95025	DUPL 3 11-17-86	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC											3
		DUPL											
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95026	3-S 11-17-86 1058	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	0.29	<0.005	
		%REC											4
		DUPL											
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95027	9-S 11-17-86 1649	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	0.035	0.34	<0.005	
		%REC											5
		DUPL									0.32		
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95028	15-S 11-17-86 1537	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC											6
		DUPL											
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95029	FME-33 11-17-86 1240	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	0.0073	0.11	<0.005	
		%REC											7
		DUPL									0.12		
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95030	RINSATE BLK 11-18-86 1821	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC											8
		DUPL											
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	

CLME CHLOROMETHANE
CLET CHLOROETHANE
11DCE 1 1-DICHLOROETHANE
BRME BROMOMETHANE
MECL METHYLENE CHLORIDE
+DICLE TRANS-1 2-DICHLOROETHENE
VICL VINYL CHLORIDE
DCLETE 1 1-DICHLOROETHENE
CHCL3 CHLOROFORM

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 2 OF 20) **********

JOB DESCRIPTION: *NIROP (CHAIN-OF-CUSTODY) — R06E444E1100000 — JOB FILE: 95023

REPORT DATE: 07 JAN 87 — RECEIPT DATE: 19 NOV 86 — EST. COMP. DATE: 07 JAN 87

B - 1 DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	1	2	3	4	5	6	7	8	9	ROW
		ANALYSIS..	72	73	74	75	76	77	78	79	80	
		PPM.....	CLME	BRME	VICL	CLET	MECL	DCLETE	11DCE	+DICLE	CHCL3	
95031	TRIP BLK 11-17-86	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										9
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95032	8-D 11-18-86 1640	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	0.048	<0.005	
		%REC						(0.004)				10
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95033	2-S 11-18-86 1030	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC								(0.003)		11
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95034	17-2 11-18-86 1344	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	0.027	<0.005	
		%REC										12
		DUPL								0.027		
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95035	7-D 11-18-86 1415	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC	102.5	99.9	104.375	105.125	97.8	101.6	94.5	108.65	102.3	13
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95036	1-PC 11-18-86 1111	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										14
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95037	TRIP BLANK 11-18-86	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										15
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95038	18-S 11-18-86 405P	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	0.33	<0.005	
		%REC										16
		DUPL								0.34		
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	

CLME	CHLOROMETHANE	BRME	BROMOMETHANE	VICL	VINYL CHLORIDE
CLET	CHLOROETHANE	MECL	METHYLENE CHLORIDE	DCLETE	1 1-DICHLOROETHENE
11DCE	1 1-DICHLOROETHANE	+DICLE	TRANS-1 2-DICHLOROETHENE	CHCL3	CHLOROFORM

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 3 OF 20) **********

JOB DESCRIPTION: *NIROP (CHAIN OF CUSTODY) R06E444E1100000 JOB FILE:95023
REPORT DATE: 07 JAN 87 RECEIPT DATE: 19 NOV 86 EST. COMP. DATE: 07 JAN 87

B = DENOTES PPB

LAB ID	PROJECT ID		COLUMN....	1	2	3	4	5	6	7	8	9	ROW
			ANALYSIS..	72	73	74	75	76	77	78	79	80	
			PPM.....	CLME	BRME	VICL	CLET	MECL	DCLETE	11DCE	+DICLE	CHCL3	
95039	19-S 11-18-86 635P	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	0.005	<0.005	
		%REC											17
		DUPL											
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95040	9-B 11-18-86 645P	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	0.028	<0.005	
		%REC								(0.0092)			18
		DUPL											
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95041	2-PC 11-19-86 835	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC											19
		DUPL											
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95042	3-PC 11-19-86 1010	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC											20
		DUPL											
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95043	4-S 11-19-86 1022	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC											21
		DUPL		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95044	4-PC 11-19-86 1208P	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC											22
		DUPL											
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95045	5-S 11-19-86 1230P	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC											23
		DUPL											
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95046	16-S 11-19-86 315P	CONC		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC			88.5	93	91	102.5	95	96	98.5	95.5	24
		DUPL											
		OID		08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	

CLME	CHLOROMETHANE	BRME	BROMOMETHANE	VICL	VINYL CHLORIDE
CLET	CHLOROETHANE	MECL	METHYLENE CHLORIDE	DCLETE	1-1-DICHLOROETHENE
11DCE	1 1-DICHLOROETHANE	+DICLE	TRANS-1 2-DICHLOROETHENE	CHCL3	CHLOROFORM

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 4 OF 20) **********

JOB DESCRIPTION:XNIROP (CHAIN-OF-CUSTODY) R06E444E1100000 JOB FILE:95023
REPORT DATE:07 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 1	2	3	4	5	6	7	8	9	ROW
			ANALYSIS.. 72	73	74	75	76	77	78	79	80	
			PPM.....CLME	BRME	VICL	CLET	MECL	DCLETE	11DCE	+DICLE	CHCL3	
95047	TRIP BLANK 11-19-86	CONC	<0.010 *	<0.010 *	<0.010 *	<0.010 *	<0.005 *	<0.005 *	<0.005 *	<0.005 *	<0.005 *	25
		%REC	*	*	*	*	*	*	*	*	*	
		DUPL	*	*	*	*	*	*	*	*	*	
		OID	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	

CLME	CHLOROMETHANE	BRME	BROMOMETHANE	VICL	VINYL CHLORIDE
CLET	CHLOROETHANE	MECL	METHYLENE CHLORIDE	DCLETE	1 1-DICHLOROETHENE
11DCE	1 1-DICHLOROETHANE	+DICLE	TRANS 1 2-DICHLOROETHENE	CHCL3	CHLOROFORM

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 5 OF 20) **********

JOB DESCRIPTION: *NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE: 95023

REPORT DATE: 07 JAN 87 RECEIPT DATE: 19 NOV 86 EST. COMP. DATE: 07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		12DCE	111TCA	C CL 4	BRCL2M	DICLPR	+CLPRE	TCE	DBRCLM	CCLPRE	ROW
		COLUMN....	10	11	12	13	14	15	16	17	18	
		ANALYSIS..	81	82	83	84	85	86	87	88	89	
		PPM.....										
95023	DUPL 1 11-17-86	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.60	<0.005	<0.005	
		%REC	*	*	*	*	*	*	*	*	*	1
		DUPL	*	*	*	*	*	*	*	*	*	
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95024	DUPL 2 11-17-86	CONC	<0.005	0.093	<0.005	<0.005	<0.005	<0.005	1.5	<0.005	<0.005	
		%REC	*	*	*	*	*	*	*	*	*	2
		DUPL	*	0.081	*	*	*	*	1.4	*	*	
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95025	DUPL 3 11-17-86	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	
		%REC	*	*	*	*	*	*	*	*	*	3
		DUPL	*	*	*	*	*	*	*	*	*	
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95026	3-S 11-17-86 1058	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.88	<0.005	<0.005	
		%REC	*	*	*	*	*	*	*	*	*	4
		DUPL	*	*	*	*	*	*	*	*	*	
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95027	9-S 11-17-86 1649	CONC	<0.005	0.12	<0.005	<0.005	<0.005	<0.005	1.8	<0.005	<0.005	
		%REC	*	*	*	*	*	*	*	*	*	5
		DUPL	*	0.14	*	*	*	*	1.7	*	*	
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95028	15-S 11-17-86 1537	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0071	<0.005	<0.005	
		%REC	*	*	*	*	*	*	*	*	*	6
		DUPL	*	*	*	*	*	*	*	*	*	
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95029	FME-33 11-17-86 1240	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	1.3	<0.005	<0.005	
		%REC	*	*	*	*	*	*	*	*	*	7
		DUPL	*	*	*	*	*	*	*	*	*	
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95030	RINSATE BLK 11-18-86 1821	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC	*	*	*	*	*	*	(0.1012) *	*	*	8
		DUPL	*	*	*	*	*	*	*	*	*	
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	

12DCE	1 2-DICHLOROETHANE	111TCA	1 1 1-TRICHLOROETHANE	C CL 4	CARBON TETRACHLORIDE
BRCL2M	BROMODICHLOROMETHANE	DICLPR	1 2 DICHLOROPROPANE	+CLPRE	TRANS-1 3-DICHLOROPROPENE
TCE	TRICHLOROETHENE	DBRCLM	DIBROMOCHLOROMETHANE	CCLPRE	CIS-1 3-DICHLOROPROPENE

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 6 OF 20) **********

JOB DESCRIPTION: *NIROP (CHAIN OF CUSTODY) RD6E444E1100000 JOB FILE: 95029

REPORT DATE: 07 JAN 87 RECEIPT DATE: 19 NOV 86 EST. COMP. DATE: 07 JAN 87

	COLUMN....	10	11	12	13	14	15	16	17	18	
	ANALYSIS..	81	82	83	84	85	86	87	88	89	
B = DENOTES PPB	PPM.....	12DCE	111TCA	C CL 4	BRCL2M	DICLPR	+CLPRE	TCE	DBRCLM	CCLPRE	
LAB ID PROJECT ID											ROW
95091 TRIP BLK 11-17-86	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	%REC										9
	DUPL										
	OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95032 8-B 11-18-86 1640	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	10.7	<0.005	<0.005	
	%REC										10
	DUPL										
	OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95033 2-S 11-18-86 1030	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.065	<0.005	<0.005	
	%REC										11
	DUPL										
	OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95034 17-2 11-18-86 1344	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.097	<0.005	<0.005	
	%REC										12
	DUPL							0.12			
	OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95035 7-B 11-18-86 1415	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	%REC	104.6	74.1	71.3	71.8	97.7	95.65	108.9	101.3	102.818	13
	DUPL										
	OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95036 1-PC 11-18-86 1111	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	%REC										14
	DUPL										
	OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95037 TRIP BLANK 11-18-86	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	%REC										15
	DUPL										
	OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95038 18-S 11-18-86 405P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	1.53	<0.005	<0.005	
	%REC										16
	DUPL							1.45			
	OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	

12DCE 1 2-DICHLOROETHANE
BRCL2M BROMODICHLOROMETHAME
TCE TRICHLOROETHENE
111TCA 1 1 1-TRICHLOROETHANE
DICLPR 1 2 DICHLOROPROPANE
DBRCLM DIBROMOCHLOROMETHANE
C CL 4 CARBON TETRACHLORIDE
+CLPRE TRANS-1 3-DICHLOROPROPENE
CCLPRE CIS-1 3-DICHLOROPROPENE

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 7 OF 20) **********

JOB DESCRIPTION: NIROP (CHAIN OF-CUSTODY) RD6E444E1100000 JOB FILE: 95023
REPORT DATE: 07 JAN 87 RECEIPT DATE: 19 NOV 86 EST. COMP. DATE: 07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	10	11	12	13	14	15	16	17	18	ROW
		ANALYSIS..	81	82	83	84	85	86	87	88	89	
		PPM.....	12DCE	111TCA	C CL 4	BRCL2M	DICLPR	+CLPRE	TCE	DBRCLM	CCLPRE	
95039	19-S 11-18-86 635P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.088	<0.005	<0.005	
		%REC										17
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95040	9-B 11-18-86 645P	CONC	<0.005	0.0086	<0.005	<0.005	<0.005	<0.005	0.65	<0.005	<0.005	
		%REC										18
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95041	2-PC 11-19-86 835	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0053	<0.005	<0.005	
		%REC										19
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95042	3-PC 11-19-86 1010	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC							(0.0035)			20
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95043	4-S 11-19-86 1022	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.019	<0.005	<0.005	
		%REC										21
		DUPL	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.011	<0.005	<0.005	
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95044	4-PC 11-19-86 1208P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC							(0.0017)			22
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95045	5-S 11-19-86 1230P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										23
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95046	16-S 11-19-86 315P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.17	<0.005	<0.005	
		%REC	90	88.5	90	91	113.5	123.889	120	132.5	127.727	24
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	

12DCE	1 2-DICHLOROETHANE	111TCA	1 1 1-TRICHLOROETHANE	C CL 4	CARBON TETRACHLORIDE
BRCL2M	BROMODICHLOROMETHANE	DICLPR	1 2 DICHLOROPROPANE	+CLPRE	TRANS-1 3-DICHLOROPROPENE
TCE	TRICHLOROETHENE	DBRCLM	DIBROMOCHLOROMETHANE	CCLPRE	CIS-1 3-DICHLOROPROPENE

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 8 OF 20) **********

JOB DESCRIPTION: MNIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE: 95023

REPORT DATE: 07 JAN 87 RECEIPT DATE: 19 NOV 86 EST. COMP. DATE: 07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	10	11	12	13	14	15	16	17	18	ROW
		ANALYSIS..	81	82	83	84	85	86	87	88	89	
		PPM.....	12DCE	111TCA	C CL 4	BRCL2M	DICLPR	+CLPRE	TCE	DBRCLM	CCLPRE	
95047	TRIP BLANK	CONC	<0.005 *	<0.005 *	<0.005 *	<0.005 *	<0.005 *	<0.005 *	<0.005 *	<0.005 *	<0.005 *	
	11-19-86	%REC	*	*	*	*	*	*	*	*	*	25
		DUPL	*	*	*	*	*	*	*	*	*	
		BID	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	

12DCE 1 2-DICHLOROETHANE
BRCL2M BROMODICHLOROMETHANE
TCE TRICHLOROETHENE
111TCA 1 1 1-TRICHLOROETHANE
DICLPR 1 2 DICHLOROPROPANE
DBRCLM DIBROMOCHLOROMETHANE
C CL 4 CARBON TETRACHLORIDE
+CLPRE TRANS-1 3-DICHLOROPROPENE
CCLPRE CIS-1 3-DICHLOROPROPENE

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 9 OF 20) **********

JOB DESCRIPTION:*NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE:95023

REPORT DATE:07-JAN-87 RECEIPT DATE:19-NOV-86 EST. COMP. DATE:07-JAN-87

B - DENOTES PPB

LAB ID	PROJECT ID		112TCA	BENZEN	CLETRE	CHBR3	TCLETA	TCLETE	TOLUEN	CLBEN	ETBEN	ROW
		COLUMN....	19	20	21	22	23	24	25	26	27	
		ANALYSIS..	90	91	92	93	94	95	96	97	98	
		PPM.....										
95023	DUPL 1 11-17-86	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										1
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95024	DUPL 2 11-17-86	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	0.14	<0.005	<0.005	<0.005	
		%REC										2
		DUPL						0.13				
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95025	DUPL 3 11-17-86	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										3
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95026	3-S 11-17-86 1050	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										4
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95027	9-S 11-17-86 1649	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	0.12	<0.005	<0.005	<0.005	
		%REC										5
		DUPL						0.13				
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95028	15-S 11-17-86 1597	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										6
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95029	FNE-33 11-17-86	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	1240	%REC						(0.0027)			(0.0020)	7
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95030	RINSATE BLK	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	11-18-86 1821	%REC										8
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	

