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COMPLETION REPORT FOR INTERIM MEASURES AT SITE 11 NSB KINGS BAY GA
7/1/2000
BECHTEL ENVIRONMENTAL

NSB Kings Bay Administrative Record
Document Index Number

31547-000
19.49.00.0016

COMPLETION REPORT FOR INTERIM MEASURES

at

SITE 11, OLD CAMDEN COUNTY LANDFILL NAVAL SUBMARIN BASE KINGS BAY, GEORGIA JULY 1998 - JULY 2000

Prepared for

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND

Under Contract No. N62467-93-D-0936
Bechtel Job No. 22567

Prepared by

BECHTEL ENVIRONMENTAL, INC.
151 LAFAYETTE DR.
OAK RIDGE, TENNESSEE

JULY 2000

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NSB Kings Bay Administrative Record
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COMPLETION REPORT

FOR

IN SITU CHEMICAL OXIDATION

JULY 1998 – JULY 2000

SITE 11, OLD CAMDEN COUNTY LANDFILL
NAVAL SUBMARINE BASE KINGS BAY, GEORGIA

Prepared for

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OAK RIDGE, TENNESSEE

JULY 2000

REVISION 0

GEOLOGIST'S CERTIFICATION

The work described and professional opinions rendered in this document, *Completion Report for In Situ Chemical Oxidation, Site 11, Old Camden County Landfill, Naval Submarine Base Kings Bay, Georgia, July 2000, Revision 0,* were conducted and developed using commonly accepted procedures consistent with applicable standards of practice. The observations and opinions presented were developed under the supervision of a professional geologist registered in the State of Georgia.

Mark A. Gage
Professional Geologist
State of Georgia License No. 001167
Expires December 31, 2001

017196-3

JUL 27 2000

Commanding Officer
Department of the Navy, Southern Division
Naval Facilities Engineering Command
Attention: Mr. Anthony Robinson (Code 18511)
2155 Eagle Drive, P.O. Box 190010
North Charleston, SC 29419-9010

SUBJECT: Bechtel Job No. 22567
Department of the Navy Contract No. N62467-93-D-0936
DO# 109, FINAL COMPLETION REPORT FOR IN SITU CHEMICAL OXIDATION, SITE 11 OLD CAMDEN COUNTY LANDFILL, NAVAL SUBMARINE BASE KINGS BAY, GEORGIA
Subject Code: 1250

Dear Mr. Robinson:

Enclosed please find two copies of the *Final Completion Report for In Situ Chemical Oxidation, Site 11, Old Camden County Landfill, Naval Submarine Base Kings Bay, Georgia,* July 2000. This final report updates the draft report issued July 10, 2000 by adding the Professional Geologist's certification and the final "Effectiveness Evaluation Report" from Geo-Cleanse International, Inc., the subcontractor who performed the in situ treatments.

This report summarizes the interim measures Bechtel conducted to remediate groundwater contaminated with tetrachloroethene (PCE) at Site 11. The interim measures activities included three phases of chemical oxidation treatment, cone penetrometer testing, Geoprobe testing, and source area excavation during August 1998 to March 2000. The Phase 1 and Phase 2 treatments reduced total chlorinated ethenes from 9,074 μg/L to the treatment goal of less than 100 μg/L. The Phase 3 treatment resulted in a 99.99% reduction from 130,000 μg/L at the highest concentration area at injector I-60 but rebounded to 10,000μg/L 41 days after the third injection. The rebound of PCE at the I-60 area indicates the presence of additional PCE below injector I-60. Additional groundwater sampling is needed to fully define the extent of PCE in this area.

We have enjoyed working with Southern Division, NSB Kings Bay, the State of Georgia, and the USGS to attain the cleanup goals for Site 11. If you have any questions concerning this matter or need additional information, please call Mark Gage at (270)-441-5125 or Robin Manning at (865)-220-6413.

Sincerely,

Paul McDee for

O.N. McNeil, Jr., P.E.
Program Manager

Enclosure: as stated

cc: John Garner, NSB Kings Bay, GA, w/2 copies

017196

JUL 10 2000

Commanding Officer
Department of the Navy Southern Division
Naval Facilities Engineering Command
Attention: Mr. Anthony Robinson Code 18511
2155 Eagle Drive, P. O. Box 190010
North Charleston, SC 29419-9010

SUBJECT: Bechtel Job No. 22567
Department of the Navy Contract No. N62467-93-D-0936
DO#0109, DRAFT – COMPLETION REPORT FOR IN SITU CHEMICAL OXIDATION, SITE 11, OLD CAMDEN COUNTY LANDFILL, NAVAL SUBMARINE BASE KINGS BAY, GEORGIA
Subject Code: 1250

Dear Mr. Robinson:

This letter serves as the Completion Report for the Interim Measures Action performed under Delivery Order 0109, at Site 11, Old Camden County Landfill, Naval Submarine Base (NSB), Kings Bay, Georgia. As agreed previously, the Completion Report is being provided as a condensed version in a letter format because many of the components of the typical Completion Report are contained in the previous issued Interim Measures Progress Report and Semiannual Corrective Action Assessment/Interim Measures Progress Reports. Additionally, the letter format meets the intent of the Technical Direction Memorandum by Mr. Herron dated July 21, 1999, to minimize the submittals necessary to satisfy the Delivery Order closeout report requirements.

This report describes the regulatory setting, provides a description of the Interim Measures Remedial Action, and includes an executive summary of treatment and investigation activities performed and presented in previously submitted reports. Figures include a regional location map, a site location, project schedule, pre- and post injection sample results, a conceptual model of I-60 source area, and a recommended Geoprobe testing program for the I-60 source area. Tables include a summary of analytical results for treatment phases 1 and 2, and phase 3. Complete analytical reports for phase 3 treatment are provided as Attachment 1 and the Geo-Cleanse International Inc. Effectiveness Evaluation Report Geo-Cleanse Treatment Program Phase III, Naval Submarine Base Kings Bay Site 11 Kings Bay, Georgia is provided as Attachment 2.

The Department of the Navy, Naval Facilities Engineering Command, Southern Division (SOUTHDIV), issued Delivery Order 0109, to Bechtel Environmental, Inc. (BEI) to conduct Interim Measures for remediation of source area contaminated groundwater at Site 11, Old Camden County Landfill at the Naval Submarine Base (NSB) Kings Bay, GA (Figure 1). Figure 2 shows the location of site 11 within the base.

Activities associated with the Interim Measures Remediation include preparation of a Corrective Action Plan (CAP), Execution Plan, and implementation of in situ chemical oxidation treatment of source area groundwater. A schedule showing the tasks and associated activities is provided in Figure3.

Corrective Action Plan (BEI 1998) **Date: July 1998**

BEI prepared and submitted a CAP (BEI 1998a) to the Navy during July 1998. This plan was prepared in compliance with the Georgia Department of Natural Resources, Environmental Protection Division (GEPD) Consent Order No. EPD-HW-1072, effective March 18, 1994, and Hazardous Waste Facility Permit No.HW-014(S)(2), issued September 29, 1989. The CAP identified, screened, and evaluated four remedial alternatives to address volatile organic compound (VOC) contaminated groundwater at site 11.

The objective of the corrective action proposed in the CAP is to meet the cleanup goals set by the GEPD for groundwater. The contaminants of concern at site 11 include chlorinated VOCs, specifically tetrachloroethene (PCE), and it's degredation constituents trichloroethene (TCE), cis-1, 2-dichloroethene, and vinyl chloride (VC). These compounds have exceeded the GEPD concentrations for Safe Drinking Water Maximum Contaminant Levels (MCLs). The MCLs for the constituents of concern are:

Constituent	GEPD/Federal MCL (μg/L)
Tetrachloroethene	5
Trichloroethene	5
Cis-1,2-dichloroethene	70
Vinyl chloride	2

The selected alternative for remediating the groundwater at site 11 was groundwater recovery and UV oxidation treatment with in situ groundwater treatment using chemical oxidation (Fentons Reagent). This alternative was selected based on an aggressive and cost effective means of remediating the groundwater. Additionally, monitored natural attenuation was proposed as an activity to be performed concurrently with the active remedial measures. This allowed for monitoring and establishing a predictable time frame for attainment of cleanup goals for the site.

An exit strategy for deactivation of the treatment system was included in the CAP. This strategy was based on VOC natural attenuation modeling results published in "Selecting Attenuation Capacity of Groundwater Systems" (USGS, 1998). The focus of this study was selecting remediation goals for site 11 using source area reduction and monitored natural attenuation. The study characterized and considered the natural attenuation capacity of the contaminated aquifer at site 11 and the predicted source area reduction concentrations necessary to be protective of downgradient offsite receptors. Results indicated a reduction of total chlorinated ethene to below 100 μg/L was required in order for natural attenuation to be protective of downgradient receptors. Additional consideration for the deactivation of the remedial system was established when the following conditions are attained:

- No monitoring/recovery well located within or downgradient of the source area contains concentrations greater than 100 μg/L of total chlorinated ethenes (summation of PCE, TCE, DCE, and VC).
- No monitoring/recovery well located within 250 ft upgradient of the subdivision contains greater than 100 μg/L TCE, or greater than 100 μg/L total chlorinated ethenes.
- No monitoring/recovery well located within 150 ft upgradient of the subdivision contains greater than 100 μg/L DCE, or greater than 100, ug/L total chlorinated ethenes.
- No monitoring/recovery well located within 100 ft upgradient of the subdivision contains greater than 100 μg/L VC, or greater than 100 μg/L total chlorinated ethenes.

Execution Plan **Date: July 1998**

BEI prepared and submitted an Execution Plan (BEI 1998b) presenting the scope of work, tasks and activities associated with the Interim Measure construction and demonstration of the in situ chemical oxidation technology. The plan described mobilization, drilling and well installation activities, construction of the groundwater conveyance system, waste management, and supervision of the in situ chemical oxidation demonstration.

In situ Chemical Oxidation Treatment

BEI contracted with Geo-Cleanse International of Kenilworth, New Jersey to perform the chemical oxidation treatment. Geo-Cleanse performed three phases of treatment during August 1998 through April 2000. During the entire treatment program, a total of 54 injectors were installed and an approximate total of 34,850 gallons of 50% hydrogen peroxide and an equivalent amount of ferrous iron catalyst were delivered to the subsurface. A description of the activities associated with each treatment phase are provided below.

Phase 1 Chemical Oxidation Treatment **Date: August 1998**

Phase 1 Treatment was performed during August 31, 1998 to February 14, 1999. Activities included well installation, groundwater sampling and analyses, and chemical oxidation treatment. Well installation included two recovery wells (MW-7 and MW-8), six monitoring wells (KBA-11-30 through KBA-11-36), and 23 injectors (I-1 through I-23) installed to a depth of 32 to 45 ft below grade (bg). Each recovery well was constructed using 6-inch diameter, stainless steel well screen and casing to a depth of 45ft bg. Construction included a 5-ft sump, 10 ft of 0.030-inch continuous slotted screen, and riser casing to the surface. The recovery wells were connected to the existing groundwater pump and treatment system at site 11, and operated during February and March 1999 immediately after phase 1 treatment, second injection. Recovery operation discontinued in March due to fouling of the wells, pumps, and effluent piping (BEI 1999a). Each groundwater monitoring well was constructed using schedule 40 PVC well screen and casing to an approximate depth of 38 ft bg. Monitoring wells were constructed with a 1 ft sump, 4 ft of 0.010 machine slotted screen, and riser casing to the surface. Each injector was completed with 1.25-inch diameter, 3-ft stainless steel screen, and black steel riser pipe from 32 to 42 ft bg and 1 to 1.5 ft above grade.

Prior to phase 1 treatment, groundwater samples were collected from selected wells and injectors to establish a baseline of contaminate levels prior to treatment. Baseline samples were collected during October 30, 1998. All samples were submitted to ENCO laboratories of Jacksonville, FL for VOC analyses. Results of this baseline sampling event (Table 1) provided pre-treatment data, which were used to evaluate the effectiveness of the subsequent chemical oxidation treatment. Figure 4 displays the results of pre-phase 1 treatment. The figure shows an elongated plume of greater than 100 µg/L (treatment goal) total chlorinated ethenes centered on monitoring well KBA-11-34. This original area of concern was centered on KBA-11-34, where the maximum total chlorinated ethenes for the site, at this time, were 9,074 µg/L.

An approximate total of 12,063 gallons of 50% hydrogen peroxide and an equivalent amount of ferrous iron catalyst solution were delivered to the subsurface during phase 1 treatment using two injections. The first injection was performed from November 2 to November 21, 1998. During this injection approximately 8,257 gallons of peroxide and an equivalent amount of catalyst solution were injected. On November 24, 1998 a post-phase 1, first injection round of samples were collected for VOC analysis. Analytical results are summarized in Table 1 and are displayed in Figure 5. There was a significant reduction of total chlorinated ethenes in KBA-11-34 from 9,074 µg/L to 219 µg/L, however, concentrations at I-4, RW-7, RW-8, and newly installed U. S. Geological Survey (USGS) piezometers showed concentrations ranging from 47 to 1146 µg/L. A second injection was thereby needed to treat these areas.

The second injection was performed during February 4 to February 14, 1999. Pre-phase 1, second injection sampling and analysis were performed January 7 and January 24, 1999. Results presented in Figure 6 show the area between I-4 and KBA-11-13A requiring additional treatment. During phase 1, second injection, approximately 3,806 gallons of peroxide and an equivalent amount of catalyst were delivered to injectors which exceeded the 100 µg/L treatment goal. A post-phase 1, second injection sampling event was performed on March 15 and April 7, 1999. Results presented in Table 1 and Figure 7 show a concentration increase in 3 of the 4 USGS piezometers at the west end of the site and an increase at the east end in the vicinity of injector I-14 (3,800 µg/L). To better define these areas, a cone penetration testing program was recommended. Complete details of phase 1 treatment are presented in Geo-Cleanse's report tilted *Final Effectiveness Evaluation Report Geo-Cleanse Treatment Program, Naval Submarine Base Kings Bay, Site 11 Kings Bay, Georgia*. This report has been provided as Appendix A of the *Interim Measures Progress Report February 1, 1999 - April 30, 1999 Site 11 Old Camden County Landfill Naval Submarine Base Kings Bay, Georgia* (BEI 1999a).

Cone Penetration Testing **Date: April 1999**

BEI contracted with Gregg In Situ Inc. of Aiken SC to conduct a cone penetration testing (CPT) program to confirm and delineate the horizontal extent of dissolved contamination at site 11. During April 12 to 14, 1999 Gregg In Situ arrived onsite with a CPT unit, a mobile laboratory, and labor to collect and analyze groundwater samples from 24 locations (CPT-1 through CPT-24) across site 11. Groundwater samples were collected from a depth of 32-35 ft bg at each location except CPT-15. At CPT-15, samples were collected at selected 3-ft intervals between 10 and 28 ft bg. The locations and corresponding analytical results are shown on Figure 8. Results confirmed the east extent of dissolved contamination in the area of I-14 and the north and south extent of contamination in the area of the USGS piezometers. Based on this data, a Phase 2 treatment was planned to address the additional areas which continue to exceed treatment goal.

Phase 2 Chemical Oxidation Treatment **Date: May 1999**

During May 20 to May 27, 1999, Bechtel and subcontractor Geo-Cleanse International, Inc. installed injectors I-24 through I-44 (Figure 9) to perform Phase 2 treatment. Areas targeted for Phase 2 treatment were east (upgradient) and west (downgradient) of the Phase 1 area of concern. These target areas showed total chlorinated ethene concentrations either exceeding or close to exceeding the target concentration of 100 µg/L. On May 20, 1999 pre-phase 2, first injection sampling and analyses was performed. Results in Table 1 and Figure 9 show areas at the east and west end of site 11 continue to exceed the treatment goal of 100 µg/L. Note the concentration at I-14 continues to increase and shows the highest concentration of 5,885 µg/L.

Approximately 11,250 gallons of 50% hydrogen peroxide and an equivalent amount of ferrous iron catalyst solution were delivered to the subsurface in two injections. The first injection was performed during June 3 through 11, 1999. During this event, approximately 8,286 gallons of peroxide and an equivalent volume of catalyst were injected. Post-phase 2 treatment, first injection sampling was performed on June 7, 1999. Results in Table 1 and on Figure 10 show a reduction in plume size and concentration from the pre-phase 2 treatment sampling, however, the area of the USGS piezometers and I-16 and I-21 still exceed the treatment goal. These areas which continue to exceed the treatment goal were subject to a second injection.

The second injection was performed during July 12 through 15, 1999 and involved approximately 2,964 gallons of 50% hydrogen peroxide and an equivalent volume of ferrous iron catalyst. Two post injection sampling events were performed to confirm the reduction of dissolved contamination. The first post-phase 2, second injection sampling occurred July 26, 1999. Results on Figure 11 show all wells, piezometers, and injectors except KBA-11-13A and I-14 and I-21 below the treatment criteria of 100 µg/L. Monitoring well KBA-11-13A is immediately downgradient to the source area and was never subject to direct treatment. KBA-11-13A is a key well for monitoring treated groundwater as it migrates across the site. It is anticipated the concentrations at

KBA-11-13A will decrease with time. Concentrations at I-14 and I-21 are barely above the treatment goal. The second post-phase 2, second injection sampling occurred on August 16, 1999. Results in Figure 12 show concentrations for all wells and injectors sampled, except KBA-11-13A and I-14 to be below the treatment goal. Total chlorinated ethenes at injector I-14 increased from 136 to 1700 µg/L. This trend at I-14 indicates a potential new source area immediately adjacent to I-14. To investigate the source of the concentration rebound at I-14, a geoprobe investigation was proposed. Complete details of Phase 2 treatment are presented in Geo-Cleanse's report titled *Final Effectiveness Evaluation Report Geo-Cleanse Treatment Program Phase II Naval Submarine Base Kings Bay, Site 11 Kings Bay, Georgia*. This report has been provided as Attachment 1 of the *Semiannual Corrective Action Assessment/Interim Measures Progress Report May - September 1999, Site 11 Old Camden County Landfill Naval Submarine Base Kings Bay, Georgia* (BEI 1999b).

Geoprobe Investigation **Date: August 1999**

A Geoprobe investigation was performed to investigate and locate the source of PCE rebounding (increasing concentration) at injector I-14. Analytical results from the August 1999 post-treatment sampling showed PCE concentrations of 1600 µg/L and 2500 µg/L (duplicate) at I-14. These results were significantly higher than July's result of 110 µg/L.

Bechtel subcontracted with Probe Domain of Jacksonville, FL to provide the equipment and labor to collect groundwater samples at the area immediately east of I-14. Probe Domain subcontracted with Analytical Laboratories of Florida, Inc., of Cocoa, FL to provide a mobile laboratory for onsite sample analyses.

Bechtel arrived onsite on August 30, 1999 to layout a grid system for sample locations. Grid points were established at 5-ft intervals and in a north-south and east-west direction from I-14. Groundwater samples were collected at 16 locations, GP-1 through GP-16 (Figure 13). Probe Domain provided a truck mounted Geoprobe™ Model 5400 direct push machine for collecting groundwater samples. Groundwater samples were collected at depths of 21 - 24 ft, 24 - 27 ft, and 27 - 30 ft bg at each location. Additional samples from depths of 11 - 14 ft, 15 –18 ft, 18 –21 ft, and 30 – 33 ft were collected at selected locations as directed by Bechtel. Samples were immediately provided to the onsite mobile laboratory under chain of custody protocol. The samples were analyzed for VOCs specifically targeting chlorinated ethenes using EPA method 8021. Figure 13 displays the PCE concentrations for the 27 to 30 ft sample interval. A maximum concentration of 99,000 µg/L was observed at GP-10 located approximately 12-ft southeast of I-14. PCE concentrations north, south, east, and west of I-14 decrease significantly in a very short distance. This data suggests a new, isolated source area of extremely high concentration of PCE. Complete details of the Geoprobe investigation are provided as Attachment 2 of the *Semiannual Corrective Action Assessment/Interim Measures Progress Report May - September 1999, Site 11 Old Camden County Landfill Naval Submarine Base Kings Bay, Georgia* (BEI 1999b).

Source Area Excavation **Date: September 1999**

Excavation of the suspected source area near injector I-14 was approved by the Navy based on the results from the previous Geoprobe investigation. On September 21, 1999, a 20-ft x 30-ft x 8-ft deep area immediately east of I-14 was excavated. All excavated material was placed on 10-mil poly sheeting to prevent contact with the ground surface. The material was visually inspected for containers and scanned with a photoionization meter to check for organic vapors. The excavation yielded several 5-gallon containers and one approximate 20-gallon container. All containers were either crushed or severely deteriorated except one 5-gallon container. The uncrushed 5-gallon container appeared to contain a gray-colored, paint-looking waste. The 20-gallon container contained a black sludge looking waste. Two samples of the waste were collected, one from a 5-gallon and one from the 20-gallon container, and were submitted to ENCO Laboratories for chemical analyses. The results for the black waste showed PCE with the highest concentration of all compounds tested. The excavated containers

were placed in a poly-drum overpack for disposal by the base public works contractor. All other material was returned to the excavation and compacted with the excavator, and a 2-ft layer of clean soil was placed on top of the refuse. A copy of the Source Area Excavation report is provided as Attachment 3 of the *Semiannual Corrective Action Assessment/Interim Measures Progress Report May - September 1999, Site 11 Old Camden County Landfill Naval Submarine Base Kings Bay, Georgia* (BEI 1999b).

Phase 3 Chemical Oxidation Treatment **Date: January 2000**

Phase 3 treatment included 3 injections and was performed during January 4 to April 19, 2000. Ten injectors (I-60 to I-69) were installed to depths ranging from 24 to 39.5 ft bg. On January 7, 2000 pre-phase 3, first injection sampling and analyses was performed. Results in Table 2 and Figure 14 show a maximum total chlorinated ethenes concentration of 130,000µg/L at I-60. The concentration at I-60 is the highest concentration observed at site 11 to date. Injector I-60 is also the lowermost completed injector (39.3 ft) of the 60 series injectors. Concentrations of the other 60 series injectors ranged from 0 to 28,580 µg/L. These data confirm the presence of a high concentration source of PCE to site 11 groundwater.

An approximate total of 11,500 gallons of 50% hydrogen peroxide and an equivalent amount of ferrous iron catalyst were delivered to the subsurface during the three injections. The first injection was performed January 18 to January 25, 2000. During this event approximately 7,000 gallons of peroxide and an equivalent amount of catalyst solution were injected. On February 2, 2000 post-phase 3, first injection sampling and analysis was performed. Results in Table 2 and Figure 15 show a significant reduction in concentration levels with several injectors still showing concentrations above the treatment goal of 100 µg/L. Based on these results, a second injection was recommended.

The second injection was performed during March 7 to March 9, 2000. During this injection approximately 3,000 gallons of peroxide and an equivalent amount of catalyst were injected. Post-phase 3, second injection sampling was performed on March 25, 2000. Results in Table 2 and Figure 16 show an overall decrease in concentrations with significant increase at injector I-60. The significant increase in total chlorinated ethenes at I-60 suggests contaminated source material may be situated below the depth of influence of I-60. This material may be continuing to leach out dissolved contamination to the groundwater. A third injection was proposed in attempt to decrease the concentration levels in the vicinity of I-60 as well as all other injectors which exceeded the treatment goal.

The third injection was performed on April 17 to April 19, 2000. Approximately 1500 gallons of peroxide and an equivalent amount of catalyst were injected. Post-phase 3 treatment, third injection samples were collected on April 27, 2000. The results in Table 2 and on Figure 17 shows total chlorinated concentration for all injectors except I-60 and I-62 to be within the treatment goal of 100 µg/L. Results for I-60 were 180 µg/L and I-62 were 160 µg/L. A second post-phase 3 treatment, third injection sampling was performed on May 30, 2000. Results in Table 2 and Figure 18 showed a concentration increase in 15 of the 18 injectors sampled. The highest concentration of 10,000 µg/L was observed at injector I-60. The significant increase observed at I-60 again suggests the presence of a source area below I-60. Complete details of the phase 3 treatment are provided in the Geo-Cleanse International, Inc. *Effectiveness Evaluation Report Geo-Cleanse Treatment Program Phase III Naval Submarine Base Kings Bay Site 11 Kings Bay Georgia* included as Attachment 2. Based on these results, a Geoprobe investigation is recommended to delineate the extent of the source are below I-60.

Conclusion

In situ chemical oxidation treatment has been successful in reducing chlorinated ethene concentrations across the areas of concern at site 11. Averaged site-wide contaminant reduction has been 99%. However, total chlorinated ethenes rebounded between the last two rounds of sampling for phase 3 treatment, primarily within the source area at injector I-60. The site-wide average for the last round of samples rebounded to 704 μg/L with the highest concentration of 10,000 μg/L at I-60. This represents a 93% reduction from pre-phase 3 treatment concentrations. Based upon these observation, a residual source area likely persists at depths greater that 35 ft in the area of I-60. With a successful remediation of most of the site 11 area and reduction of the source area to the area of I-60, additional chemical oxidation treatment most likely is warranted if further source area delineation detects high concentrations of PCE deeper than I-60.

Recommendations

Based on the results of the phase 3 treatment, there appears to be a source area of PCE contamination below the 60 series of injectors. Figures 19 and 20 display a conceptual model for pre- and post-phase 3 treatment, and show a possible scenario for PCE at this location. The highest PCE concentration to date of 130,000 μg/L was observed at I-60. This area is a major source of contamination to the groundwater at site 11. It is likely PCE mounded along the sand / sand with silt contact at an approximate depth of 38 to 40 ft bg. The mounding in this area would create an increase head pressure of the PCE and result in PCE being pushed deeper into the formation than other downgradient areas of the plume. This would explain the rebound or increase in PCE after phase 3 injections.

A Geoprobe investigation is recommended to define the extent of the source area below the 60 series injectors. This would include using a Geoprobe or similar type unit capable of collecting groundwater samples from a depth of 60 ft bg. A mobile, onsite laboratory is recommended to provide immediate analyses of the collected samples. The program should consist of a minimum nine test locations, with one located adjacent to I-60 and others spaced approximately 10 ft apart in all directions from I-60 as shown in Figure 21. Groundwater samples should be collected from each location at depths of 35-38 ft, 40-43 ft, 44-47 ft, and 48-51 ft. Additional locations and/or deeper samples may be required to fully define the extent of the source area. All samples would be analyzed using the onsite lab for VOC analysis, specifically targeting the chlorinated compounds. The program would be complete when the extent of the source area is defined.

Budget

The budget for the Delivery Order was $1,344,282. A cost summary by phases of work performed is provided below:

Work Description by Phase	Budget Cost ($ in 1,000)	Actual Cost ($ in 1,000)
Chemical Oxidation Treatment (Phase 1, 2, & 3)	$1,169	$1,118
Phase 3, 2nd Injection	141	145
Phase 3, 3rd Injection	35	34
Total	$1,345	$1,297

Cost Savings
Bechtel brought its successful Savannah River experience with In Situ Chemical Oxidation to Kings Bay to achieve estimated savings of more than $3 million, as compared to the existing pump and treat system. Savings are achieved by reducing treatment time from 20 years to 5 as compared to the pump and treat system, eliminating the cost of pump and treat operations, and reducing sampling, analyses, and data interpretation.

Safety and Health
The Delivery Order was executed in a safe manner without incident or accident to personnel or the environment.

References
References in this letter were made to the following documents:

Bechtel Environmental Inc., (BEI) 1998a. *Corrective Action Plan Site 11 Old Camden County Landfill, Naval Submarine Base Kings Bay, Georgia. Revision 1.* Oak Ridge, Tennessee. July

BEI, 1998b. *Execution Plan for Interim Measures at Site 11, Old Camden County Landfill U.S. Naval Submarine Base Kings Bay, Georgia, Revision 0.* Oak Ridge, Tennessee. July

BEI, 1999a. *Interim Measures Progress Report February 1, 1999 - April 30, 1999 Site 11 Old Camden County Landfill Naval Submarine Base Kings Bay, Georgia.* Revision 0. Oak Ridge, Tennessee. May

BEI, 1999b. *Semiannual Corrective Action Assessment/Interim Measures Progress Report May - September 1999 Site 11 Old Camden County Landfill Naval Submarine Base Kings Bay, Georgia.* Oak Ridge, Tennessee, October

U.S. Geological Survey, 1998. *Selecting Renediation Goals by Assessing the Natural Attenuation Capacity of Ground-Water Systems.* Columbia, South Carolina, January

Please review and respond with comments by Monday, July 17. If you have any questions, please don't hesitate to call me at (865) 220-6407.