112TCA	1 1 2-TRICHLOROETHANE	BENZEN	BENZENE	CLETRE	2-CHLOROETHYLVINYLETHER
CHBR3	BROMOFORM	TCLETA	1 1 2 2-TETRACHLOROETHANE	TCLETE	TETRACHLOROETHENE
TOLUEN	TOLUENE	CLBEN	CHLOROBENZENE	ETBEN	ETHYLBENZENE

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 10 OF 20) **********

JOB DESCRIPTION:*NIROP (CHAIN-OF-CUSTODY) R06E444E1100000 JOB FILE:95023

REPORT DATE:07 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

B - DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 19	20	21	22	23	24	25	26	27	ROW
			ANALYSIS.. 90	91	92	93	94	95	96	97	98	
			PPM.....112TCA	BENZEN	CLETRE	CHBR3	TCLETA	TCLETE	TOLUEM	CLBEN	ETBEN	
95031	TRIP BLK 11-17-86	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										9
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95032	8-D 11-18-86 1640	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC					(0.0024)					10
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95033	2-S 11-18-86 1030	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										11
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95034	17-2 11-18-86 1344	CONC	<0.005	0.0065	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC						(0.1015)				12
		DUPL		0.0084								
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95035	7-B 11-18-86 1415	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC	100.05	100	109.95	94.35	101.6	103.9	103.4	99.25	100.2	13
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95036	1-PG 11-18-86 1111	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										14
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95037	TRIP BLANK 11-18-86	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										15
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95038	18-S 11-18-86 405P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										16
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	

112TCA 1 1 2-TRICHLOROETHANE
CHBR3 BROMOFORM
TOLUEN TOLUENE
BENZEN BENZENE
TCLETA 1 1 2 2-TETRACHLOROETHANE
CLBEN CHLOROBENZENE
CLETRE 2-CHLOROETHYLVINYLETHER
TCLETE TETRACHLOROETHENE
ETBEN ETHYLBENZENE

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 11 OF 20) **********

JOB DESCRIPTION: *NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE: 95023
REPORT DATE: 07 JAN 87 RECEIPT DATE: 19 NOV 86 EST. COMP. DATE: 07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 19	20	21	22	23	24	25	26	27	ROW
		ANALYSIS..	90	91	92	93	94	95	96	97	98	
		PPM.....	112TCA	BENZEN	CLETRE	CHBR3	TCLETA	TCLETE	TOLUEN	CLBEN	ETBEN	
95039	19-S 11-18-86-635P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										17
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95040	9-B 11-18-86-645P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC						(0.0029)				18
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95041	2-PC 11-19-86 835	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										19
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95042	3-PC 11-19-86 1010	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										20
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95043	4-S 11-19-86 1022	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										21
		DUPL	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95044	4-PC 11-19-86 1208P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										22
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95045	5-S 11-19-86 1230P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										23
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95046	16-S 11-19-86 915P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC	122	121	112	96.5	97	100	93	93.5	91.5	24
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	

112TCA 1 1 2-TRICHLOROETHANE
CHBR3 BROMOFORM
TOLUEN TOLUENE
BENZEN BENZENE
TCLETA 1 1 2 2-TETRACHLOROETHANE
CLBEN CHLOROBENZENE
CLETRE 2-CHLOROETHYLVINYLETHER
TCLETE TETRACHLOROETHENE
ETBEN ETHYLBENZENE

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 12 OF 20) **********

JOB DESCRIPTION:*NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE:95023
REPORT DATE:07 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

	COLUMN....	19	20	21	22	23	24	25	26	27	
	ANALYSIS..	90	91	92	93	94	95	96	97	98	
B = DENOTES PPB	PPM.....	112TCA	BENZEN	CLETRE	CHBR3	TCLETA	TCLETE	TOLUEN	CLBEN	ETBEN	
LAB ID / PROJECT ID											ROW
95047 TRIP BLANK	CONC	<0.005 *	<0.005 *	<0.010 *	<0.005 *	<0.005 *	<0.005 *	<0.005 *	<0.005 *	<0.005 *	
11-19-86	%REC	*	*	*	*	*	*	*	*	*	25
	DUPL	*	*	*	*	*	*	*	*	*	
	QID	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	

112TCA 1 1 2-TRICHLOROETHANE
CHBR3 BROMOFORM
TOLUEN TOLUENE
BENZEN BENZENE
TCLETA 1 1 2 2-TETRACHLOROETHANE
CLBEN CHLOROBENZENE
CLETRE 2-CHLOROETHYLVINYLETHER
TCLETE TETRACHLOROETHENE
ETBEN ETHYLBENZENE

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 13 OF 20) **********

JOB DESCRIPTION: *NIROP (CHAIN-OF-CUSTODY) RDGE444E1100000 JOB FILE: 95023
REPORT DATE: 07 JAN 87 RECEIPT DATE: 19 NOV 86 EST. COMP. DATE: 07 JAN 87

B = DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	28	29	30	31	32	33	34	35	36	ROW
		ANALYSIS..	99	100	156	157	158	159	160	161	162	
		PPM.....	ACRO	ACRY	TCLFLM	9DCLBZ	2DCLBZ	4DCLBZ	2-BUTA	CISDIC *	T-XYLE	
95023	DUPL 1 11-17-86	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	0.19	<0.005	
		%REC										1
		DUPL								0.19		
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95024	DUPL 2 11-17-86	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	0.34	<0.005	
		%REC										2
		DUPL								0.32		
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95025	DUPL 3 11-17-86	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										3
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95026	3-S 11-17-86 1058	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	0.29	<0.005	
		%REC										4
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95027	9-S 11-17-86 1649	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	0.34	<0.005	
		%REC										5
		DUPL								0.32		
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95028	15-S 11-17-86 1537	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										6
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95029	FME-33 11-17-86 1240	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	0.11	<0.005	
		%REC										7
		DUPL								0.12		
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95030	RINSATE BLK 11-18-86 1821	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										8
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	

ACRO ACROLEIN
ACRY ACRYLONITRILE
TCLFLM TRICHLOROFLUOROMETHANE
9DCLBZ 19-DICHLOROBENZENE
2DCLBZ 12-DICHLOROBENZENE
4DCLBZ 14-DICHLOROBENZENE
2-BUTA 2-BUTANONE
CISDIC CIS-12-DICHLOROETHYLENE
T-XYLE TOTAL XYLENE

* = Cis & trans-1,2-dichloroethene are co-eluting isomers. Concentrations are totals based on the trans isomer.

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 14 OF 20) **********

JOB DESCRIPTION:*NIROP (CHAIN OF CUSTODY) RD6E444E1100000 JOB FILE:95023
REPORT DATE:07 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	28	29	30	31	32	33	34	35	36	ROW
		ANALYSIS..	99	100	156	157	158	159	160	161	162	
		PPM.....	ACRO	ACRY	TCLFLM	3DCLBZ	2DCLBZ	4DCLBZ	2-BUTA	CISDIC	T-XYLE	
95031	TRIP BLK 11-17-86	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										9
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95032	B-D 11-18-86 1640	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	0.048	<0.005	
		%REC										10
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95033	2-S 11-18-86 1030	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										11
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95034	17-2 11-18-86 1344	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	0.027	<0.005	
		%REC										12
		DUPL								0.027		
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95035	7-D 11-18-86 1415	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC	134.05	111.05	98.85							13
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95036	1-PC 11-18-86 1111	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										14
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95037	TRIP BLANK 11-18-86	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										15
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95038	18-S 11-18-86 405P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	0.33	<0.005	
		%REC										16
		DUPL							0.34			
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	

ACRO ACROLEIN
ACRY ACRYLONITRILE
TCLFLM TRICHLOROFLUOROMETHANE
3DCLBZ 13-DICHLOROBENZENE
2DCLBZ 12-DICHLOROBENZENE
4DCLBZ 14-DICHLOROBENZENE
2-BUTA 2-BUTANONE
CISDIC CIS-12-DICHLOROETHYLENE
T-XYLE TOTAL XYLENE

INMAC

JOB DESCRIPTION:*NIROP (CHAIN OF CUSTODY) RD6E444E1100000 JOB FILE:95023
REPORT DATE:07 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

B - DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	28	29	30	31	32	33	34	35	36	ROW
		ANALYSIS..	99	100	156	157	158	159	160	161	162	
		PPM.....	ACRO	ACRY	TCLFLM	3DCLBZ	2DCLBZ	4DCLBZ	2-BUTA	CISDIC	T-XYLE	
95039	19-S 11-18-86-635P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										17
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95040	9-D 11-18-86 645P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	0.028	<0.005	
		%REC										18
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95041	2-PC 11-19-86 835	CONC	<0.10	<0.10	0.0077	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										19
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95042	3-PC 11-19-86 1010	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										20
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95043	4-S 11-19-86 1022	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										21
		DUPL	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95044	4-PC 11-19-86 1208P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										22
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95045	5-S 11-19-86 1230P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										23
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	
95046	16-S 11-19-86 315P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC	98.5	110.3	93							24
		DUPL										
		OID	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	08956325	

ACRO ACROLEIN
TCLFLM TRICHLOROFLUOROMETHANE
4DCLBZ 14-DICHLORODENZENE
T-XYLE TOTAL XYLENE
ACRY ACRYLONITRILE
3DCLBZ 13-DICHLOROBENZENE
2-BUTA 2-BUTANONE
2DCLBZ 12-DICHLORODENZENE
CISDIC CIS-12-DICHLOROETHYLENE

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 17 OF 20) **********

JOB DESCRIPTION: *NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE: 95023
REPORT DATE: 07 JAN 87 RECEIPT DATE: 19 NOV 86 EST. COMP. DATE: 07 JAN 87

B - DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 37	38	39	UNKNOWNS	ROW
			ANALYSIS.. 163	164	165		
		PPM.....	TOLUEN *	2DICHL *	BROFL *		
95023	DUPL 1 11-17-86	CONC		*	*	*	
		%REC	95	* 83	* 90.9	* None	1
		%Rec DUPL	98.1	* 73.2	* 100.0	*	
		OID	08956325*	08956325*	08956325*		
95024	DUPL 2 11-17-86	CONC	89.5	* 95.6	* 113	*	
		%REC	91.7	* 80.4	* 110	* None	2
		%Rec DUPL	99.6	* 92.0	* 98.7	*	
		OID	08956325*	08956325*	08956325*		
95025	DUPL 3 11-17-86	%Rec CONC	99.6	*	*	*	
		%REC		* 101	* 94.7	* None	3
		DUPL		*	*	*	
		OID	08956325*	08956325*	08956325*		
95026	3-S 11-17-86 1058	CONC		*	*	* Acetone	
		%REC	95.8	* 99.6	* 94	* 46 ppb	4
		%Rec DUPL	90.4	* 96.4	* 92.0	*	
		OID	08956325*	08956325*	08956325*		
95027	9-3 11-17-86 1649	%Rec CONC	93.5	* 95.4	* 102	* Acetone	
		%REC	97.5	* 101	* 93.1	* 120 ppb	5
		%Rec DUPL	98.6	* 95.1	* 83.3	*	
		OID	08956325*	08956325*	08956325*		
95028	15-S 11-17-86 1537	CONC		*	*	* None	
		%REC	98.2	* 78	* 99.7	*	6
		DUPL		*	*	*	
		OID	08956325*	08956325*	08956325*		
95029	FHE-33 11-17-86 1240	CONC		*	*	* None	
		%REC	97.4	* 93.2	* 104	*	7
		%Rec DUPL	98.7	* 102	* 98.0	*	
		OID	08956325*	08956325*	08956325*		
95080	RINSATE BLK 11-18-86 1821	CONC		*	*	* Hexane / Acetone / Bromochlorodifluoromethane	
		%REC	99.1	* 105	* 99.1	* 17 ppb / 590 ppb / 69 ppb	8
		DUPL		*	*	*	
		OID	08956325*	08956325*	08956325*		

TOLUEN TOLUENE-D8 SURR 2DICHL 12-DICHLOROETHANE-D4 SUR BROFL 4-BROMOFLUOROBENZENE

* = Surrogate values which are reported in percent recovery.

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 16 OF 20) **********

JOB DESCRIPTION:*NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE:95023
REPORT DATE:07 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	28	29	30	31	32	33	34	35	36	ROW
		ANALYSIS..	99	100	156	157	158	159	160	161	162	
		PPM.....:	ACRO	ACRY	TCLFLM	3DCLBZ	2DCLBZ	4DCLBZ	2-BUTA	CISDIC	T-XYLE	
95047	TRIP BLANK	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
	11-19-86	%REC	*	*	*	*	*	*	*	*	*	25
		DUPL	*	*	*	*	*	*	*	*	*	
		OID	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	08956325*	

ACRO	ACROLEIN	ACRY	ACRYLONITRILE
TCLFLM	TRICHLOROFLUOROMETHANE	3DCLBZ	13-DICHLOROBENZENE
4DCLBZ	14-DICHLOROBENZENE	2-BUTA	2-BUTANONE
T-XYLE	TOTAL XYLENE		

2DCLBZ	12-DICHLOROBENZENE
CISDIC	CIS-12-DICHLOROETHYLENE

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 18 OF 20) **********

JOB DESCRIPTION: *NIROP (CHAIN OF CUSTODY) RD6E444E1100000 JOB FILE: 95023

REPORT DATE: 07 JAN 87 RECEIPT DATE: 19 NOV 86 EST. COMP. DATE: 07 JAN 87

B : - DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 37	38	39	UNKNOWNS		ROW
			ANALYSIS.. 163	164	165			
		PPM.....	TOLUEN *	2DICHL *	BROFL *			
~~95031~~	~~TRIP BLK 11-17-86~~	~~CONC~~		*	*	~~Acetone~~		
		%REC	97.4	* 98.3	* 99.7 *	51 ppb		9
		DUPL		*	*			
		OID	08956325*	08956325*	08956325*			
~~95032~~	~~8-D 11-18-86 1640~~	~~CONC~~		*	*			
		%REC	101	* 95.7	* 95.9 *	Acetone	Freon 113	10
		~~DUPL~~	97.4	* 97.8	* 99.6 *	130 ppb	31 ppb	
		OID	08956325*	08956325*	08956325*			
~~95033~~	~~2-G 11-18-86 1030~~	~~CONC~~		*	*	~~None~~		
		%REC	100	* 92.1	* 101 *			11
		DUPL		*	*			
		OID	08956325*	08956325*	08956325*			
~~95034~~	~~17-2 11-18-86 1944~~	~~CONC~~		*	*	~~Acetone~~	~~Freon 113~~	
		%REC	99.5	* 90.6	* 98.3 *	80 ppb	40 ppb	12
		~~DUPL~~	98.6	* 95.2	* 101 *			
		OID	08956325*	08956325*	08956325*			
~~95035~~	~~7-D 11-18-86 1415~~	~~CONC~~	103	* 95.9	* 96.3 *	None		
		%REC	108	* 106	* 104 *			13
		~~DUPL~~	102	* 106	* 103 *			
		OID	08956325*	08956325*	08956325*			
~~95036~~	~~1-PC 11-18-86 1111~~	~~CONC~~		*	*	None		
		%REC	101	* 96.1	* 98.4 *			14
		DUPL		*	*			
		OID	08956325*	08956325*	08956325*			
~~95037~~	~~TRIP BLANK~~	~~CONC~~		*	*			
	11-18-86	%REC	101	* 94.4	* 90.1 *	None		15
		DUPL		*	*			
		OID	08956325*	08956325*	08956325*			
~~95038~~	~~18-9 11-18-86 405P~~	~~CONC~~	~~101~~	~~* 98.7~~	~~* 89.9~~ *	None		
		%REC	95.3	* 92	* 88.7 *			16
		~~DUPL~~	100	* 96.0	* 112.0 *			
		OID	08956325*	08956325*	08956325*			

TOLUEN TOLUENE-D8 SURR 2DICHL 12-DICHLORDETHANE-D4 SUR BROFL 4-BROMOFLUOROBENZENE

* = Surrogate values which are reported in percent recovery.

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 19 OF 20) **********

JOB DESCRIPTION:*NIROP (CHAIN OF CUSTODY) R06E444E1100000 JOB FILE:95023
REPORT DATE:07 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN....	37	38	39	UNKNOWNS	ROW
			ANALYSIS..	163	164	165		
			PPM.....	TOLUEN *	2DICHL *	BROFL *		
95039	19-S 11-18-86 635P	CONC					None	
		%REC		103	99.1	89.3		17
		DUPL						
		OID		08956325	08956325	08956325		
95040	9-D 11-18-86 645P	CONC					None	
		%REC		103	98.6	110		18
		~~DUPL~~		103	99.5	88.5		
		OID		08956325	08956325	08956325		
95041	2-PC 11-19-86 835	CONC					None	
		%REC		102	96.9	92.6		19
		DUPL						
		OID		08956325	08956325	08956325		
95042	3-PC 11-19-86 1010	CONC					None	
		%REC		96.7	93.7	108		20
		DUPL						
		OID		08956325	08956325	08956325		
95043	4-S 11-19-86 1022	CONC					None	
		%REC		99.6	93.7	95.2		21
		DUPL						
		OID		08956325	08956325	08956325		
95044	4-PC 11-19-86 1208P	CONC					None	
		%REC		96	93.6	91.3		22
		DUPL						
		OID		08956325	08956325	08956325		
95045	5-S 11-19-86 1230P	CONC					None	
		%REC		95.4	91	99.4		23
		DUPL						
		OID		08956325	08956325	08956325		
95046	16-S 11-19-86 315P	CONC					None	
		%REC		94.6	93	92.9		24
		~~DUPL~~		100	89.9	97.0		
		OID		08956325	08956325	08956325		

TOLUEN TOLUENE-D8 SURR 2DICHL 12-DICHLOROETHANE-D4 SUR BROFL 4-BROMOFLUOROBENZENE

* = Surrogate values which are reported in percent recovery.

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 20 OF 20) **********

JOB DESCRIPTION:*NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE:95023
REPORT DATE:07 JAN 87 RECEIPT DATE:19 NOV 86 EST. COMP. DATE:07 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 37	38	39	ROW
			ANALYSIS.. 163	164	165	
		PPM.....	TOLUEN *	2DICHL*	BROFL*	
95047	TRIP BLANK	CONC	*	*	*	
	11-19-86	%REC	98.3 *	93.5 *	96.3 *	25
		DUPL	*	*	*	
		OID	08956325*	08956325*	08956325*	

TOLUEN TOLUENE-D8 SURR 2DICHL. 12-DICHLOROETHANE-D4 SUR BROFL. 4-BROMOFLUOROBENZENE

* - Surrogate values which are reported in percent recovery.

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 10) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE:95148
REPORT DATE:06 JAN 87 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

B = DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 1	2	3	4	5	6	7	8	9	ROW
			ANALYSIS.. 72	73	74	75	76	77	78	79	80	
			PPM.....CLME	BRME	VICL	CLET	MECL	DCLETE	11DCE	+DICLE	CHCL3	
95148	10-S 11-19-86 440P	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	0.036	<0.005	1
		%REC										
		DUPL								0.038		
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95149	13-S 11-19-86 629P	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	2
		%REC										
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95150	14-S 11-19-86 659P	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	3
		%REC										
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95151	12-S 11-19-86 750P	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	4
		%REC										
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95152	20-S 11-20-86 814A	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	5
		%REC										
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95153	11-S 11-20-86 937A	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	0.022	<0.005	6
		%REC										
		DUPL	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	0.021	<0.005	
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95154	6-D 11-20-86 1045A	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	7
		%REC										
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95155	7-S 11-20-86 1129A	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	8
		%REC										
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	

CLME	CHLOROMETHANE	BRME	BROMOMETHANE	VICL	VINYL CHLORIDE
CLET	CHLOROETHANE	MECL	METHYLENE CHLORIDE	DCLETE	1-1-DICHLOROETHENE
11DCE	1 1-DICHLOROETHANE	+DICLE	TRANS-1 2-DICHLOROETHENE	CHCL3	CHLOROFORM

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 2 OF 10) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE:95148
REPORT DATE:06 JAN 87 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	1	2	3	4	5	6	7	8	9	ROW
		ANALYSIS..	72	73	74	75	76	77	78	79	80	
		PPM.....	CLME	BRME	VICL	CLET	MECL	DCLETE	11DCE	+DICLE	CHCL3	
95156	8-8 11-20-86 202P	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	0.0073	0.24	<0.005	9
		%REC	*	*	*	*	*	*	*	*	*	
		DUPL	*	*	*	*	*	*	*	0.24	*	
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95157	TRIP BLANK	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	10
		%REC	*	*	*	*	*	*	*	*	*	
		DUPL	*	*	*	*	*	*	*	*	*	
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	

CLME	CHLOROMETHANE	BRME	BROMOMETHANE	VICL	VINYL CHLORIDE
CLET	CHLOROETHANE	MECL	METHYLENE CHLORIDE	DCLETE	1 1-DICHLOROETHENE
11DCE	1 1-DICHLOROETHANE	+DICLE	TRANS-1 2-DICHLOROETHENE	CHCL3	CHLOROFORM

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 3 OF 10) **********

JOB DESCRIPTION:MIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE:95148

REPORT DATE:06 JAN 87 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 10	11	12	13	14	15	16	17	18	ROW
			ANALYSIS.. 81	82	83	84	85	86	87	88	89	
			PPN.....	12DCE	111TCA	C CL 4	BRCL2M	DICLPR	+CLPRE	TCE	DBRCLM	CCLPRE
95148	10-S 11-19-86 440P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.21	<0.005	<0.005	
		%REC										1
		DUPL							0.20			
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	0896350	08936350	
95149	13-S 11-19-86 629P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										2
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	0896350	08936350	
95150	14-S 11-19-86 659P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										3
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	0896350	08936350	
95151	12-S 11-19-86 750P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										4
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	0896350	08936350	
95152	20-S 11-20-86 814A	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										5
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	0896350	08936350	
95153	11-S 11-20-86 937A	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.032	<0.005	<0.005	
		%REC										6
		DUPL	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.039	<0.005	<0.005	
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	0896350	08936350	
95154	6-B 11-20-86 1045A	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.011	<0.005	<0.005	
		%REC										7
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	0896350	08936350	
95155	7-S 11-20-86 1129A	CONC	<0.005	0.0051	<0.005	<0.005	<0.005	<0.005	0.13	<0.005	<0.005	
		%REC										8
		DUPL							0.13			
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	0896350	08936350	

12DCE	1 2-DICHLOROETHANE	111TCA	1 1 1-TRICHLOROETHANE	C CL 4	CARBON TETRACHLORIDE
BRCL2M	BROMODICHLOROMETHANE	DICLPR	1 2 DICHLOROPROPANE	+CLPRE	TRANS-1 3-DICHLOROPROPENE
TCE	TRICHLOROETHENE	DBRCLM	DIBROMOCHLOROMETHANE	CCLPRE	CIS-1 3-DICHLOROPROPENE

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 4 OF 10) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) R06E444E1100000 JOB FILE:95148
REPORT DATE:06 JAN 87 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID	COLUNN....	10	11	12	13	14	15	16	17	18	ROW
		ANALYSIS..	81	82	83	84	85	86	87	88	89	
		PPN.....	12DCE	111TCA	C CL 4	BRCL2M	DICLPR	+CLPRE	TCE	DBRCLM	CCLPRE	
95156	B-S-11-20-86-202P	CONC	<0.005	0.018	<0.005	<0.005	<0.005	<0.005	9.2	<0.005	<0.005	
		%REC	*	*	*	*	*	*	*	*	*	9
		DUPL	*	*	*	*	*	*	*	*	*	
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	0896350	08936350	
95157	TRIP BLANK	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC	*	*	*	*	*	*	*	*	*	10
		DUPL	*	*	*	*	*	*	*	*	*	
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	0896350	08936350	

12DCE	1 2-DICHLOROETHANE	111TCA	1 1 1-TRICHLOROETHANE	C CL 4	CARBON TETRACHLORIDE
BRCL2M	BROMODICHLOROMETHANE	DICLPR	1 2 DICHLOROPROPANE	+CLPRE	TRANS-1 3-DICHLOROPROPENE
TCE	TRICHLOROETHENE	DBRCLM	DIBROMOCHLOROMETHANE	CCLPRE	CIS-1 3-DICHLOROPROPENE

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 5 OF 10) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E44E1100000 JOB FILE:95148

REPORT DATE:06 JAN 87 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 19	20	21	22	23	24	25	26	27	ROW
			ANALYSIS.. 90	91	92	93	94	95	96	97	98	
		PPM.....	112TCA	BENZEN	CLETRE	CHBR3	TCLETA	TCLETE	TOLUEN	CLBEN	ETBEN	
95148	10-S 11-19-86 440P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										1
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95149	13-S 11-19-86 629P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										2
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95150	14-S 11-19-86 659P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										3
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95151	12-S 11-19-86 750P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										4
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95152	20-S 11-20-86 814A	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										5
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95153	11-S 11-20-86 937A	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										6
		DUPL	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95154	6-D 11-20-86 1045A	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										7
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95155	7-S 11-20-86 1129A	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										8
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	

112TCA	1 1 2-TRICHLOROETHANE	BENZEN	BENZENE	CLETRE	2-CHLOROETHYLVINYLETHER
CHBR3	BROMOFORM	TCLETA	1 1 2 2-TETRACHLOROETHANE	TCLETE	TETRACHLOROETHENE
TOLUEN	TOLUENE	CLBEN	CHLOROBENZENE	ETBEN	ETHYLBENZENE

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 6 OF 10) **********

JOB DESCRIPTION:NIROP (CHAIN OF-CUSTODY) RD6E444E1100000 JOB FILE:95148
REPORT DATE:06 JAN 87 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN....	19	20	21	22	23	24	25	26	27	ROW
			ANALYSIS..	90	91	92	93	94	95	96	97	98	
			PPM.....	112TCA	BENZEN	CLETRE	CHBR3	TCLETA	TCLETE	TOLUEN	CLBEN	ETBEN	
95156	8-S-11-20-86-202P	CONC		<0.005	<0.005	<0.010	<0.005	<0.005	0.046	<0.005	<0.005	<0.005	
		%REC											9
		DUPL.							0.043				
		OID		08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95157	TRIP BLANK	CONC		<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC											10
		DUPL.											
		OID		08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	

112TCA	1 1 2-TRICHLOROETHANE	BENZEN	BENZENE	CLETRE	2-CHLOROETHYLVINYLETHER
CHBR3	BROMOFORM	TCLETA	1 1 2 2-TETRACHLOROETHANE	TCLETE	TETRACHLOROETHENE
TOLUEN	TOLUENE	CLBEN	CHLORODENZENE	ETBEN	ETHYLBENZENE

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 7 OF 10) **********

JOB DESCRIPTION:NIROP (CHAIN OF CUSTODY) RD6E444E1100000 JOB FILE:95148
REPORT DATE:06 JAN 87 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	28	29	30	31	32	33	34	35	36	ROW
		ANALYSIS..	99	100	156	157	158	159	160	161	162	
		PPM.....	ACRO	ACRY	TCLFLM	3DCLBZ	2DCLBZ	4DCLBZ	BUTANO	CISDIC	T-XYLE	
95148	10-S 11-19-86 440P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	0.036	<0.005	1
		%REC										
		DUPL								0.038		
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95149	13-S 11-19-86 629P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	2
		%REC										
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95150	14-S 11-19-86 659P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	3
		%REC										
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95151	12-S 11-19-86 750P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	4
		%REC										
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95152	20-S 11-20-86 814A	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	5
		%REC										
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95153	11-S 11-20-86 937A	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	0.022	<0.005	6
		%REC										
		DUPL	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	0.021	<0.005	
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95154	6-D 11-20-86 1045A	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	7
		%REC										
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95155	7-S 11-20-86 1129A	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	8
		%REC										
		DUPL										
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	

ACRO ACROLEIN
ACRY ACRYLONITRILE
TCLFLM TRICHLOROFLUOROMETHANE
3DCLBZ 13 DICHLOROBENZENE
2DCLBZ 12 DICHLOROBENZENE
4DCLBZ 14 DICHLOROBENZENE
BUTANO 2-BUTANONE
CISDIC CIS 12 DICHLOROETHYLENE
T-XYLE TOTAL XYLENE

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 8 OF 10) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE:95148
REPORT DATE:06 JAN 87 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	28	29	30	31	32	33	34	35	36	ROW
		ANALYSIS..	99	100	156	157	158	159	160	161	162	
		PPM.....	ACRO	ACRY	TCLFLM	3DCLBZ	2DCLBZ	4DCLBZ	BUTANO	CISD1C	T-XYLE	
95156	B-S 11-20-86 202P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	0.24	<0.005	
		%REC	*	*	*	*	*	*	*	*	*	9
		DUPL	*	*	*	*	*	*	*	0.24	*	
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	
95157	TRIP BLANK	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC	*	*	*	*	*	*	*	*	*	10
		DUPL	*	*	*	*	*	*	*	*	*	
		OID	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	08936350	

ACRO ACROLEIN
ACRY ACRYLONITRILE
TCLFLM TRICHLOROFLUOROMETHANE
3DCLBZ 13 DICHLOROBENZENE
2DCLBZ 12 DICHLOROBENZENE
4DCLBZ 14 DICHLOROBENZENE
BUTANO 2-BUTANONE
CISD1C CIS 12 DICHLOROETHYLENE
T-XYLE TOTAL XYLENE