Sincerely,

O. N. McNeil

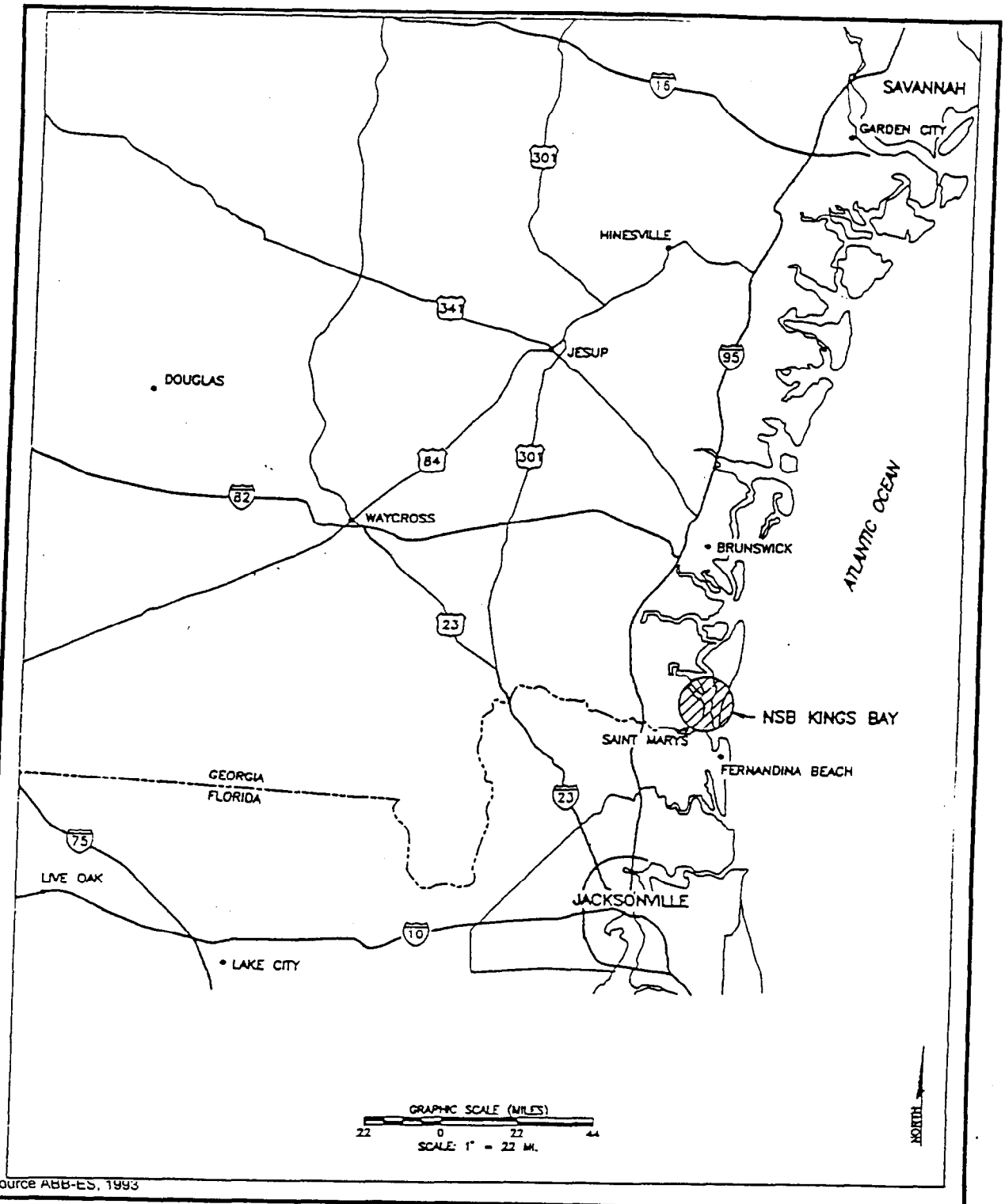
O. N. McNeil, Jr., P.E.
Program Manager

ONM:mg/Lr2036

Attachments:
1. Analytical Reports - Phase 3 Treatment
2. Geo-Cleanse Effectiveness Evaluation Report for Phase 3

cc: J. Garner

Figures

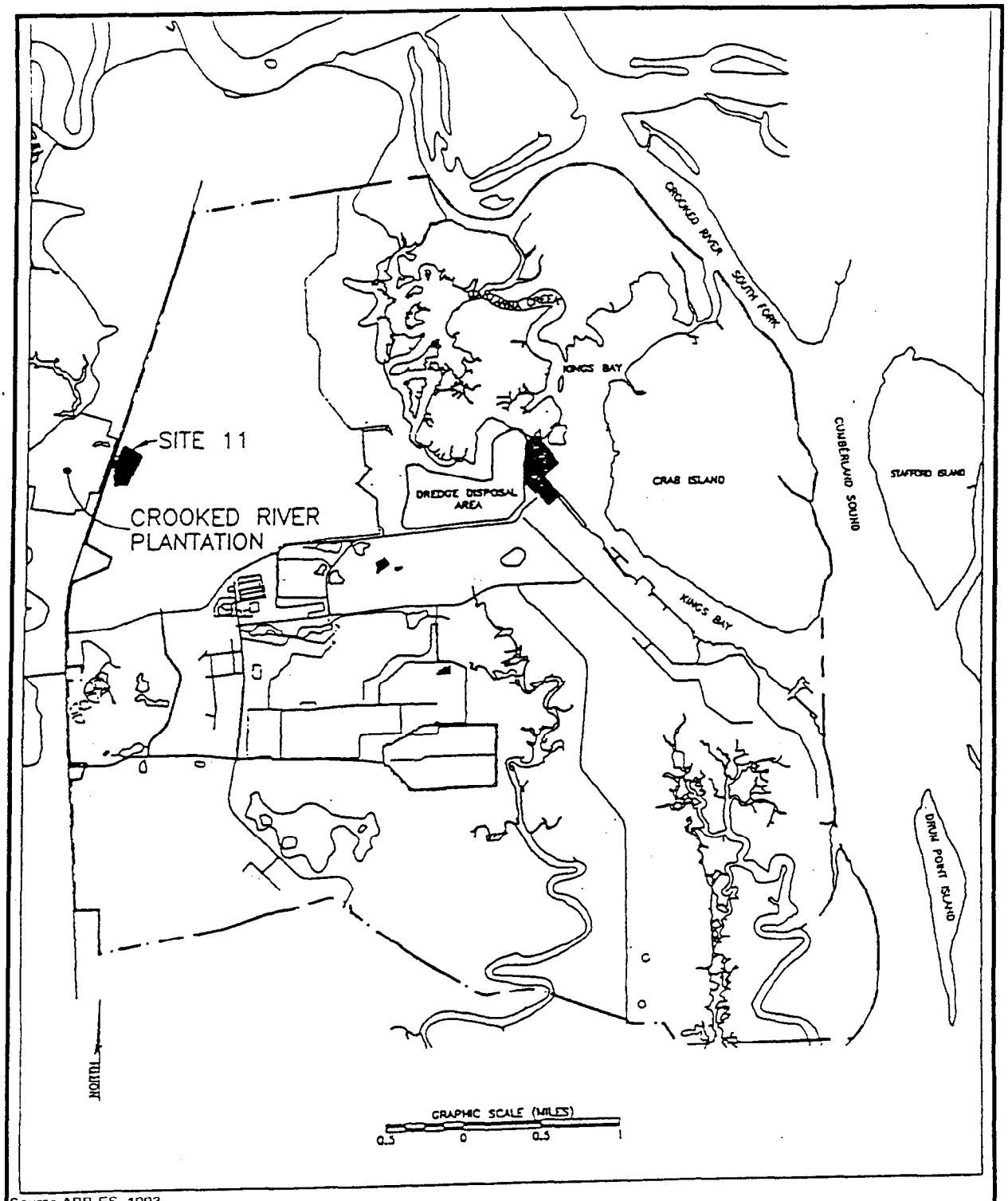


Source ABB-ES, 1993

Figure 1
Regional Location Map

Groundwater Monitoring Plan
Site 11, Old Camden County Landfill

Naval Submarine Base
Kings Bay, Georgia



Source ABB-ES, 1993

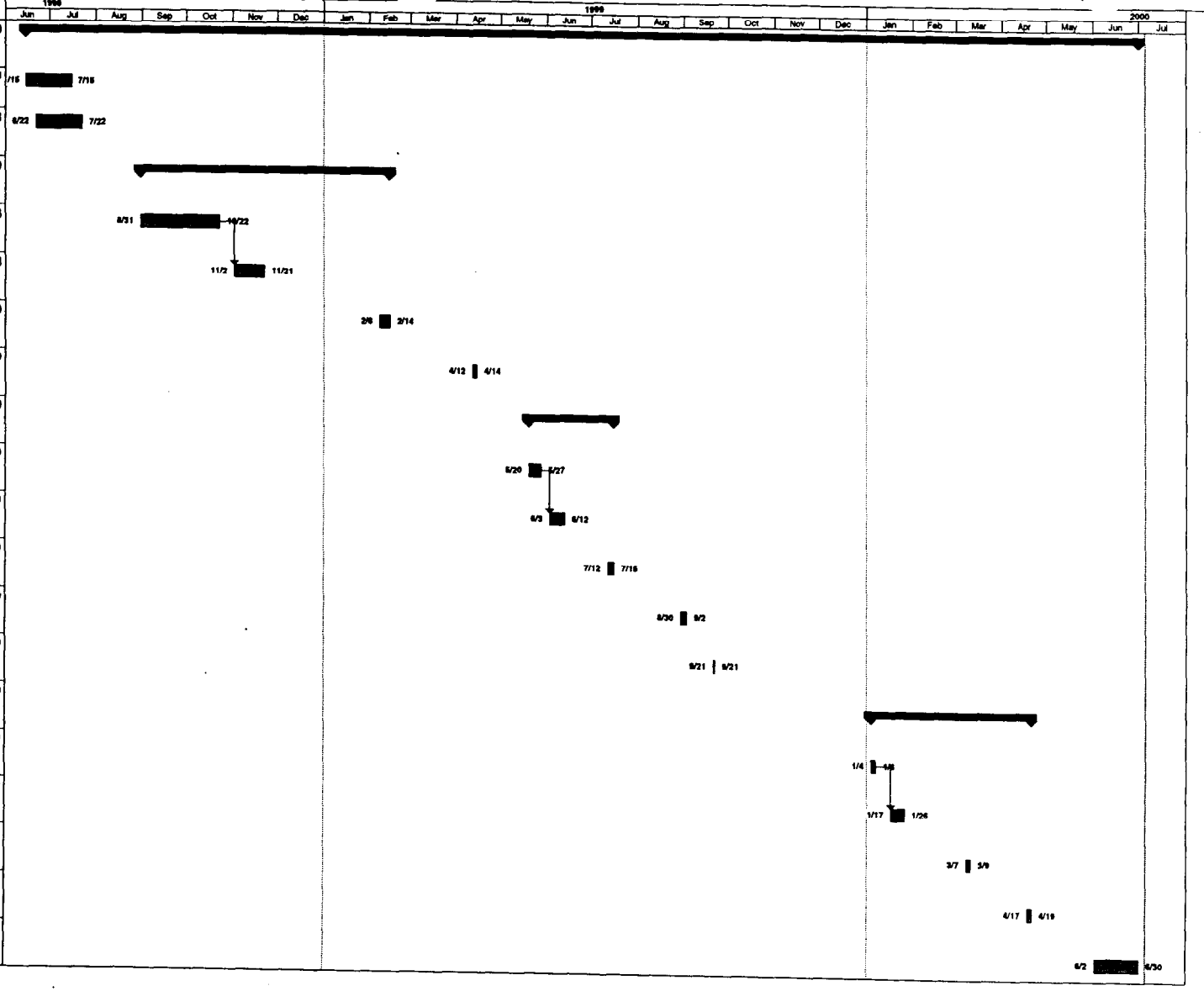
Figure 2
Site Location Map

Groundwater Monitoring Plan
Site 11, Old Camden County Landfill

Naval Submarine Base
Kings Bay, Georgia

Chemical Oxida[illegible]tment Schedule
Site 11, Old Camden County Land[illegible]l Submarine Base Kings Bay, GA

ID	Task Name	Duration	Start	Finish
1	**Delivery Order**	**535d**	**6/15/98**	**6/30/00**
2	Corrective Action Plan	23d	6/15/98	7/15/98
3	Execution Plan	23d	6/22/98	7/22/98
4	**Phase I Treatment**	**120d**	**8/31/98**	**2/14/99**
5	Install Injectors	39d	8/31/98	10/22/98
6	First Injection	15d	11/2/98	11/21/98
7	Second Injection	5d	2/8/99	2/14/99
8	**Cone Penetrometer Investigation**	3d	4/12/99	4/14/99
9	**Phase II Treatment**	**41d**	**5/20/99**	**7/15/99**
10	Install Injectors	6d	5/20/99	5/27/99
11	First Injection	7d	6/3/99	6/12/99
12	Second Injection	4d	7/12/99	7/15/99
13	**Geoprobe Investigation**	4d	8/30/99	9/2/99
14	**Souce Area Excavation**	1d	9/21/99	9/21/99
15	**Phase III Treatment**	**77d**	**1/4/00**	**4/19/00**
16	Install Injectors	3d	1/4/00	1/6/00
17	First Injection	7d	1/17/00	1/25/00
18	Second Injection	3d	3/7/00	3/9/00
19	Third Injection	3d	4/17/00	4/19/00
20	**Project Closeout**	**21d**	**6/2/00**	**6/30/00**



Project:
Date: 7/5/00

Task | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Milestone | Rolled Up Progress

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Page 1

Figure 3

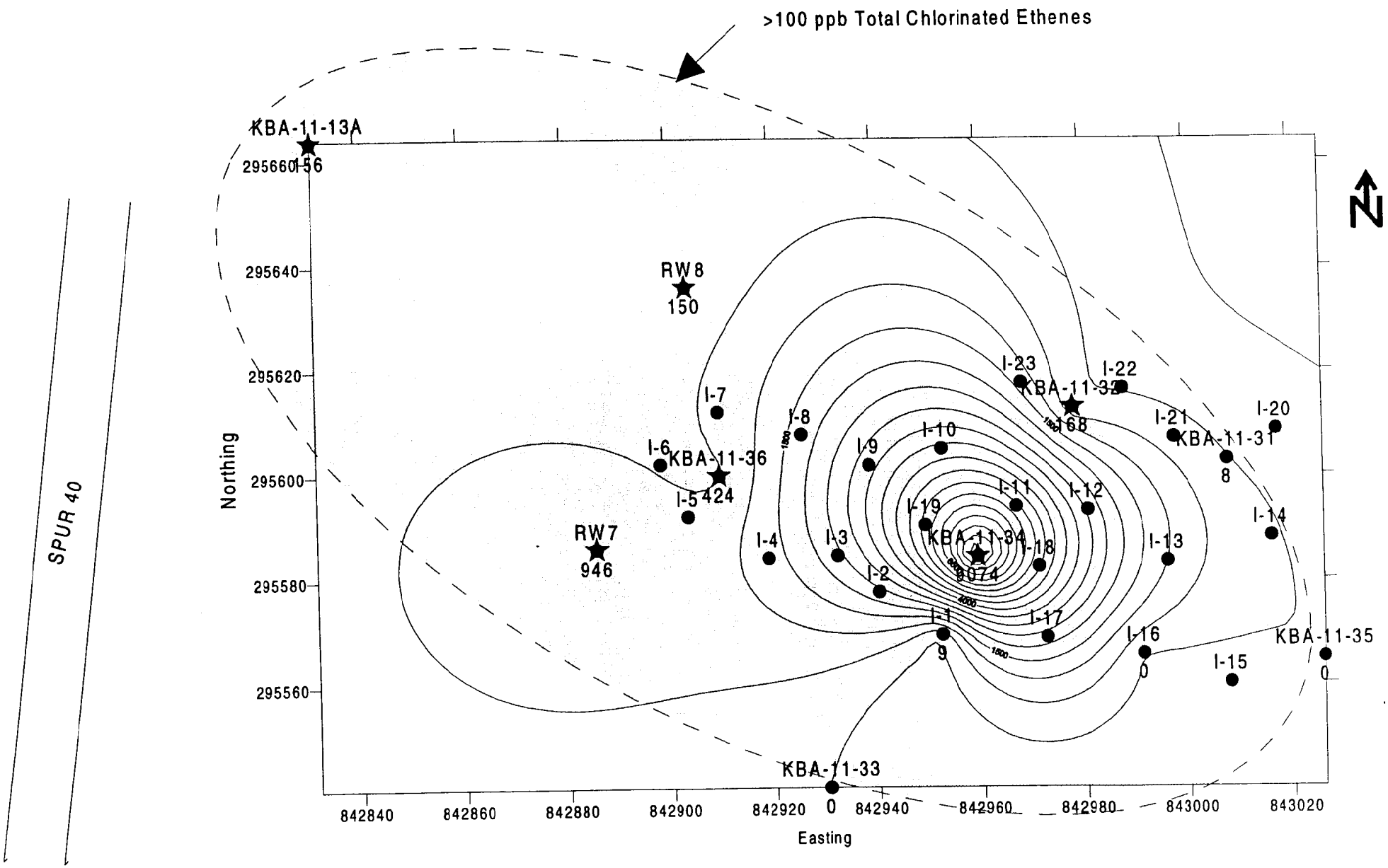

Figure 4 - Pre-Phase 1 Treatment, Total Chlorinated Ethenes (ppb) - 10/30/98 Contour Interval = 500 ppb

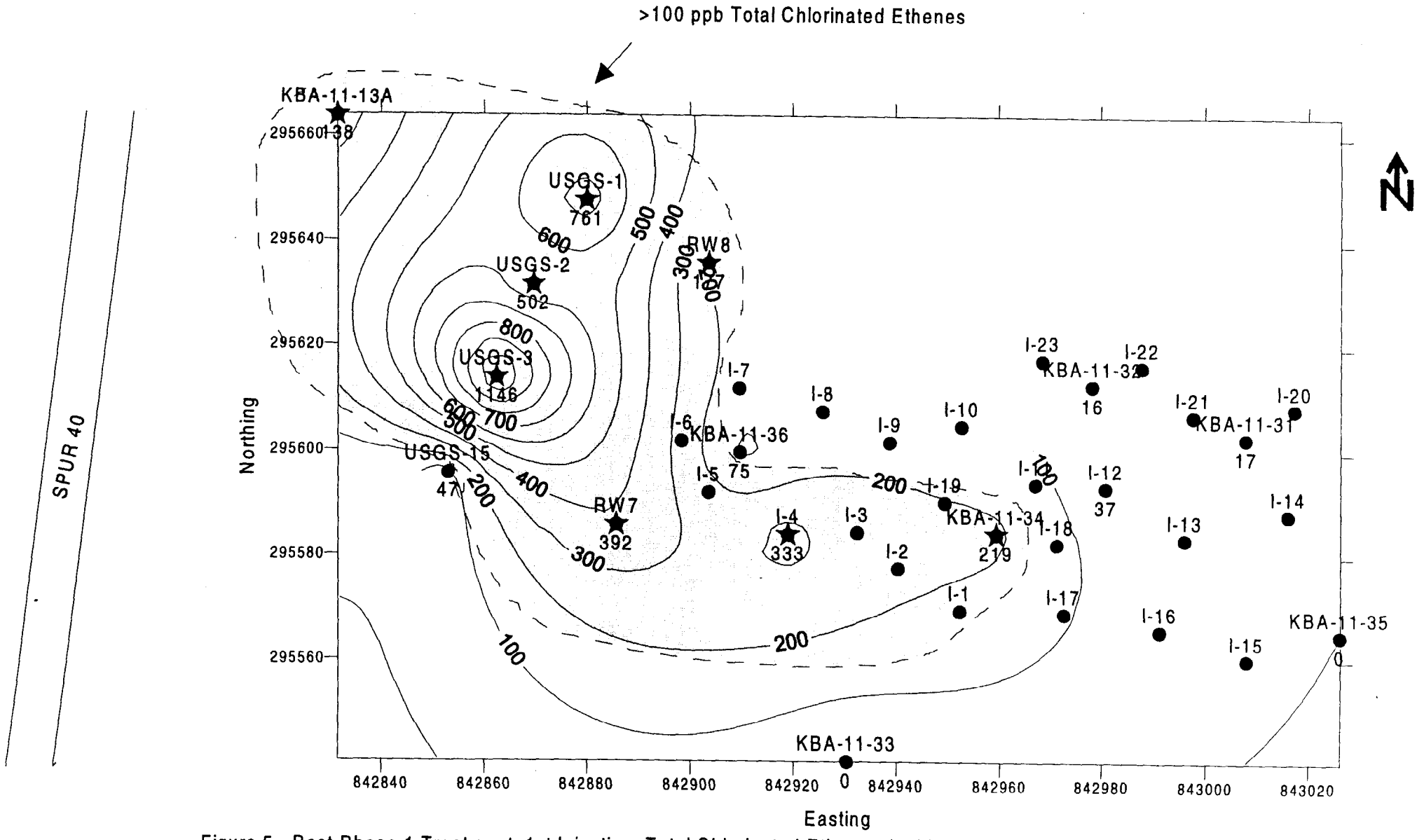

Figure 5 - Post-Phase 1 Treatment, 1st Injection, Total Chlorinated Ethenes (ppb) - 11/24/98

Contour Interval = 100 ppb

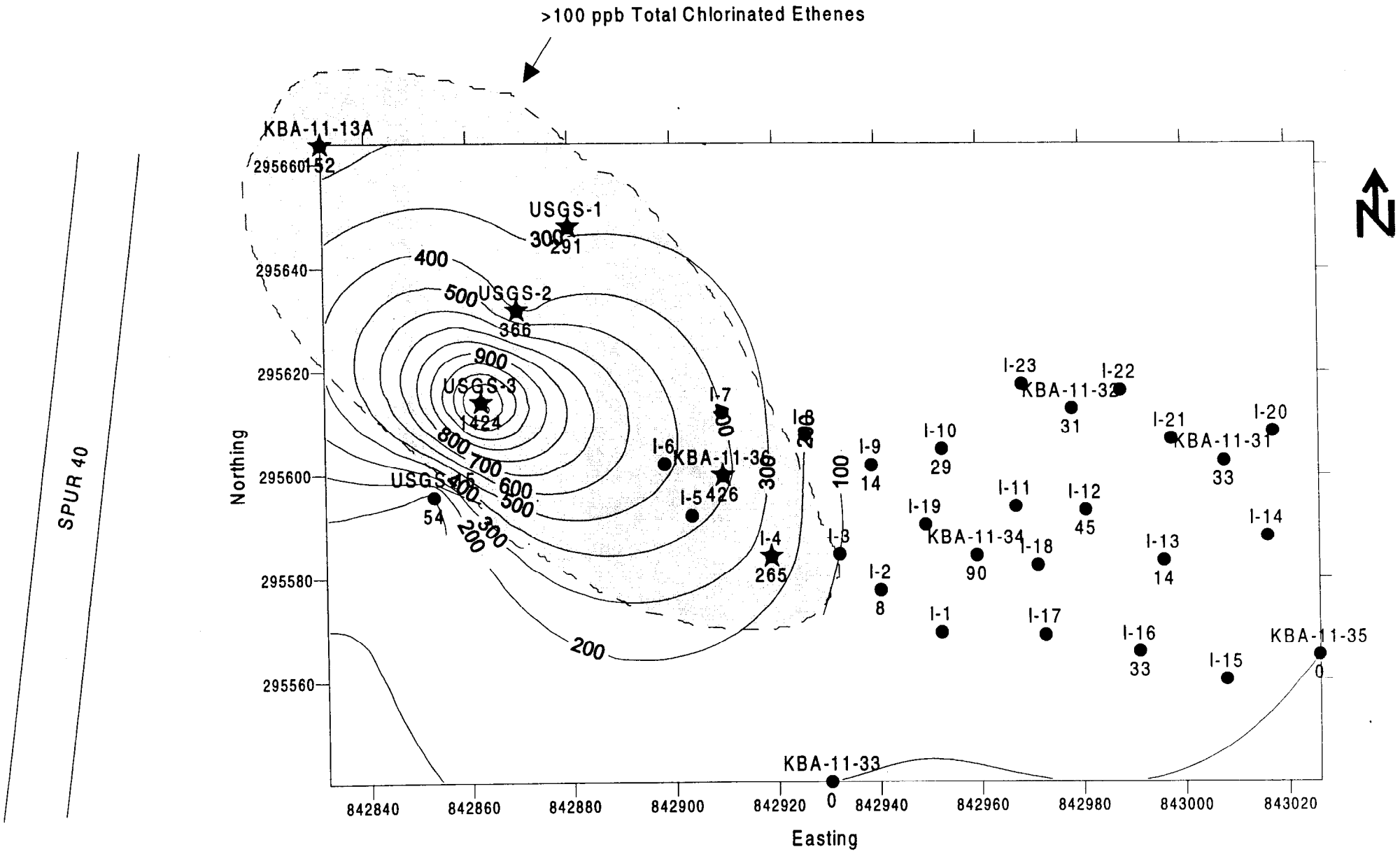

Figure 6 - Pre-Phase 1, 2nd Injection, Total Chlorinated Ethenes (ppb) - 1/7 & 1/27/99 Contour Interval = 100 ppb

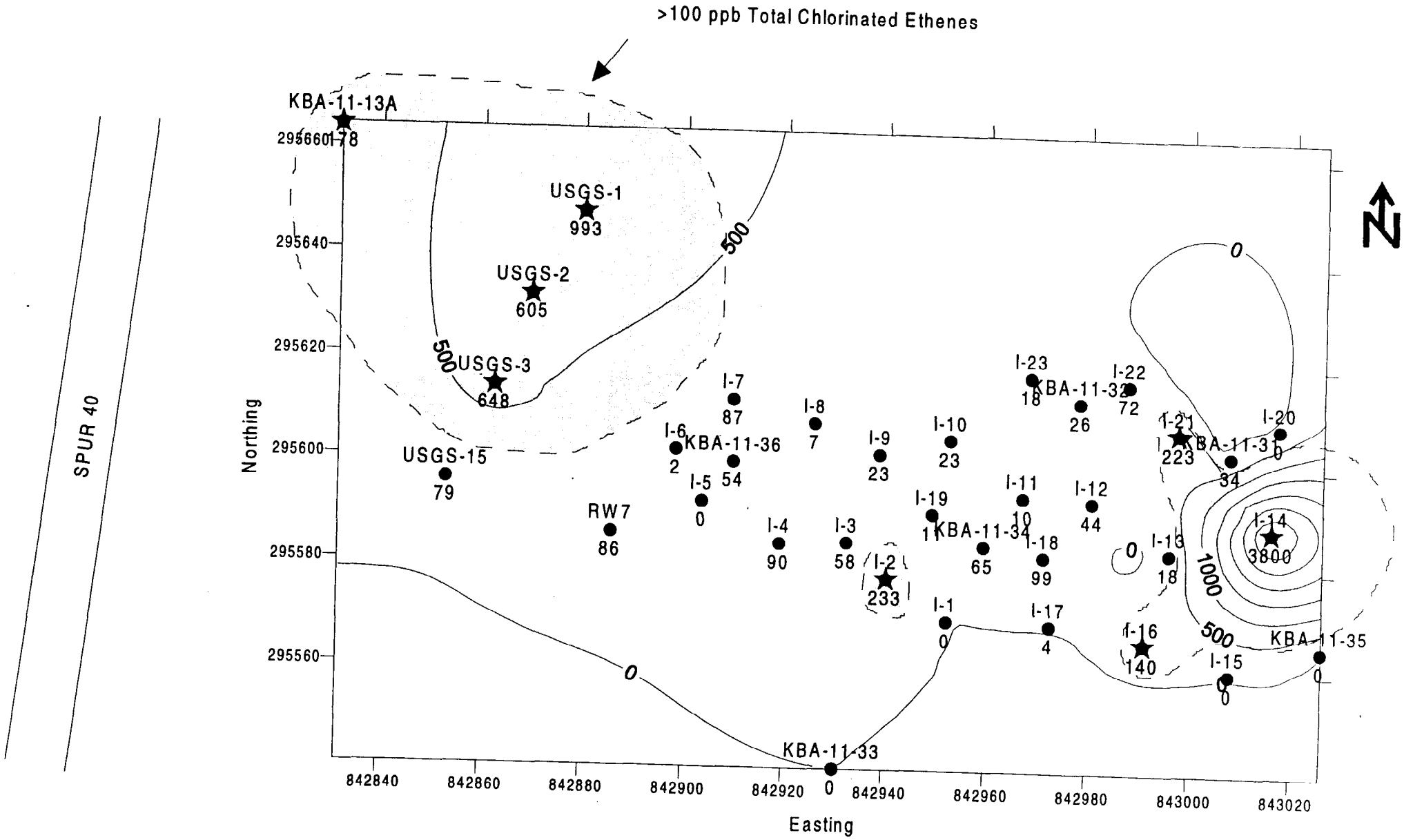

Figure 7 - Post Phase 1 Treatment, 2nd Injection, Total Chlorinated Ethenes (ppb) - 3/15 & 4/7/99 CI = 500 ppb

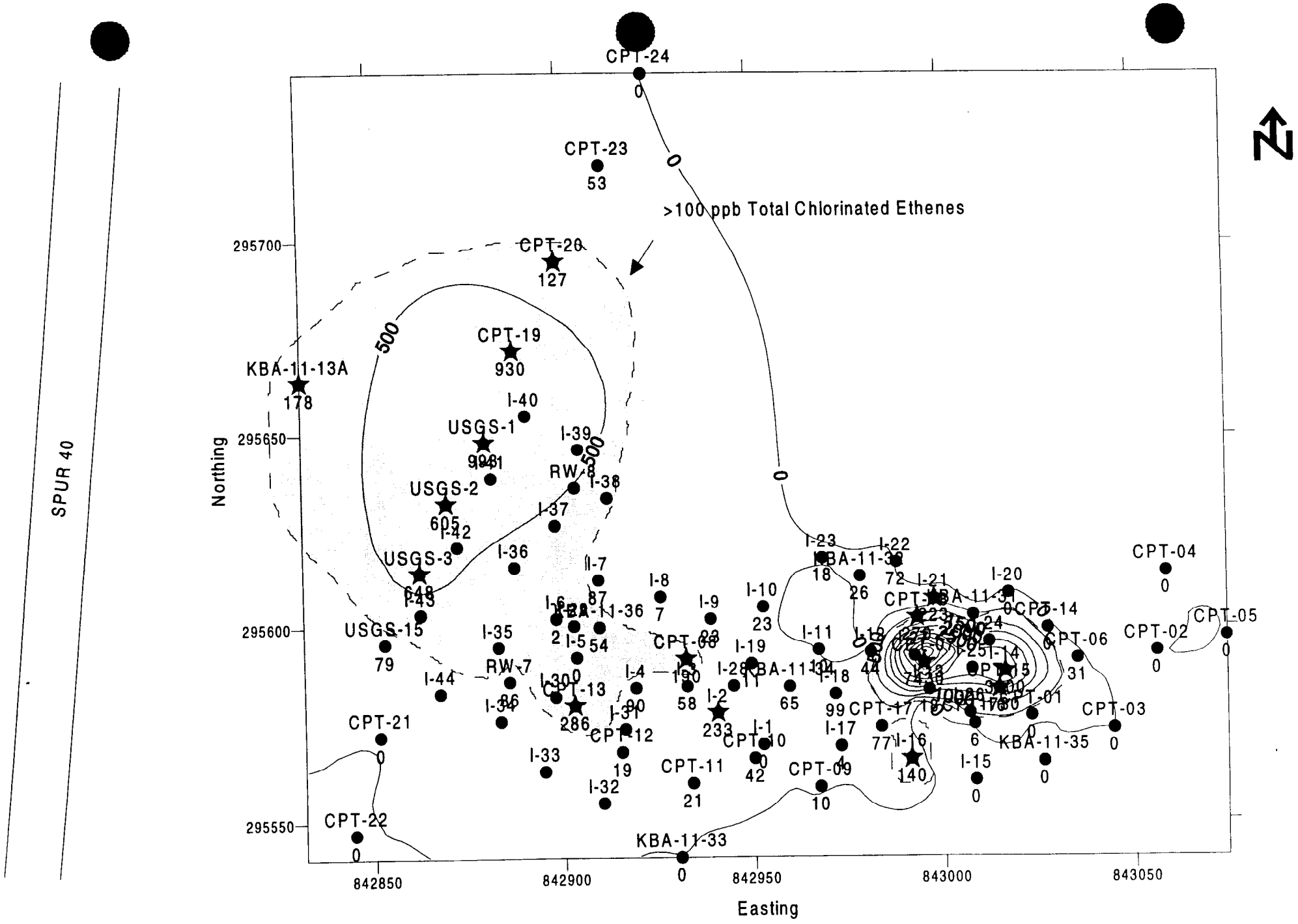

Figure 8 - Cone Penetrometer Testing w/ Post-Phase 1 Treatment, 2nd Injection, Total CE(ppb) - 4/12/99 CI = 500 ppb