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 9 OF 10) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) R06E444E1100000 JOB FILE:95148
REPORT DATE:06 JAN 87 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

B = DENOTES PPB

LAB ID	PROJECT ID		COLUMN....	37	38	39	UNKNOWNS	ROW
			ANALYSIS..	163	164	165		
			PPM.....	TOLUEN	DICLET	BRFLBZ		
95148	10-S 11-19-86 440P	% Rec	CONC	99.8	96.1	95.2	None	1
			%REC	*	*	*		
		% Rec	DUPL	98.0	98.3	90.8		
			OID	08936350*	08936350*	08936350*		
95149	13-S 11-19-86 629P	% Rec	CONC	98.1	95.0	96.3	None	2
			%REC	*	*	*		
			DUPL	*	*	*		
			OID	08936350*	08936350*	08936350*		
95150	14-S 11-19-86 659P	% Rec	CONC	101	96.3	88.8	None	3
			%REC	*	*	*		
			DUPL	*	*	*		
			OID	08936350*	08936350*	08936350*		
95151	12-S 11-19-86 750P	% Rec	CONC	101	100	97.8	None	4
			%REC	*	*	*		
			DUPL	*	*	*		
			OID	08936350*	08936350*	08936350*		
95152	20-S 11-20-86 814A	% Rec	CONC	99.6	101	91.2	None	5
			%REC	*	*	*		
			DUPL	*	*	*		
			OID	08936350*	08936350*	08936350*		
95153	11-S 11-20-86 937A	% Rec	CONC	102	97.6	97.9	None	6
			%REC	*	*	*		
		% Rec	DUPL	99.5	98.2	96.2		
			OID	08936350*	08936350*	08936350*		
95154	6-D 11-20-86 1045A	% Rec	CONC	97.1	97.5	113	None	7
			%REC	*	*	*		
			DUPL	*	*	*		
			OID	08936350*	08936350*	08936350*		
95155	7-S 11-20-86 1129A	% Rec	CONC	100	93.5	98.3	None	8
			%REC	*	*	*		
		% Rec	DUPL	99.2	95.5	98.7		
			OID	08936350*	08936350*	08936350*		

TOLUEN TOLUENE-D8 (SURR) DICLET 12 DICHLOROETHANE-D4 (SU BRFLBZ 4-BROMOFLUOROBEZENE (SUR

* = Surrogate values which are reported in percent recovery.

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 10 OF 10) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE:95148
REPORT DATE:06 JAN 87 RECEIPT DATE:21 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 37	38	39	UNKNOWNS	ROW
			ANALYSIS.. 163	164	165		
		PPM.....	TOLUEN *	DICLET *	BRFLBZ *		
95156	8-3-11-20-86-202P	% Rec CONC	102 *	95.5 *	88.5 *	None	
		%REC	98 *	93.6 *	98.7 *		9
		% Rec DUPL	100 *	92.4 *	97.0 *		
		OID	08936350*	08936350*	08936350*		
95157	TRIP BLANK	CONC	101 *	99.4 *	97.6 *	None	
		%REC	*	*	*		10
		DUPL	*	*	*		
		OID	08936350*	08936350*	08936350*		

TOLUEN TOLUENE-D8 (SURR) DICLET 12 DICHLOROETHANE-D4 (SU BRFLBZ 4-BROMOFLUOROBEZENE (SUR

* = Surrogate values which are reported in percent recovery.

4.3 Surrogate spike recovery must be evaluated for acceptance by determining whether the concentration (measured as percent recovery) falls inside the contract required recovery limits listed in Table 4.2.

4.4 Treatment of surrogate spike recovery information is according to paragraphs 4.4.1 through 4.4.2.

4.4.1 Method Blank Surrogate Spike Recovery

The laboratory must take the actions listed below if any one of the following conditions exist:

- Recovery of any one surrogate compound in the volatile fraction is outside the required surrogate spike recovery limits.
- Recovery of any one surrogate compound in either the base/neutral or acid fraction is outside surrogate spike recovery limits.

TABLE 4.2. CONTRACT REQUIRED SURROGATE SPIKE RECOVERY LIMITS

Fraction	Surrogate Compound	Low/Medium Water	Low/Medium Soil/Sediment
VOA	Toluene-d_8	88-110	81-117
VOA	4-Bromofluorobenzene	86-115	74-121
VOA	1,2-Dichloroethane-d_4	76-114	70-121
BNA	Nitrobenzene-d_5	35-114	23-120
BNA	2-Fluorobiphenyl	43-116	30-115
BNA	p-Terphenyl-d_{14}	33-141	18-137
BNA	Phenol-d_5	10-94	24-113
BNA	2-Fluorophenol	21-100	25-121
BNA	2,4,6-Tribromophenol	10-123	19-122
Pest.	Dibutylchlorendate	(24-154)*	(20-150)*

* These limits are for advisory purposes only. They are not used to determine if a sample should be reanalyzed. When sufficient data becomes available, the USEPA may set performance based contract required windows.

4.4.1.1 Check calculations to assure there are no errors; check internal standard and surrogate spiking solutions for degradation, contamination, etc; also, check instrument performance.

4.4.1.2 Recalculate or reinject/repurge the blank or extract if steps in 4.4.1.1 fail to reveal the cause of the non-compliant surrogate recoveries.

4.4.1.3 Re-extract and reanalyze the blank.

4.4.1.4 If the measures listed in 4.4.1.1 thru 4.4.1.3 fail to correct

RK 1/31/87

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 1 OF 5) **********

JOB DESCRIPTION:NIROP (CHAIN OF CUSTODY) RDGE444E1100000 JOB FILE:95194
REPORT DATE:07 JAN 87 RECEIPT DATE:24 NOV 86 EST. COMP. DATE:06 JAN 87

B = DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	1	2	3	4	5	6	7	8	9	ROW
		ANALYSIS..	72	73	74	75	76	77	78	79	80	
		PPM.....	CLME	BRME	VICL	CLET	MECL	DCLETE	11DCE	+DICLE	CHCL3	
95194	1-S 11-20-86 505P	CONC	<0.010	<0.010	<0.010	<0.010	0.013	<0.005	<0.005	<0.005	<0.005	
		%REC										1
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95195	1-D 11-20-86 647P	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										2
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95196	5-D 11-20-86 745P	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										3
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95197	2-D 11-20-86 839P	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										4
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95198	4-D 11-20-86 1030P	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										5
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95199	3-D 11-20-86 1127P	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC	90	89.5	90.25	94		96	98.5	94.5	95.5	6
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95200	6-S 11-20-86 1150P	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	0.019	0.58	<0.005	
		%REC										7
		DUPL								0.60		
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95201	RINSATE BLK 11-20-86 1159	CONC	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										8
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	

CLME	CHLOROMETHANE	BRME	BROMOMETHANE	VICL	VINYL CHLORIDE
CLET	CHLOROETHANE	MECL	METHYLENE CHLORIDE	DCLETE	1 1-DICHLOROETHENE
11DCE	1 1-DICHLOROETHANE	+DICLE	TRANS-1 2-DICHLOROETHENE	CHCL3	CHLOROFORM

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 2 OF 5) **********

JOB DESCRIPTION:NINOP (CHAIN-OF-CUSTODY) RDGE444E1100000 JOB FILE:95194
REPORT DATE:07 JAN 87 RECEIPT DATE:24 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 10	11	12	13	14	15	16	17	18	ROW
			ANALYSIS.. 81	82	83	84	85	86	87	88	89	
			PPM.....12DCE	111TCA	C CL-4	BRCL2M	DICLPR	+CLPRE	TCE	DBRCLM	CCLPRE	
95194	1-6 11-20-86 505P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC							(0.002)			1
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95195	1-D 11-20-86 647P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										2
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95196	5-D 11-20-86 745P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										3
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95197	2-D 11-20-86 839P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0092	<0.005	<0.005	
		%REC										4
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95198	4-D 11-20-86 1030P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC							(0.0017)			5
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95199	3-D 11-20-86 1127P	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.012	<0.005	<0.005	
		%REC	97	91	94	93.5	96	81.6667	95	97	108.636	6
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95200	6-S 11-20-86 1150P	CONC	<0.005	0.13	<0.005	<0.005	<0.005	<0.005	3.8	<0.005	<0.005	
		%REC										7
		DUPL							3.5			
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95201	RINSATE BLK 11-20-86 1159	CONC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
		%REC										8
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	

12DCE	1 2-DICHLOROETHANE	111TCA	1 1 1-TRICHLOROETHANE	C CL 4	CARBON TETRACHLORIDE
BRCL2M	BROMODICHLOROMETHANE	DICLPR	1 2-DICHLOROPROPANE	+CLPRE	TRANS-1 3-DICHLOROPROPENE
TCE	TRICHLOROETHENE	DBRCLM	DIBROMOCHLOROMETHANE	CCLPRE	CIS-1 3-DICHLOROPROPENE

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 3 OF 5) **********

JOB DESCRIPTION:NIROP (CHAIN-OF-CUSTODY) RD6E444E1100000 JOB FILE:95194

REPORT DATE:07 JAN 87 RECEIPT DATE:24 NOV 86 EST. COMP. DATE:06 JAN 87

B = DENOTES PPB	COLUMN....	19	20	21	22	23	24	25	26	27	
	ANALYSIS..	90	91	92	93	94	95	96	97	98	
LAB ID / PROJECT ID	PPM.....	112TCA	BENZEN	CLETRE	CHBR3	TCLETA	TCLETE	TOLUEN	CLBEN	ETBEN	ROW
95194 1-S 11-20-86 505P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	%REC										1
	DUPL										
	OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95195 1-D 11-20-86 647P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	%REC										2
	DUPL										
	OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95196 5-D 11-20-86 745P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	%REC										3
	DUPL										
	OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95197 2-D 11-20-86 839P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	%REC										4
	DUPL										
	OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95198 4-D 11-20-86 1030P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	%REC										5
	DUPL										
	OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95199 3-D 11-20-86 1127P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	%REC	107.5	96.5	120	102	93	83.5	86.5	102.5	108.5	6
	DUPL										
	OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95200 6-S 11-20-86 1150P	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	0.20	<0.005	<0.005	<0.005	
	%REC										7
	DUPL						0.20				
	OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95201 RINSATE BLK 11-20-86 1159	CONC	<0.005	<0.005	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
	%REC										8
	DUPL										
	OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	

112TCA 1 1 2-TRICHLOROETHANE
CHBR3 BROMOFORM
TOLUEN TOLUENE
BENZEN BENZENE
TCLETA 1 1 2 2-TETRACHLOROETHANE
CLBEN CHLOROBENZENE
CLETRE 2-CHLOROETHYLVINYLETHER
TCLETE TETRACHLOROETHENE
ETBEN ETHYLBENZENE

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 4 OF 5) **********

JOB DESCRIPTION:NIROP (CHAIN OF CUSTODY) RD6E444E1100000 JOB FILE:95194

REPORT DATE:07 JAN 87 RECEIPT DATE:24 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID	COLUMN....	28	29	30	31	32	33	34	35	36	ROW
		ANALYSIS..	99	100	156	157	158	159	160	161	162	
		PPM.....	ACRO	ACRY	TCLFLM	3DCLBZ	2DCLBZ	4DCLBZ	BUTANO	CISDIC	T-XYLE	
95194	1-B 11-20-86 505P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										1
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95195	1-D 11-20-86 647P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										2
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95196	5-B 11-20-86 745P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										3
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95197	2-B 11-20-86 839P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										4
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95198	4-D 11-20-86 1030P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										5
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95199	3-D 11-20-86 1127P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC	95.75	100.55	96							6
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95200	6-S 11-20-86 1150P	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	0.58	<0.005	
		%REC										7
		DUPL							0.60			
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	
95201	RINSATE BLK 11-20-86 1159	CONC	<0.10	<0.10	<0.005	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	
		%REC										8
		DUPL										
		OID	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	08936356	

ACRO ACROLEIN
TCLFLM TRICHLOROFLUOROMETHANE
4DCLBZ 14 DICHLOROBENZENE
T-XYLE TOTAL XYLENE

ACRY ACRYLONITRILE
3DCLBZ 13 DICHLOROBENZENE
BUTANO 2-BUTANONE

2DCLBZ 12 DICHLOROBENZENE
CISDIC CIS 12 DICHLOROETHYLENE

INMAC

********** ENVIRONMENTAL LABORATORY ANALYTICAL LABORATORY GROUP DATA REPORTING SHEET (SHEET 5 OF 5) **********

JOB DESCRIPTION:NIROP (CHAIN OF CUSTODY) RD6E444E1100000 JOB FILE:95194
REPORT DATE:07 JAN 87 RECEIPT DATE:24 NOV 86 EST. COMP. DATE:06 JAN 87

B : DENOTES PPB

LAB ID	PROJECT ID		COLUMN.... 37	38	39	UNKNOWNS	ROW
			ANALYSIS.. 163	164	165		
			PPM.....TOLUEN *	DICLET *	BRFLBZ *		
95194	1-S 11-20-86 505P	% Rec CONC	94.7 *	92.6 *	105 *	None	
		%REC	*	*	*		1
		DUPL	*	*	*		
		OID	08936356*	08936356*	08936356*		
95195	1-D 11-20-86 647P	% Rec CONC	94.6 *	90.9 *	93.0 *	None	
		%REC	*	*	*		2
		DUPL	*	*	*		
		OID	08936356*	08936356*	08936356*		
95196	5-D 11-20-86 745P	% Rec CONC	97.1 *	89.9 *	99.2 *	None	
		%REC	*	*	*		3
		DUPL	*	*	*		
		OID	08936356*	08936356*	08936356*		
95197	2-D 11-20-86 839P	% Rec CONC	95.6 *	92.9 *	87.0 *	None	
		%REC	*	*	*		4
		DUPL	*	*	*		
		OID	08936356*	08936356*	08936356*		
95198	4-D 11-20-86 1030P	% Rec CONC	99.8 *	94.6 *	99.8 *	None	
		%REC	*	*	*		5
		DUPL	*	*	*		
		OID	08936356*	08936356*	08936356*		
95199	3-D 11-20-86 1127P	% Rec CONC	97.1 *	95.5 *	110 *	None	
		%REC	*	*	*		6
		% Rec DUPL	88.1 *	97.7 *	95.0 *		
		OID	08936356*	08936356*	08936356*		
95200	6-S 11-20-86 1150P	% Rec CONC	102 *	92.7 *	97.4 *	None	
		%REC	*	95.3 *	100 *		7
		% Rec DUPL	101 *	95.2 *	97.9 *		
		OID	08936356*	08936356*	08936356*		
95201	RINSATE BLK 11-20-86 1159	% Rec CONC	96.8 *	93.0 *	100 *	None	
		%REC	*	*	*		8
		DUPL	*	*	*		
		OID	08936356*	08936356*	08936356*		

TOLUEN TOLUENE-D8 (SURR) DICLET 12 DICHLOROETHANE-D4 (S BRFLBZ 4 BROMOFLUOROBENZENE (SU

* = Surrogate values which are reported in percent recovery.