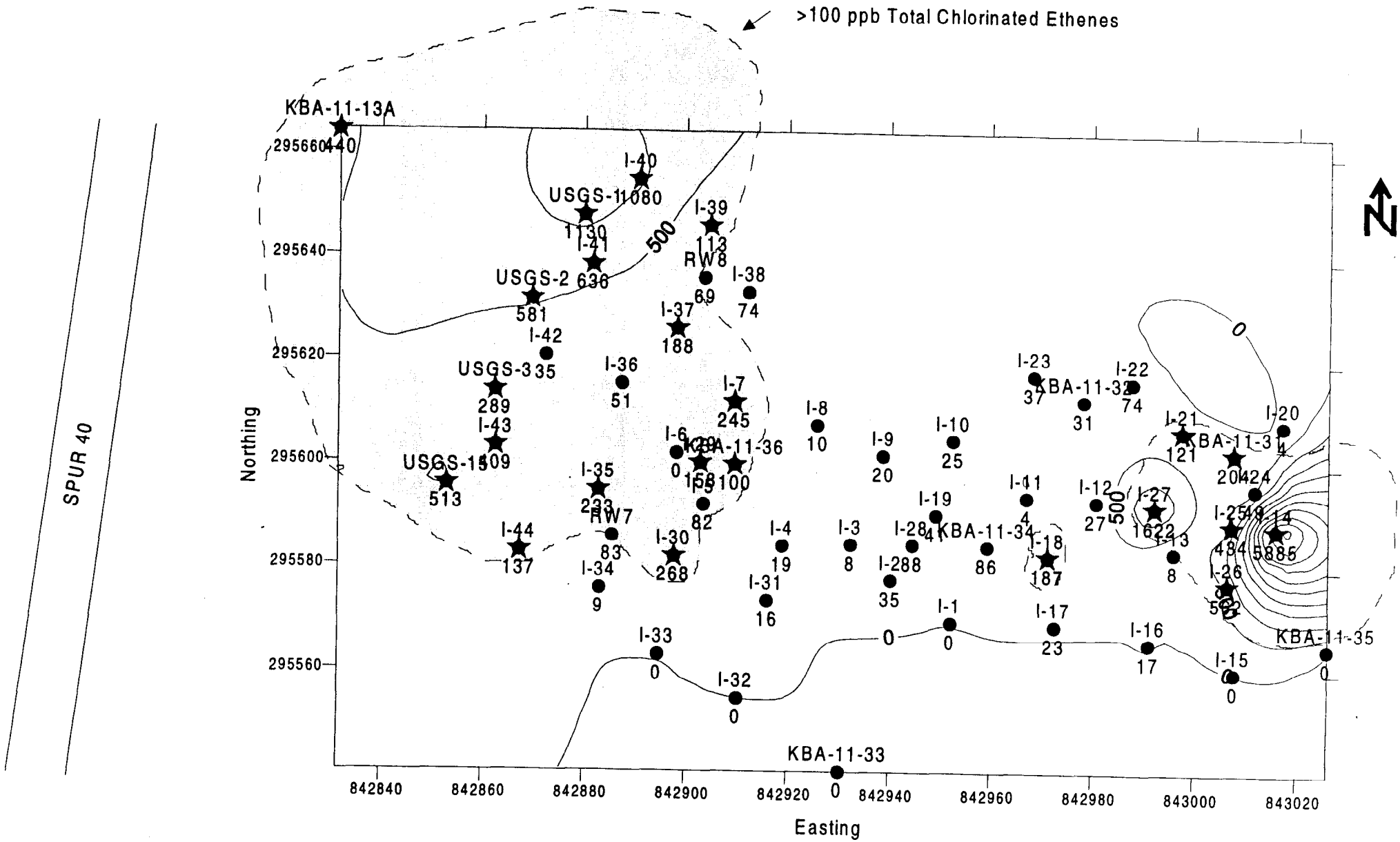

Figure 9 - Pre-Phase 2 Treatment, 1st Injection, Total Chlorinated Ethenes (ppb) - 5/20/99 CI = 500 ppb

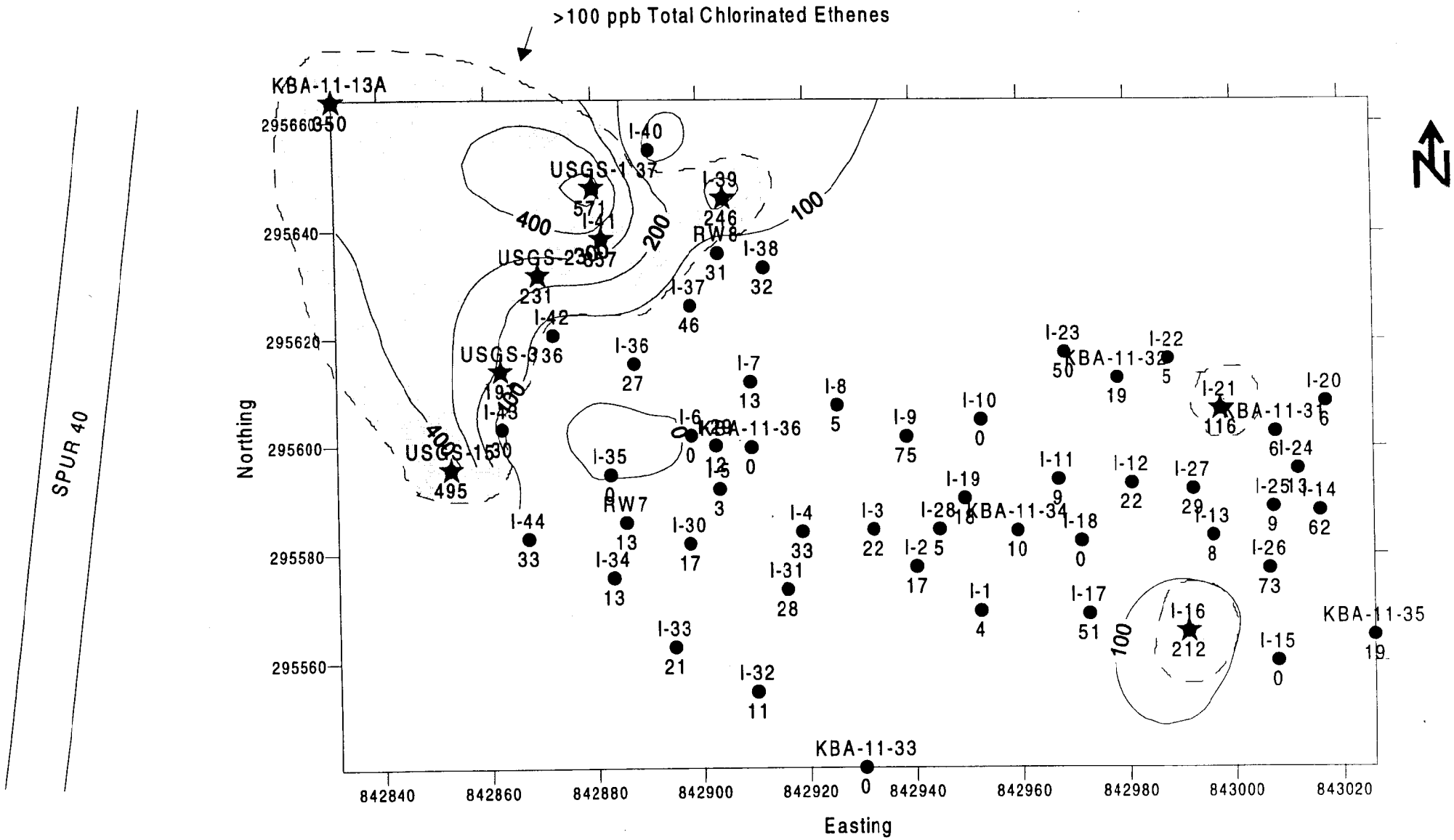

Figure 10 - Post-Phase 2 Treatment, 1st Injection, Total Chlorinated Ethenes (ppb) - 6/21/99 CII = 50 ppb

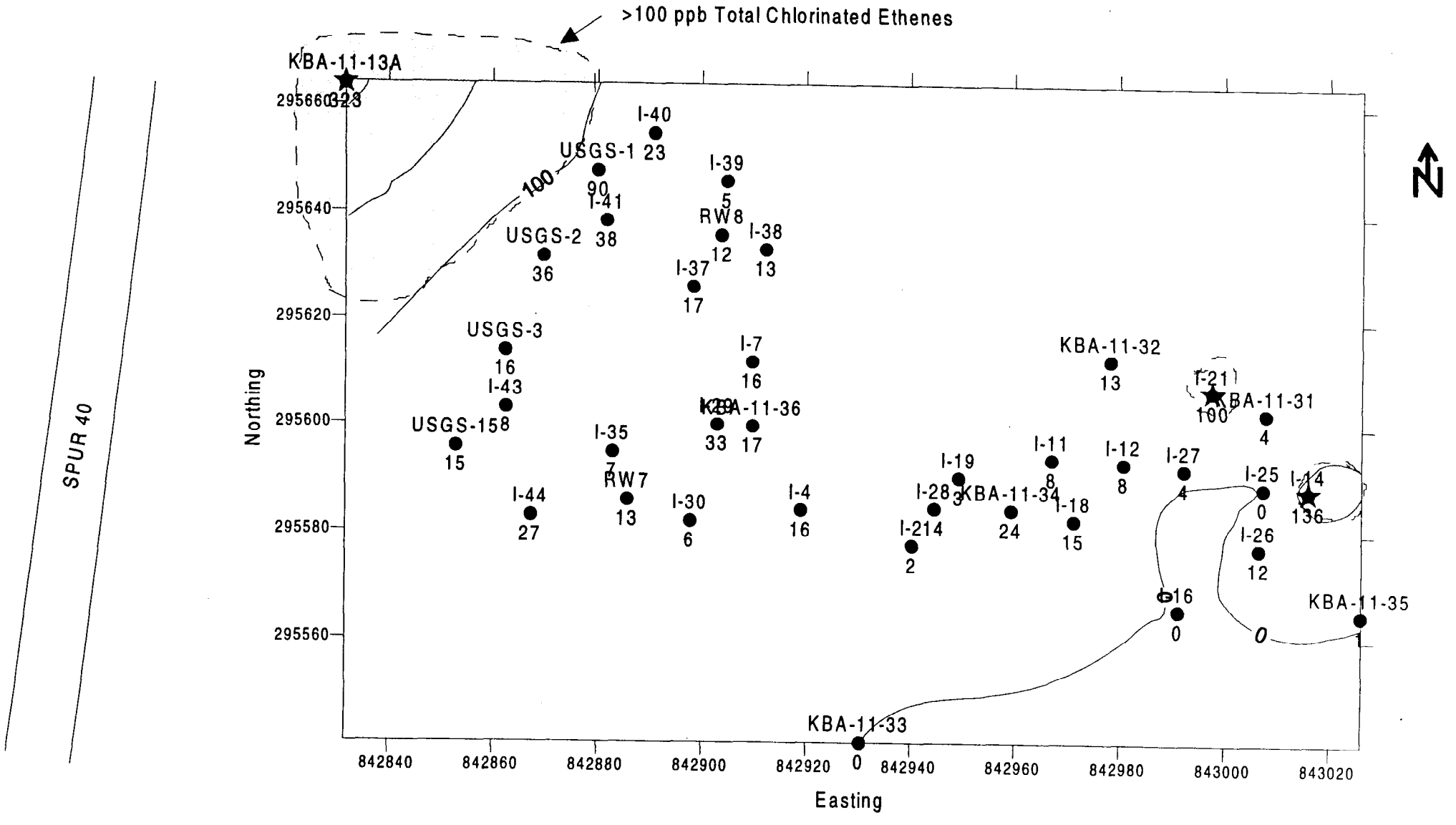

Figure 11 - Post-Phase 2 Treatment, 2nd Injection, Total Chlorinated Ethenes (ppb) - 7/26/99 Contour Interval = 20 ft

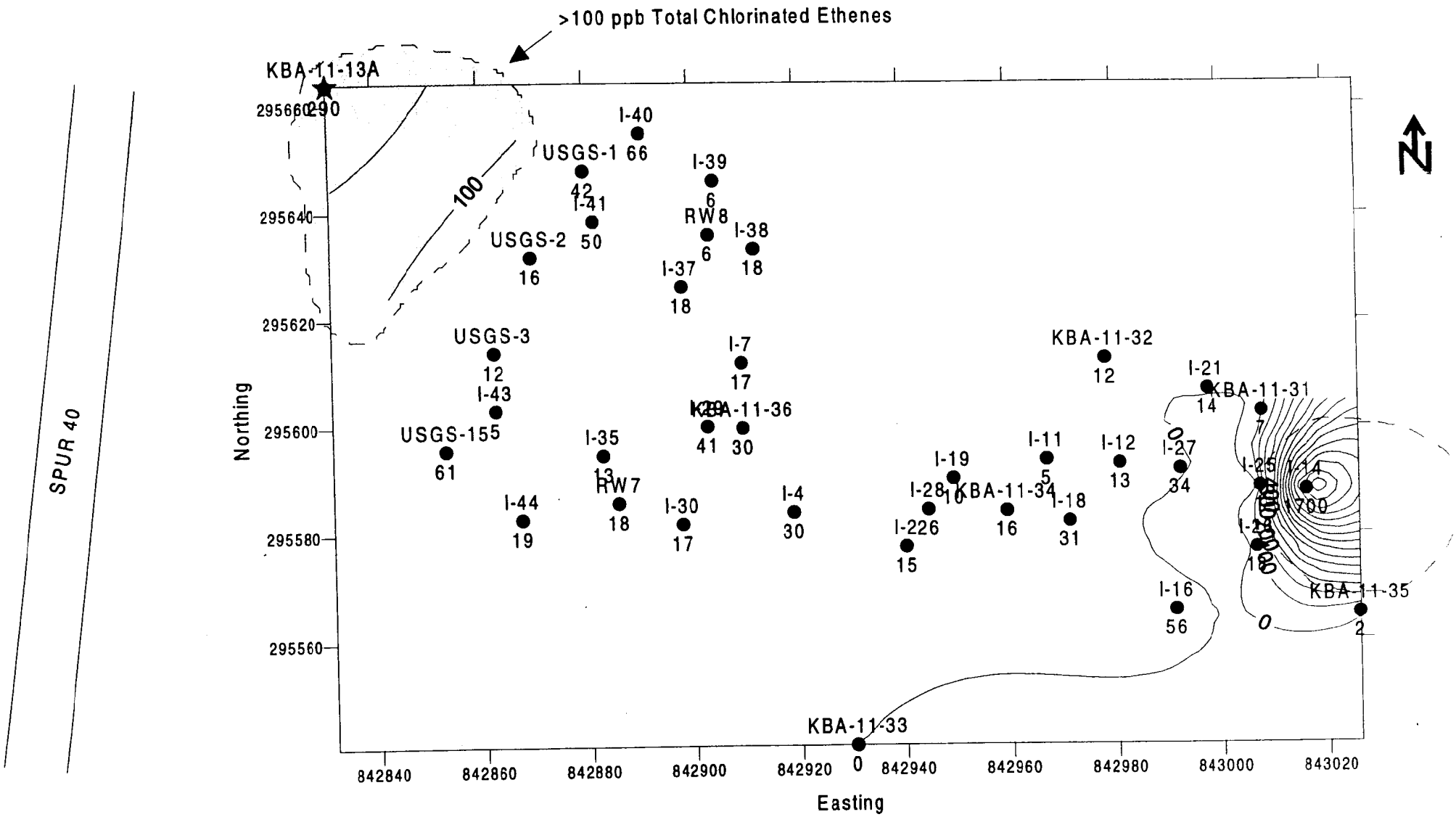

Figure 12 - Second Post-Phase 2 Treatment, 2nd Injection, Total Chlorinated Ethenes (ppb) - 8/16/99 Contour Interval = 100 ft

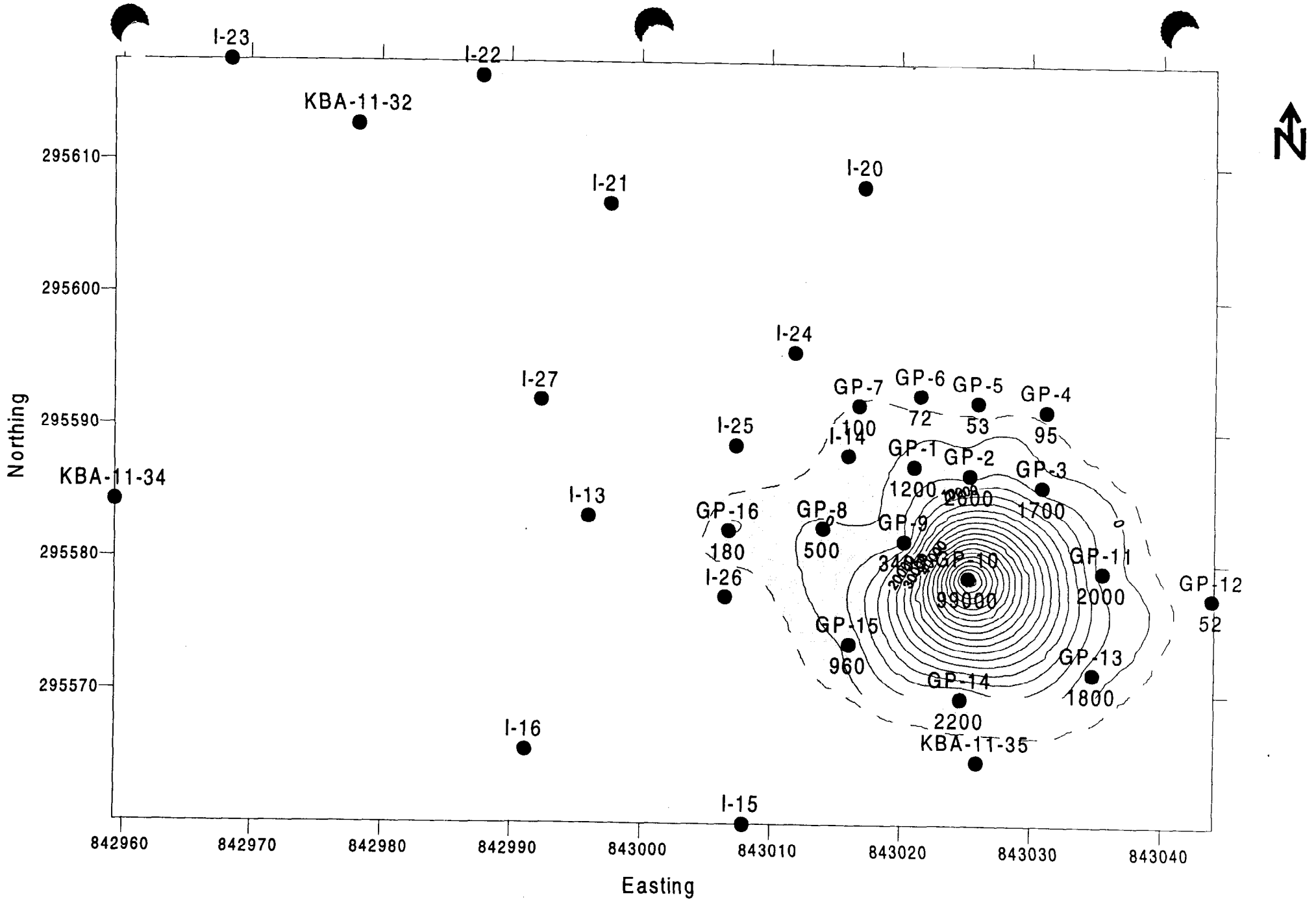

Figure 13 - Geoprobe Investigation, PCE Concentrations (ppb) 27 - 30 ft, 8/31/99

Contour Interval = 5000 ppb

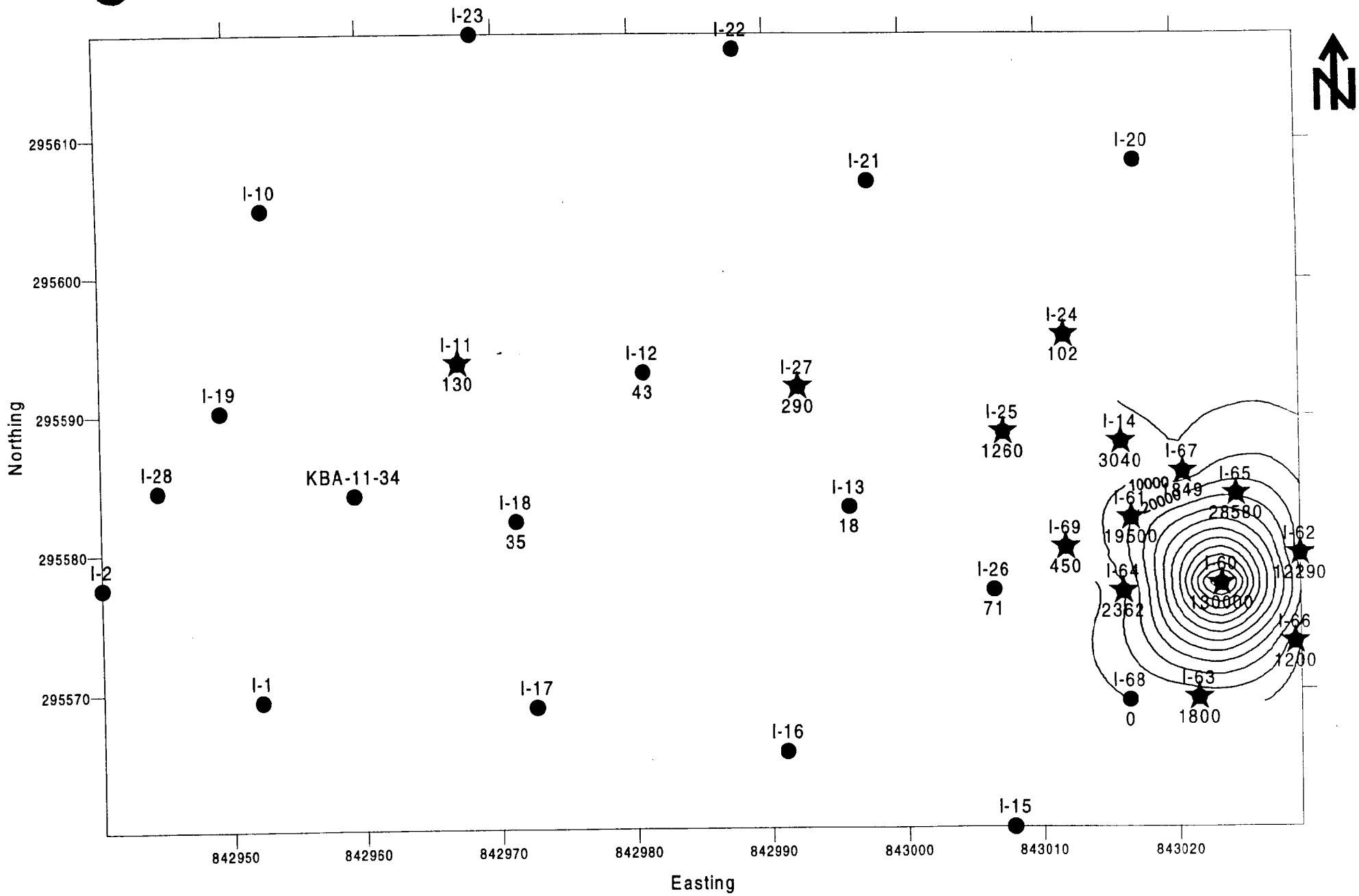

Figure 14 - Pre-Phase 3 Treatment, 1st Injection, Total Chlorinated Ethenes (ppb) - 1/7/00 Contour Interval = 10,000 ppb

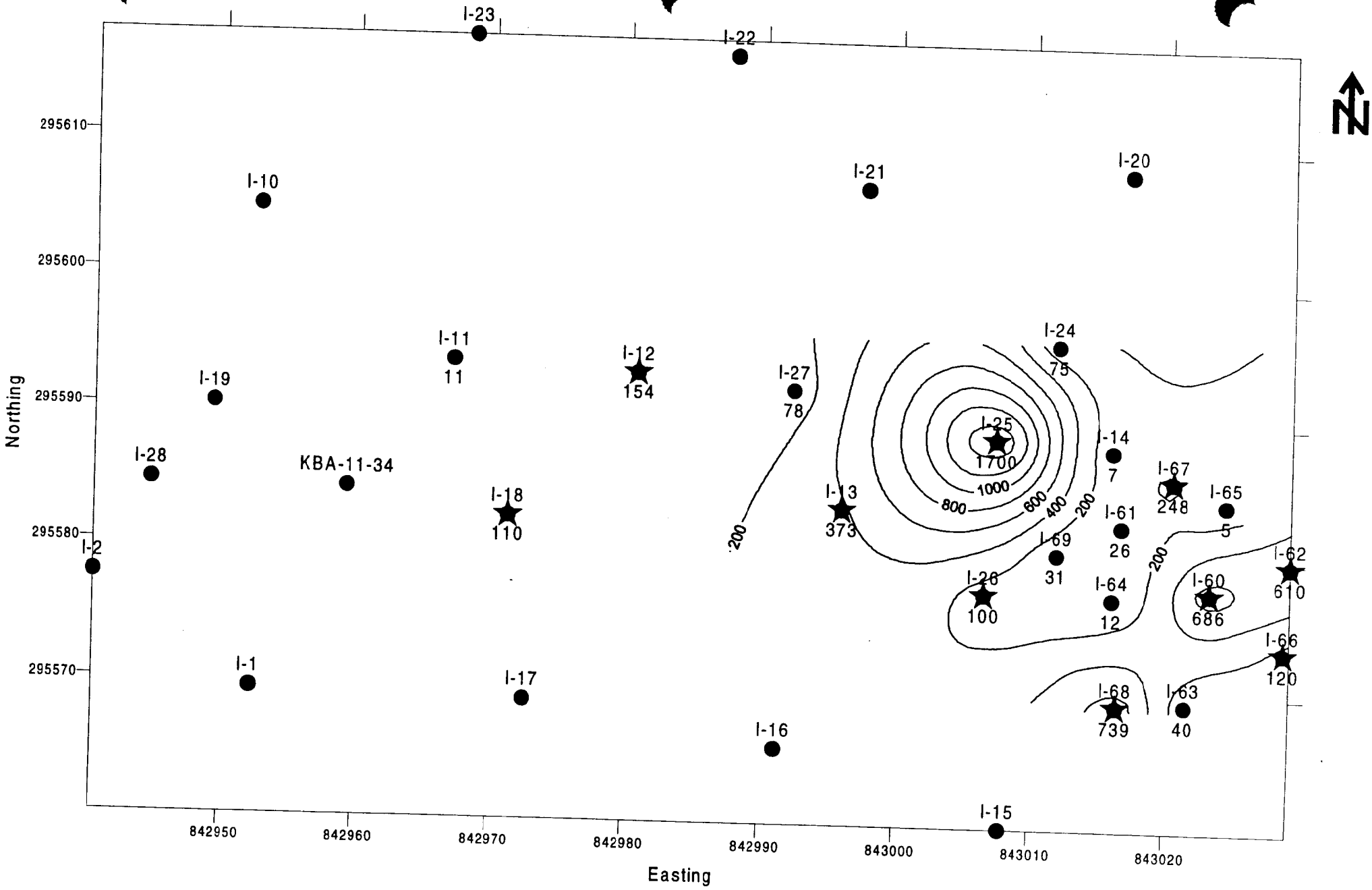

Figure 15 - Post-Phase 3 Treatment, 1st Injection, Total Chlorinated Ethenes (ppb) - 2/2/00 Contour Interval = 200 ppb

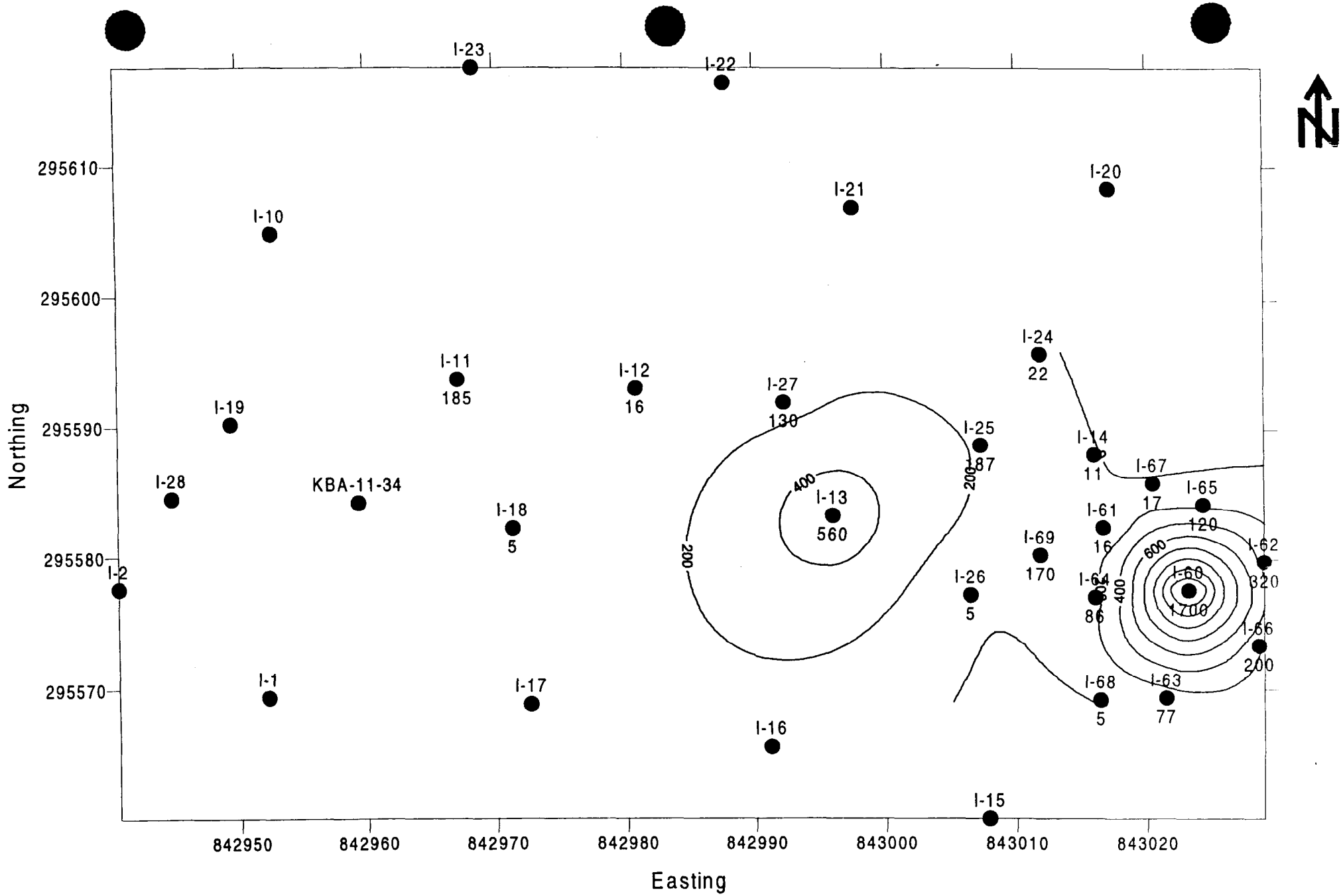

Figure 16 - Post-Phase 3 Treatment, 2nd Injection, Total Chlorinated Ethenes (ppb) - 3/25/00 Contour Interval = 200 ppb

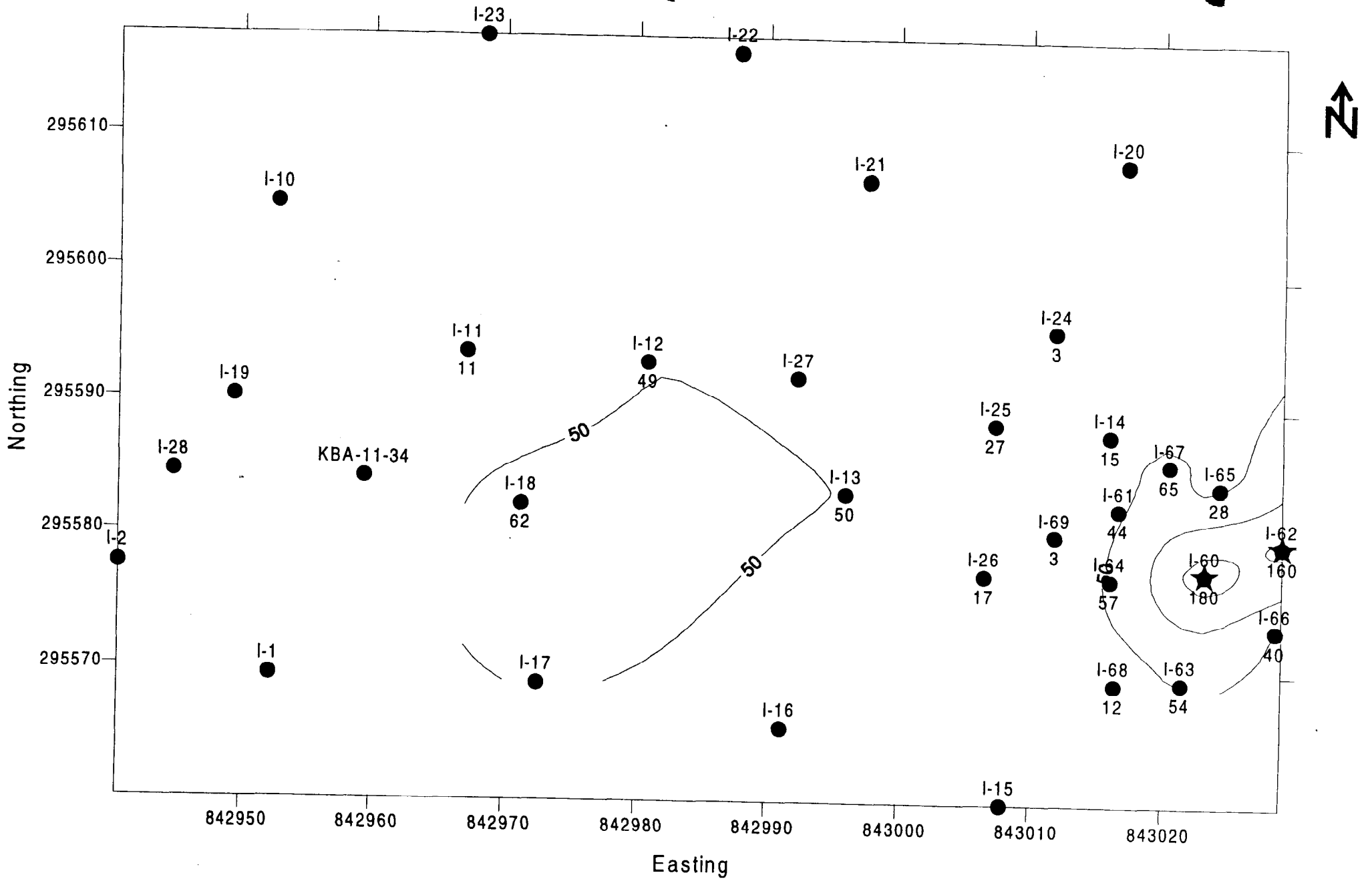

Figure 17 - Post-Phase 3 Treatment, 3rd Injection, Total Chlorinated Ethenes (ppb) - 4/27/00 Contour Interval = 50 ppb

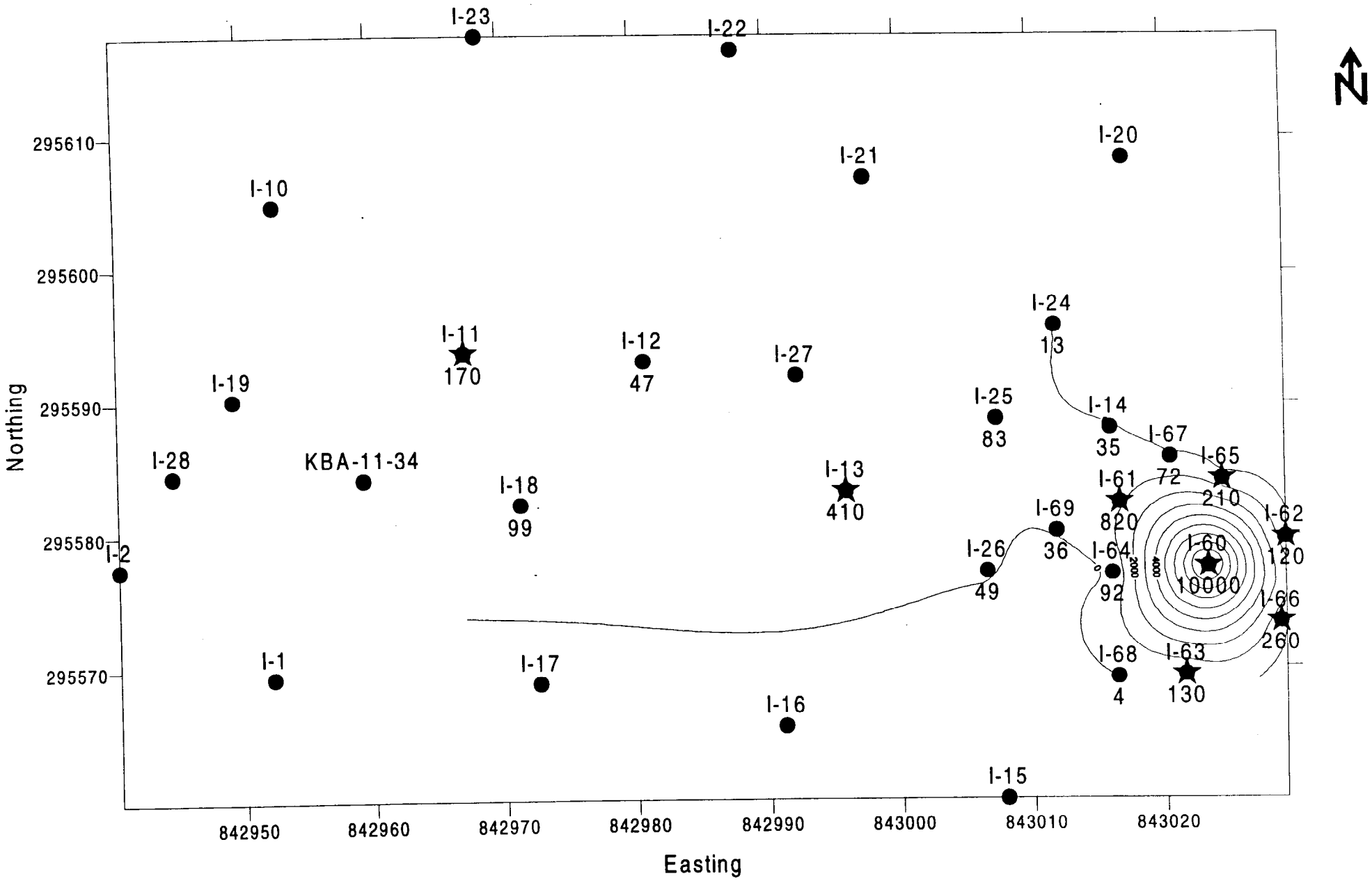

Figure 18 - 2nd Post-Phase 3 Treatment, 3rd Injection, Total Chlorinated Ethenes (ppb) - 5/30/00 Contour Interval = 1000 ppb

Pre-Treatment Model

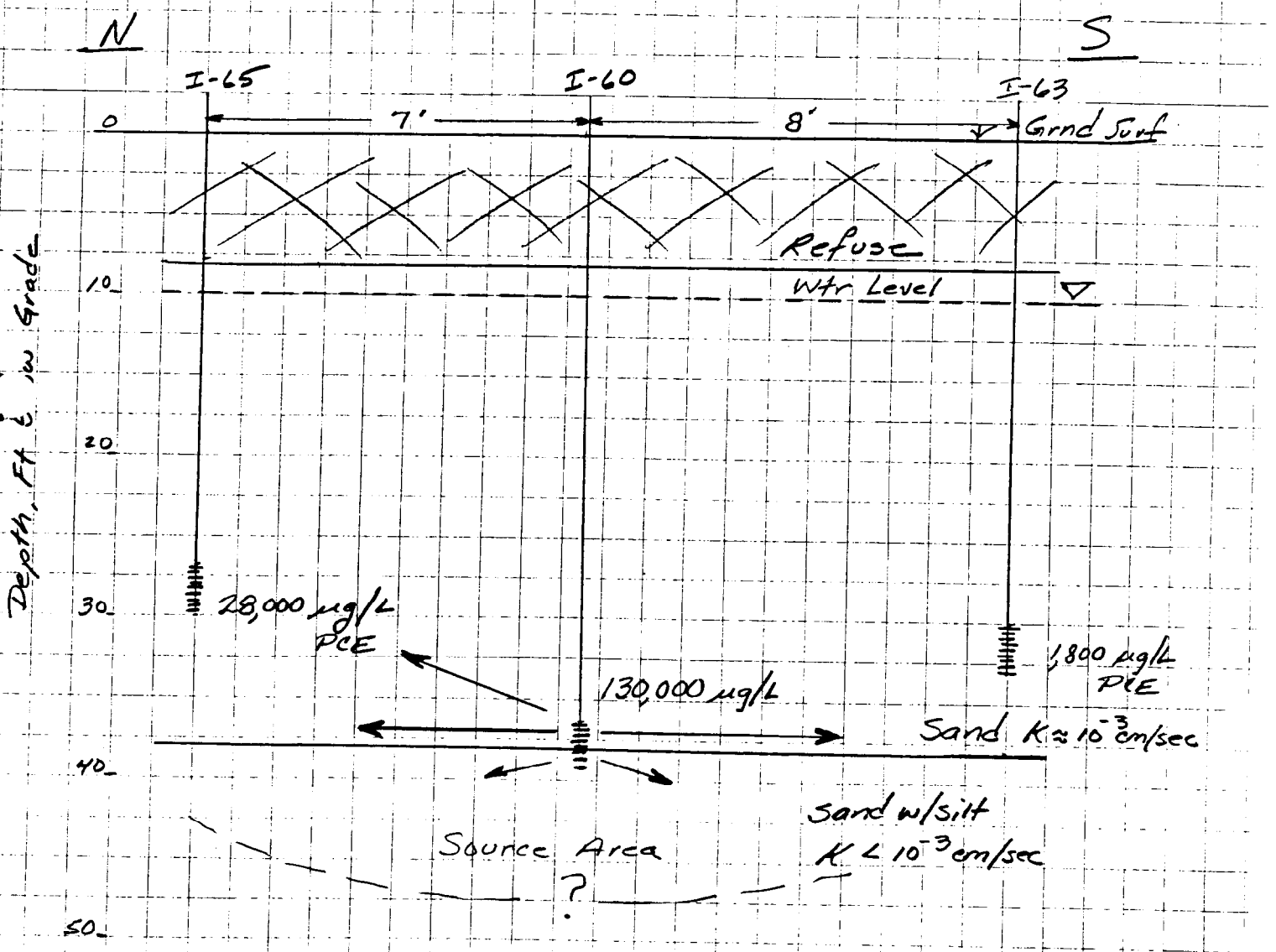

Figure 19 - Pre-Phase 3 Treatment Model

Post-Treatment Model 5-30-00

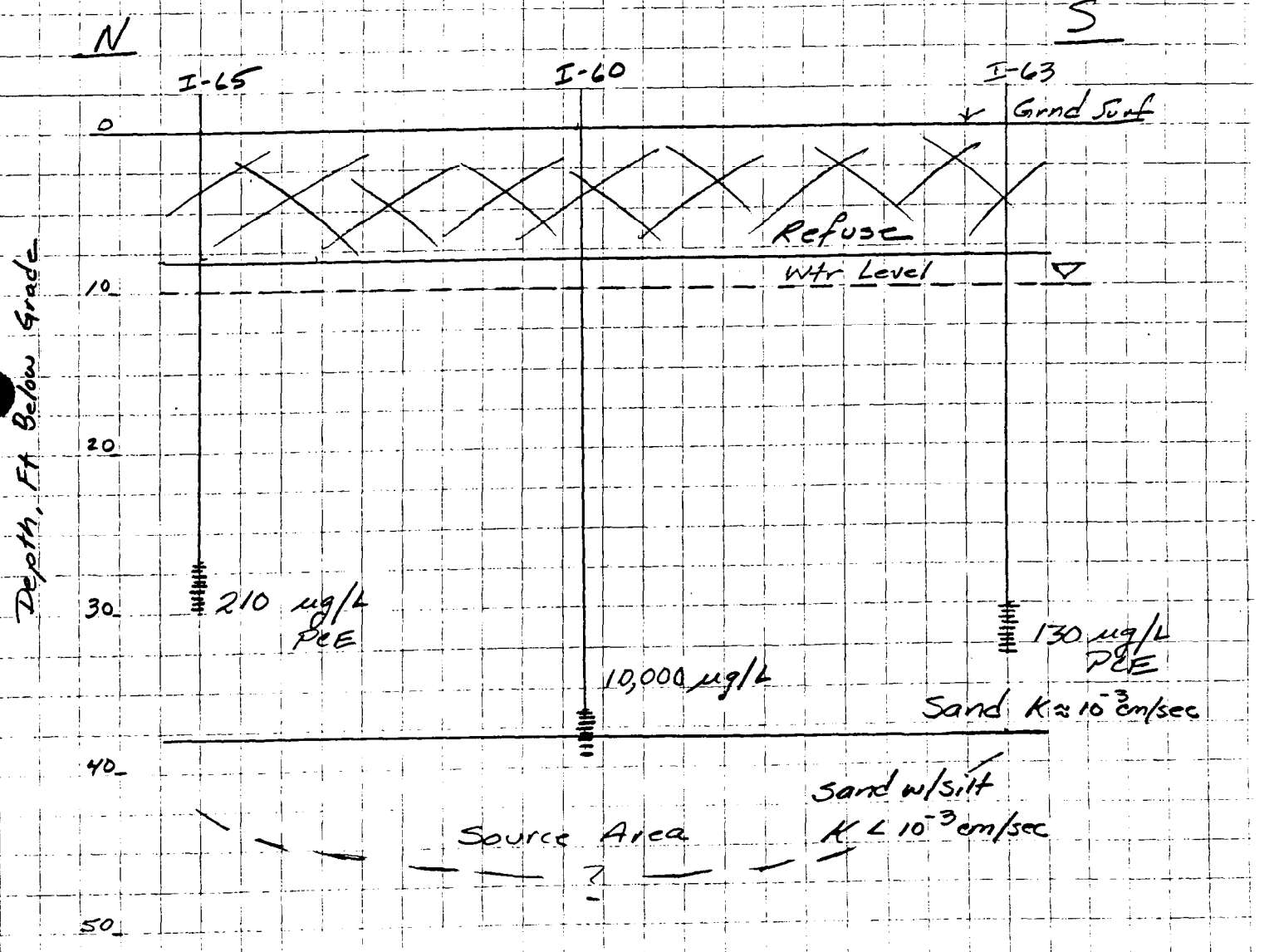

Figure 20 - Post-Phase 3, 3rd Injection

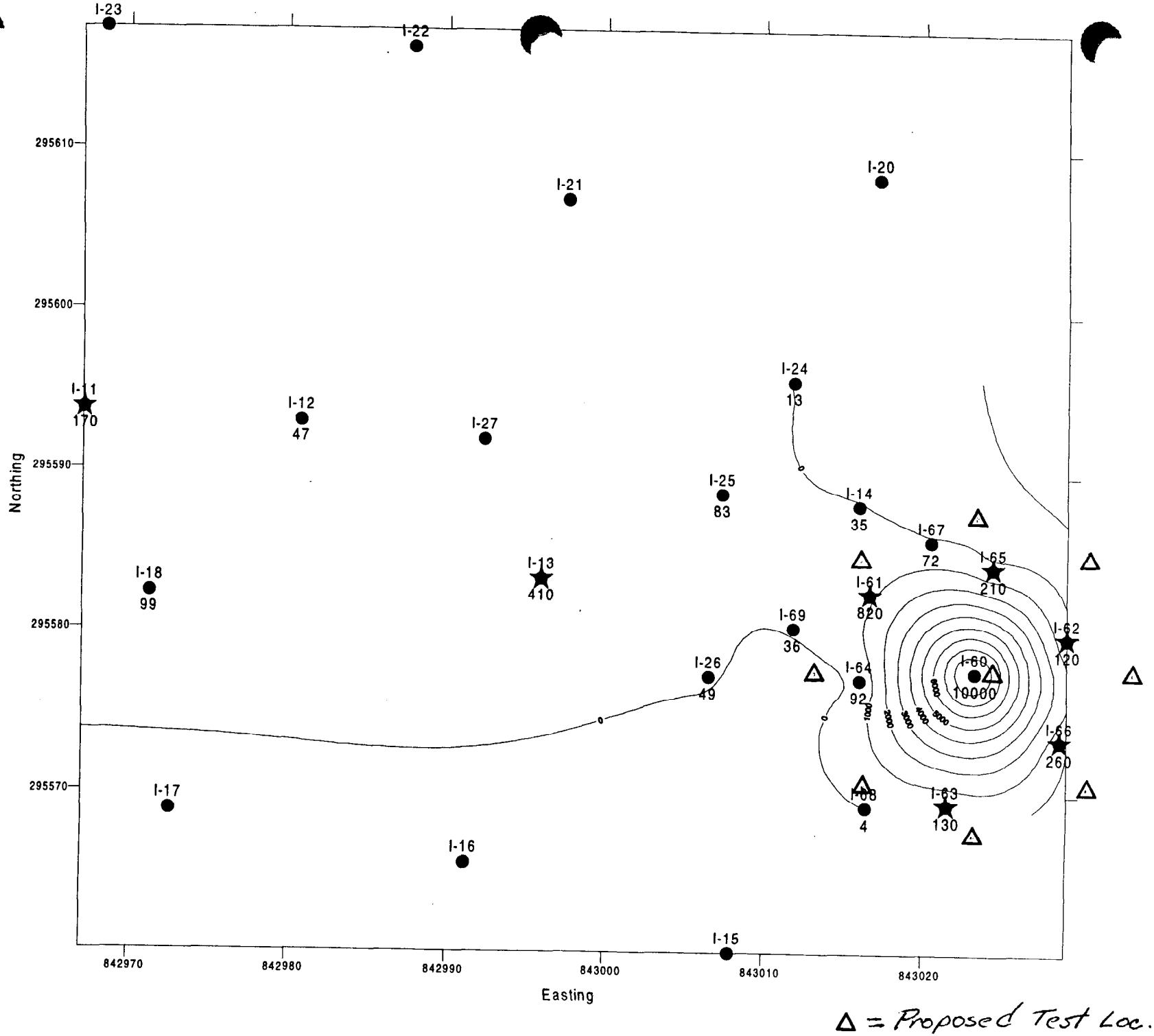

Figure 21 - Proposed Locations for Source Area Testing

Tables

Table 1. Analytical Summary, Phase I & II Treatments, NSB Kings Bay, GA

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total Chlorinated Ethenes (µg/L)[2,3]
KBA-11-31	9/17/1998	<1	9	6	2	17
	10/30/1998	<1	1	7	<1	8
	11/6/1998	1	<1	<1	<1	1
	11/24/1998	8	7	2	<1	17
	12/22/1998	12	12	6	<1	30
	1/27/1999	14	15	4	<1	33
	2/18/1999	23	17	5	<1	45
	3/15/1999	15	12	7	<1	34
	5/20/1999	69	57	73	5	204
	6/21/1999	6	<1	<1	<1	6
	7/26/1999	4	<1	<1	<1	4
	8/16/1999	7	<1	<1	<1	7
KBA-11-32	9/17/1998	3	91	30	9	133
	10/30/1998	<1	110	54	4	168
	11/13/1998	<1	<1	<1	<1	0
	11/24/1998	4	9	3	<1	16
	12/22/1998	7	13	5	<1	25
	1/27/1999	9	17	5	<1	31
	2/18/1999	6	8	3	<1	17
	3/15/1999	11	11	4	<1	26
	5/20/1999	18	13	<1	<5	31
	6/21/1999	12	6	1	<1	19
	7/26/1999	9	4	<1	<1	13
	8/16/1999	10	2	<1	<1	12
KBA-11-33	9/17/1998	<1	<1	<1	<1	0
	10/30/1998	<1	<1	<1	<1	0
	11/24/1998	<1	<1	<1	<1	0
	12/22/1998	<1	<1	<1	<1	0
	1/27/1999	<3	<1	<1	<1	0
	2/18/1999	<1	<1	<1	<1	0
	3/15/1999	<1	<1	<1	<1	0
	5/20/1999	<3	<1	<1	<5	0
	6/22/1999	<3	<1	<1	<1	0
	7/26/1999	<3	<1	<1	<1	0
	8/16/1999	<1	<1	<1	<1	0
KBA-11-34	9/17/1998	3,200	350	8	<1	3,558
	9/17/98 (dup)	2,500	320	8	<1	2,828
	10/30/1998	8,500	550	24	<1	9,074
	11/13/1998	180	30	<5	<5	210
	11/24/1998	200	19	<1	<1	219
	11/24/98 (dup)	130	15	<1	<1	145
	12/22/1998	87	6	<1	<1	93
	1/27/1999	83	7	<1	<1	90
	2/18/1999	9	<1	<1	<1	9
	3/15/1999	62	3	<1	<1	65
	3/15/99 (dup)	57	2	<1	<1	59
	5/20/1999	83	3	<1	<5	86
	6/22/1999	10	<1	<1	<1	10
	7/26/1999	24	<1	<1	<1	24
	8/16/1999	16	<	<1	<1	16

Table 1. Analytical Summary, Phase I & II Treatments, NSB Kings Bay, GA

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total Chlorinated Ethenes (µg/L)[2,3]
KBA-11-35	9/17/1998	<1	<1	<1	<1	0
	10/30/1998	<1	<1	<1	<1	0
	11/6/1998	<1	<1	<1	<1	0
	11/24/1998	<1	<1	<1	<1	0
	12/22/1998	<1	<1	<1	<1	0
	1/27/1999	<3	<1	<1	<1	0
	2/18/1999	<1	<1	<1	<1	0
	3/15/1999	<1	<1	<1	<1	0
	5/20/1999	<3	<1	<1	<5	0
	6/21/1999	18	1	<1	<1	19
	7/26/1999	<3	<1	1	<1	1
	8/16/1999	2	<1	<1	<1	2
KBA-11-36	9/17/1998	7	440	60	5	512
	10/30/1998	5	360	60	<1	424
	10/30/98 (dup)	4	330	59	1	394
	11/24/1998	17	55	3	<1	75
	12/22/1998	370	44	2	<1	416
	1/27/1999	380	44	2	<1	426
	2/18/1999	3	<1	3	<1	6
	3/15/1999	51	3	<1	<1	54
	5/20/1999	90	10	<1	<5	100
	6/22/1999	<3	<1	<1	<1	0
	7/26/1999	14	3	<1	<1	17
	8/16/1999	28	2	<1	<1	30
KBA-11-13A	9/17/1998	<1	24	160	78	262
	10/30/1998	<10	16	130	10	156
	11/4/1998	<3	15	5	28	48
	11/24/1998	<1	16	100	22	138
	11/25/1998	<5	16	79	26	121
	12/22/1998	<1	14	230	22	266
	1/7/1999	<5	<5	34	60	94
	1/27/1999	<3	20	110	22	152
	2/18/1999	<1	15	150	22	187
	3/15/1999	<10	13	150	15	178
	4/7/1999	<1	7	49	93	149
	5/20/1999	<3	29	350	61	440
	6/23/1999	<3	25	280	45	350
	7/26/1999	<15	26	240	57	323
	8/17/1999	<1	24	240	26	290
RW7	10/30/1998	720	160	66	<1	946
	11/24/1998	220	62	110	<1	392
	1/27/99[1]	<3	2	2	<1	4
	2/18/1999	120	10	5	<1	135
	2/18/99 (dup)	120	10	6	<1	136
	3/15/1999	69	10	7	<1	86
	5/20/1999	77	6	<1	<5	83
	5/20/99 (dup)	76	6	<1	<5	82
	6/23/1999	9	2	2	<1	13
	6/23/99 (dup)	10	2	2	<1	14
	7/27/1999	11	2	<1	<1	13
	8/17/1999	18	<1	<1	<1	18
	8/17/99 (dup)	18	2	<1	<1	20

Table 1. Analytical Summary, Phase I & II Treatments, NSB Kings Bay, GA

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total Chlorinated Ethenes (µg/L)[2,3]
RW8	10/30/1998	<1	83	57	10	150
	11/24/1998	<1	57	110	10	177
	1/27/99[1]	<3	2	2	<1	4
	2/18/1999	5	17	110	7	139
	5/20/1999	11	14	22	22	69
	6/23/1999	4	4	23	<1	31
	7/27/1999	<3	5	7	<1	12
	8/17/1999	1	2	3	<1	6
USGS-1	8/6/1998	<5	1,140	919	314	2,373
	11/4/1998	<3	28	340	33	401
	11/25/1998	<5	120	580	61	761
	1/7/1999	<5	78	213	<5	291
	4/7/1999	<1	198	731	64	993
	5/20/99[4]	500	240	25	<5	765
	5/26/1999	<3	190	820	120	1,130
	6/23/1999	<30	150	400	21	571
	6/23/99 (dup)	<30	170	420	21	611
	7/27/1999	<3	13	77	<1	90
	8/17/1999	<1	8	34	<1	42
USGS-2	8/6/1998	<5	160	290	219	669
	11/4/1998	<3	560	660	45	1,265
	11/25/1998	<5	180	300	22	502
	1/7/1999	<5	34	293	39	366
	4/7/1999	<1	49	500	56	605
	5/20/99[4]	15	96	190	16	317
	6/3/1999	<3	130	440	11	581
	6/23/1999	4	57	170	<1	231
	7/27/1999	<3	2	34	<1	36
	8/17/1999	<1	3	13	<1	16
USGS-3	8/6/1998	<5	45	328	327	700
	11/4/1998	<3	350	1,300	74	1,724
	11/25/1998	<5	260	860	26	1,146
	1/7/1999	<5	290	1,070	64	1,424
	4/7/1999	5	97	492	54	648
	5/20/99[4]	6	71	430	24	531
	6/3/1999	20	130	130	9	289
	6/23/1999	70	67	60	<1	197
	7/27/1999	<3	1	15	<1	16
	8/17/1999	<1	2	10	<1	12
USGS-15	11/4/1998	<1	9	3	7	19
	11/25/1998	<5	7	34	6	47
	1/7/1999	<5	25	29	<5	54
	4/7/1999	29	42	8	<1	79
	5/20/99[4]	<3	160	840	110	1,110
	6/3/1999	330	170	13	<1	513
	6/23/1999	310	160	25	<5	495
	7/27/1999	6	7	2	<1	15
	8/17/1999	26	28	7	<1	61
I-1	10/30/1998	<1	<1	9	<1	9
	12/22/1998	<1	<1	<1	<1	0
	3/16/1999	<1	<1	<1	<1	0
	5/20/1999	<3	<1	<1	<5	0
	6/22/1999	4	<1	<1	<1	4

Table 1. Analytical Summary, Phase I & II Treatments, NSB Kings Bay, GA

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total Chlorinated Ethenes (µg/L)[2,3]
I-2	12/22/1998	290	9	<1	<1	299
	1/27/1999	4	<1	4	<1	8
	2/18/1999	52	1	<1	<1	53
	3/16/1999	230	3	<1	<1	233
	3/16/99 (dup)	250	4	<1	<1	254
	5/20/1999	27	3	5	<5	35
	6/22/1999	10	<1	7	<1	17
	7/27/1999	<3	<1	2	<1	2
	8/16/1999	15	<1	<1	<1	15
I-3	12/22/1998	<1	<1	1	<1	1
	3/16/1999	56	2	<1	<1	58
	5/20/1999	8	<1	<1	<5	8
	6/22/1999	22	<1	<3	<1	22
I-4	11/24/1998	290	43	<1	<1	333
	12/22/1998	900	30	1	<1	931
	1/27/1999	230	18	17	<1	265
	2/18/1999	97	2	<1	<1	99
	3/16/1999	88	2	<1	<1	90
	3/16/99 (dup)	87	2	<1	<1	89
	5/20/1999	13	3	3	<5	19
	6/22/1999	32	1	<1	<1	33
	6/22/99 (dup)	21	<1	<1	<1	21
	7/27/1999	<3	1	15	<1	16
	8/17/1999	30	<1	<1	<1	30
	8/17/99 (dup)	6	<1	<1	<1	6
I-5	2/18/1999	<1	<1	1	<1	1
	3/16/1999	<1	<1	<1	<1	0
	5/20/1999	77	4	1	<5	82
	6/22/1999	<3	<1	3	<1	3
I-6	2/18/1999	2	<1	<1	<1	2
	3/16/1999	2	<1	<1	<1	2
	5/20/1999	<3	<1	<1	<5	0
	6/22/1999	<3	<1	<1	<1	0
I-7	2/18/1999	<1	<1	210	3	213
	3/16/1999	<1	<1	85	2	87
	5/21/1999	4	1	240	<1	245
	6/22/1999	<3	<1	13	<1	13
	7/27/1999	<3	<1	16	<1	16
	8/16/1999	6	1	10	<1	17
I-8	12/22/1998	13	15	1	<1	29
	3/16/1999	7	<1	<1	<1	7
	5/20/1999	3	2	5	<5	10
	6/22/1999	5	<1	<1	<1	5
I-9	12/22/1998	9	1	37	1	48
	1/27/1999	<3	1	13	<1	14
	3/16/1999	8	3	12	<1	23
	5/20/1999	<3	<1	20	<5	20
	6/22/1999	70	3	2	<1	75
I-10	12/22/1998	27	8	<1	<1	35
	1/27/1999	25	4	<1	<1	29
	3/16/1999	22	1	<1	<1	23
	5/20/1999	22	3	<1	<5	25
	6/22/1999	<3	<1	<1	<1	0