INMAC

NIROP

External QA sample run with NIROP samples.

ERA # 507 (prepared 1/17/86)

Analyte	WES VALUE	TRUE VALUE	EXPECTED RANGE
1,2-Dichloroethane	37.1	39.2	25-53
1,1,1-Trichloroethane	154.5	183	110-250
1,2-Dichloropropane	51.1	57.9	24-92
Trichloroethane	76.2	73.2	56-90
1,1,2-Trichloroethane	155.3	152	110-190
Benzene	15.2	17.3	10-23
1,1,2,2-Tetrachloroethane	65.8	80.5	55-100
Chlorobenzene	50.6	55.6	34-77

4.3 Surrogate spike recovery must be evaluated for acceptance by determining whether the concentration (measured as percent recovery) falls inside the contract required recovery limits listed in Table 4.2.

4.4 Treatment of surrogate spike recovery information is according to paragraphs 4.4.1 through 4.4.2.

4.4.1 Method Blank Surrogate Spike Recovery

The laboratory must take the actions listed below if any one of the following conditions exist:

- Recovery of any one surrogate compound in the volatile fraction is outside the required surrogate spike recovery limits.
- Recovery of any one surrogate compound in either the base/neutral or acid fraction is outside surrogate spike recovery limits.

TABLE 4.2. CONTRACT REQUIRED SURROGATE SPIKE RECOVERY LIMITS

Fraction	Surrogate Compound	Low/Medium Water	Low/Medium Soil/Sediment
VOA	Toluene-d_8	88-110	81-117
VOA	4-Bromofluorobenzene	86-115	74-121
VOA	1,2-Dichloroethane-d_4	76-114	70-121
BNA	Nitrobenzene-d_5	35-114	23-120
BNA	2-Fluorobiphenyl	43-116	30-115
BNA	p-Terphenyl-d_{14}	33-141	18-137
BNA	Phenol-d_5	10-94	24-113
BNA	2-Fluorophenol	21-100	25-121
BNA	2,4,6-Tribromophenol	10-123	19-122
Pest.	Dibutylchlorendate	(24-154)*	(20-150)*

* These limits are for advisory purposes only. They are not used to determine if a sample should be reanalyzed. When sufficient data becomes available, the USEPA may set performance based contract required windows.

4.4.1.1 Check calculations to assure there are no errors; check internal standard and surrogate spiking solutions for degradation, contamination, etc; also, check instrument performance.

4.4.1.2 Recalculate or reinject/repurge the blank or extract if steps in 4.4.1.1 fail to reveal the cause of the non-compliant surrogate recoveries.

4.4.1.3 Re-extract and reanalyze the blank.

4.4.1.4 If the measures listed in 4.4.1.1 thru 4.4.1.3 fail to correct

DEPARTMENT OF THE ARMY
Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 1 - Sheet 1 of 6

Project: NIROP
Date Sample Received: 11-19-87
Customer Station No: 9-S
Material Description: WATER

MRD No.

Sample No.	Analysis Procedure No.	Analysis	Result TOTAL METALS	Result Dissolved METALS	Units
9-S	EPA-200.7	Antimony	<50	<50	ug/L
	EPA-7060	Arsenic	—	—	ug/L
	EPA-200.7	Barium	257	64	ug/L
	EPA-200.7	Beryllium	3	< 2	ug/L
	EPA-200.7	Cadmium	< 3	< 3	ug/L
	EPA-200.7	Calcium	308,000	140,000	ug/L
	EPA-200.7	Chromium	248	<5	ug/L
	EPA-200.7	Copper	246	<5	ug/L
	EPA-200.7	Lead	109	<10	ug/L
	EPA-200.7	Magnesium	92,000	37,000	ug/L
	EPA-200.7	Manganese	1808	22	ug/L
	EPA-7470	Mercury	0.3	<0.2	ug/L
	EPA-200.7	Nickel	195	7	ug/L
	EPA-200.7	Potassium	7 000	7,000	ug/L
	EPA-7740	Selenium			ug/L
	EPA-200.7	Silver	<10	<10	ug/L
	EPA-200.7	Sodium	34,000	27,000	ug/L
	EPA-200.7	Thallium	<50	<50	ug/L
	EPA-200.7	Zinc	1568	174	ug/L
	SM-403.	ALKALINITY (as CaCO3)	427		mg/L
	EPA-353.2	Nitrate	5.2		mg/L
	EPA-375.2	Sulfate	124		mg/L
	SD-407B	CHLORIDES	17		mg/L
	EPA-335.2	Cyanide	0.003		mg/L

DEPARTMENT OF THE ARMY
Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 1 - Sheet 2 of 6

Project: NIROP
Date Sample Received: 11-19-87
Customer Station No: 3-S
Material Description: WATER

MRD No.

Sample No.	Analysis Procedure No.	Analysis	Result: Total Metals	Result: Dissolved Metals	Units
3-S	EPA-200.7	Antimony	<50	<50	ug/L
	EPA-7060	Arsenic	3	<2	ug/L
	EPA-200.7	Barium	132	86	ug/L
	EPA-200.7	Beryllium	<2	<2	ug/L
	EPA-200.7	Cadmium	<3	<3	ug/L
	EPA-200.7	Calcium	175,000	168,000	ug/L
	EPA-200.7	Chromium	21	<5	ug/L
	EPA-200.7	Copper	16	<5	ug/L
	EPA-200.7	Lead	17	<10	ug/L
	EPA-200.7	Magnesium	32,000	32,000	ug/L
	EPA-200.7	Manganese	1524	1094	ug/L
	EPA-7470	Mercury	<0.2	<0.2	ug/L
	EPA-200.7	Nickel	18	8	ug/L
	EPA-200.7	Potassium	30,000	3,000	ug/L
	EPA-7740	Selenium	<2	<2	ug/L
	EPA-200.7	Silver	<10	<10	ug/L
	EPA-200.7	Sodium	5,000	6,000	ug/L
	EPA-200.7	Thallium	<50	<50	ug/L
	EPA-200.7	Zinc	1146	141	ug/L
	SM 15th ED. 403	ALKALINITY (AS CaCO3)		468	mg/L
	EPA-353.2	Nitrate		2.78	mg/L
	EPA-375.2	Sulfate		129	mg/L
	SD-407B	CHLORIDES		6	mg/L
	EPA-335.2	Cyanide		0.002	mg/L

DEPARTMENT OF THE ARMY
Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 1 - Sheet 3 of 6

Project: NIRDP
Date Sample Received: 11-19-87
Customer Station No: 15-S
Material Description: WATER

MRD No.

Sample No.	Analysis Procedure No.	Analysis	Result: Total Metals	Result: Dissolved Metals	Units
15-S	EPA-200.7	Antimony	<50	<50	ug/L
	EPA-7060	Arsenic	—	—	ug/L
	EPA-200.7	Barium	114	61	ug/L
	EPA-200.7	Beryllium	<2	<2	ug/L
	EPA-200.7	Cadmium	<3	<3	ug/L
	EPA-200.7	Calcium	197,000	192,000	ug/L
	EPA-200.7	Chromium	17	<5	ug/L
	EPA-200.7	Copper	52	<5	ug/L
	EPA-200.7	Lead	123	<10	ug/L
	EPA-200.7	Magnesium	60,000	59,000	ug/L
	EPA-200.7	Manganese	2592	2253	ug/L
	EPA-7470	Mercury	<0.2	<0.2	ug/L
	EPA-200.7	Nickel	32	7	ug/L
	EPA-200.7	Potassium	5,000	4,000	ug/L
	EPA-7740	Selenium	<2	<2	ug/L
	EPA-200.7	Silver	<10	<10	ug/L
	EPA-200.7	Sodium	12,000	12,000	ug/L
	EPA-200.7	Thallium	<50	<50	ug/L
	EPA-200.7	Zinc	28,204	2163	ug/L
	SM. 403	ALKALINITY	468		mg/L
	EPA-353.2	Nitrate	0.01		mg/L
	EPA-375.2	Sulfate	293		mg/L
	SD-407B	CHLORIDES	16		
	EPA-335.2	Cyanide	0.002		mg/L

DEPARTMENT OF THE ARMY
Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 1 - Sheet 4 of 6

Project: NIROP
Date Sample Received: 11-19-87
Customer Station No: RINSATE
Material Description: WATER

MRD No.

Sample No.	Analysis Procedure No.	Analysis	Result TOTAL METALS	Result DISSOLVED METALS	Units
RINSATE	EPA-200.7	Antimony	<50	<50	ug/L
	EPA-7060	Arsenic	<2	<2	ug/L
	EPA-200.7	Barium	<3	<3	ug/L
	EPA-200.7	Beryllium	<2	<2	ug/L
	EPA-200.7	Cadmium	<3	<3	ug/L
	EPA-200.7	Calcium			ug/L
	EPA-200.7	Chromium	<5	<5	ug/L
	EPA-200.7	Copper	<5	<5	ug/L
	EPA-200.7	Lead	<10	<10	ug/L
	EPA-200.7	Magnesium	<1,000	<1,000	ug/L
	EPA-200.7	Manganese	<5	<5	ug/L
	EPA-7470	Mercury	<0.2	<0.2	ug/L
	EPA-200.7	Nickel	7	<5	ug/L
	EPA-200.7	Potassium	<1,000	<1,000	ug/L
	EPA-7740	Selenium	<2	<2	ug/L
	EPA-200.7	Silver	<10	<10	ug/L
	EPA-200.7	Sodium	<1,000	<1,000	ug/L
	EPA-200.7	Thallium	<50	<50	ug/L
	EPA-200.7	Zinc	5	7	ug/L
	SM-403	ALKALINITY	4		mg/L
	EPA-353.2	Nitrate	<0.01		mg/L
	EPA-375.2	Sulfate	<10		mg/L
		CHLORIDE	2		mg/L
	EPA-335.2	Cyanide	0.001		mg/L

DEPARTMENT OF THE ARMY
Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 1 - Sheet 5 of 6

Project: NIROP
Date Sample Received: 11-29-87
Customer Station No: FIELD BLANK
Material Description: WATER

MRD No.

Sample No.	Analysis Procedure No.	Analysis	Result	Units
FIELD BLANK	EPA-200.7	Antimony	NOT TESTED	ug/L
	EPA-7060	Arsenic		ug/L
	EPA-200.7	Barium		ug/L
	EPA-200.7	Beryllium		ug/L
	EPA-200.7	Cadmium		ug/L
	EPA-200.7	Calcium		ug/L
	EPA-200.7	Chromium		ug/L
	EPA-200.7	Copper		ug/L
	EPA-200.7	Lead		ug/L
	EPA-200.7	Magnesium		ug/L
	EPA-200.7	Manganese		ug/L
	EPA-7470	Mercury		ug/L
	EPA-200.7	Nickel		ug/L
	EPA-200.7	Potassium		ug/L
	EPA-7740	Selenium		ug/L
	EPA-200.7	Silver		ug/L
	EPA-200.7	Sodium		ug/L
	EPA-200.7	Thallium		ug/L
	EPA-200.7	Zinc		ug/L
	EPA-353.2	Nitrate	<0.01	mg/L
	EPA-375.2	Sulfate	—	mg/L
	EPA-335.2	Cyanide	0.001	mg/L

PROJECT: NIROP

DATE SAMPLE RECEIVED: 11-22-87

MATERIAL DESCRIPTION: WATER

SAMPLE I.D.	NITRATE mg/l [EPA-353.2]
1-D	0.02
2-D	<0.01
3-D	0.04
4-D	<0.01
5-D	<0.01
1-S	0.14
6-S	1.64
Rinsate Blank	0.01

DEPARTMENT OF THE ARMY
MISSOURI RIVER DIVISION, CORPS OF ENGINEERS
DIVISION LABORATORY
OMAHA, NEBRASKA 68102

21 APR 1987

Rec'd 5-7

Subject: Quality Assurance Testing Results

Project: NIROP
Intended Use:
Source of Material:

Submitted by: Thomas Thiele, MROED-EA
Date Sampled: _____, **Date Received:** 11/19/86 & 11/22/86
Method of Test or Specification: See attached tables

References: Omaha District, Request ENE 6499 23 Sept 86 and ENE 7499 24 Apr 87

REMARKS

1. All Quality Assurance (QA) results can be found on the attached Tables 1-6.

2. All samples were received in good condition and all chain-of-custody paperwork was correctly filled out. The original chain-of-custody forms are attached to the end of this report.

3. All samples were analyzed at MRD Laboratory except for the Volatile Organic samples. These samples were subcontracted out to the Tennessee Valley Authority (TVA) Laboratory in Chattanooga, Tennessee.

4. All Contractor Laboratory (WES) results are compared to the QA results on each of the individual tables. Several discrepancies were noted.

Submitted by:

R. K. Schlenker

R. K. SCHLENKER, P.E.
Director, MRD Laboratory

RECEIVED RMT, INC.