Table 1. Analytical Summary, Phase I & II Treatments, NSB Kings Bay, GA

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total Chlorinated Ethenes (µg/L)[2,3]
I-11	11/13/1998	<1	<1	200	<1	200
	12/22/1998	5	<1	66	<1	71
	12/22/98 (dup)	3	<1	57	<1	60
	2/18/1999	1	<1	27	1	29
	3/16/1999	<1	<1	10	<1	10
	5/21/1999	<3	<1	4	<1	4
	6/21/1999	5	<1	4	<1	9
	7/26/1999	4	<1	4	<1	8
	8/16/1999	3	<1	2	<1	5
I-12	11/13/1998	170	44	<5	<5	214
	11/24/1998	29	8	<1	<1	37
	12/22/1998	76	2	<1	<1	78
	12/22/98 (dup)	65	1	<1	<1	66
	1/27/1999	43	2	<1	<1	45
	2/18/1999	25	<1	<1	<1	25
	3/16/1999	44	<1	<1	<1	44
	5/20/1999	27	<1	<1	<5	27
	6/21/1999	22	<1	<1	<1	22
	7/26/1999	8	<1	<1	<1	8
	8/16/1999	13	<1	<1	<1	13
I-13	12/22/1998	<1	<1	33	2	35
	1/27/1999	<3	<1	14	<1	14
	2/18/1999	<1	<1	79	<1	79
	2/18/99 (dup)	<1	<1	61	2	63
	3/16/1999	6	<1	12	<1	18
	5/21/1999	<3	<1	8	<1	8
	6/21/1999	4	<1	4	<1	8
I-14	3/16/1999	3,500	300	<10	<10	3,800
	3/31/1999	3,200	200	<50	<50	3,400
	4/12/1999	2,420	220	11	5	2,656
	5/20/1999	5,000	870	15	<5	5,885
	5/20/99 (dup)	4,600	730	12	<5	5,342
	6/21/1999	48	14	<1	<1	62
	6/21/99 (dup)	59	18	<1	<1	77
	7/26/1999	110	26	<1	<1	136
	7/26/99 (dup)	110	27	<1	<1	137
	8/16/1999	1,600	100	<50	<50	1,700
	8/16/99 (dup)	2,500	160	<50	<50	2,660
I-15	3/16/1999	<1	<1	<1	<1	0
	5/20/1999	<3	<1	<1	<5	0
	6/21/1999	<3	<1	<1	<1	0
I-16	10/30/1998	<1	<1	<1	<1	0
	12/22/1998	71	<1	<1	<1	71
	1/27/1999	33	<1	<1	<1	33
	3/16/1999	140	<10	<10	<10	140
	3/31/1999	68	<1	<1	<1	68
	5/20/1999	17	<1	<1	<5	17
	6/21/1999	210	2	<1	<1	212
	7/26/1999	<3	<1	<1	<1	0
	8/16/1999	56	<1	<1	<1	56
I-17	12/22/1998	<1	<1	<1	<1	0
	3/16/1999	4	<1	<1	<1	4
	5/20/1999	22	<1	1	<5	23
	6/21/1999	51	<1	<1	<1	51

Table 1. Analytical Summary, Phase I & II Treatments, NSB Kings Bay, GA

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total Chlorinated Ethenes (µg/L)[2,3]
I-18	12/22/1998	16	<1	<1	<1	16
	3/16/1999	96	3	<1	<1	99
	5/20/1999	180	7	<1	<5	187
	6/21/1999	<3	<1	<1	<1	0
	7/26/1999	15	<1	<1	<1	15
	8/16/1999	31	<1	<1	<1	31
I-19	12/22/1998	<1	<1	100	<1	100
	2/18/1999	<1	<1	110	2	112
	3/16/1999	1	<1	8	2	11
	5/21/1999	7	<1	34	<1	41
	6/22/1999	<3	<1	18	<1	18
	7/26/1999	<3	<1	3	<1	3
	8/16/1999	4	<1	6	<1	10
I-20	3/16/1999	<1	<1	<1	<1	0
	5/20/1999	<3	3	1	<5	4
	6/21/1999	<3	<1	6	<1	6
I-21	3/16/1999	<1	<1	210	13	223
	5/21/1999	4	<1	110	7	121
	6/21/1999	<3	1	110	5	116
	7/26/1999	<3	<1	100	<1	100
	8/16/1999	<1	<1	14	<1	14
I-22	3/16/1999	14	30	28	<1	72
	5/20/1999	33	24	12	5	74
	6/21/1999	4	1	<1	<1	5
I-23	3/16/1999	6	8	4	<1	18
	5/21/1999	19	13	5	<1	37
	6/22/1999	24	21	5	<1	50
I-24	5/21/1999	30	15	4	<1	49
	6/21/1999	8	5	<1	<1	13
I-25	5/25/1999	390	42	2	<1	434
	6/21/1999	<3	<1	9	<1	9
	7/26/1999	<3	<1	<1	<1	0
	8/16/1999	<1	<1	1	<1	1
I-26	5/25/1999	550	11	1	<1	562
	6/21/1999	73	<1	<1	<1	73
	7/26/1999	12	<1	<1	<1	12
	8/16/1999	18	<1	<1	<1	18
I-27	5/21/1999	1,400	220	2	<1	1,622
	6/21/1999	26	3	<1	<1	29
	7/26/1999	4	<1	<1	<1	4
	8/16/1999	34	<1	<1	<1	34
I-28	5/24/1999	84	4	<1	<1	88
	6/22/1999	5	<1	<1	<1	5
	7/26/1999	14	<1	<1	<1	14
	8/16/1999	26	<1	<1	<1	26
I-29	5/25/1999	150	8	<1	<1	158
	6/22/1999	7	<1	5	<1	12
	7/27/1999	30	3	<1	<1	33
	8/16/1999	40	1	<1	<1	41
I-30	5/25/1999	250	18	<1	<1	268
	6/22/1999	16	1	<1	<1	17
	7/27/1999	6	<1	<1	<1	6
	8/16/1999	17	<1	<1	<1	17

Table 1. Analytical Summary, Phase I & II Treatments, NSB Kings Bay, GA

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total Chlorinated Ethenes (µg/L)[2,3]
I-31	5/26/1999	14	1	1	<1	16
	6/22/1999	24	3	1	<1	28
I-32	5/26/1999	<3	<1	<1	<1	0
	6/22/1999	11	<1	<1	<1	11
I-33	5/26/1999	<3	<1	<1	<1	0
	6/22/1999	17	3	1	<1	21
I-34	5/26/1999	9	<1	<1	<1	9
	6/23/1999	9	3	1	<1	13
I-35	5/27/1999	11	49	150	23	233
	6/23/1999	<3	<1	<1	<1	0
	7/27/1999	6	1	<1	<1	7
	8/17/1999	11	2	<1	<1	13
I-36	5/26/1999	26	15	10	<1	51
	6/23/1999	20	5	2	<1	27
I-37	5/27/1999	13	5	170	<1	188
	6/22/1999	<3	3	43	<1	46
	7/27/1999	3	3	11	<1	17
	8/17/1999	10	3	5	<1	18
I-38	5/27/1999	9	34	31	<1	74
	6/23/1999	9	15	8	<1	32
	7/27/1999	<3	6	7	<1	13
	8/16/1999	2	7	9	<1	18
I-39	5/27/1999	<3	17	73	23	113
	6/23/1999	<3	26	220	<1	246
	7/27/1999	<3	3	2	<1	5
	8/17/1999	<1	3	3	<1	6
I-40	5/27/1999	<3	130	810	140	1,080
	6/23/1999	3	22	12	<1	37
	7/27/1999	<3	7	16	<1	23
	8/17/1999	2	14	50	<1	66
I-41	5/27/1999	<3	23	560	53	636
	6/23/1999	<30	27	330	<10	357
	7/27/1999	<3	6	32	<1	38
	8/17/1999	<1	10	40	<1	50
I-42	5/27/1999	<3	4	31	<1	35
	6/23/1999	<3	3	33	<1	36
I-43	5/27/1999	120	210	79	<1	409
	6/23/1999	15	11	4	<1	30
	7/27/1999	3	2	3	<1	8
	8/17/1999	2	2	1	<1	5
I-44	5/27/1999	120	16	1	<1	137
	6/23/1999	23	8	2	<1	33
	7/27/1999	20	7	<1	<1	27
	8/17/1999	15	4	<1	<1	19

Notes:

1. Results for RW7 and RW8 on 1/27/99 are not considered valid due to inadequate purging prior to sample collection.
2. Total Chlorinated Aliphatics (CACs) = sum of tetrachloroethene, trichloroethene, cis-1,2-dichloroethene, and vinyl chloride conc.
3. For computation of Total Chlorinated Aliphatics (CACs), all non-detect values were assumed to be zero.
4. Data are considered suspect, and the wells were re-sampled on 5/26/99 or 6/3/99.

Table 2 - Analytical Summary, Phase III Treatment, Site 11 NSB Kings Bay, GA

Well ID	Date	Tetrachloroethene (ug/L)	Trichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	Vinyl Chloride (ug/L)	Total Chlorinated Ethenes (ug/L)
I-11	1/7/2000	130.0	10U	10U	10U	130.0
	2/2/2000	11.0	1U	1.4I	1U	11.0
	3/25/2000	150.0	5U	35.0	5U	185.0
	4/27/2000	11.0	1U	1U	1U	11.0
	5/30/2000	170.0	7.0	6.5I	5U	177.0
I-12	1/7/2000	43.0	2.6I	1U	1U	43.0
	2/2/2000	150.0	4.2	1U	1U	154.2
	3/25/2000	16.0	1U	1U	1U	16.0
	4/27/2000	49.0	1U	1U	1U	49.0
	5/30/2000	47.0	1.8I	1U	1U	47.0
	5/30/2000-DUP	50	1.8I	1U	1U	50.0
I-13	1/7/2000	18.0	1.2I	1.3I	1U	18.0
	2/2/2000	370.0	3.2	1I	1U	373.2
	3/25/2000	560.0	5U	5U	5U	560.0
	4/27/2000	12.0	1U	38.0	1U	50.0
	5/30/2000	41.0	5U	5U	5U	41.0
I-14	1/7/2000	2800.0	240.0	15I	10U	3040.0
	1/22/2000	200.0	20U	20U	20U	200.0
	2/2/2000	7.4	1U	1U	1U	7.4
	3/25/2000	11.0	1U	1U	1U	11.0
	4/27/2000	15.0	1U	2I	1U	15.0
	5/30/2000	32.0	2.8	1.6I	1U	34.8
I-18	1/7/2000	31.0	3.3	1U	1.0	35.3
	2/2/2000	110.0	1.5I	1U	1U	110.0
	3/25/2000	4.6	1U	1U	1U	4.6
	4/27/2000	62.0	1U	1U	1U	62.0
	5/30/2000	99.0	1.6I	1U	1U	99.0
I-24	1/7/2000	86.0	12.0	4.2	1U	102.2
	2/2/2000	71.0	4.4	1U	1U	75.4
	3/25/2000	22.0	1U	1U	1U	22.0
	4/28/2000	3.2	1U	1U	1U	3.2
	5/30/2000	13.0	1.4I	1.3I	1U	13.0
I-25	1/7/2000	1100.0	160.0	10U	10U	1260.0
	2/2/2000	1700.0	10U	10U	10U	1700.0
	3/25/2000	77.0	1U	110.0	1U	187.0
	4/27/2000	27.0	1U	1.3I	1U	27.0
	5/30/2000	81.0	1U	2.0	1U	83.0
I-26	1/7/2000	71.0	1.6I	1U	1U	71.0
	2/2/2000	100.0	1U	1U	1U	100.0
	3/25/2000	4.7	1U	1U	1U	4.7
	4/27/2000	17.0	1U	1U	1U	17.0
	5/30/2000	49.0	1U	1.5I	IU	49.0

U = compound was analyzed for but not detected to the level shown.
I = analyte detected; value is between the method detection limit and the practical quantitation limit.

Table 2 - Analytical Summary, Phase III Treatment, Site 11 NSB Kings Bay, GA

Well ID	Date	Tetrachloroethene (ug/L)	Trichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	Vinyl Chloride (ug/L)	Total Chlorinated Ethenes (ug/L)
I-27	1/7/2000	270.0	20.0	5U	5U	290.0
	2/2/2000	78.0	5U	5U	5U	78.0
	3/25/2000	130.0	5U	5U	5U	130.0
I-60	1/7/2000	130000.0	5000U	5000U	5000U	130000.0
	1/22/2000	20000.0	20U	88.0	20.0	20108.0
	2/2/2000	660.0	10U	26.0	10U	686.0
	2/2/2000 (DUP)	670.0	2.8I	23.0	1.0I	693.0
	3/25/2000	1700.0	20U	20U	20U	1700.0
	3/25/2000 (DUP	1400.0	25U	120.0	20U	1520.0
	4/27/2000	180.0	5U	5U	5U	180.0
	4/27/00 (DUP)	69.0	1I	1U	1U	69.0
	5/30/2000	10000.0	100U	100U	100U	10000.0
I-61	1/7/2000	16000.0	3500.0	10U	10U	19500.0
	1/7/2000 DUP	14000.0	2300.0	20U	20U	16300.0
	1/22/2000	290.0	20U	20U	20U	290.0
	3/25/2000	16.0	1U	1U	1U	16.0
	4/27/2000	44.0	1U	1U	1U	44.0
	5/30/2000	820.0	20U	20U	20U	820.0
I-62	1/7/2000	12000.0	290.0	20U	20U	12290.0
	1/22/2000	950.0	1U	1U	1U	950.0
	2/2/2000	610.0	10U	10U	10U	610.0
	3/25/2000	320.0	5U	5U	5U	320.0
	4/27/2000	160.0	5U	5U	5U	160.0
	5/30/2000	120.0	5U	5U	5U	120.0
I-63	1/7/2000	1800.0	20U	20U	20U	1800.0
	1/22/2000	20.0	1U	1U	1U	20.0
	2/2/2000	40.0	1U	1U	1U	40.0
	3/25/2000	77.0	1U	1U	1U	77.0
	4/27/2000	54.0	1U	1U	1U	54.0
	5/30/2000	130.0	5U	5U	5U	130.0
I-64	1/7/2000	2300.0	62.0	10U	10U	2362.0
	1/22/2000	35.0	1U	1U	1U	35.0
	2/2/2000	12.0	1U	1U	1U	12.0
	3/25/1999	86.0	1U	1U	1U	86.0
	4/27/2000	57.0	1U	1U	1U	57.0
	5/30/2000	92.0	5U	5U	5U	92.0
	5/30/2000-DUP	93.0	1.5U	1U	1U	93.0
I-65	1/7/2000	28000.0	580.0	10U	10U	28580.0
	1/22/2000	28.0	1U	1U	1U	28.0
	2/2/2000	4.5	1U	1U	1U	4.5
	3/25/2000	120.0	5U	5U	5U	120.0
	4/27/2000	28.0	1U	1U	1U	28.0
	5/30/2000	210.0	5U	5U	5U	210.0

U = compound was analyzed for but not detected to the level shown.

I = analyte detected; value is between the method detection limit and the practical quantitation limit.

Table 2 - Analytical Summary, Phase III Treatment, Site 11 NSB Kings Bay, GA

Well ID	Date	Tetrachloroethene (ug/L)	Trichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	Vinyl Chloride (ug/L)	Total Chlorinated Ethenes (ug/L)
I-66	1/7/2000	1200.0	20U	20U	20U	1200.0
	1/22/2000	1.5I	1U	1U	1U	0.0
	2/2/2000	120.0	5U	5U	5U	120.0
	3/25/2000	200.0	20U	20U	20U	200.0
	4/28/2000	40.0	1U	1U	1U	40.0
	5/30/2000	260.0	5U	5U	5U	260.0
I-67	1/7/2000	1800.0	49.0	10U	10U	1849.0
	1/22/2000	28.0	2.9	1U	1U	30.9
	2/2/2000	220.0	28.0	5U	5U	248.0
	3/25/2000	17.0	1U	1U	1U	17.0
	4/28/2000	62.0	3.3	1U	1U	65.3
	5/30/2000	72.0	5U	5.2I	5U	72.0
I-68	1/7/2000	1I	1U	1U	1U	0.0
	2/2/2000	730.0	9.2	1.4I	1U	739.2
	3/25/2000	4.8	1U	1U	1U	4.8
	4/28/2000	12.0	1U	1U	1U	12.0
	5/30/2000	4.0	1U	1U	1U	4.0
I-69	1/7/2000	450.0	17I	10U	10U	450.0
	1/22/2000	36.0	1U	1U	1U	36.0
	2/2/2000	31.0	1U	1U	1U	31.0
	3/25/2000	170.0	5U	5U	5U	170.0
	4/28/2000	2.9	1U	1U	1U	2.9
	5/30/2000	36.0	1.8I	1U	1U	36.0

Events

1/7/00 - Baseline sampling
1/17/00 - 1st injection
1/22/00 - Sampling during 1st injection
2/2/00 - Post 1st injection sampling
3/7/00 - 2nd injection
3/25/00 - Post 2nd injection sampling
4/17/00 - 3rd injection
4/27/00 - Post 3rd injection sampling
5/30/00 - Post 3rd injection sampling

U = compound was analyzed for but not detected to the level shown.
I = analyte detected; value is between the method detection limit and the practical quantitation limit.

Attachment 1
Analytical Reports for Phase 3 Treatment

017123

Environmental Conservation Laboratories, Inc.
4810 Executive Park Court, Suite 211
sonville, Florida 32216-6069
/ 296-3007
904 / 296-6210
www.encolabs.com

ENCO Laboratories

DHRS Certification No. E82277

CLIENT : Bechtel Environmental, Inc.
ADDRESS: NAS Jacksonville
P.O. Box 171
Jacksonville, FL 32215

REPORT # : JR1137
DATE SUBMITTED: January 8, 2000
DATE REPORTED : January 12, 2000

ATTENTION: Mr. Mark Gage

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

PROJECT #: WO# JX185

Site 11 Kings Bay

#1	- I-27	@ 08:55	(01/06/00)
#2	- I-12	@ 09:30	(01/06/00)
#3	- I-11	@ 10:00	(01/06/00)
#4	- I-18	@ 10:35	(01/06/00)
#5	- I-25	@ 11:15	(01/06/00)
#6	- I-14	@ 11:50	(01/06/00)
#7	- I-24	@ 12:15	(01/06/00)
#8	- I-13	@ 15:30	(01/06/00)
#9	- I-26	@ 15:40	(01/06/00)
#10	- I-68	@ 08:40	(01/07/00)
#11	- I-64	@ 10:20	(01/07/00)
#12	- I-69	@ 10:50	(01/07/00)
#13	- I-61	@ 11:20	(01/07/00)
#14	- I-67	@ 12:30	(01/07/00)
#15	- I-65	@ 13:00	(01/07/00)

<<<CONTINUED>>>

017123

Environmental Conservation Laboratories, Inc.
4810 Executive Park Court, Suite 211
Jacksonville, Florida 32216-6069
904 / 296-3007
Fax 904 / 296-6210
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ENCO Laboratories

DHRS Certification No. E82277

CLIENT : Bechtel Environmental, Inc.
ADDRESS: NAS Jacksonville
P.O. Box 171
Jacksonville, FL 32215

REPORT # : JR1137
DATE SUBMITTED: January 8, 2000
DATE REPORTED : January 12, 2000

ATTENTION: Mr. Mark Gage

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

PROJECT #: WO# JX185

Site 11 Kings Bay

#16 - I-62 @ 13:30 (01/07/00)
#17 - I-60 @ 14:00 (01/07/00)
#18 - I-66 @ 14:30 (01/07/00)
#19 - I-63 @ 16:00 (01/07/00)
#20 - DUP-1 (01/07/00)

PROJECT MANAGER Scott D Martin
Scott D. Martin

ENCO LABORATORIES
REPORT # : JR1137
DATE REPORTED: January 12, 2000
REFERENCE : WO# JX185
PROJECT NAME : Site 11 Kings Bay

RESULTS OF ANALYSIS

:PA METHOD 8021 - 'OLATILE ORGANICS	I-27			I-12		Units
)ichlorodifluoromethane	5.0	U	D1	1.0	U	µg/L
:hloromethane	10	U	D1	2.0	U	µg/L
'inyl Chloride	5.0	U	D1	1.0	U	µg/L
;romomethane	5.0	U	D1	1.0	U	µg/L
:hloroethane	10	U	D1	2.0	U	µg/L
'richlorofluoromethane	10	U	D1	2.0	U	µg/L
.,1-Dichloroethene	5.0	U	D1	1.0	U	µg/L
lethylene Chloride	10	U	D1	2.0	U	µg/L
.-1,2-Dichloroethene	5.0	U	D1	1.0	U	µg/L
.,1-Dichloroethane	5.0	U	D1	1.0	U	µg/L
:-1,2-Dichloroethene	5.0	U	D1	1.0	U	µg/L
:h[illegible]oform	5.0	U	D1	1.0	U	µg/L
,[illegible]-Trichloroethane	5.0	U	D1	1.0	U	µg/L
:arbon Tetrachloride	5.0	U	D1	1.0	U	µg/L
,2-Dichloroethane	5.0	U	D1	1.0	U	µg/L
'richloroethene	**20**		D1	**2.6**	I	µg/L
,2-Dichloropropane	5.0	U	D1	1.0	U	µg/L
;romodichloromethane	5.0	U	D1	1.0	U	µg/L
-1,3-Dichloropropene	5.0	U	D1	1.0	U	µg/L
-1,3-Dichloropropene	5.0	U	D1	1.0	U	µg/L
,1,2-Trichloroethane	5.0	U	D1	1.0	U	µg/L
'etrachloroethene	**270**		D1	**43**		µg/L
;ibromochloromethane	5.0	U	D1	1.0	U	µg/L
'hlorobenzene	5.0	U	D1	1.0	U	µg/L
romoform	5.0	U	D1	1.0	U	µg/L
,1,2,2-Tetrachloroethane	5.0	U	D1	1.0	U	µg/L
,3-Dichlorobenzene	5.0	U	D1	1.0	U	µg/L
,4-Dichlorobenzene	5.0	U	D1	1.0	U	µg/L
,2-Dichlorobenzene	5.0	U	D1	1.0	U	µg/L

urrogate:	% RECOV	% RECOV	LIMITS
romofluorobenzene	64	61	52-167
;ate Analyzed	01/10/00	01/11/00	

= Compound was analyzed for but not detected to the level shown.
= nalyte detected; value is between the Method Detection Level (MDL) .nd the Practical Quantitation Level (PQL).
D1 = Analyte value determined from a 1:5 dilution.

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:PA METHOD 8021 - 'OLATILE ORGANICS	I-11			I-18	Units
)ichlorodifluoromethane	10	U	D2	1.0 U	µg/L
:hloromethane	20	U	D2	2.0 U	µg/L
'inyl Chloride	10	U	D2	1.0 U	µg/L
;romomethane	10	U	D2	1.0 U	µg/L
:hloroethane	20	U	D2	2.0 U	µg/L
'richlorofluoromethane	20	U	D2	2.0 U	µg/L
,1-Dichloroethene	10	U	D2	1.0 U	µg/L
lethylene Chloride	20	U	D2	2.0 U	µg/L
-1,2-Dichloroethene	10	U	D2	1.0 U	µg/L
,1-Dichloroethane	10	U	D2	1.0 U	µg/L
-1,2-Dichloroethene	10	U	D2	1.0 U	µg/L
[illegible]roform	10	U	D2	1.0 U	µg/L
,1,1-Trichloroethane	10	U	D2	1.0 U	µg/L
'arbon Tetrachloride	10	U	D2	1.0 U	µg/L
,2-Dichloroethane	10	U	D2	1.0 U	µg/L
'richloroethene	10	U	D2	**3.3**	µg/L
,2-Dichloropropane	10	U	D2	1.0 U	µg/L
romodichloromethane	10	U	D2	1.0 U	µg/L
-1,3-Dichloropropene	10	U	D2	1.0 U	µg/L
-1,3-Dichloropropene	10	U	D2	1.0 U	µg/L
,1,2-Trichloroethane	10	U	D2	1.0 U	µg/L
etrachloroethene	**130**		D2	**31**	µg/L
ibromochloromethane	10	U	D2	1.0 U	µg/L
hlorobenzene	10	U	D2	1.0 U	µg/L
romoform	10	U	D2	1.0 U	µg/L
,1,2,2-Tetrachloroethane	10	U	D2	1.0 U	µg/L
,3-Dichlorobenzene	10	U	D2	1.0 U	µg/L
,4-Dichlorobenzene	10	U	D2	1.0 U	µg/L
,2-Dichlorobenzene	10	U	D2	1.0 U	µg/L
urrogate:	**% RECOV**			**% RECOV**	**LIMITS**
romofluorobenzene	55			52	52-167
ate Analyzed	01/09/00			01/11/00	

[illegible]ompound was analyzed for but not detected to the level shown.
2[illegible] Analyte value determined from a 1:10 dilution.

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EPA METHOD 8021 - VOLATILE ORGANICS	I-25			I-14			Units
Dichlorodifluoromethane	10	U	D2	10	U	D2	µg/L
Chloromethane	20	U	D2	20	U	D2	µg/L
Vinyl Chloride	10	U	D2	10	U	D2	µg/L
Bromomethane	10	U	D2	10	U	D2	µg/L
Chloroethane	20	U	D2	20	U	D2	µg/L
Trichlorofluoromethane	20	U	D2	20	U	D2	µg/L
1,1-Dichloroethene	10	U	D2	10	U	D2	µg/L
Methylene Chloride	20	U	D2	20	U	D2	µg/L
t-1,2-Dichloroethene	10	U	D2	10	U	D2	µg/L
1,1-Dichloroethane	10	U	D2	10	U	D2	µg/L
c-1,2-Dichloroethene	10	U	D2	**15**	I	D2	µg/L
Chloroform	10	U	D2	10	U	D2	µg/L
1,1,1-Trichloroethane	10	U	D2	10	U	D2	µg/L
Carbon Tetrachloride	10	U	D2	10	U	D2	µg/L
1,2-Dichloroethane	10	U	D2	10	U	D2	µg/L
Trichloroethene	**160**		D2	**240**		D2	µg/L
1,2-Dichloropropane	10	U	D2	10	U	D2	µg/L
Bromodichloromethane	10	U	D2	10	U	D2	µg/L
c-1,3-Dichloropropene	10	U	D2	10	U	D2	µg/L
t-1,3-Dichloropropene	10	U	D2	10	U	D2	µg/L
1,1,2-Trichloroethane	10	U	D2	10	U	D2	µg/L
Tetrachloroethene	**1100**		D2	**2800**		D3	µg/L
Dibromochloromethane	10	U	D2	10	U	D2	µg/L
Chlorobenzene	10	U	D2	10	U	D2	µg/L
Bromoform	10	U	D2	10	U	D2	µg/L
1,1,2,2-Tetrachloroethane	10	U	D2	10	U	D2	µg/L
1,3-Dichlorobenzene	10	U	D2	10	U	D2	µg/L
1,4-Dichlorobenzene	10	U	D2	10	U	D2	µg/L
1,2-Dichlorobenzene	10	U	D2	10	U	D2	µg/L

Surrogate:	% RECOV	% RECOV	LIMITS
Bromofluorobenzene	57	60	52-167
Date Analyzed	01/09/00	01/09/00	

U = Compound was analyzed for but not detected to the level shown.
I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
D2 = Analyte value determined from a 1:10 dilution.
D3 = Analyte value determined from a 1:50 dilution.

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PA METHOD 8021 - OLATILE ORGANICS	I-24	I-13	Units
ichlorodifluoromethane	1.0 U	1.0 U	µg/L
hloromethane	2.0 U	2.0 U	µg/L
inyl Chloride	1.0 U	1.0 U	µg/L
romomethane	1.0 U	1.0 U	µg/L
hloroethane	2.0 U	2.0 U	µg/L
richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
ethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-1,2-Dichloroethene	**4.2**	**1.3** I	µg/L
hloroform	1.0 U	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	**12**	**1.2** I	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	**86**	**18**	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
ilorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
3-Dichlorobenzene	1.0 U	1.0 U	µg/L
4-Dichlorobenzene	1.0 U	1.0 U	µg/L
2-Dichlorobenzene	1.0 U	1.0 U	µg/L
irrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	61	65	52-167
ite Analyzed	01/10/00	01/10/00	

= Compound was analyzed for but not detected to the level shown.
nalyte detected; value is between the Method Detection Level (MDL)
nd the Practical Quantitation Level (PQL).