MAY 21 1987

FILE:

SOLSKY/gc/3211

Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 1 - Sheet 1 of 2

Project: NIROP | Customer Sample No: 3-S
Date Sample Received: 11/19/86 | Material Description: Water

Analysis Procedure No.	Analysis	QA Result	WES Result	Units
	Total Metals			
EPA-200.7	Antimony	<50	-	ug/L
EPA-7060	Arsenic	3	<5	ug/L
*EPA-200.7	Barium	132	88	ug/L
EPA-200.7	Beryllium	<2	-	ug/L
EPA-200.7	Cadmium	<3	1.4	ug/L
EPA-200.7	Calcium	175,000	169,000	ug/L
*EPA-200.7	Chromium	21	9	ug/L
EPA-200.7	Copper	16	24	ug/L
* EPA-200.7	Lead	17	171	ug/L
EPA-200.7	Magnesium	32,000	-	ug/L
EPA-200.7	Manganese	1,524	1,560	ug/L
EPA-7470	Mercury	<.2	<0.4	ug/L
EPA-200.7	Nickel	18	18	ug/L
EPA-200.7	Potassium	30,000	-	ug/L
EPA-7740	Selenium	<2	<5	ug/L
EPA-200.7	Silver	<10	1	ug/L
EPA-200.7	Sodium	5,000	-	ug/L
EPA-200.7	Thallium	<50	-	ug/L
EPA-200.7	Zinc	1,146	1,520	ug/L
	Dissolved Metals			
EPA-200.7	Antimony	<50	-	ug/L
EPA-7060	Arsenic	<2	<5	ug/L
*EPA-200.7	Barium	86	165	ug/L
EPA-200.7	Beryllium	<2	-	ug/L
EPA-200.7	Cadmium	<3	0.3	ug/L
EPA-200.7	Calcium	168,000	157,000	ug/L
EPA-200.7	Chromium	<5	3	ug/L
EPA-200.7	Copper	<5	3	ug/L
EPA-200.7	Lead	<10	2	ug/L
EPA-200.7	Magnesium	32,000	30,100	ug/L
EPA-200.7	Manganese	1,094	1,040	ug/L
EPA-7470	Mercury	<0.2	<0.4	ug/L
*EPA-200.7	Nickel	8	<1	ug/L
EPA-200.7	Potassium	3,000	3,850	ug/L
EPA-7740	Selenium	<2	<5	ug/L
EPA-200.7	Silver	<10	<1	ug/L
EPA-200.7	Sodium	6,000	7,830	ug/L
EPA-200.7	Thallium	<50	-	ug/L
EPA-200.7	Zinc	141	131	ug/L
	General Chemistry			
SM-403	Alkalinity (As $CACO_3$)	468	481	mg/L
*EPA-353.2	Nitrate	2.78	1.17	mg/L
EPA-375.2	Sulfate	129	97.0	mg/L
SM-407B	Chlorides	6	4.8	mg/L
EPA 335.2	Cyanide	0.002	<0.010	mg/L

DEPARTMENT OF THE ARMY
Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 1 - Sheet 2 of 2

Analysis Procedure No.	Analysis	TVA Result	WES Result	Units
	Volatile Organics			
EPA-624	Carbon tetrachloride	< 10	< 5	ug/L
	Bromoform	< 10	< 5	ug/L
	Benzene	< 10	< 5	ug/L
	2-Chloroethylvinyl ether	< 10	< 10	ug/L
	Chloroethane	< 10	< 10	ug/L
	Dibromochloromethane	< 10	< 5	ug/L
	Chlorobenzene	< 10	< 5	ug/L
	1,1-Dichloroethane	< 10	< 5	ug/L
	Ethylbenzene	< 10	< 5	ug/L
	1,3-Dichloropropene	< 10	< 5	ug/L
	1,2-Dichloropropane	< 10	< 5	ug/L
	1,1-Dichloroethene	< 10	< 5	ug/L
	Acrylonitrile	<100	< 100	ug/L
	Acrolein	<100	< 100	ug/L
	1,2-Dichloroethane	< 10	< 5	ug/L
	Bromodichloromethane	< 10	< 5	ug/L
	Chloroform	< 10	< 5	ug/L
	Bromomethane	< 10	< 10	ug/L
	Chloromethane	< 10	< 10	ug/L
	Methylene chloride	< 10	< 5	ug/L
	1,1,2,2-TetraClethane	< 10	< 5	ug/L
	Tetrachloroethene	< 10	< 5	ug/L
	Toluene	< 10	< 5	ug/L
	trans-1,2-Dichloroethene	163	290	ug/L
	1,1,1-Trichloroethane	< 10	< 5	ug/L
	1,1,2-Trichloroethane	< 10	< 5	ug/L
	Trichloroethene	540	880	ug/L
	Trichlorofluoromethane	< 10	< 5	ug/L
	Vinyl chloride	< 10	< 10	ug/L
	Acetone	-	46	ug/L

Comments: Several discrepancies exist between the QA data and the Contractor's data. These discrepancies are indicated by a "*." Most of the water samples had small amounts of sediment in the containers which could affect the results especially if varying amounts of sediment existed between the QA sample and the Contractor's sample. This was especially noticeable in the analysis for total metals where the results for barium, chromium, and lead disagreed. The results for barium and nickel also disagreed in the analysis for dissolved metals. The QA laboratory normally requires a one-liter sample for each of these analyses, however, only a one-half liter sample was sent. As a result some analyses could not be completed. It was also discovered that low recoveries were noticed by the QA lab when the samples were analyzed. Insufficient sample was available to investigate this problem. As a result, the lab's data may be questionable quality.

Acetone was seen by the Contractor's lab when the Volatile Organics were tested. See comments on Table 5.

Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 2 - Sheet 1 of 2

Project: NIROP | Customer Sample No: 9-S
Date Sample Received: 11/19/86 | Material Description: Water

Analysis Procedure No.	Analysis	QA Result	WES Result	Units
	Total Metals			
EPA-200.7	Antimony	<50	-	ug/L
EPA-7060	Arsenic	-	23	ug/L
EPA-200.7	Barium	1,155	986	ug/L
EPA-200.7	Beryllium	3	-	ug/L
EPA-200.7	Cadmium	<3	3.4	ug/L
*EPA-200.7	Calcium	308,000	154,000	ug/L
EPA-200.7	Chromium	248	267	ug/L
EPA-200.7	Copper	395	377	ug/L
EPA-200.7	Lead	168	174	ug/L
EPA-200.7	Magnesium	92,000	-	ug/L
EPA-200.7	Manganese	3,300	2,540	ug/L
EPA-7470	Mercury	0.3	<0.4	ug/L
EPA-200.7	Nickel	282	322	ug/L
EPA-200.7	Potassium	7,000	-	ug/L
EPA-7740	Selenium	-	76	ug/L
EPA-200.7	Silver	<10	1	ug/L
EPA-200.7	Sodium	34,000	-	ug/L
EPA-200.7	Thallium	<50	-	ug/L
EPA-200.7	Zinc	2,900	3,150	ug/L
	Dissolved Metals			
EPA-200.7	Antimony	<50	-	ug/L
EPA-7060	Arsenic	-	<5	ug/L
*EPA-200.7	Barium	64	109	ug/L
EPA-200.7	Beryllium	<2	-	ug/L
EPA-200.7	Cadmium	<3	0.6	ug/L
EPA-200.7	Calcium	140,000	133,000	ug/L
EPA-200.7	Chromium	<5	3	ug/L
EPA-200.7	Copper	<5	5	ug/L
EPA-200.7	Lead	<10	3	ug/L
EPA-200.7	Magnesium	37,000	33,000	ug/L
EPA-200.7	Manganese	22	26	ug/L
EPA-7470	Mercury	<0.2	<0.4	ug/L
*EPA-200.7	Nickel	7	<1	ug/L
EPA-200.7	Potassium	7,000	5,490	ug/L
EPA-7740	Selenium	-	4.9	ug/L
EPA-200.7	Silver	<10	<1	ug/L
EPA-200.7	Sodium	27,000	28,200	ug/L
EPA-200.7	Thallium	<50	-	ug/L
EPA-200.7	Zinc	174	184	ug/L
	General Chemistry			
SM-403	Alkalinity (As $CACO_3$)	427	436	mg/L
*EPA-353.2	Nitrate	5.2	3.92	mg/L
EPA-375.2	Sulfate	124	91.7	mg/L
SM-407B	Chlorides	17	15.2	mg/L
EPA 335.2	Cyanide	0.003	<0.010	mg/L

Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 2 - Sheet 2 of 2

Analysis Procedure No.	Analysis	TVA Result	WES Result	Units
	Volatile Organics			
EPA-624	Carbon tetrachloride	< 10	< 5	ug/L
	Bromoform	< 10	< 5	ug/L
	Benzene	< 10	< 5	ug/L
	2-Chloroethylvinyl ether	< 10	< 10	ug/L
	Chloroethane	< 10	< 10	ug/L
	Dibromochloromethane	< 10	< 5	ug/L
	Chlorobenzene	< 10	< 5	ug/L
	1,1-Dichloroethane	< 10	< 5	ug/L
	Ethylbenzene	< 10	< 5	ug/L
	1,3-Dichloropropene	< 10	< 5	ug/L
	1,2-Dichloropropane	< 10	< 5	ug/L
	*1,1-Dichloroethene	< 10	35	ug/L
	Acrylonitrile	<100	< 100	ug/L
	Acrolein	<100	< 100	ug/L
	1,2-Dichloroethane	< 10	< 5	ug/L
	Bromodichloromethane	< 10	< 5	ug/L
	Chloroform	< 10	< 5	ug/L
	Bromomethane	< 10	< 10	ug/L
	Chloromethane	< 10	< 10	ug/L
	Methylene chloride	< 10	< 5	ug/L
	1,1,2,2-TetraClethane	< 10	< 5	ug/L
	Tetrachloroethene	99	120	ug/L
	Toluene	< 10	< 5	ug/L
	trans-1,2-Dichloroethene	270.00	340	ug/L
	1,1,1-Trichloroethane	101	120	ug/L
	1,1,2-Trichloroethane	< 10	< 5	ug/L
	Trichloroethene	1670	1800	ug/L
	Trichlorofluoromethane	< 10	< 5	ug/L
	Vinyl chloride	< 10	< 10	ug/L
	Acetone	-	120	ug/L

Comments: Several discrepancies were found between the QA lab's and the Contractor lab's results. These discrepancies are of the same type as already noted and discussed under Table 1.

This sample is contaminated with several organic compounds. Only a single discrepancy was noted between the two lab's results. Acetone was again reported by the Contractor lab.

Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 3 - Sheet 1 of 2

Project: NIROP | Customer Sample No: 15-S
Date Sample Received: 11/19/86 | Material Description: Water

Analysis Procedure No.	Analysis	QA Result	WES Result	Units
	Total Metals			
EPA-200.7	Antimony	<50	-	ug/L
EPA-7060	Arsenic	-	45	ug/L
*EPA-200.7	Barium	114	172	ug/L
EPA-200.7	Beryllium	<2	-	ug/L
*EPA-200.7	Cadmium	<3	19.4	ug/L
EPA-200.7	Calcium	197,000	207,000	ug/L
EPA-200.7	Chromium	17	11	ug/L
*EPA-200.7	Copper	52	89	ug/L
*EPA-200.7	Lead	123	174	ug/L
EPA-200.7	Magnesium	60,000	-	ug/L
EPA-200.7	Manganese	2,592	2,460	ug/L
EPA-7470	Mercury	<0.2	<0.4	ug/L
EPA-200.7	Nickel	32	39	ug/L
EPA-200.7	Potassium	5,000	-	ug/L
EPA-7740	Selenium	<2	<5	ug/L
EPA-200.7	Silver	<10	<1	ug/L
EPA-200.7	Sodium	12,000	-	ug/L
EPA-200.7	Thallium	<50	-	ug/L
EPA-200.7	Zinc	28,204	25,400	ug/L
	Dissolved Metals			
EPA-200.7	Antimony	<50	-	ug/L
EPA-7060	Arsenic	-	14	ug/L
*EPA-200.7	Barium	61	136	ug/L
EPA-200.7	Beryllium	<2	-	ug/L
EPA-200.7	Cadmium	<3	0.8	ug/L
EPA-200.7	Calcium	192,000	159,000	ug/L
EPA-200.7	Chromium	<5	2	ug/L
EPA-200.7	Copper	<5	2	ug/L
EPA-200.7	Lead	<10	3	ug/L
EPA-200.7	Magnesium	59,000	53,400	ug/L
EPA-200.7	Manganese	2,060	1,960	ug/L
EPA-7470	Mercury	<0.2	<0.4	ug/L
EPA-200.7	Nickel	<5	<1	ug/L
EPA-200.7	Potassium	4,000	4,920	ug/L
EPA-7740	Selenium	<2	<5	ug/L
EPA-200.7	Silver	<10	<1	ug/L
EPA-200.7	Sodium	12,000	10,600	ug/L
EPA-200.7	Thallium	<50	-	ug/L
EPA-200.7	Zinc	2,163	1,840	ug/L
	General Chemistry			
SM-403	Alkalinity (As $CACO_3$)	468	477	mg/L
*EPA-353.2	Nitrate	0.01	0.028	mg/L
EPA-375.2	Sulfate	293	318	mg/L
SM-407B	Chlorides	16	15.0	mg/L
EPA 335.2	Cyanide	0.002	<0.010	mg/L

Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 3 - Sheet 2 of 2

Analysis Procedure No.	Analysis	TVA Result	WES Result	Units
	Volatile Organics			
EPA-624	Carbon tetrachloride	< 10	< 5	ug/L
	Bromoform	< 10	< 5	ug/L
	Benzene	< 10	< 5	ug/L
	2-Chloroethylvinyl ether	< 10	< 10	ug/L
	Chloroethane	< 10	< 10	ug/L
	Dibromochloromethane	< 10	< 5	ug/L
	Chlorobenzene	< 10	< 5	ug/L
	1,1-Dichloroethane	< 10	< 5	ug/L
	Ethylbenzene	< 10	< 5	ug/L
	1,3-Dichloropropene	< 10	< 5	ug/L
	1,2-Dichloropropane	< 10	< 5	ug/L
	1,1-Dichloroethene	< 10	< 5	ug/L
	Acrylonitrile	<100	< 100	ug/L
	Acrolein	<100	< 100	ug/L
	1,2-Dichloroethane	< 10	< 5	ug/L
	Bromodichloromethane	< 10	< 5	ug/L
	Chloroform	< 10	< 5	ug/L
	Bromomethane	< 10	< 10	ug/L
	Chloromethane	< 10	< 10	ug/L
	Methylene chloride	< 10	< 5	ug/L
	1,1,2,2-TetraClethane	< 10	< 5	ug/L
	Tetrachloroethene	< 10	< 5	ug/L
	Toluene	< 10	< 5	ug/L
	trans-1,2-Dichloroethene	< 10	< 5	ug/L
	1,1,1-Trichloroethane	< 10	< 5	ug/L
	1,1,2-Trichloroethane	< 10	< 5	ug/L
	Trichloroethene	13	7.1	ug/L
	Trichlorofluoromethane	< 10	< 5	ug/L
	Vinyl chloride	< 10	< 10	ug/L

Comments: Refer to the comments noted under Table 2. Little organic contamination was found in this sample.

Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 4 - Sheet 1 of 2

Project: NIROP
Date Sample Received: 11/19/86
Customer Sample No: Rinsate Blank
Material Description: Water

Analysis Procedure No.	Analysis	QA Result	WES Result	Units
	Total Metals			
EPA-200.7	Antimony	<50	-	ug/L
EPA-7060	Arsenic	<2	<5	ug/L
EPA-200.7	Barium	<3	<10	ug/L
EPA-200.7	Beryllium	<2	-	ug/L
EPA-200.7	Cadmium	<3	0.2	ug/L
EPA-200.7	Calcium	-	<100	ug/L
EPA-200.7	Chromium	<5	4	ug/L
EPA-200.7	Copper	<5	5	ug/L
EPA-200.7	Lead	<10	9	ug/L
EPA-200.7	Magnesium	<1,000	-	ug/L
EPA-200.7	Manganese	<5	<30	ug/L
EPA-7470	Mercury	<0.2	<0.4	ug/L
*EPA-200.7	Nickel	7	17	ug/L
EPA-200.7	Potassium	<1,000	-	ug/L
EPA-7740	Selenium	<2	<5	ug/L
EPA-200.7	Silver	<10	<1	ug/L
EPA-200.7	Sodium	<1,000	-	ug/L
EPA-200.7	Thallium	<50	-	ug/L
EPA-200.7	Zinc	5	<30	ug/L
	Dissolved Metals			
EPA-200.7	Antimony	<50	-	ug/L
EPA-7060	Arsenic	<2	<5	ug/L
EPA-200.7	Barium	<3	<10	ug/L
EPA-200.7	Beryllium	<2	-	ug/L
EPA-200.7	Cadmium	<3	0.4	ug/L
EPA-200.7	Calcium	-	<100	ug/L
EPA-200.7	Chromium	<5	1	ug/L
EPA-200.7	Copper	<5	3	ug/L
EPA-200.7	Lead	<10	2	ug/L
EPA-200.7	Magnesium	<1,000	<10	ug/L
EPA-200.7	Manganese	<5	<30	ug/L
EPA-7470	Mercury	<0.2	<0.4	ug/L
EPA-200.7	Nickel	<5	<1	ug/L
EPA-200.7	Potassium	<1,000	<100	ug/L
EPA-7740	Selenium	<2	<5	ug/L
EPA-200.7	Silver	<10	<1	ug/L
EPA-200.7	Sodium	<1,000	<100	ug/L
EPA-200.7	Thallium	<50	-	ug/L
EPA-200.7	Zinc	7	<30	ug/L
	General Chemistry			
SM-403	Alkalinity (As $CACO_3$)	4	<5.0	mg/L
EPA-353.2	Nitrate	<0.01	0.021	mg/L
EPA-375.2	Sulfate	<10	<10.0	mg/L
SM-407B	Chlorides	2	<1.0	mg/L
EPA 335.2	Cyanide	0.001	<0.010	mg/L

DEPARTMENT OF THE ARMY
Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 4 - Sheet 2 of 2

Analysis Procedure No.	Analysis	TVA Result	WES Result	Units
	Volatile Organics			
EPA-624	Carbon tetrachloride	< 10	< 5	ug/L
	Bromoform	< 10	< 5	ug/L
	Benzene	< 10	< 5	ug/L
	2-Chloroethylvinyl ether	< 10	< 10	ug/L
	Chloroethane	< 10	< 10	ug/L
	Dibromochloromethane	< 10	< 5	ug/L
	Chlorobenzene	< 10	< 5	ug/L
	1,1-Dichloroethane	< 10	< 5	ug/L
	Ethylbenzene	< 10	< 5	ug/L
	1,3-Dichloropropene	< 10	< 5	ug/L
	1,2-Dichloropropane	< 10	< 5	ug/L
	1,1-Dichloroethene	< 10	< 5	ug/L
	Acrylonitrile	<100	< 100	ug/L
	Acrolein	<100	< 100	ug/L
	1,2-Dichloroethane	< 10	< 5	ug/L
	Bromodichloromethane	< 10	< 5	ug/L
	Chloroform	< 10	< 5	ug/L
	Bromomethane	< 10	< 10	ug/L
	Chloromethane	< 10	< 10	ug/L
	Methylene chloride	< 10	< 5	ug/L
	1,1,2,2-TetraClethane	< 10	< 5	ug/L
	trans-1,2-Dichloroethene	< 10	< 5	ug/L
	Tetrachloroethene	< 10	< 5	ug/L
	Toluene	< 10	< 5	ug/L
	1,1,1-Trichloroethane	< 10	< 5	ug/L
	1,1,2-Trichloroethane	< 10	< 5	ug/L
	Trichloroethene	< 10	< 5	ug/L
	Trichlorofluoromethane	< 10	< 5	ug/L
	Vinyl chloride	< 10	< 10	ug/L
	Acetone	-	590	ug/L
	Hexane	-	17	ug/L
	Bromochlorodifluoromethane	-	69	ug/L

Comments: Only a single minor discrepancy was noted. However, several organic compounds were detected by the Contractor Laboratory. Since this sample is a Rinsate Blank it should be free of contamination. These results would indicate sample contamination in the field. However, since two of the three compounds were not reported in any of the other samples, these results are most likely indicative of laboratory contamination of the sample. Acetone was again found at a high level in this sample.

DEPARTMENT OF THE ARMY
Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 5 - Sheet 1 of 1

Project: NIROP
Date Sample Received: 11/19/86
Customer Sample No: Trip Blank
Material Description: Water

Analysis Procedure No.	Analysis	QA Result	WES Result	Units
	Volatile Organics			
EPA-624	Carbon tetrachloride	< 10	< 5	ug/L
	Bromoform	< 10	< 5	ug/L
	Benzene	< 10	< 5	ug/L
	2-Chloroethylvinyl ether	< 10	< 10	ug/L
	Chloroethane	< 10	< 10	ug/L
	Dibromochloromethane	< 10	< 5	ug/L
	Chlorobenzene	< 10	< 5	ug/L
	1,1-Dichloroethane	< 10	< 5	ug/L
	Ethylbenzene	< 10	< 5	ug/L
	1,3-Dichloropropene	< 10	< 5	ug/L
	1,2-Dichloropropane	< 10	< 5	ug/L
	1,1-Dichloroethene	< 10	< 5	ug/L
	Acrylonitrile	<100	< 100	ug/L
	Acrolein	<100	< 100	ug/L
	1,2-Dichloroethane	< 10	< 5	ug/L
	Bromodichloromethane	< 10	< 5	ug/L
	Chloroform	< 10	< 5	ug/L
	Bromomethane	< 10	< 10	ug/L
	Chloromethane	< 10	< 10	ug/L
	Methylene chloride	< 10	< 5	ug/L
	1,1,2,2-TetraClethane	< 10	< 5	ug/L
	Tetrachloroethene	< 10	< 5	ug/L
	Toluene	< 10	< 5	ug/L
	trans-1,2-Dichloroethene	< 10	< 5	ug/L
	1,1,1-Trichloroethane	< 10	< 5	ug/L
	1,1,2-Trichloroethane	< 10	< 5	ug/L
	Trichloroethene	< 10	< 5	ug/L
	Trichlorofluoromethane	< 10	< 5	ug/L
	Vinyl chloride	< 10	< 10	ug/L
	Acetone	-	51	ug/L

Comments: Only acetone was detected at a low level by the Contractor Laboratory (WES). Acetone is a common laboratory contaminant and its presence in a trip blank is not desirable. Since acetone was detected in several other samples, it would seem to indicate that the contamination is being introduced at the Contractor's Laboratory.

DEPARTMENT OF THE ARMY
Missouri River Division, Corps of Engineers
Division Laboratory
Omaha, Nebraska

TABLE 6 - Sheet 1 of 1

Project: NIROP
Date Sample Received: 11/22/86 Material Description: Water
Customer Sample No: 1-D, 2-D, 3-D, 4-D, 5-D, 1-S, 6-S, Rinsate Blank

Sample No.	Analysis Procedure No.	Analysis	QA Result	WES Result	Units
1-D	EPA-353.2	Nitrate	0.02	-	mg/L
2-D	EPA-353.2	Nitrate	<0.01	-	mg/L
3-D	EPA-353.2	Nitrate	0.04	-	mg/L
4-D	EPA-353.2	Nitrate	<0.01	-	mg/L
5-D	EPA-353.2	Nitrate	<0.01	-	mg/L
1-S	EPA-353.2	Nitrate	0.14	-	mg/L
6-S	EPA-353.2	Nitrate	1.64	-	mg/L
Rinsate Blank	EPA-353.2	Nitrate	0.01	-	mg/L

Comments: No results were available from WES for comparison. The level of nitrates found was very low and for three samples, nitrate was not detected.

APPENDIX E

CHAIN-OF-CUSTODY FORMS

RMT, INC.

CHAIN-OF-CUSTODY RECORD

PROJECT NO. 1120.09

PROJECT NAME NIROP

SAMPLERS: (Signature) [illegible] / Van Kuch

RMT NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	500ml plastic HNO_3	500ml plastic HNO_3 unfiltered	500ml plastic H_2SO_4	500ml plastic NaOH	500ml plastic unpreserved	40ml glass vapors	REMARKS
	11-17-86	10:58		X	3-S	7	1	1	1	1	1	2	
	11-17-86	16:49		X	9-S	7	1	1	1	1	1	2	
	11-17-86	15:37		X	15-S	7	1	1	1	1	1	2	
	11-17-86	18:21		X	Rinsate BLK	14	2	2	2	2	2	4	
	11-17-86			X	Trip BLK	9	1	1	1	1	1	4	TWO TRIP BLANK VIAL HAS AIR Bubble in them

Relinquished by: (Signature) ①	Date/Time	Received by: (Signature) ②	Relinquished by: (Signature) ③	Date/Time	Received by: (Signature) ④
Van Kuch	11/18/86 3:12	Cooler/Federal Exp			

Relinquished by: (Signature) ⑤	Date/Time	Received by: (Signature) ⑥	Relinquished by: (Signature) ⑦	Date/Time	Received by: (Signature) ⑧

Relinquished by: (Signature) ⑨	Date/Time	Received by: (Signature) ⑩	Relinquished by: (Signature) ⑪	Date/Time	Received by: (Signature) ⑫

Relinquished by: (Signature) ⑬	Date/Time	Received for Laboratory by: (Signature) ⑭	Date/Time	Remarks
		[illegible] 11/19	11/19/86 11:00 AM	

RMT, INC.

CHAIN-OF-CUSTODY RECORD

PROJECT NO.	PROJECT NAME
1120.09	NIRCP

SAMPLERS: (Signature) [signature]

RMT NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	1000ml 1+250ml plastic Nitrogen							REMARKS
	11-20-86	5:05p		X	1-S	1	1							
	11-20-86	6:47p		X	1-D	1	1							
	11-20-86	7:45p		X	5-D	1	1							
	11-20-86	8:39p		X	2-D	1	1							
	11-20-86	10:30p		X	4-D	1	1							
	11-20-86	11:27p		X	3-D	1	1							
	11-20-86	11:50p		X	6-S	1	1							
	11-20-86	11:59p			Rinsate BLK	1	1							

Relinquished by: (Signature) ①	Date/Time	Received by: (Signature) ②	Relinquished by: (Signature) ③	Date/Time	Received by: (Signature) ④
[signature]	11-21-86 4:00p	Fed Exp/Cooler 912 892330			
Relinquished by: (Signature) ⑤	**Date/Time**	**Received by: (Signature) ⑥**	**Relinquished by: (Signature) ⑦**	**Date/Time**	**Received by: (Signature) ⑧**
Relinquished by: (Signature) ⑨	**Date/Time**	**Received by: (Signature) ⑩**	**Relinquished by: (Signature) ⑪**	**Date/Time**	**Received by: (Signature) ⑫**
Relinquished by: (Signature) ⑬	**Date/Time**	**Received for Laboratory by: (Signature) ⑭**	**Date/Time**		**Remarks**
		[signature]	11/22/86	10:30 A.M.	

RMT, INC.

CHAIN-OF-CUSTODY RECORD

PROJECT NO.	PROJECT NAME
1125.09	NIROP

SAMPLERS: (Signature)

RMT NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	250 ml plastic HNO3 WEIGHED	250 ml plastic HNO3	250 ml plastic unpres.	250 ml plastic NaOH	1000 ml plastic H2SO4	40 ml glass unpres.	REMARKS
	11/18	1640			8-D	6	0	1	1	1	1	2	
	11/18	1030			2-S	6	0	1	1	1	1	2	
	11/18	1344			17-S	6	0	1	1	1	1	2	
	11/18	1415			7-D	6	0	1	1	1	1	2	
	11/18	1111			1-PC	6	0	1	1	1	1	2	
					TRIP BLANK	2	0					2	

Relinquished by: (Signature) ①	Date/Time	Received by: (Signature) ②	Relinquished by: (Signature) ③	Date/Time	Received by: (Signature) ④
Relinquished by: (Signature) ⑤	**Date/Time**	**Received by: (Signature) ⑥**	**Relinquished by: (Signature) ⑦**	**Date/Time**	**Received by: (Signature) ⑧**
Relinquished by: (Signature) ⑨	**Date/Time**	**Received by: (Signature) ⑩**	**Relinquished by: (Signature) ⑪**	**Date/Time**	**Received by: (Signature) ⑫**
Relinquished by: (Signature) ⑬	**Date/Time**	**Received for Laboratory by: (Signature) ⑭**	**Date/Time**	**Remarks**	

RMT, INC.

MRD

CHAIN-OF-CUSTODY RECORD

PROJECT NO.: [illegible]

PROJECT NAME: [illegible]

SAMPLERS: (Signature) [illegible] / Tom Kiel

RMT NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	500ml plastic HNO3	500ml plastic HNO3	500ml plastic H2SO4	500ml plastic N/A	500ml plastic [illegible]	40ml glass [illegible]	REMARKS
	11-7-86	16:55		X	3-S	7	1	1	1	1	1	2	
	11-7-86	16:49		X	9-S	7	1	1	1	1	1	2	
	11-7-86	15:37		X	15-S	7	1	1	1	1	1	2	
	11-7-86	15:21		X	Rinsate Blk	14	2	2	2	2	2	4	
	11-7-86			X	Trip Blk	9	1	1	1	1	1	4	

Relinquished by: (Signature) ①	Date/Time	Received by: (Signature) ②	Relinquished by: (Signature) ③	Date/Time	Received by: (Signature) ④
Tom Kiel	11/18/86 5:12	Cooler/Federal Exp			

Relinquished by: (Signature) ⑤	Date/Time	Received by: (Signature) ⑥	Relinquished by: (Signature) ⑦	Date/Time	Received by: (Signature) ⑧

Relinquished by: (Signature) ⑨	Date/Time	Received by: (Signature) ⑩	Relinquished by: (Signature) ⑪	Date/Time	Received by: (Signature) ⑫

Relinquished by: (Signature) ⑬	Date/Time	Received for Laboratory by: (Signature) ⑭	Date/Time	Remarks

RMT, INC.

CHAIN-OF-CUSTODY RECORD

PROJECT NO.	PROJECT NAME
112109	N-ROD

SAMPLERS: (Signature) [illegible] / Tom Kal

RMT NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	250ml Plastic HNO3	250ml Plastic HNO3	250ml Plastic [illegible]	250ml Plastic [illegible]	125ml Plastic [illegible]		REMARKS
	11-17-86	16:58		X	3-S	5	1	1	1	1	1		
	11-17-86	16:49		X	9-S	5	1	1	1	1	1		
	11-17-86	15:37		X	15-S	5	1	1	1	1	1		
	11-17-86	12:40		X	FMC-33	4	0	1	1	1	1		
	11-17-86	18:21		X	Rinsate Pit	5	1	1	1	1	1		

Relinquished by: (Signature) ①	Date/Time	Received by: (Signature) ②	Relinquished by: (Signature) ③	Date/Time	Received by: (Signature) ④
Tom Kal	11/18 3:04	Cooler / Fed Exp.			
Relinquished by: (Signature) ⑤	**Date/Time**	**Received by: (Signature) ⑥**	**Relinquished by: (Signature) ⑦**	**Date/Time**	**Received by: (Signature) ⑧**
Relinquished by: (Signature) ⑨	**Date/Time**	**Received by: (Signature) ⑩**	**Relinquished by: (Signature) ⑪**	**Date/Time**	**Received by: (Signature) ⑫**
Relinquished by: (Signature) ⑬	**Date/Time**	**Received for Laboratory by: (Signature) ⑭**	**Date/Time**	**Remarks**	

RMT, INC.