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EPA METHOD 8021 - VOLATILE ORGANICS	I-26	I-68	Units
Dichlorodifluoromethane	1.0 U	1.0 U	µg/L
Chloromethane	2.0 U	2.0 U	µg/L
Vinyl Chloride	1.0 U	1.0 U	µg/L
Bromomethane	1.0 U	1.0 U	µg/L
Chloroethane	2.0 U	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	1.0 U	µg/L
Methylene Chloride	2.0 U	2.0 U	µg/L
:-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	1.0 U	µg/L
:-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
C oform	1.0 U	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	1.0 U	µg/L
Trichloroethene	**1.6** I	1.0 U	µg/L
.,2-Dichloropropane	1.0 U	1.0 U	µg/L
Bromodichloromethane	1.0 U	1.0 U	µg/L
:-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
:-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
.,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
Tetrachloroethene	**71**	**1.0** I	µg/L
Dibromochloromethane	1.0 U	1.0 U	µg/L
Chlorobenzene	1.0 U	**5.2**	µg/L
Bromoform	1.0 U	1.0 U	µg/L
.,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
.,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
.,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
.,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
Surrogate:	**% RECOV**	**% RECOV**	**LIMITS**
Bromofluorobenzene	66	65	52-167
Date Analyzed	01/10/00	01/10/00	

U = Compound was analyzed for but not detected to the level shown.
I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

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EPA METHOD 8021 - VOLATILE ORGANICS	I-64			I-69			Units
Dichlorodifluoromethane	10	U	D2	10	U	D2	µg/L
Chloromethane	20	U	D2	20	U	D2	µg/L
Vinyl Chloride	10	U	D2	10	U	D2	µg/L
Bromomethane	10	U	D2	10	U	D2	µg/L
Chloroethane	20	U	D2	20	U	D2	µg/L
Trichlorofluoromethane	20	U	D2	20	U	D2	µg/L
1,1-Dichloroethene	10	U	D2	10	U	D2	µg/L
Methylene Chloride	20	U	D2	20	U	D2	µg/L
t-1,2-Dichloroethene	10	U	D2	10	U	D2	µg/L
1,1-Dichloroethane	10	U	D2	10	U	D2	µg/L
c-1,2-Dichloroethene	10	U	D2	10	U	D2	µg/L
Chloroform	10	U	D2	10	U	D2	µg/L
1,1,1-Trichloroethane	10	U	D2	10	U	D2	µg/L
Carbon Tetrachloride	10	U	D2	10	U	D2	µg/L
1,2-Dichloroethane	10	U	D2	10	U	D2	µg/L
Trichloroethene	**62**		D2	**17**	I	D2	µg/L
1,2-Dichloropropane	10	U	D2	10	U	D2	µg/L
Bromodichloromethane	10	U	D2	10	U	D2	µg/L
c-1,3-Dichloropropene	10	U	D2	10	U	D2	µg/L
t-1,3-Dichloropropene	10	U	D2	10	U	D2	µg/L
1,1,2-Trichloroethane	10	U	D2	10	U	D2	µg/L
Tetrachloroethene	**2300**		D3	**450**		D2	µg/L
Dibromochloromethane	10	U	D2	10	U	D2	µg/L
Chlorobenzene	10	U	D2	10	U	D2	µg/L
Bromoform	10	U	D2	10	U	D2	µg/L
1,1,2,2-Tetrachloroethane	10	U	D2	10	U	D2	µg/L
1,3-Dichlorobenzene	10	U	D2	10	U	D2	µg/L
1,4-Dichlorobenzene	10	U	D2	10	U	D2	µg/L
1,2-Dichlorobenzene	10	U	D2	10	U	D2	µg/L

Surrogate:	% RECOV	% RECOV	LIMITS
Bromofluorobenzene	61	66	52-167
Date Analyzed	01/10/00	01/10/00	

U = Compound was analyzed for but not detected to the level shown.
I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
D2 = Analyte value determined from a 1:10 dilution.
D3 = Analyte value determined from a 1:50 dilution.

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EPA METHOD 8021 - VOLATILE ORGANICS	I-61			I-67			Units
)ichlorodifluoromethane	10	U	D2	10	U	D2	µg/L
:hloromethane	20	U	D2	20	U	D2	µg/L
/inyl Chloride	10	U	D2	10	U	D2	µg/L
3romomethane	10	U	D2	10	U	D2	µg/L
:hloroethane	20	U	D2	20	U	D2	µg/L
'richlorofluoromethane	20	U	D2	20	U	D2	µg/L
.,1-Dichloroethene	10	U	D2	10	U	D2	µg/L
Iethylene Chloride	20	U	D2	20	U	D2	µg/L
.-1,2-Dichloroethene	10	U	D2	10	U	D2	µg/L
.,1-Dichloroethane	10	U	D2	10	U	D2	µg/L
:-1 ?-Dichloroethene	10	U	D2	10	U	D2	µg/L
:[illegible] oform	10	U	D2	10	U	D2	µg/L
.,1,1-Trichloroethane	10	U	D2	10	U	D2	µg/L
'arbon Tetrachloride	10	U	D2	10	U	D2	µg/L
,2-Dichloroethane	10	U	D2	10	U	D2	µg/L
'richloroethene	**3500**		D4	**49**		D2	µg/L
,2-Dichloropropane	10	U	D2	10	U	D2	µg/L
romodichloromethane	10	U	D2	10	U	D2	µg/L
-1,3-Dichloropropene	10	U	D2	10	U	D2	µg/L
-1,3-Dichloropropene	10	U	D2	10	U	D2	µg/L
,1,2-Trichloroethane	10	U	D2	10	U	D2	µg/L
etrachloroethene	**16000**		D4	**1800**		D3	µg/L
ibromochloromethane	10	U	D2	10	U	D2	µg/L
hlorobenzene	10	U	D2	10	U	D2	µg/L
romoform	10	U	D2	10	U	D2	µg/L
,1,2,2-Tetrachloroethane	10	U	D2	10	U	D2	µg/L
,3-Dichlorobenzene	10	U	D2	10	U	D2	µg/L
,4-Dichlorobenzene	10	U	D2	10	U	D2	µg/L
,2-Dichlorobenzene	10	U	D2	10	U	D2	µg/L

urrogate:	% RECOV	% RECOV	LIMITS
romofluorobenzene	54	64	52-167
ate Analyzed	01/10/00	01/10/00	

= Compound was analyzed for but not detected to the level shown.
2 = Analyte value determined from a 1:10 dilution.
3 Analyte value determined from a 1:50 dilution.
4 Analyte value determined from a 1:200 dilution.

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EPA METHOD 8021 - VOLATILE ORGANICS	I-65			I-62			Units
Dichlorodifluoromethane	10	U	D2	20	U	D5	µg/L
Chloromethane	20	U	D2	40	U	D5	µg/L
Vinyl Chloride	10	U	D2	20	U	D5	µg/L
Bromomethane	10	U	D2	20	U	D5	µg/L
Chloroethane	20	U	D2	40	U	D5	µg/L
Trichlorofluoromethane	20	U	D2	40	U	D5	µg/L
1,1-Dichloroethene	10	U	D2	20	U	D5	µg/L
Methylene Chloride	20	U	D2	40	U	D5	µg/L
-1,2-Dichloroethene	10	U	D2	**20**	I	D5	µg/L
,1-Dichloroethane	10	U	D2	20	U	D5	µg/L
-1,2-Dichloroethene	10	U	D2	20	U	D5	µg/L
Chloroform	10	U	D2	20	U	D5	µg/L
,1,1-Trichloroethane	10	U	D2	20	U	D5	µg/L
Carbon Tetrachloride	10	U	D2	20	U	D5	µg/L
Dichloroethane	10	U	D2	20	U	D5	µg/L
Trichloroethene	**580**		D2	**290**		D5	µg/L
,2-Dichloropropane	10	U	D2	20	U	D5	µg/L
Bromodichloromethane	10	U	D2	20	U	D5	µg/L
-1,3-Dichloropropene	10	U	D2	20	U	D5	µg/L
-1,3-Dichloropropene	10	U	D2	20	U	D5	µg/L
,1,2-Trichloroethane	10	U	D2	20	U	D5	µg/L
Tetrachloroethene	**28000**		D6	**12000**		D4	µg/L
Dibromochloromethane	10	U	D2	20	U	D5	µg/L
Chlorobenzene	10	U	D2	20	U	D5	µg/L
Bromoform	10	U	D2	20	U	D5	µg/L
,1,2,2-Tetrachloroethane	10	U	D2	20	U	D5	µg/L
,3-Dichlorobenzene	10	U	D2	20	U	D5	µg/L
,4-Dichlorobenzene	10	U	D2	20	U	D5	µg/L
,2-Dichlorobenzene	10	U	D2	20	U	D5	µg/L

Surrogate:	% RECOV	% RECOV	LIMITS
Bromofluorobenzene	51	60	52-167
Date Analyzed	01/10/00	01/11/00	

= Compound was analyzed for but not detected to the level shown.
= Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
D2 = Analyte value determined from a 1:10 dilution.
D4 = Analyte value determined from a 1:200 dilution.
D5 = Analyte value determined from a 1:20 dilution.
D6 = Analyte value determined from a 1:500 dilution.

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:PA METHOD 8021 - 'OLATILE ORGANICS	I-60			I-66			Units
ichlorodifluoromethane	5000	U	D7	20	U	D5	µg/L
hloromethane	10000	U	D7	40	U	D5	µg/L
inyl Chloride	5000	U	D7	20	U	D5	µg/L
romomethane	5000	U	D7	20	U	D5	µg/L
hloroethane	10000	U	D7	40	U	D5	µg/L
richlorofluoromethane	10000	U	D7	40	U	D5	µg/L
,1-Dichloroethene	5000	U	D7	20	U	D5	µg/L
ethylene Chloride	10000	U	D7	40	U	D5	µg/L
-1,2-Dichloroethene	5000	U	D7	20	U	D5	µg/L
,1-Dichloroethane	5000	U	D7	20	U	D5	µg/L
-1,2-Dichloroethene	5000	U	D7	20	U	D5	µg/L
[illegible]oform	5000	U	D7	20	U	D5	µg/L
,1,1-Trichloroethane	5000	U	D7	20	U	D5	µg/L
arbon Tetrachloride	5000	U	D7	20	U	D5	µg/L
,2-Dichloroethane	5000	U	D7	20	U	D5	µg/L
richloroethene	5000	U	D7	20	U	D5	µg/L
,2-Dichloropropane	5000	U	D7	20	U	D5	µg/L
romodichloromethane	5000	U	D7	20	U	D5	µg/L
-1,3-Dichloropropene	5000	U	D7	20	U	D5	µg/L
-1,3-Dichloropropene	5000	U	D7	20	U	D5	µg/L
,1,2-Trichloroethane	5000	U	D7	20	U	D5	µg/L
etrachloroethene	**130000**		D7	**1200**		D5	µg/L
ibromochloromethane	5000	U	D7	20	U	D5	µg/L
hlorobenzene	5000	U	D7	20	U	D5	µg/L
romoform	5000	U	D7	20	U	D5	µg/L
,1,2,2-Tetrachloroethane	5000	U	D7	20	U	D5	µg/L
,3-Dichlorobenzene	5000	U	D7	20	U	D5	µg/L
,4-Dichlorobenzene	5000	U	D7	20	U	D5	µg/L
,2-Dichlorobenzene	5000	U	D7	20	U	D5	µg/L

ırrogate:	% RECOV	% RECOV	LIMITS
romofluorobenzene	63	54	52-167
ate Analyzed	01/12/00	01/11/00	

= Compound was analyzed for but not detected to the level shown.
5 nalyte value determined from a 1:20 dilution.
7 Analyte value determined from a 1:5000 dilution.

ENCO LABORATORIES
REPORT # : JR1137
DATE REPORTED: January 12, 2000
REFERENCE : WO# JX185
PROJECT NAME : Site 11 Kings Bay

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-63			DUP-1			Units
Dichlorodifluoromethane	20	U	D5	20	U	D5	µg/L
Chloromethane	40	U	D5	40	U	D5	µg/L
Vinyl Chloride	20	U	D5	20	U	D5	µg/L
Bromomethane	20	U	D5	20	U	D5	µg/L
Chloroethane	40	U	D5	40	U	D5	µg/L
Trichlorofluoromethane	40	U	D5	40	U	D5	µg/L
1,1-Dichloroethene	20	U	D5	20	U	D5	µg/L
Methylene Chloride	40	U	D5	40	U	D5	µg/L
t-1,2-Dichloroethene	20	U	D5	20	U	D5	µg/L
1,1-Dichloroethane	20	U	D5	20	U	D5	µg/L
c-1,2-Dichloroethene	20	U	D5	20	U	D5	µg/L
Chloroform	20	U	D5	20	U	D5	µg/L
1,1,1-Trichloroethane	20	U	D5	20	U	D5	µg/L
Carbon Tetrachloride	20	U	D5	20	U	D5	µg/L
1,2-Dichloroethane	20	U	D5	20	U	D5	µg/L
Trichloroethene	20	U	D5	**2300**		D5	µg/L
1,2-Dichloropropane	20	U	D5	20	U	D5	µg/L
Bromodichloromethane	20	U	D5	20	U	D5	µg/L
c-1,3-Dichloropropene	20	U	D5	20	U	D5	µg/L
t-1,3-Dichloropropene	20	U	D5	20	U	D5	µg/L
1,1,2-Trichloroethane	20	U	D5	20	U	D5	µg/L
Tetrachloroethene	**1800**		D5	**14000**		D4	µg/L
Dibromochloromethane	20	U	D5	20	U	D5	µg/L
Chlorobenzene	20	U	D5	20	U	D5	µg/L
Bromoform	20	U	D5	20	U	D5	µg/L
1,1,2,2-Tetrachloroethane	20	U	D5	20	U	D5	µg/L
1,3-Dichlorobenzene	20	U	D5	20	U	D5	µg/L
1,4-Dichlorobenzene	20	U	D5	20	U	D5	µg/L
1,2-Dichlorobenzene	20	U	D5	20	U	D5	µg/L

Surrogate:	% RECOV	% RECOV	LIMITS
Bromofluorobenzene	60	53	52-167
Date Analyzed	01/11/00	01/11/00	

U = Compound was analyzed for but not detected to the level shown.
D4 = Analyte value determined from a 1:200 dilution.
D5 = Analyte value determined from a 1:20 dilution.

ENCO LABORATORIES
REPORT # : JR1137
DATE REPORTED: January 12, 2000
REFERENCE : WO# JX185
PROJECT NAME : Site 11 Kings Bay

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	LAB BLANK	LAB BLANK	Units
Dichlorodifluoromethane	1.0 U	1.0 U	µg/L
Chloromethane	2.0 U	2.0 U	µg/L
Vinyl Chloride	1.0 U	1.0 U	µg/L
Bromomethane	1.0 U	1.0 U	µg/L
Chloroethane	2.0 U	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
Methylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
oform	1.0 U	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
Trichloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
Bromodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
Tetrachloroethene	1.0 U	1.0 U	µg/L
Dibromochloromethane	1.0 U	1.0 U	µg/L
Chlorobenzene	1.0 U	1.0 U	µg/L
Bromoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
urrogate:	**% RECOV**	**% RECOV**	**LIMITS**
Bromofluorobenzene	66	55	52-167
Date Analyzed	01/09/00	01/10/00	

Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JR1137
DATE REPORTED: January 12, 2000
REFERENCE : WO# JX185
PROJECT NAME : Site 11 Kings Bay

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	LAB BLANK	LAB BLANK	Units
Dichlorodifluoromethane	1.0 U	1.0 U	µg/L
Chloromethane	2.0 U	2.0 U	µg/L
Vinyl Chloride	1.0 U	1.0 U	µg/L
Bromomethane	1.0 U	1.0 U	µg/L
Chloroethane	2.0 U	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	1.0 U	µg/L
Methylene Chloride	2.0 U	2.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	1.0 U	µg/L
c-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
Chloroform	1.0 U	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	1.0 U	µg/L
Trichloroethene	1.0 U	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	1.0 U	µg/L
Bromodichloromethane	1.0 U	1.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
Tetrachloroethene	1.0 U	1.0 U	µg/L
Dibromochloromethane	1.0 U	1.0 U	µg/L
Chlorobenzene	1.0 U	1.0 U	µg/L
Bromoform	1.0 U	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
1,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
Surrogate:	**% RECOV**	**% RECOV**	**LIMITS**
Bromofluorobenzene	66	76	52-167
Date Analyzed	01/11/00	01/12/00	

J Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JR1137
DATE REPORTED: January 12, 2000
REFERENCE : WO# JX185
PROJECT NAME : Site 11 Kings Bay

QUALITY CONTROL DATA

'arameter	% RECOVERY MS/MSD/LCS	ACCEPT LIMITS	% RPD MS/MSD	ACCEPT LIMITS
:PA Method 601/6230D/8010/8021				
(ethylene Chloride	88/ 95/ 97	51-155	8	29
'hloroform	108/101/163	63-145	7	16
'arbon Tetrachloride	100/ 90/122	64-146	10	21
'richloroethene	80/ 83/ 86	60-140	4	24
'etrachloroethene	*/ */ 96	66-146	*	21
hlorobenzene	98/ 98/ 98	70-137	<1	19

ıvironmental Conservation Laboratories Comprehensive QA Plan #910190

= MS/MSD/RPD unavailable due to high original sample concentration.
= Less Than
3 = Matrix Spike
3D = Matrix Spike Duplicate
:S = Laboratory Control Standard
?D = Relative Percent Difference

ıis report shall not be reproduced except in full, without the written
ɔprıval of the laboratory. Results for these procedures apply only to
ı mples as submitted.

CHAIN OF CUSTODY RECORD

VK1121

BECHTEL

Site Name: Site 11 Kings Bay
Delivery Order No.: 109
Cooler/Crate No.: 1

SEIR No.:
COC Number:
Lab: ENCO
Field Logbook No.:
Logbook Pg. No.:

Sampled by: M.A. Gage (Print) M.A. Gage (Sign) ____ (Print) ____ (Sign)

Legend — SAMPLE TYPE

PSB	Preservative Blank	BLS	Blind Spike
FDP	Field Duplicate	BLB	Blink Blank
ENV	Environmental	PTS	Point Source
FDB	Field Blank	FRP	Field Replicate
GEO	Geotechnical Sample	RSB	Rinsate Blank
MXD	Matrix Spike Duplicate	SPL	Split
MXS	Matrix Spike	TRP	Trip Blank

MATRIX

AIR	Air	SBS	Subsurface Soil	PTW	Potable Water
FLO	Flora	SED	Sediment	SEP	Seeps
FAU	Fauna	SFS	Surface Soil	SOL	Solid
GWT	Groundwater	SPW	Surface Water	WWT	Waste Water
LCH	Leachate	SLG	Sludge	SLW	Solid Waste
OIL	Oil	SST	Surface Water Storm Event		

QC LEVELS

S Sample Results and QC
C Reported
D Sample results, QC and raw data reported
E Sample resuts, blanks, and calibration reportred
S Screening level analysis

Station ID	BEI Sample ID	Sample Type	Matrix Code	Collection Date/Time	Container ID	Preservative	Pay Item	Parameter	Priority	QC Code
I-27	I-27	ENV	GWT	1-6-2000/0855	01,02	HCL		8021	2 DAY TAT	
I-12	I-12	↓	↓	/0930	↓	↓		↓	↓	
I-11	I-11	↓	↓	/1000	↓	↓		↓	↓	
I-18	I-18	↓	↓	/1035	↓	↓		↓	↓	
I-25	I-25	↓	↓	/1115	↓	↓		↓	↓	
I-14	I-14	↓	↓	/1150	↓	↓		↓	↓	

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR TRANSFER
M.A. Gage	J. Cuilon	1/6/2000	0900	Transfer to ENCO

COMMENTS/INSTRUCTIONS

2 Day TAT!
Most samples HOT!

CONTAMINATION	YES	NO
Radiological		✓
Chemical	✓	

Shipper: NA Delivered to ENCO

Ship to: NA

Airbill No. NA Traffic Report No. ____

This package conforms to the conditions and limitations specified in 49 CFR 173.421 for excepted radioactive material, limited quantity, n.o.s., UN2910.

01121

CHAIN OF CUSTODY RECORD (Continued)

Station ID	BEI Sample ID	Sample Type	Matrix Code	Collection Date/Time	Container ID	Preservative	Pay Item	Parameter	Priority	QC Level
I-24	I-24	ENV	GWT	1/6/2000/1215	01,02	HCL		8021	2 DAY TAT	
I-13	I-13			/1530						
I-26	I-26			/1540						
I-68	I-68			1/7/2000 0840						
I-64	I-64			1020						
I-69	I-69			1050						
I-61	I-61			1120						
I-67	I-67			1230						
I-65	I-65			1300						
I-62	I-62			1330						
I-60	I-60			1400						
I-66	I-66			1430						
~~Du~~ I-63	I-63			1500						
DuP-1	DuP-1			—						

NFS

01123

Environmental Conservation Laboratories, Inc.
4810 Executive Park Court, Suite 211
onville, Florida 32216-6069
296-3007
Fax 904 / 296-6210
www.encolabs.com

ENCO Laboratories

DHRS Certification No. E82277

LIENT : Bechtel Environmental, Inc.
DDRESS: NAS Jacksonville
P.O. Box 171
Jacksonville, FL 32215

REPORT # : JR1364
DATE SUBMITTED: January 22, 2000
DATE REPORTED : January 25, 2000

TTENTION: Mr. Mark Gage

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

WO# JX185

Kings Bay

01/22/00

#1 - I-14
#2 - I-60
#3 - I-61
#4 - I-62
#5 - I-63
#6 - I-64
#7 - I-65
#8 - I-66
#9 - I-67
#10 - I-69
#11 - DUP-1

CT MANAGER

Scott D. Martin

ENCO LABORATORIES
REPORT # : JR1364
DATE REPORTED: January 25, 2000
REFERENCE : WO# JX185
PROJECT NAME : Kings Bay

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-14			I-60			Units
Dichlorodifluoromethane	20	U	D1	20	U	D1	µg/L
Chloromethane	40	U	D1	40	U	D1	µg/L
Vinyl Chloride	20	U	D1	20	U	D1	µg/L
Bromomethane	20	U	D1	20	U	D1	µg/L
Chloroethane	40	U	D1	40	U	D1	µg/L
Trichlorofluoromethane	40	U	D1	40	U	D1	µg/L
,1-Dichloroethene	20	U	D1	20	U	D1	µg/L
Methylene Chloride	40	U	D1	40	U	D1	µg/L
-1,2-Dichloroethene	20	U	D1	20	U	D1	µg/L
,1-Dichloroethane	20	U	D1	20	U	D1	µg/L
-1,2-Dichloroethene	20	U	D1	**88**		D1	µg/L
Chloroform	20	U	D1	**34**	I	D1	µg/L
-Trichloroethane	20	U	D1	20	U	D1	µg/L
n Tetrachloride	20	U	D1	20	U	D1	µg/L
,2-Dichloroethane	20	U	D1	20	U	D1	µg/L
Trichloroethene	20	U	D1	20	U	D1	µg/L
,2-Dichloropropane	20	U	D1	20	U	D1	µg/L
romodichloromethane	20	U	D1	20	U	D1	µg/L
-1,3-Dichloropropene	20	U	D1	20	U	D1	µg/L
-1,3-Dichloropropene	20	U	D1	20	U	D1	µg/L
,1,2-Trichloroethane	20	U	D1	20	U	D1	µg/L
etrachloroethene	**200**		D1	**20000**		D2	µg/L
ibromochloromethane	20	U	D1	20	U	D1	µg/L
hlorobenzene	20	U	D1	20	U	D1	µg/L
romoform	20	U	D1	20	U	D1	µg/L
,1,2,2-Tetrachloroethane	20	U	D1	20	U	D1	µg/L
,3-Dichlorobenzene	20	U	D1	20	U	D1	µg/L
,4-Dichlorobenzene	20	U	D1	20	U	D1	µg/L
,2-Dichlorobenzene	20	U	D1	20	U	D1	µg/L

urrogate:	% RECOV	% RECOV	LIMITS
romofluorobenzene	90	66	52-167
ate Analyzed	01/22/00	01/22/00	

= Compound was analyzed for but not detected to the level shown.
= Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
1 Analyte value determined from a 1:20 dilution.
2 Analyte value determined from a 1:500 dilution.

ENCO LABORATORIES
REPORT # : JR1364
DATE REPORTED: January 25, 2000
REFERENCE : WO# JX185
PROJECT NAME : Kings Bay

RESULTS OF ANALYSIS

:PA METHOD 8021 - 'OLATILE ORGANICS	I-61			I-62			Units
)ichlorodifluoromethane	20	U	D1	1.0	U		µg/L
:hloromethane	40	U	D1	2.0	U		µg/L
'inyl Chloride	20	U	D1	1.0	U		µg/L
3romomethane	20	U	D1	1.0	U		µg/L
:hloroethane	40	U	D1	2.0	U		µg/L
'richlorofluoromethane	40	U	D1	2.0	U		µg/L
,1-Dichloroethene	20	U	D1	1.0	U		µg/L
lethylene Chloride	40	U	D1	2.0	U		µg/L
-1,2-Dichloroethene	20	U	D1	1.0	U		µg/L
,1-Dichloroethane	20	U	D1	1.0	U		µg/L
-2-Dichloroethene	20	U	D1	1.0	U		µg/L
roform	20	U	D1	**90**			µg/L
,1,1-Trichloroethane	20	U	D1	1.0	U		µg/L
'arbon Tetrachloride	20	U	D1	1.0	U		µg/L
,2-Dichloroethane	20	U	D1	1.0	U		µg/L
'richloroethene	20	U	D1	1.0	U		µg/L
,2-Dichloropropane	20	U	D1	1.0	U		µg/L
romodichloromethane	20	U	D1	1.0	U		µg/L
-1,3-Dichloropropene	20	U	D1	1.0	U		µg/L
-1,3-Dichloropropene	20	U	D1	1.0	U		µg/L
,1,2-Trichloroethane	20	U	D1	1.0	U		µg/L
'etrachloroethene	**290**		D1	**950**		D1	µg/L
ibromochloromethane	20	U	D1	1.0	U		µg/L
'hlorobenzene	20	U	D1	1.0	U		µg/L
romoform	20	U	D1	1.0	U		µg/L
,1,2,2-Tetrachloroethane	20	U	D1	1.0	U		µg/L
,3-Dichlorobenzene	20	U	D1	1.0	U		µg/L
,4-Dichlorobenzene	20	U	D1	1.0	U		µg/L
,2-Dichlorobenzene	20	U	D1	1.0	U		µg/L
urrogate:	**% RECOV**			**% RECOV**			**LIMITS**
romofluorobenzene	87			66			52-167
ate Analyzed	01/22/00			01/22/00			

Compound was analyzed for but not detected to the level shown.
1 = Analyte value determined from a 1:20 dilution.

ENCO LABORATORIES
REPORT # : JR1364
DATE REPORTED: January 25, 2000
REFERENCE : WO# JX185
PROJECT NAME : Kings Bay

RESULTS OF ANALYSIS

:PA METHOD 8021 - 'OLATILE ORGANICS	I-63	I-64	Units
)ichlorodifluoromethane	1.0 U	1.0 U	µg/L
:hloromethane	**3.0** I	**6.0**	µg/L
'inyl Chloride	1.0 U	1.0 U	µg/L
;romomethane	1.0 U	1.0 U	µg/L
:hloroethane	2.0 U	2.0 U	µg/L
'richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
:ethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
[illegible]oform	1.0 U	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	**20**	**35**	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
hlorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
urrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	67	56	52-167
ate Analyzed	01/23/00	01/23/00	

= Compound was analyzed for but not detected to the level shown.
[illegible]alyte detected; value is between the Method Detection Level (MDL) [illegible]nd the Practical Quantitation Level (PQL).

ENCO LABORATORIES
REPORT # : JR1364
DATE REPORTED: January 25, 2000
REFERENCE : WO# JX185
PROJECT NAME : Kings Bay

RESULTS OF ANALYSIS

:PA METHOD 8021 - 'OLATILE ORGANICS	I-65	I-66	Units
)ichlorodifluoromethane	1.0 U	1.0 U	µg/L
:hloromethane	**3.0** I	**10**	µg/L
'inyl Chloride	1.0 U	1.0 U	µg/L
romomethane	1.0 U	1.0 U	µg/L
'hloroethane	2.0 U	2.0 U	µg/L
'richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
'ethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
H[illegible]oform	**6.2**	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	**28**	**1.5** I	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
hlorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
urrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	53	70	52-167
ate Analyzed	01/23/00	01/23/00	

= Compound was analyzed for but not detected to the level shown.
[illegible]nalyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

ENCO LABORATORIES
REPORT # : JR1364
DATE REPORTED: January 25, 2000
REFERENCE : WO# JX185
PROJECT NAME : Kings Bay

RESULTS OF ANALYSIS

PA METHOD 8021 - OLATILE ORGANICS	I-67	I-69	Units
ichlorodifluoromethane	1.0 U	1.0 U	µg/L
hloromethane	2.0 U	2.0 U	µg/L
inyl Chloride	1.0 U	1.0 U	µg/L
romomethane	1.0 U	1.0 U	µg/L
hloroethane	2.0 U	2.0 U	µg/L
richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
ethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
h form	1.0 U	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	**2.9**	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	**28**	**36**	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
hlorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
rrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	78	68	52-167
ate Analyzed	01/23/00	01/23/00	

ompound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JR1364
DATE REPORTED: January 25, 2000
REFERENCE : WO# JX185
PROJECT NAME : Kings Bay

RESULTS OF ANALYSIS

PA METHOD 8021 - OLATILE ORGANICS	DUP-1			LAB BLANK	Units
ichlorodifluoromethane	20	U	D1	1.0 U	µg/L
hloromethane	40	U	D1	2.0 U	µg/L
inyl Chloride	20	U	D1	1.0 U	µg/L
romomethane	20	U	D1	1.0 U	µg/L
hloroethane	40	U	D1	2.0 U	µg/L
richlorofluoromethane	40	U	D1	2.0 U	µg/L
,1-Dichloroethene	20	U	D1	1.0 U	µg/L
ethylene Chloride	40	U	D1	2.0 U	µg/L
-1,2-Dichloroethene	20	U	D1	1.0 U	µg/L
,1-Dichloroethane	20	U	D1	1.0 U	µg/L
-1,2-Dichloroethene	**110**		D1	1.0 U	µg/L
h[illegible]roform	**52**		D1	1.0 U	µg/L
[illegible]-Trichloroethane	20	U	D1	1.0 U	µg/L
arbon Tetrachloride	20	U	D1	1.0 U	µg/L
,2-Dichloroethane	20	U	D1	1.0 U	µg/L
richloroethene	**40**	I	D1	1.0 U	µg/L
,2-Dichloropropane	20	U	D1	1.0 U	µg/L
romodichloromethane	20	U	D1	1.0 U	µg/L
-1,3-Dichloropropene	20	U	D1	1.0 U	µg/L
-1,3-Dichloropropene	20	U	D1	1.0 U	µg/L
,1,2-Trichloroethane	20	U	D1	1.0 U	µg/L
etrachloroethene	**27000**		D2	1.0 U	µg/L
ibromochloromethane	20	U	D1	1.0 U	µg/L
hlorobenzene	20	U	D1	1.0 U	µg/L
romoform	20	U	D1	1.0 U	µg/L
1,2,2-Tetrachloroethane	20	U	D1	1.0 U	µg/L
,3-Dichlorobenzene	20	U	D1	1.0 U	µg/L
,4-Dichlorobenzene	20	U	D1	1.0 U	µg/L
,2-Dichlorobenzene	20	U	D1	1.0 U	µg/L

urrogate:	% RECOV	% RECOV	LIMITS
romofluorobenzene	89	84	52-167
ate Analyzed	01/23/00	01/22/00	

= Compound was analyzed for but not detected to the level shown.
= Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
[illegible] Analyte value determined from a 1:20 dilution.
2 = Analyte value determined from a 1:500 dilution.

ENCO LABORATORIES
REPORT # : JR1364
DATE REPORTED: January 25, 2000
REFERENCE : WO# JX185
PROJECT NAME : Kings Bay

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	LAB BLANK	LAB BLANK	Units
Dichlorodifluoromethane	1.0 U	1.0 U	µg/L
Chloromethane	2.0 U	2.0 U	µg/L
Vinyl Chloride	1.0 U	1.0 U	µg/L
Bromomethane	1.0 U	1.0 U	µg/L
Chloroethane	2.0 U	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
Methylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
Chloroform	1.0 U	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
Trichloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
Bromodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
Tetrachloroethene	1.0 U	1.0 U	µg/L
Dibromochloromethane	1.0 U	1.0 U	µg/L
Chlorobenzene	1.0 U	1.0 U	µg/L
Bromoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
Surrogate:	**% RECOV**	**% RECOV**	**LIMITS**
Bromofluorobenzene	84	77	52-167
Date Analyzed	01/22/00	01/23/00	

Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JR1364
DATE REPORTED: January 25, 2000
REFERENCE : WO# JX185
PROJECT NAME : Kings Bay

QUALITY CONTROL DATA

'arameter	% RECOVERY MS/MSD/LCS	ACCEPT LIMITS	% RPD MS/MSD	ACCEPT LIMITS
:PA Method 601/6230D/8010/8021 (I-14,I-60,I-61)				
lethylene Chloride	91/ 94/ 96	51-155	3	29
'hloroform	88/ 94/ 91	63-145	6	16
'arbon Tetrachloride	92/106/100	64-146	14	21
'richloroethene	97/105/ 98	60-140	8	24
'etrachloroethene	94/ 98/ 99	66-146	4	21
'hlorobenzene	92/ 93/ 93	70-137	1	19
PA Method 601/6230D/8010/8021 (I-62,I-63,I-64,I-65,I-66,I-67,I-69,DUP-1)				
ethylene Chloride	84/106/ 76	51-155	23	29
hloroform	92/ 99/ 80	63-145	7	16
arbon Tetrachloride	118/106/ 80	64-146	11	21
richloroethene	122/114/ 77	60-140	7	24
etrachloroethene	111/102/ 75	66-146	8	21
hlorobenzene	83/ 94/ 74	70-137	12	19

nvironmental Conservation Laboratories Comprehensive QA Plan #910190

= Less Than
S = Matrix Spike
SD = Matrix Spike Duplicate
CS = Laboratory Control Standard
PD = Relative Percent Difference

his report shall not be reproduced except in full, without the written approval of the laboratory. Results for these procedures apply only to the samples as submitted.

CHAIN OF CUSTODY RECORD

BECHTEL

Site Name: Site 11 Kings Bay
Delivery Order No.:
Cooler/Crate No.:

SEIR No.:
COC Number:
Lab: ENCO
Field Logbook No.:
Logbook Pg. No.:

Sampled by: M.A. Gage (Print) — M.A. Gage (Sign) — (Print) — (Sign)

Legend — SAMPLE TYPE

PSB	Preservative Blank	BLS	Blind Spike
FDP	Field Duplicate	BLB	Blink Blank
ENV	Environmental	PTS	Point Source
FDB	Field Blank	FRP	Field Replicate
GEO	Geotechnical Sample	RSB	Rinsate Blank
MXD	Matrix Spike Duplicate	SPL	Split
MXS	Matrix Spike	TRP	Trip Blank

MATRIX

AIR	Air	SBS	Subsurface Soil	PTW	Potable Water
FLO	Flora	SED	Sediment	SEP	Seeps
FAU	Fauna	SFS	Surface Soil	SOL	Solid
GWT	Groundwater	SPW	Surface Water	WWT	Waste Water
LCH	Leachate	SLG	Sludge	SLW	Solid Waste
OIL	Oil	SST	Surface Water Storm Event		

QC LEVELS

S Sample Results and QC
C Reported
D Sample results, QC and raw data reported
E Sample resuts, blanks, and calibration reportred
S Screening level analysis

Station ID	BEI Sample ID	Sample Type	Matrix Code	Collection Date/Time	Container ID	Preservative	Pay Item	Parameter	Priority	QC Code
I-14	I-14	ENV	GWT	1-22-00/1130	01, 02	HCL		8021	24 Hr TAT	
I-60	I-60	↓	↓	1045	↓	↓		↓	↓	
I-61	I-61	↓	↓	1200	↓	↓		↓	↓	
I-62	I-62	↓	↓	1010	↓	↓		↓	↓	
I-63	I-63	↓	↓	1330	↓	↓		↓	↓	
I-64	I-64	↓	↓	1230	↓	↓		↓	↓	

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR TRANSFER
M.A. Gage	J. Wilson	1/22/00	1500	Transfer To ENCO

COMMENTS/INSTRUCTIONS
Below 100 ppb PCE

CONTAMINATION	YES	NO
Radiological		✓
Chemical	✓	

Shipper: NA
Ship to: NA

Airbill No. NA Traffic Report No. NA

This package conforms to the conditions and limitations specified in 49 CFR 173.421 for excepted radioactive material, limited quantity, n.o.s., UN2910.

CHAIN OF CUSTODY RECORD (Continued)

Station ID	BEI Sample ID	Sample Type	Matrix Code	Collection Date/Time	Container ID	Preservative	Pay Item	Parameter	Priority	QC Level
I-65	I-65	ENV	GWT	1-22-00/1015	01,02	HCL		8021	24hr TAT	
I-66	I-66	↓	↓	0835	↓	↓		↓	↓	
I-67	I-67	↓	↓	1050	↓	↓		↓	↓	
I-69	I-69	↓	↓	1300	↓	↓		↓	↓	
Dup-1	Dup-1	↓	↓	—	↓	↓		↓	↓	

MFS

017095

LIENT : Bechtel Environmental, Inc.
DDRESS: NAS Jacksonville
P.O. Box 171
Jacksonville, FL 32215

REPORT # : JR1511
DATE SUBMITTED: February 3, 2000
DATE REPORTED : February 11, 2000

ITENTION: Mr. Mark Gage

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

Site 11 Kings Bay

#1	- I-60	@ 12:00	(02/02/00)
#2	- I-61	@ 15:25	(02/02/00)
#3	- I-62	@ 13:45	(02/02/00)
#4	- I-63	@ 11:30	(02/02/00)
#5	- I-64	@ 16:00	(02/02/00)
#6	- I-65	@ 14:20	(02/02/00)
#7	- I-66	@ 13:15	(02/02/00)
#8	- I-67	@ 14:50	(02/02/00)
#9	- I-68	@ 17:00	(02/02/00)
#10	- I-69	@ 16:30	(02/02/00)
#11	- DUP-01		(02/02/00)
#12	- I-11	@ 11:15	(02/03/00)
#13	- I-12	@ 10:45	(02/03/00)
#14	- I-13	@ 09:45	(02/03/00)
#15	- I-14	@ 07:50	(02/03/00)

<<<CONTINUED>>>

Environmental Conservation Laboratories, Inc.
4810 Executive Park Court, Suite 211
Jacksonville, Florida 32216-6069
904 / 296-3007
Fax 904 / 296-6210
www.encolabs.com

ENCO Laboratories

DHRS Certification No. E82277

CLIENT : Bechtel Environmental, Inc.
ADDRESS: NAS Jacksonville
P.O. Box 171
Jacksonville, FL 32215

REPORT # : JR1511
DATE SUBMITTED: February 3, 2000
DATE REPORTED : February 11, 2000

ATTENTION: Mr. Mark Gage

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

Site 11 Kings Bay

#16	- I 24		(02/03/00)
#17	- I-25	@ 08:45	(02/03/00)
#18	- I-26	@ 09:15	(02/03/00)
#19	- I-27	@ 10:15	(02/03/00)
#20	- I-18	@ 11:50	(02/03/00)

PROJECT MANAGER Scott D Martin
Scott D. Martin

017095

ENCO LABORATORIES
REPORT # : JR1511
DATE REPORTED: February 11, 2000
REFERENCE : WO# JX179
PROJECT NAME : Site 11 Kings Bay

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-60			I-61	Units
Dichlorodifluoromethane	10	U	D1	1.0 U	µg/L
Chloromethane	20	U	D1	2.0 U	µg/L
Vinyl Chloride	10	U	D1	1.0 U	µg/L
Bromomethane	10	U	D1	1.0 U	µg/L
Chloroethane	20	U	D1	2.0 U	µg/L
Trichlorofluoromethane,	20	U	D1	2.0 U	µg/L
,1-Dichloroethene	10	U	D1	1.0 U	µg/L
Methylene Chloride	20	U	D1	2.0 U	µg/L
-1,2-Dichloroethene	10	U	D1	1.0 U	µg/L
,1-Dichloroethane	10	U	D1	1.0 U	µg/L
-Dichloroethene	**26**		D1	1.0 U	µg/L
Chloroform	**45**		D1	**3.0**	µg/L
,1,1-Trichloroethane	10	U	D1	1.0 U	µg/L
arbon Tetrachloride	10	U	D1	1.0 U	µg/L
,2-Dichloroethane	10	U	D1	1.0 U	µg/L
richloroethene	10	U	D1	1.0 U	µg/L
,2-Dichloropropane	10	U	D1	1.0 U	µg/L
romodichloromethane	10	U	D1	1.0 U	µg/L
-1,3-Dichloropropene	10	U	D1	1.0 U	µg/L
-1,3-Dichloropropene	10	U	D1	1.0 U	µg/L
,1,2-Trichloroethane	10	U	D1	1.0 U	µg/L
etrachloroethene	**660**		D1	**26**	µg/L
ibromochloromethane	10	U	D1	1.0 U	µg/L
hlorobenzene	10	U	D1	1.0 U	µg/L
romoform	10	U	D1	1.0 U	µg/L
,1,2,2-Tetrachloroethane	10	U	D1	1.0 U	µg/L
,3-Dichlorobenzene	10	U	D1	1.0 U	µg/L
,4-Dichlorobenzene	10	U	D1	1.0 U	µg/L
,2-Dichlorobenzene	10	U	D1	1.0 U	µg/L
urrogate:	**% RECOV**			**% RECOV**	**LIMITS**
romofluorobenzene	73			74	52-167
ate Analyzed	02/09/00			02/12/00	

ompound was analyzed for but not detected to the level shown.
1 = Analyte value determined from a 1:10 dilution.

ENCO LABORATORIES
REPORT # : JR1511
DATE REPORTED: February 11, 2000
REFERENCE : WO# JX179
PROJECT NAME : Site 11 Kings Bay

RESULTS OF ANALYSIS

PA METHOD 8021 - OLATILE ORGANICS	I-62			I-63		Units
ichlorodifluoromethane	10	U	D1	1.0	U	µg/L
hloromethane	20	U	D1	2.0	U	µg/L
inyl Chloride	10	U	D1	1.0	U	µg/L
romomethane	10	U	D1	1.0	U	µg/L
hloroethane	20	U	D1	2.0	U	µg/L
richlorofluoromethane	20	U	D1	2.0	U	µg/L
,1-Dichloroethene	10	U	D1	1.0	U	µg/L
ethylene Chloride	**24**	I	D1	**2.0**	I	µg/L
-1,2-Dichloroethene	10	U	D1	1.0	U	µg/L
,1-Dichloroethane	10	U	D1	1.0	U	µg/L
-1,2-Dichloroethene	10	U	D1	1.0	U	µg/L
h[illegible]oform	**21**		D1	**4.7**		µg/L
,1,1-Trichloroethane	10	U	D1	1.0	U	µg/L
arbon Tetrachloride	10	U	D1	1.0	U	µg/L
,2-Dichloroethane	10	U	D1	1.0	U	µg/L
richloroethene	10	U	D1	1.0	U	µg/L
,2-Dichloropropane	10	U	D1	1.0	U	µg/L
romodichloromethane	10	U	D1	1.0	U	µg/L
-1,3-Dichloropropene	10	U	D1	1.0	U	µg/L
-1,3-Dichloropropene	10	U	D1	1.0	U	µg/L
,1,2-Trichloroethane	10	U	D1	1.0	U	µg/L
etrachloroethene	**610**		D1	**40**		µg/L
ibromochloromethane	10	U	D1	1.0	U	µg/L
hlorobenzene	10	U	D1	1.0	U	µg/L
romoform	10	U	D1	1.0	U	µg/L
,1,2,2-Tetrachloroethane	10	U	D1	1.0	U	µg/L
,3-Dichlorobenzene	10	U	D1	1.0	U	µg/L
,4-Dichlorobenzene	10	U	D1	1.0	U	µg/L
,2-Dichlorobenzene	10	U	D1	1.0	U	µg/L
urrogate:	**% RECOV**			**% RECOV**		**LIMITS**
romofluorobenzene	75			61		52-167
ate Analyzed	02/12/00			02/12/00		

= Compound was analyzed for but not detected to the level shown.
[illegible]Analyte detected; value is between the Method Detection Level (MDL) [illegible]and the Practical Quantitation Level (PQL).
1 = Analyte value determined from a 1:10 dilution.

ENCO LABORATORIES
REPORT # : JR1511
DATE REPORTED: February 11, 2000
REFERENCE : WO# JX179
PROJECT NAME : Site 11 Kings Bay

RESULTS OF ANALYSIS

PA METHOD 8021 - OLATILE ORGANICS	I-64	I-65	Units
ichlorodifluoromethane	1.0 U	1.0 U	µg/L
hloromethane	2.0 U	2.0 U	µg/L
inyl Chloride	1.0 U	1.0 U	µg/L
romomethane	1.0 U	1.0 U	µg/L
hloroethane	2.0 U	2.0 U	µg/L
richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
ethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-1 Dichloroethene	1.0 U	1.0 U	µg/L
oform	**2.9**	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	**12**	**4.5**	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
ilorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
irrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	65	86	52-167
ate Analyzed	02/08/00	02/06/00	

= Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JR1511
DATE REPORTED: February 11, 2000
REFERENCE : WO# JX179
PROJECT NAME : Site 11 Kings Bay

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-66			I-67			Units
Dichlorodifluoromethane	5.0	U	D2	5.0	U	D2	µg/L
Chloromethane	10	U	D2	10	U	D2	µg/L
Vinyl Chloride	5.0	U	D2	5.0	U	D2	µg/L
Bromomethane	5.0	U	D2	5.0	U	D2	µg/L
Chloroethane	10	U	D2	10	U	D2	µg/L
Trichlorofluoromethane	10	U	D2	10	U	D2	µg/L
1,1-Dichloroethene	5.0	U	D2	5.0	U	D2	µg/L
Methylene Chloride	10	U	D2	10	U	D2	µg/L
t-1,2-Dichloroethene	5.0	U	D2	5.0	U	D2	µg/L
1,1-Dichloroethane	5.0	U	D2	5.0	U	D2	µg/L
c-1,2-Dichloroethene	5.0	U	D2	5.0	U	D2	µg/L
Chloroform	5.0	U	D2	5.0	U	D2	µg/L
1,1,1-Trichloroethane	5.0	U	D2	5.0	U	D2	µg/L
Carbon Tetrachloride	5.0	U	D2	5.0	U	D2	µg/L
1,2-Dichloroethane	5.0	U	D2	5.0	U	D2	µg/L
Trichloroethene	5.0	U	D2	**28**		D2	µg/L
1,2-Dichloropropane	5.0	U	D2	5.0	U	D2	µg/L
Bromodichloromethane	5.0	U	D2	5.0	U	D2	µg/L
c-1,3-Dichloropropene	5.0	U	D2	5.0	U	D2	µg/L
t-1,3-Dichloropropene	5.0	U	D2	5.0	U	D2	µg/L
1,1,2-Trichloroethane	5.0	U	D2	5.0	U	D2	µg/L
Tetrachloroethene	**120**		D2	**220**		D2	µg/L
Dibromochloromethane	5.0	U	D2	5.0	U	D2	µg/L
Chlorobenzene	5.0	U	D2	5.0	U	D2	µg/L
Bromoform	5.0	U	D2	5.0	U	D2	µg/L
1,1,2,2-Tetrachloroethane	5.0	U	D2	5.0	U	D2	µg/L
1,3-Dichlorobenzene	5.0	U	D2	5.0	U	D2	µg/L
1,4-Dichlorobenzene	5.0	U	D2	5.0	U	D2	µg/L
1,2-Dichlorobenzene	5.0	U	D2	5.0	U	D2	µg/L

Surrogate:	% RECOV	% RECOV	LIMITS
Bromofluorobenzene	69	68	52-167
Date Analyzed	02/08/00	02/08/00	

U = Compound was analyzed for but not detected to the level shown.
D2 = Analyte value determined from a 1:5 dilution.

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:PA METHOD 8021 - 'OLATILE ORGANICS	I-68		I-69	Units
)ichlorodifluoromethane	1.0 U		1.0 U	µg/L
:hloromethane	2.0 U		2.0 U	µg/L
'inyl Chloride	1.0 U		1.0 U	µg/L
:romomethane	1.0 U		1.0 U	µg/L
'hloroethane	2.0 U		2.0 U	µg/L
'richlorofluoromethane	2.0 U		2.0 U	µg/L
,1-Dichloroethene	1.0 U		1.0 U	µg/L
:ethylene Chloride	2.0 U		2.0 U	µg/L
-1,2-Dichloroethene	1.0 U		1.0 U	µg/L
,1-Dichloroethane	1.0 U		1.0 U	µg/L
-1,2-Dichloroethene	**1.4** I		1.0 U	µg/L
h[illegible]oform	1.0 U		1.0 U	µg/L
,[illegible]-Trichloroethane	1.0 U		1.0 U	µg/L
arbon Tetrachloride	1.0 U		1.0 U	µg/L
,2-Dichloroethane	1.0 U		1.0 U	µg/L
richloroethene	**9.2**		1.0 U	µg/L
,2-Dichloropropane	1.0 U		1.0 U	µg/L
romodichloromethane	1.0 U		1.0 U	µg/L
-1,3-Dichloropropene	1.0 U		1.0 U	µg/L
-1,3-Dichloropropene	1.0 U		1.0 U	µg/L
,1,2-Trichloroethane	1.0 U		1.0 U	µg/L
etrachloroethene	**730**	D1	**31**	µg/L
ibromochloromethane	1.0 U		1.0 U	µg/L
hlorobenzene	**2.0**		1.0 U	µg/L
romoform	1.0 U		1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U		1.0 U	µg/L
,3-Dichlorobenzene	1.0 U		1.0 U	µg/L
,4-Dichlorobenzene	**2.6** I		1.0 U	µg/L
,2-Dichlorobenzene	1.0 U		1.0 U	µg/L
urrogate:	**% RECOV**		**% RECOV**	**LIMITS**
romofluorobenzene	81		68	52-167
ate Analyzed	02/05/00		02/08/00	

= Compound was analyzed for but not detected to the level shown.
[illegible]alyte detected; value is between the Method Detection Level (MDL) [illegible]d the Practical Quantitation Level (PQL).
1 = Analyte value determined from a 1:10 dilution.

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PA METHOD 8021 - OLATILE ORGANICS	DUP-01		I-11	Units
ichlorodifluoromethane	1.0 U		1.0 U	µg/L
hloromethane	2.0 U		2.0 U	µg/L
inyl Chloride	1.0 I		1.0 U	µg/L
romomethane	1.0 U		1.0 U	µg/L
hloroethane	2.0 U		2.0 U	µg/L
richlorofluoromethane	2.0 U		2.0 U	µg/L
,1-Dichloroethene	1.0 U		1.0 U	µg/L
ethylene Chloride	2.0 U		2.0 U	µg/L
-1,2-Dichloroethene	1.0 U		1.0 U	µg/L
,1-Dichloroethane	4.4		1.1 I	µg/L
-1,2-Dichloroethene	23		1.4 I	µg/L
hloroform	37		1.0 U	µg/L
-Trichloroethane	1.0 U		1.0 U	µg/L
arbon Tetrachloride	1.0 U		1.0 U	µg/L
2-Dichloroethane	1.0 U		1.0 U	µg/L
richloroethene	2.8 I		1.0 U	µg/L
2-Dichloropropane	1.0 U		1.0 U	µg/L
romodichloromethane	1.0 U		1.0 U	µg/L
-1,3-Dichloropropene	1.0 U		1.0 U	µg/L
-1,3-Dichloropropene	1.0 U		1.0 U	µg/L
1,2-Trichloroethane	1.0 U		1.0 U	µg/L
etrachloroethene	670	D1	11	µg/L
bromochloromethane	1.0 U		1.0 U	µg/L
lorobenzene	1.0 U		1.0 U	µg/L
romoform	1.0 U		1.0 U	µg/L
1,2,2-Tetrachloroethane	1.0 U		1.0 U	µg/L
3-Dichlorobenzene	1.0 U		1.0 U	µg/L
4-Dichlorobenzene	1.0 U		1.0 U	µg/L
2-Dichlorobenzene	1.0 U		1.0 U	µg/L
rrogate:	**% RECOV**		**% RECOV**	**LIMITS**
romofluorobenzene	84		59	52-167
te Analyzed	02/05/00		02/09/00	

= Compound was analyzed for but not detected to the level shown.
= Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
= Analyte value determined from a 1:10 dilution.

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EPA METHOD 8021 - VOLATILE ORGANICS	I-12		I-13		Units
Dichlorodifluoromethane	1.0 U		1.0 U		µg/L
Chloromethane	2.0 U		2.0 U		µg/L
Vinyl Chloride	1.0 U		1.0 U		µg/L
Bromomethane	1.0 U		1.0 U		µg/L
Chloroethane	2.0 U		2.0 U		µg/L
Trichlorofluoromethane	2.0 U		2.0 U		µg/L
1,1-Dichloroethene	1.0 U		1.0 U		µg/L
Methylene Chloride	2.0 U		2.0 U		µg/L
t-1,2-Dichloroethene	1.0 U		1.0 U		µg/L
1,1-Dichloroethane	1.0 U		1.0 U		µg/L
c-1,2-Dichloroethene	1.0 U		**1.0** I		µg/L
Chloroform	**2.1**		1.0 U		µg/L
1,1,1-Trichloroethane	1.0 U		1.0 U		µg/L
Carbon Tetrachloride	1.0 U		1.0 U		µg/L
1,2-Dichloroethane	1.0 U		1.0 U		µg/L
Trichloroethene	**4.2**		**3.2**		µg/L
1,2-Dichloropropane	1.0 U		1.0 U		µg/L
Bromodichloromethane	1.0 U		1.0 U		µg/L
c-1,3-Dichloropropene	1.0 U		1.0 U		µg/L
t-1,3-Dichloropropene	1.0 U		1.0 U		µg/L
1,1,2-Trichloroethane	1.0 U		1.0 U		µg/L
Tetrachloroethene	**150**	D2	**370**	D2	µg/L
Dibromochloromethane	1.0 U		1.0 U		µg/L
Chlorobenzene	1.0 U		1.0 U		µg/L
Bromoform	1.0 U		1.0 U		µg/L
1,1,2,2-Tetrachloroethane	1.0 U		1.0 U		µg/L
1,3-Dichlorobenzene	1.0 U		1.0 U		µg/L
1,4-Dichlorobenzene	1.0 U		**2.4** I		µg/L
1,2-Dichlorobenzene	1.0 U		1.0 U		µg/L
Surrogate:	**% RECOV**		**% RECOV**		**LIMITS**
Bromofluorobenzene	79		79		52-167
Date Analyzed	02/06/00		02/06/00		

U = Compound was analyzed for but not detected to the level shown.
I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
D2 = Analyte value determined from a 1:5 dilution.

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PA METHOD 8021 - OLATILE ORGANICS	I-14	I-24	Units
ichlorodifluoromethane	1.0 U	1.0 U	µg/L
hloromethane	**4.0** I	2.0 U	µg/L
inyl Chloride	1.0 U	1.0 U	µg/L
romomethane	1.0 U	1.0 U	µg/L
hloroethane	2.0 U	2.0 U	µg/L
richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
ethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
oform	1.0 U	**1.6** I	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	1.0 U	**4.4**	µg/L
.2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	**7.4**	**71**	µg/L
.bromochloromethane	1.0 U	1.0 U	µg/L
ilorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
3-Dichlorobenzene	1.0 U	1.0 U	µg/L
4-Dichlorobenzene	1.0 U	1.0 U	µg/L
2-Dichlorobenzene	1.0 U	1.0 U	µg/L
irrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	69	89	52-167
ite Analyzed	02/09/00	02/06/00	

= Compound was analyzed for but not detected to the level shown.
nalyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

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EPA METHOD 8021 - VOLATILE ORGANICS	I-25			I-26		Units
Dichlorodifluoromethane	10	U	D1	1.0	U	µg/L
Chloromethane	20	U	D1	2.0	U	µg/L
Vinyl Chloride	10	U	D1	1.0	U	µg/L
Bromomethane	10	U	D1	1.0	U	µg/L
Chloroethane	20	U	D1	2.0	U	µg/L
Trichlorofluoromethane	20	U	D1	2.0	U	µg/L
1,1-Dichloroethene	10	U	D1	1.0	U	µg/L
Methylene Chloride	20	U	D1	2.0	U	µg/L
:-1,2-Dichloroethene	10	U	D1	1.0	U	µg/L
1,1-Dichloroethane	10	U	D1	1.0	U	µg/L
:-1,2-Dichloroethene	10	U	D1	1.0	U	µg/L
Ch[illegible]oform	**17**	I	D1	**4.0**		µg/L
1[illegible]-Trichloroethane	10	U	D1	1.0	U	µg/L
Carbon Tetrachloride	10	U	D1	1.0	U	µg/L
1,2-Dichloroethane	10	U	D1	1.0	U	µg/L
Trichloroethene	10	U	D1	1.0	U	µg/L
1,2-Dichloropropane	10	U	D1	1.0	U	µg/L
Bromodichloromethane	10	U	D1	**1.1**	I	µg/L
:-1,3-Dichloropropene	10	U	D1	1.0	U	µg/L
:-1,3-Dichloropropene	10	U	D1	1.0	U	µg/L
,1,2-Trichloroethane	10	U	D1	1.0	U	µg/L
Tetrachloroethene	**1700**		D3	**100**		µg/L
Dibromochloromethane	10	U	D1	1.0	U	µg/L
Chlorobenzene	10	U	D1	1.0	U	µg/L
Bromoform	10	U	D1	1.0	U	µg/L
,1,2,2-Tetrachloroethane	10	U	D1	1.0	U	µg/L
,3-Dichlorobenzene	10	U	D1	1.0	U	µg/L
,4-Dichlorobenzene	10	U	D1	1.0	U	µg/L
,2-Dichlorobenzene	10	U	D1	1.0	U	µg/L

Surrogate:	% RECOV	% RECOV	LIMITS
Bromofluorobenzene	88	80	52-167
Date Analyzed	02/06/00	02/06/00	

U = Compound was analyzed for but not detected to the level shown.
I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
D1 = Analyte value determined from a 1:10 dilution.
D3 = Analyte value determined from a 1:25 dilution.

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PA METHOD 8021 - OLATILE ORGANICS	I-27			I-18			Units
ichlorodifluoromethane	5.0	U	D2	1.0	U		µg/L
ıloromethane	10	U	D2	2.0	U		µg/L
inyl Chloride	5.0	U	D2	1.0	U		µg/L
romomethane	5.0	U	D2	1.0	U		µg/L
ıloroethane	10	U	D2	2.0	U		µg/L
richlorofluoromethane	10	U	D2	2.0	U		µg/L
.1-Dichloroethene	5.0	U	D2	1.0	U		µg/L
ethylene Chloride	10	U	D2	2.0	U		µg/L
·1,2-Dichloroethene	5.0	U	D2	1.0	U		µg/L
1-Dichloroethane	5.0	U	D2	1.0	U		µg/L
·1,2-Dichloroethene	5.0	U	D2	1.0	U		µg/L
ı[illegible]oform	5.0	U	D2	1.0	U		µg/L
[illegible]-Trichloroethane	5.0	U	D2	1.0	U		µg/L
ırbon Tetrachloride	5.0	U	D2	1.0	U		µg/L
2-Dichloroethane	5.0	U	D2	1.0	U		µg/L
richloroethene	5.0	U	D2	**1.5**	I		µg/L
2-Dichloropropane	5.0	U	D2	1.0	U		µg/L
romodichloromethane	5.0	U	D2	1.0	U		µg/L
1,3-Dichloropropene	5.0	U	D2	1.0	U		µg/L
1,3-Dichloropropene	5.0	U	D2	1.0	U		µg/L
1,2-Trichloroethane	5.0	U	D2	1.0	U		µg/L
trachloroethene	**78**		D2	**110**		D2	µg/L
bromochloromethane	5.0	U	D2	1.0	U		µg/L
ılorobenzene	5.0	U	D2	1.0	U		µg/L
romoform	5.0	U	D2	1.0	U		µg/L
1,2,2-Tetrachloroethane	5.0	U	D2	1.0	U		µg/L
3-Dichlorobenzene	5.0	U	D2	1.0	U		µg/L
4-Dichlorobenzene	5.0	U	D2	1.0	U		µg/L
2-Dichlorobenzene	5.0	U	D2	1.0	U		µg/L
rrogate:	% RECOV			% RECOV			LIMITS
romofluorobenzene	82			80			52-167
te Analyzed	02/06/00			02/06/00			

= Compound was analyzed for but not detected to the level shown.
= Analyte detected; value is between the Method Detection Level (MDL) [illegible]nd the Practical Quantitation Level (PQL).
= Analyte value determined from a 1:5 dilution.

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PA METHOD 8021 - OLATILE ORGANICS	LAB BLANK	LAB BLANK	Units
ichlorodifluoromethane	1.0 U	1.0 U	µg/L
hloromethane	2.0 U	2.0 U	µg/L
inyl Chloride	1.0 U	1.0 U	µg/L
romomethane	1.0 U	1.0 U	µg/L
hloroethane	2.0 U	2.0 U	µg/L
richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
ethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
- Dichloroethene	1.0 U	1.0 U	µg/L
h oform	1.0 U	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	1.0 U	1.0 U	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
hlorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
urrogate:	% RECOV	% RECOV	LIMITS
romofluorobenzene	89	84	52-167
ate Analyzed	02/04/00	02/05/00	

= Compound was analyzed for but not detected to the level shown.