CHAIN-OF-CUSTODY RECORD

PROJECT NO.	PROJECT NAME
110209	[illegible]

SAMPLERS: (Signature) [illegible]

RMT NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Final Grab Samples	REMARKS
	11-17-86			X	Dup 1	7	1	1	1	1	1	2	
	11-17-86			X	Dup 2	7	1	1	1	1	1	2	
	11-17-86			X	Dup 3	7	1	1	1	1	1	2	
	11-17-86	10:58			3-S	2						2	
	11-17-86	14:49			9-S	2						2	
	11-17-86	15:27			15-S	2						2	
	11-17-86	12:40			FMC-33	2						2	
	11-17-86	12:21			Rincate Blk	2						2	
	11-17-86				Trip Blk	~~7~~	1	1	1	1	1	2	

Relinquished by: (Signature) ①	Date/Time	Received by: (Signature) ②	Relinquished by: (Signature) ③	Date/Time	Received by: (Signature) ④
[illegible]	11/18/86 2:50	Cooler/Fed Ex			

Relinquished by: (Signature) ⑤	Date/Time	Received by: (Signature) ⑥	Relinquished by: (Signature) ⑦	Date/Time	Received by: (Signature) ⑧

Relinquished by: (Signature) ⑨	Date/Time	Received by: (Signature) ⑩	Relinquished by: (Signature) ⑪	Date/Time	Received by: (Signature) ⑫

Relinquished by: (Signature) ⑬	Date/Time	Received for Laboratory by: (Signature) ⑭	Date/Time	Remarks

RMT, INC.

CHAIN-OF-CUSTODY RECORD

PROJECT NO. [illegible]

PROJECT NAME [illegible]

SAMPLERS: (Signature) [illegible]

RMT NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	REMARKS
	11-18-86	4:55P		✓	18-S	6	1	1	1	1	2		NO SULFIDE
	11-18-86	6:35A		✓	19-S	6	1	1	1	1	2		↓
	11-18-86	6:45A		✓	9-D	6	1	1	1	1	2		

Relinquished by: (Signature) ①	Date/Time	Received by: (Signature) ②	Relinquished by: (Signature) ③	Date/Time	Received by: (Signature) ④
[illegible]	11-19-86 4P	[illegible] / FED EX			

Relinquished by: (Signature) ⑤	Date/Time	Received by: (Signature) ⑥	Relinquished by: (Signature) ⑦	Date/Time	Received by: (Signature) ⑧

Relinquished by: (Signature) ⑨	Date/Time	Received by: (Signature) ⑩	Relinquished by: (Signature) ⑪	Date/Time	Received by: (Signature) ⑫

Relinquished by: (Signature) ⑬	Date/Time	Received for Laboratory by: (Signature) ⑭	Date/Time	Remarks

RMT, INC.

CHAIN-OF-CUSTODY RECORD

PROJECT NO. [illegible]

PROJECT NAME [illegible]

SAMPLERS: (Signature) [illegible]

RMT NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	REMARKS
	11-19-86	8:35A		✓	2-PC	6	1	1	1	1	2		No Surface
	11-19-86	10:10A		✓	3-PC	6	1	1	1	1	2		
	11-19-86	10:35A		✓	4-S	6	1	1	1	1	2		
	11-19-86	12:08P		✓	4-PC	6	1	1	1	1	2		
	11-19-86	12:30P		✓	5-S	6	1	1	1	1	2		
	11-19-86	1:15P		✓	16-S	6	1	1	1	1	2		
					TRIP BLANK	2					2		

Relinquished by: (Signature) ①	Date/Time	Received by: (Signature) ②	Relinquished by: (Signature) ③	Date/Time	Received by: (Signature) ④
[illegible]	11-19-86 4pm	TFO Ex/[illegible]			

Relinquished by: (Signature) ⑤	Date/Time	Received by: (Signature) ⑥	Relinquished by: (Signature) ⑦	Date/Time	Received by: (Signature) ⑧

Relinquished by: (Signature) ⑨	Date/Time	Received by: (Signature) ⑩	Relinquished by: (Signature) ⑪	Date/Time	Received by: (Signature) ⑫

Relinquished by: (Signature) ⑬	Date/Time	Received for Laboratory by: (Signature) ⑭	Date/Time	Remarks

RMT, INC.

CHAIN-OF-CUSTODY RECORD

PROJECT NO.	PROJECT NAME
[illegible]	[illegible]

SAMPLERS: (Signature) [illegible]

RMT NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	REMARKS
	11-19-86	[illegible]		✓	12-5	6	1	1	1	1	2		No [illegible]
	11-19-86	[illegible]		✓	13-5	6	1	1	1	1	2		
	11-9-86	6:59P		✓	14-5	6	1	1	1	1	2		
	11-9-86	7:30P		✓	12-5	6	1	1	1	1	2		✓

Relinquished by: (Signature) ①	Date/Time	Received by: (Signature) ②	Relinquished by: (Signature) ③	Date/Time	Received by: (Signature) ④
[illegible]	11-20-86 4:30p	[illegible]			
Relinquished by: (Signature) ⑤	Date/Time	Received by: (Signature) ⑥	Relinquished by: (Signature) ⑦	Date/Time	Received by: (Signature) ⑧
Relinquished by: (Signature) ⑨	Date/Time	Received by: (Signature) ⑩	Relinquished by: (Signature) ⑪	Date/Time	Received by: (Signature) ⑫
Relinquished by: (Signature) ⑬	Date/Time	Received for Laboratory by: (Signature) ⑭	Date/Time	Remarks	

RMT, INC.

CHAIN-OF-CUSTODY RECORD

PROJECT NO. [illegible]

PROJECT NAME [illegible]

SAMPLERS: (Signature) [illegible]

RMT NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	REMARKS
/	[illegible]	8:14A		✓	20-5	6	1	1	1	1	2		NO SULFIDE
/	[illegible]	9:27A		✓	11-2	6	1	1	1	1	2		
/	[illegible]	[illegible]		✓	6-7	6	1	1	1	1	2		
/	[illegible]	11:40A		✓	7-5	6	1	1	1	1	2		
/	[illegible]	[illegible]		✓	8-5	6	1	1	1	1	2		
					TRIP BLANK	2					2		

Relinquished by: (Signature) ①	Date/Time	Received by: (Signature) ②	Relinquished by: (Signature) ③	Date/Time	Received by: (Signature) ④
[illegible]	[illegible] 4:45P	[illegible] FED EX			
Relinquished by: (Signature) ⑤	Date/Time	Received by: (Signature) ⑥	Relinquished by: (Signature) ⑦	Date/Time	Received by: (Signature) ⑧
Relinquished by: (Signature) ⑨	Date/Time	Received by: (Signature) ⑩	Relinquished by: (Signature) ⑪	Date/Time	Received by: (Signature) ⑫
Relinquished by: (Signature) ⑬	Date/Time	Received for Laboratory by: (Signature) ⑭	Date/Time	Remarks	

RMT, INC.

CHAIN-OF-CUSTODY RECORD

PROJECT NO.	PROJECT NAME
1180 01	NIROD

SAMPLERS: (Signature)

RMT NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	Acid	H2SO4 pH<2						REMARKS
	11-20-86	5:05p		X	1-S	1	1							
	11-20-86	6:47p		X	1-D	1	1							
	11-20-86	7:45p		X	5-D	1	1							
	11-20-86	8:39p		X	2-D	1	1							
	11-20-86	10:20p		X	4-D	1	1							
	11-20-86	11:07p		X	3-D	1	1							
	11-20-86	11:50p		X	6-S	1	1							
	11-20-86	11:59p			Rinsate BLK	1	1							

Relinquished by: (Signature) ①	Date/Time	Received by: (Signature) ②	Relinquished by: (Signature) ③	Date/Time	Received by: (Signature) ④
	11-21-86 4:00p	Fed Exp/Cooler 212 [illegible] 3330			

Relinquished by: (Signature) ⑤	Date/Time	Received by: (Signature) ⑥	Relinquished by: (Signature) ⑦	Date/Time	Received by: (Signature) ⑧

Relinquished by: (Signature) ⑨	Date/Time	Received by: (Signature) ⑩	Relinquished by: (Signature) ⑪	Date/Time	Received by: (Signature) ⑫

Relinquished by: (Signature) ⑬	Date/Time	Received for Laboratory by: (Signature) ⑭	Date/Time	Remarks

RMT, INC.

CHAIN-OF-CUSTODY RECORD

PROJECT NO.: [illegible]

PROJECT NAME: [illegible]

SAMPLERS: (Signature) [signature]

RMT NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	125ml HNO3 Metals	250ml Nonmetals Dissolved Metals	1liter Nonmetals	250ml Nonmetals	40ml Vials	250ml HNO3 Rinsate	REMARKS
	11-20-86	5:05p		X	1-S	5	1	1	0	1	2	0	No suis to
	11-20-86	6:40p		X	1-D	5	1	1	0	1	2	0	
	11-20-86	7:45p		X	5-D	5	1	1	0	1	2	0	
	11-20-86	6:09p		X	2-D	5	1	1	0	1	2	0	
	11-20-86	6:30p		X	4-D	5	1	1	0	1	2	0	
	11-20-86	11:27p		X	3-D	5	1	1	0	1	2	0	
	11-20-86	11:50p		X	6-S	5	1	1	0	1	2	0	
	11-20-86	11:59p			Rinsate Blk	6	1	1	0	1	2	1	

Relinquished by: (Signature) ①	Date/Time	Received by: (Signature) ②	Relinquished by: (Signature) ③	Date/Time	Received by: (Signature) ④
[signature]	11-21-86 4:00p	Fed Expl / Cooler 912893341			

Relinquished by: (Signature) ⑤	Date/Time	Received by: (Signature) ⑥	Relinquished by: (Signature) ⑦	Date/Time	Received by: (Signature) ⑧

Relinquished by: (Signature) ⑨	Date/Time	Received by: (Signature) ⑩	Relinquished by: (Signature) ⑪	Date/Time	Received by: (Signature) ⑫

Relinquished by: (Signature) ⑬	Date/Time	Received for Laboratory by: (Signature) ⑭	Date/Time	Remarks

RMT, Inc.

RECEIPT FOR SPLIT SAMPLES

PROJ. NO.	PROJECT NAME	Name of Facility/Site
1120.09	NIROP	NIROP

SAMPLERS: (Signature) Jeff Chinla

Facility/Site Location: NIROP / Fridley, MN

STA. NO.	STATION DESCRIPTION/LOCATION	DATE	TIME	SAMPLE TYPE WATER COMP	SAMPLE TYPE WATER GRAB	SAMPLE TYPE SOIL COMP	SAMPLE TYPE SOIL GRAB	NO. OF CONTAINERS	REMARKS
	6-D	11-20-86	10:45A		X			4	VOC
	7-S	11-20-86	11:39A		X			4	
	8-D	11-18-86	4:40p		X			4	
	9-S	11-17-86	4:49p		X			4	
	9-D	11-18-86	6:45p		X			4	
	10-S	11-19-86	4:40p		X			4	
	11-S	11-20-86	9:37A		X			4	
	15-S	11-17-86	3:37p		X			4	
	16-S	11-19-86	3:15p		X			4	
	17-S	11-18-86	1:44p		X			4	
	18-S	11-18-86	4:05p		X			4	
	19-S	11-18-86	6:35p		X			4	

Transferred by: (Signature) Jeff Chinla

Date: 11-20-86 Time: 1:35p

Received by: (Signature) Donna Beilke

Telephone: 612/297-1796

Title: MPCA Date: 11-20-86 Time: 1:35 pm

DISTRIBUTION: Original to Coordinator Field Files: Copy to Facility/Site Representative

APPENDIX F

CALCULATIONS

COMPUTATION SHEET

RMT INC.

1406 East Washington Avenue Suite 124 Madison, Wisconsin 53703 (608) 255-2134

SHEET 1 OF 2

PROJECT / PROPOSAL NAME	PREPARED By:	Date:	CHECKED By:	Date:	PROJECT/PROPOSAL NO.
Frigley	TEK	7/6	HEC	8/6/87	1254.03

Calculations for Significance of Chloride Detected in Downgradient Shallow wells Versus Background Shallow wells

Downgradient Wells	Cl^- (mg/l)
5-S	50.0
6-S	32.7
10-S	36.6
11-S	23.2
17-S	25.6

$\overline{X}_m = 33.62$

$r_m(n-1)^2 = 112.73 = S_m^2$

$N_m = 5$

Background Wells	Cl^- (mg/l)
1-S	19.5
2-S	4.5
7-S	18.7
12-S	45.7
13-S	13.7
14-S	68.8
15-S	15.0
16-S	4.6

$\overline{X}_b = 22.56$

$r_b(n-1)^2 = 379.63 = S_b^2$

$N_b = 8$

From the TEGD (USEPA, 1985)

$$t_* = \frac{\overline{X}_m - \overline{X}_b}{\sqrt{\frac{S_m^2}{N_m} + \frac{S_b^2}{N_b}}}$$

$$t^* = \frac{33.62 - 22.56}{\sqrt{\frac{112.73}{5} + \frac{379.63}{8}}} = \frac{11.06}{\sqrt{69.999}}$$

$t^* = 1.32$

COMPUTATION SHEET

RMT INC.

1406 East Washington Avenue Suite 124 Madison, Wisconsin 53703 (608) 255-2134

SHEET 2 OF 2

PROJECT / PROPOSAL NAME	PREPARED By	Date	CHECKED By	Date	PROJECT/PROPOSAL NO.
Friday	TEK	7/6	HEC	7/6/87	1254.03

$$t_c = \frac{w_b t_b + w_m t_m}{w_b + w_m}$$

$w_b = S_b^2/N_b = 379.63/8 = 47.45$

$w_m = S_m^2/N_m = 112.73/5 = 22.55$

t_b = from table B-1 p. B-5 of TEGD = 2.998

t_m = " = 3.747

$$t_c = \frac{(47.45 \times 2.998) + (22.55 \times 3.747)}{(47.45 + 22.55)} = \frac{226.7}{70}$$

$t_c = 3.24$

$\therefore$ Since t^* is $< t_c$ there is NO statistical INDICATION that chloride concentrations are larger in the well under comparison than in the background DATA. (P. B-4 of TEGD)