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PA METHOD 8021 - OLATILE ORGANICS	LAB BLANK	LAB BLANK	Units
ichlorodifluoromethane	1.0 U	1.0 U	µg/L
hloromethane	2.0 U	2.0 U	µg/L
nyl Chloride	1.0 U	1.0 U	µg/L
omethane	1.0 U	1.0 U	µg/L
hloroethane	2.0 U	2.0 U	µg/L
richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
ethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-2-Dichloroethene	1.0 U	1.0 U	µg/L
oform	1.0 U	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
omodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	1.0 U	1.0 U	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
ilorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
irrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	81	81	52-167
ate Analyzed	02/06/00	02/06/00	

= Compound was analyzed for but not detected to the level shown.

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PA METHOD 8021 - OLATILE ORGANICS	LAB BLANK	LAB BLANK	Units
ichlorodifluoromethane	1.0 U	1.0 U	µg/L
hloromethane	2.0 U	2.0 U	µg/L
inyl Chloride	1.0 U	1.0 U	µg/L
romomethane	1.0 U	1.0 U	µg/L
hloroethane	2.0 U	2.0 U	µg/L
richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
ethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-1 -Dichloroethene	1.0 U	1.0 U	µg/L
h oform	1.0 U	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	1.0 U	1.0 U	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
nlorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
urrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	87	69	52-167
ate Analyzed	02/07/00	02/08/00	

= Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JR1511
DATE REPORTED: February 11, 2000
REFERENCE : WO# JX179
PROJECT NAME : Site 11 Kings Bay

RESULTS OF ANALYSIS

:PA METHOD 8021 - 'OLATILE ORGANICS	LAB BLANK	LAB BLANK	Units
)ichlorodifluoromethane	1.0 U	1.0 U	µg/L
:hloromethane	2.0 U	2.0 U	µg/L
'inyl Chloride	1.0 U	1.0 U	µg/L
;romomethane	1.0 U	1.0 U	µg/L
'hloroethane	2.0 U	2.0 U	µg/L
'richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
ethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
h[illegible]roform	1.0 U	1.0 U	µg/L
,[illegible]1-Trichloroethane	1.0 U	1.0 U	µg/L
arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
:richloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	1.0 U	1.0 U	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
hlorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
ırrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	69	73	52-167
ate Analyzed	02/09/00	02/09/00	

[illegible]ompound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JR1511
DATE REPORTED: February 11, 2000
REFERENCE : WO# JX179
PROJECT NAME : Site 11 Kings Bay

QUALITY CONTROL DATA

'arameter	% RECOVERY MS/MSD/LCS	ACCEPT LIMITS	% RPD MS/MSD	ACCEPT LIMITS
'PA Method 601/6230D/8010/8021 (I-60,I-61,I-62,I-63,I-64,I-65,I-66,I-67,I-8,I-69,DUP-01)				
(ethylene Chloride	88/ 86/ 90	51-155	2	29
'hloroform	98/ 98/ 92	63-145	<1	16
'arbon Tetrachloride	99/104/100	64-146	5	21
'richloroethene	91/ 93/ 95	60-140	2	24
'etrachloroethene	*/ */101	66-146	*	21
hlorobenzene	95/ 92/ 96	70-137	3	19
PA Method 601/6230D/8010/8021 (I-11,I-12,I-13,I-14,I-24,I-25,I-26,I-27,I-18)				
e[illegible]-lene Chloride	86/ 82/102	51-155	5	29
H[illegible]oform	95/ 83/109	63-145	13	16
arbon Tetrachloride	89/ 76/120	64-146	16	21
richloroethene	89/ 85/109	60-140	4	24
etrachloroethene	94/104/ 93	66-146	10	21
hlorobenzene	86/ 84/ 90	70-137	2	19

nvironmental Conservation Laboratories Comprehensive QA Plan #910190

= MS/MSD/RPD unavailable due to high original sample concentration.
= Less Than
S = Matrix Spike
SD = Matrix Spike Duplicate
CS = Laboratory Control Standard
PD = Relative Percent Difference

his report shall not be reproduced except in full, without the written p[illegible]val of the laboratory. Results for these procedures apply only to h[illegible]mples as submitted.

CHAIN OF CUSTODY RECORD

BECHTEL

Site Name: Site 11 Kings Bay
Delivery Order No.:
Cooler/Crate No.:

SEIR No.:
COC Number:
Lab: ENCO
Field Logbook No.:
Logbook Pg. No.:

Sampled by: M.A. Gage (Print) M.A. Gage (Sign) (Print) (Sign)

Legend — SAMPLE TYPE

PSB	Preservative Blank	BLS	Blind Spike
FDP	Field Duplicate	BLB	Blink Blank
ENV	Environmental	PTS	Point Source
FDB	Field Blank	FRP	Field Replicate
GEO	Geotechnical Sample	RSB	Rinsate Blank
MXD	Matrix Spike Duplicate	SPL	Split
MXS	Matrix Spike	TRP	Trip Blank

MATRIX

AIR	Air	SBS	Subsurface Soil	PTW	Potable Water
FLO	Flora	SED	Sediment	SEP	Seeps
FAU	Fauna	SFS	Surface Soil	SOL	Solid
GWT	Groundwater	SPW	Surface Water	WWT	Waste Water
LCH	Leachate	SLG	Sludge	SLW	Solid Waste
OIL	Oil	SST	Surface Water Storm Event		

QC LEVELS

S Sample Results and QC
C Reported
D Sample results, QC and raw data reported
E Sample resuts, blanks, and calibration reportred
S Screening level analysis

Station ID	BEI Sample ID	Sample Type	Matrix Code	Collection Date/Time	Container ID	Preservative	Pay Item	Parameter	Priority	QC Code
I-60	I-60	ENV	GWT	2-2-00/1200	01, 02	HCL		8021	5-Day TAT	
I-61	I-61			/1525						
I-62	I-62			/1345						
I-63	I-63			/1130						
I-64	I-64			/1600						
I-65	I-65			/1420						

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR TRANSFER
M.A. Gage	[illegible]	2/3/00	18:30	Transfer to ENCO
Kevin Dove	[illegible]	2/3/00	15:30	

COMMENTS/INSTRUCTIONS

JR1511

CONTAMINATION	YES	NO
Radiological		✓
Chemical	✓	

Shipper: NA

Ship to: NA

Airbill No. NA Traffic Report No.

This package conforms to the conditions and limitations specified in 49 CFR 173.421 for excepted radioactive material, limited quantity, n.o.s., UN2910.

0120095

CHAIN OF CUSTODY RECORD (Continued)

Station ID	BEI Sample ID	Sample Type	Matrix Code	Collection Date/Time	Container ID	Preservative	Pay Item	Parameter	Priority	QC Level
I-66	I-66	ENV	GWT	2-2-00/1315	01, 02	HCL		8021	5-Day TAT	
I-67	I-67			/1450						
I-68	I-68			/1700						
I-69	I-69			/1630						
DUP-01	DUP-01			/ —						
I-11	I-11			2-3-00/1115						
I-12	I-12			/1045						
I-13	I-13			/0945						
I-14	I-14			/0750						
I-24	I-24			/						
I-25	I-25			/0845						
I-26	I-26			/0915						
I-27	I-27			/1015						
I-18	I-18			/1150						

NFS

017095

017179

Environmental Conservation Laboratories, Inc.
4810 Executive Park Court, Suite 211
Jacksonville, Florida 32216-6069
904 / 296-3007
Fax 904 / 296-6210
www.encolabs.com

ENCO Laboratories

DHRS Certification No. E82277

CLIENT : Bechtel Environmental, Inc.
ADDRESS: NAS Jacksonville
P.O. Box 171
Jacksonville, FL 32215

REPORT # : JAX10459
DATE SUBMITTED: March 26, 2000
DATE REPORTED : March 31, 2000

ATTENTION: Mr. Mark Gage

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

PROJECT #: SITE 11

NSB Kings Bay

03/25/00

#1	- I-11	@ 08:00
#2	- I-12	@ 08:30
#3	- I-13	@ 09:30
#4	- I-14	@ 12:00
#5	- I-18	@ 09:00
#6	- I-24	@ 17:10
#7	- I-25	@ 11:00
#8	- I-26	@ 10:30
#9	- I-27	@ 10:00
#10	- I-60	@ 13:45
#11	- I-61	@ 12:45
#12	- I-62	@ 15:25
#13	- I-63	@ 16:25
#14	- I-64	@ 13:15
#15	- I-65	@ 14:50

CONTINUED

017179

Environmental Conservation Laboratories, Inc.
4[illegible] Executive Park Court, Suite 211
[illegible]onville, Florida 32216-6069
[illegible] / 296-3007
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DATE REPORTED : March 31, 2000

ATTENTION: Mr. Mark Gage

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

PROJECT #: SITE 11

NSB Kings Bay

03/25/00

#16 - I-66 @ 15:55
#17 - I-67 @ 14:20
#18 - I-68 @ 16:55
#19 - I-69 @ 11:30
#20 - DUP-01 @ 00:00

[illegible]T MANAGER Scott D. Martin
Scott D. Martin

ENCO LABORATORIES
REPORT # : JAX10459
DATE REPORTED: March 31, 2000
REFERENCE : SITE 11
PROJECT NAME : NSB Kings Bay

RESULTS OF ANALYSIS

:PA METHOD 8021 - 'OLATILE ORGANICS	I-11			I-12	Units
)ichlorodifluoromethane	5.0	U	D1	1.0 U	µg/L
:hloromethane	10	U	D1	2.0 U	µg/L
'inyl Chloride	5.0	U	D1	1.0 U	µg/L
;romomethane	5.0	U	D1	1.0 U	µg/L
:hloroethane	10	U	D1	2.0 U	µg/L
'richlorofluoromethane	10	U	D1	2.0 U	µg/L
,1-Dichloroethene	5.0	U	D1	1.0 U	µg/L
lethylene Chloride	10	U	D1	2.0 U	µg/L
-1,2-Dichloroethene	5.0	U	D1	1.0 U	µg/L
,1-Dichloroethane	5.0	U	D1	1.0 U	µg/L
-[illegible]2-Dichloroethene	**35**		D1	1.0 U	µg/L
:h[illegible]roform	5.0	U	D1	1.0 U	µg/L
,1,1-Trichloroethane	5.0	U	D1	1.0 U	µg/L
'arbon Tetrachloride	5.0	U	D1	1.0 U	µg/L
,2-Dichloroethane	5.0	U	D1	1.0 U	µg/L
richloroethene	5.0	U	D1	1.0 U	µg/L
,2-Dichloropropane	5.0	U	D1	1.0 U	µg/L
romodichloromethane	5.0	U	D1	1.0 U	µg/L
-1,3-Dichloropropene	5.0	U	D1	1.0 U	µg/L
-1,3-Dichloropropene	5.0	U	D1	1.0 U	µg/L
,1,2-Trichloroethane	5.0	U	D1	1.0 U	µg/L
etrachloroethene	**150**		D1	**16**	µg/L
ibromochloromethane	5.0	U	D1	**1.6**	µg/L
hlorobenzene	5.0	U	D1	1.0 U	µg/L
romoform	5.0	U	D1	1.0 U	µg/L
,1,2,2-Tetrachloroethane	5.0	U	D1	1.0 U	µg/L
,3-Dichlorobenzene	5.0	U	D1	1.0 U	µg/L
,4-Dichlorobenzene	5.0	U	D1	1.0 U	µg/L
,2-Dichlorobenzene	5.0	U	D1	1.0 U	µg/L
urrogate:	**% RECOV**			**% RECOV**	**LIMITS**
romofluorobenzene	92			92	52-167
ate Analyzed	03/29/00			03/29/00	

[illegible]ompound was analyzed for but not detected to the level shown.
1[illegible] Analyte value determined from a 1:5 dilution.

ENCO LABORATORIES
REPORT # : JAX10459
DATE REPORTED: March 31, 2000
REFERENCE : SITE 11
PROJECT NAME : NSB Kings Bay

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-13			I-14	Units
Dichlorodifluoromethane	5.0	U	D1	1.0 U	µg/L
Chloromethane	10	U	D1	2.0 U	µg/L
Vinyl Chloride	5.0	U	D1	1.0 U	µg/L
Bromomethane	5.0	U	D1	1.0 U	µg/L
Chloroethane	10	U	D1	2.0 U	µg/L
Trichlorofluoromethane	10	U	D1	2.0 U	µg/L
,1-Dichloroethene	5.0	U	D1	1.0 U	µg/L
Methylene Chloride	10	U	D1	2.0 U	µg/L
-1,2-Dichloroethene	5.0	U	D1	1.0 U	µg/L
,1-Dichloroethane	5.0	U	D1	1.0 U	µg/L
-1,2-Dichloroethene	5.0	U	D1	1.0 U	µg/L
Chloroform	5.0	U	D1	1.0 U	µg/L
,1,1-Trichloroethane	5.0	U	D1	1.0 U	µg/L
Carbon Tetrachloride	5.0	U	D1	1.0 U	µg/L
,2-Dichloroethane	5.0	U	D1	1.0 U	µg/L
Trichloroethene	5.0	U	D1	1.0 U	µg/L
,2-Dichloropropane	5.0	U	D1	1.0 U	µg/L
Bromodichloromethane	5.0	U	D1	1.0 U	µg/L
-1,3-Dichloropropene	5.0	U	D1	1.0 U	µg/L
-1,3-Dichloropropene	5.0	U	D1	1.0 U	µg/L
,1,2-Trichloroethane	5.0	U	D1	1.0 U	µg/L
Tetrachloroethene	**560**		D1	**11**	µg/L
Dibromochloromethane	5.0	U	D1	1.0 U	µg/L
Chlorobenzene	5.0	U	D1	1.0 U	µg/L
Bromoform	5.0	U	D1	1.0 U	µg/L
,1,2,2-Tetrachloroethane	5.0	U	D1	1.0 U	µg/L
,3-Dichlorobenzene	5.0	U	D1	1.0 U	µg/L
,4-Dichlorobenzene	5.0	U	D1	1.0 U	µg/L
,2-Dichlorobenzene	5.0	U	D1	1.0 U	µg/L

Surrogate:	% RECOV	% RECOV	LIMITS
Bromofluorobenzene	64	94	52-167
Date Analyzed	03/28/00	03/29/00	

U Compound was analyzed for but not detected to the level shown.
D1 Analyte value determined from a 1:5 dilution.

ENCO LABORATORIES
REPORT # : JAX10459
DATE REPORTED: March 31, 2000
REFERENCE : SITE 11
PROJECT NAME : NSB Kings Bay

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-18	I-24	Units
Dichlorodifluoromethane	1.0 U	1.0 U	µg/L
Chloromethane	2.0 U	2.0 U	µg/L
Vinyl Chloride	1.0 U	1.0 U	µg/L
Bromomethane	1.0 U	1.0 U	µg/L
Chloroethane	2.0 U	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	1.0 U	µg/L
Methylene Chloride	2.0 U	2.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	1.0 U	µg/L
c-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
Chloroform	1.0 U	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	1.0 U	µg/L
Trichloroethene	1.0 U	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	1.0 U	µg/L
Bromodichloromethane	1.0 U	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
Tetrachloroethene	**4.6**	**22**	µg/L
Dibromochloromethane	**3.6**	1.0 U	µg/L
Chlorobenzene	1.0 U	1.0 U	µg/L
Bromoform	1.0 U	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
1,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
Surrogate:	**% RECOV**	**% RECOV**	**LIMITS**
Bromofluorobenzene	66	93	52-167
Date Analyzed	03/31/00	03/29/00	

U Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX10459
DATE REPORTED: March 31, 2000
REFERENCE : SITE 11
PROJECT NAME : NSB Kings Bay

RESULTS OF ANALYSIS

PA METHOD 8021 - OLATILE ORGANICS	I-25	I-26	Units
ichlorodifluoromethane	1.0 U	1.0 U	µg/L
hloromethane	2.0 U	2.0 U	µg/L
inyl Chloride	1.0 U	1.0 U	µg/L
romomethane	1.0 U	1.0 U	µg/L
hloroethane	2.0 U	2.0 U	µg/L
richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
ethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	**3.0**	1.0 U	µg/L
,1-Dichloroethane	**11**	1.0 U	µg/L
[illegible] Dichloroethene	**110**	1.0 U	µg/L
h[illegible]oform	1.0 U	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	**77**	**4.7**	µg/L
ibromochloromethane	1.0 U	**3.7**	µg/L
hlorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
urrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	90	57	52-167
ate Analyzed	03/29/00	03/28/00	

= Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX10459
DATE REPORTED: March 31, 2000
REFERENCE : SITE 11
PROJECT NAME : NSB Kings Bay

RESULTS OF ANALYSIS

PA METHOD 8021 - OLATILE ORGANICS	I-27			I-60			Units
ichlorodifluoromethane	5.0	U	D1	20	U	D2	µg/L
hloromethane	10	U	D1	40	U	D2	µg/L
inyl Chloride	5.0	U	D1	20	U	D2	µg/L
romomethane	5.0	U	D1	20	U	D2	µg/L
hloroethane	10	U	D1	40	U	D2	µg/L
richlorofluoromethane	10	U	D1	40	U	D2	µg/L
,1-Dichloroethene	5.0	U	D1	20	U	D2	µg/L
ethylene Chloride	10	U	D1	40	U	D2	µg/L
1,2-Dichloroethene	5.0	U	D1	20	U	D2	µg/L
,1-Dichloroethane	5.0	U	D1	20	U	D2	µg/L
-1,2-Dichloroethene	5.0	U	D1	20	U	D2	µg/L
hloroform	**6.0**		D1	**140**		D2	µg/L
,[illegible]-Trichloroethane	5.0	U	D1	20	U	D2	µg/L
arbon Tetrachloride	5.0	U	D1	20	U	D2	µg/L
,2-Dichloroethane	5.0	U	D1	20	U	D2	µg/L
richloroethene	5.0	U	D1	20	U	D2	µg/L
,2-Dichloropropane	5.0	U	D1	20	U	D2	µg/L
romodichloromethane	5.0	U	D1	20	U	D2	µg/L
-1,3-Dichloropropene	5.0	U	D1	20	U	D2	µg/L
-1,3-Dichloropropene	5.0	U	D1	20	U	D2	µg/L
,1,2-Trichloroethane	5.0	U	D1	20	U	D2	µg/L
etrachloroethene	**130**		D1	**1700**		D2	µg/L
ibromochloromethane	5.0	U	D1	20	U	D2	µg/L
hlorobenzene	5.0	U	D1	20	U	D2	µg/L
romoform	5.0	U	D1	20	U	D2	µg/L
,1,2,2-Tetrachloroethane	5.0	U	D1	20	U	D2	µg/L
,3-Dichlorobenzene	5.0	U	D1	20	U	D2	µg/L
,4-Dichlorobenzene	5.0	U	D1	20	U	D2	µg/L
,2-Dichlorobenzene	5.0	U	D1	20	U	D2	µg/L

urrogate:	% RECOV	% RECOV	LIMITS
romofluorobenzene	60	93	52-167
ate Analyzed	03/28/00	03/29/00	

= Compound was analyzed for but not detected to the level shown.
1[illegible] Analyte value determined from a 1:5 dilution.
2[illegible] Analyte value determined from a 1:20 dilution.

ENCO LABORATORIES
REPORT # : JAX10459
DATE REPORTED: March 31, 2000
REFERENCE : SITE 11
PROJECT NAME : NSB Kings Bay

RESULTS OF ANALYSIS

:PA METHOD 8021 - 'OLATILE ORGANICS	I-61	I-62		Units
)ichlorodifluoromethane	1.0 U	5.0 U	D1	µg/L
:hloromethane	2.0 U	10 U	D1	µg/L
'inyl Chloride	1.0 U	5.0 U	D1	µg/L
romomethane	1.0 U	5.0 U	D1	µg/L
:hloroethane	2.0 U	10 U	D1	µg/L
'richlorofluoromethane'	2.0 U	10 U	D1	µg/L
,1-Dichloroethene	1.0 U	5.0 U	D1	µg/L
:ethylene Chloride	2.0 U	10 U	D1	µg/L
-1,2-Dichloroethene	1.0 U	5.0 U	D1	µg/L
,1 ⁻ichloroethane	1.0 U	5.0 U	D1	µg/L
-Dichloroethene	1.0 U	5.0 U	D1	µg/L
'hloroform	1.0 U	**47**	D1	µg/L
,1,1-Trichloroethane	1.0 U	5.0 U	D1	µg/L
arbon Tetrachloride	1.0 U	5.0 U	D1	µg/L
,2-Dichloroethane	1.0 U	5.0 U	D1	µg/L
richloroethene	1.0 U	5.0 U	D1	µg/L
,2-Dichloropropane	1.0 U	5.0 U	D1	µg/L
romodichloromethane	1.0 U	5.0 U	D1	µg/L
-1,3-Dichloropropene	1.0 U	5.0 U	D1	µg/L
-1,3-Dichloropropene	1.0 U	5.0 U	D1	µg/L
,1,2-Trichloroethane	1.0 U	5.0 U	D1	µg/L
etrachloroethene	**16**	**320**	D1	µg/L
ibromochloromethane	1.0 U	5.0 U	D1	µg/L
hlorobenzene	1.0 U	5.0 U	D1	µg/L
romoform	1.0 U	5.0 U	D1	µg/L
,1,2,2-Tetrachloroethane	1.0 U	5.0 U	D1	µg/L
,3-Dichlorobenzene	1.0 U	5.0 U	D1	µg/L
,4-Dichlorobenzene	1.0 U	5.0 U	D1	µg/L
,2-Dichlorobenzene	1.0 U	5.0 U	D1	µg/L
urrogate:	**% RECOV**	**% RECOV**		**LIMITS**
romofluorobenzene	92	91		52-167
ate Analyzed	03/30/00	03/29/00		

ɔmpound was analyzed for but not detected to the level shown.
Analyte value determined from a 1:5 dilution.

ENCO LABORATORIES
REPORT # : JAX10459
DATE REPORTED: March 31, 2000
REFERENCE : SITE 11
PROJECT NAME : NSB Kings Bay

RESULTS OF ANALYSIS

:PA METHOD 8021 - 'OLATILE ORGANICS	I-63	I-64	Units
)ichlorodifluoromethane	1.0 U	1.0 U	µg/L
:hloromethane	2.0 U	2.0 U	µg/L
'inyl Chloride	1.0 U	1.0 U	µg/L
;romomethane	1.0 U	1.0 U	µg/L
:hloroethane	2.0 U	2.0 U	µg/L
'richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
:ethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
h[illegible]oform	**3.9**	**5.0**	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	**77**	**86**	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
hlorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
urrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	93	93	52-167
ate Analyzed	03/29/00	03/29/00	

[illegible]Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX10459
DATE REPORTED: March 31, 2000
REFERENCE : SITE 11
PROJECT NAME : NSB Kings Bay

RESULTS OF ANALYSIS

:PA METHOD 8021 - 'OLATILE ORGANICS	I-65			I-66			Units
)ichlorodifluoromethane	5.0	U	D1	20	U	D2	µg/L
:hloromethane	10	U	D1	40	U	D2	µg/L
'inyl Chloride	5.0	U	D1	20	U	D2	µg/L
ıromomethane	5.0	U	D1	20	U	D2	µg/L
:hloroethane	10	U	D1	40	U	D2	µg/L
'richlorofluoromethane	10	U	D1	40	U	D2	µg/L
,1-Dichloroethene	5.0	U	D1	20	U	D2	µg/L
lethylene Chloride	10	U	D1	40	U	D2	µg/L
-1,2-Dichloroethene	5.0	U	D1	20	U	D2	µg/L
,1-Dichloroethane	5.0	U	D1	20	U	D2	µg/L
-Dichloroethene	5.0	U	D1	20	U	D2	µg/L
oform	5.0	U	D1	20	U	D2	µg/L
,1,1-Trichloroethane	5.0	U	D1	20	U	D2	µg/L
:arbon Tetrachloride	5.0	U	D1	20	U	D2	µg/L
,2-Dichloroethane	5.0	U	D1	20	U	D2	µg/L
'richloroethene	5.0	U	D1	20	U	D2	µg/L
,2-Dichloropropane	5.0	U	D1	20	U	D2	µg/L
romodichloromethane	5.0	U	D1	20	U	D2	µg/L
-1,3-Dichloropropene	5.0	U	D1	20	U	D2	µg/L
-1,3-Dichloropropene	5.0	U	D1	20	U	D2	µg/L
,1,2-Trichloroethane	5.0	U	D1	20	U	D2	µg/L
'etrachloroethene	**120**		D1	**200**		D2	µg/L
ibromochloromethane	5.0	U	D1	20	U	D2	µg/L
'hlorobenzene	5.0	U	D1	20	U	D2	µg/L
romoform	5.0	U	D1	20	U	D2	µg/L
,1,2,2-Tetrachloroethane	5.0	U	D1	20	U	D2	µg/L
,3-Dichlorobenzene	5.0	U	D1	20	U	D2	µg/L
,4-Dichlorobenzene	5.0	U	D1	20	U	D2	µg/L
,2-Dichlorobenzene	5.0	U	D1	20	U	D2	µg/L

urrogate:	% RECOV	% RECOV	LIMITS
romofluorobenzene	90	67	52-167
ate Analyzed	03/29/00	03/29/00	

= Compound was analyzed for but not detected to the level shown.
1 = Analyte value determined from a 1:5 dilution.
2 = Analyte value determined from a 1:20 dilution.

ENCO LABORATORIES
REPORT # : JAX10459
DATE REPORTED: March 31, 2000
REFERENCE : SITE 11
PROJECT NAME : NSB Kings Bay

RESULTS OF ANALYSIS

PA METHOD 8021 - OLATILE ORGANICS	I-67	I-68	Units
ichlorodifluoromethane	1.0 U	1.0 U	µg/L
hloromethane	2.0 U	2.0 U	µg/L
nyl Chloride	1.0 U	1.0 U	µg/L
romomethane	1.0 U	1.0 U	µg/L
hloroethane	2.0 U	2.0 U	µg/L
richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
ethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
hloroform	1.0 U	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	**17**	**4.8**	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
hlorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
urrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	90	69	52-167
ate Analyzed	03/30/00	03/29/00	

U Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX10459
DATE REPORTED: March 31, 2000
REFERENCE : SITE 11
PROJECT NAME : NSB Kings Bay

RESULTS OF ANALYSIS

PA METHOD 8021 - OLATILE ORGANICS	I-69			DUP-01			Units
ichlorodifluoromethane	5.0	U	D1	25	U	D3	µg/L
hloromethane	10	U	D1	50	U	D3	µg/L
inyl Chloride	5.0	U	D1	25	U	D3	µg/L
romomethane	5.0	U	D1	25	U	D3	µg/L
hloroethane	10	U	D1	50	U	D3	µg/L
richlorofluoromethane	10	U	D1	50	U	D3	µg/L
,1-Dichloroethene	5.0	U	D1	25	U	D3	µg/L
ethylene Chloride	10	U	D1	50	U	D3	µg/L
-1,2-Dichloroethene	5.0	U	D1	25	U	D3	µg/L
,1-Dichloroethane	5.0	U	D1	25	U	D3	µg/L
-1 -Dichloroethene	5.0	U	D1	25	U	D3	µg/L
h oform	5.0	U	D1	**120**		D3	µg/L
,1,1-Trichloroethane	5.0	U	D1	25	U	D3	µg/L
arbon Tetrachloride	5.0	U	D1	25	U	D3	µg/L
,2-Dichloroethane	5.0	U	D1	25	U	D3	µg/L
richloroethene	5.0	U	D1	25	U	D3	µg/L
,2-Dichloropropane	5.0	U	D1	25	U	D3	µg/L
romodichloromethane	5.0	U	D1	25	U	D3	µg/L
-1,3-Dichloropropene	5.0	U	D1	25	U	D3	µg/L
-1,3-Dichloropropene	5.0	U	D1	25	U	D3	µg/L
,1,2-Trichloroethane	5.0	U	D1	25	U	D3	µg/L
etrachloroethene	**170**		D1	**1400**		D3	µg/L
ibromochloromethane	5.0	U	D1	25	U	D3	µg/L
hlorobenzene	5.0	U	D1	25	U	D3	µg/L
romoform	5.0	U	D1	25	U	D3	µg/L
,1,2,2-Tetrachloroethane	5.0	U	D1	25	U	D3	µg/L
,3-Dichlorobenzene	5.0	U	D1	25	U	D3	µg/L
,4-Dichlorobenzene	5.0	U	D1	25	U	D3	µg/L
,2-Dichlorobenzene	5.0	U	D1	25	U	D3	µg/L

urrogate:	% RECOV	% RECOV	LIMITS
romofluorobenzene	95	93	52-167
ate Analyzed	03/30/00	03/30/00	

= Compound was analyzed for but not detected to the level shown.
1 Analyte value determined from a 1:5 dilution.
3 Analyte value determined from a 1:25 dilution.

ENCO LABORATORIES
REPORT # : JAX10459
DATE REPORTED: March 31, 2000
REFERENCE : SITE 11
PROJECT NAME : NSB Kings Bay

RESULTS OF ANALYSIS

:PA METHOD 8021 - 'OLATILE ORGANICS	LAB BLANK	LAB BLANK	Units
)ichlorodifluoromethane	1.0 U	1.0 U	µg/L
:hloromethane	2.0 U	2.0 U	µg/L
'inyl Chloride	1.0 U	1.0 U	µg/L
ɪromomethane	1.0 U	1.0 U	µg/L
:hloroethane	2.0 U	2.0 U	µg/L
'richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
lethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-2-Dichloroethene	1.0 U	1.0 U	µg/L
roform	1.0 U	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
'arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
'richloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	1.0 U	1.0 U	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
hlorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
urrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	64	93	52-167
ate Analyzed	03/28/00	03/29/00	

Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX10459
DATE REPORTED: March 31, 2000
REFERENCE : SITE 11
PROJECT NAME : NSB Kings Bay

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	LAB BLANK	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
,1-Dichloroethane	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
oform	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	1.0 U	µg/L
,2-Dichloropropane	1.0 U	µg/L
Bromodichloromethane	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	1.0 U	µg/L
Dibromochloromethane	1.0 U	µg/L
Chlorobenzene	1.0 U	µg/L
Bromoform	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	µg/L

Surrogate:	% RECOV	LIMITS
Bromofluorobenzene	61	52-167
Date Analyzed	03/29/00	

Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX10459
DATE REPORTED: March 31, 2000
REFERENCE : SITE 11
PROJECT NAME : NSB Kings Bay

RESULTS OF ANALYSIS

:PA METHOD 8021 - 'OLATILE ORGANICS	LAB BLANK	LAB BLANK	Units
)ichlorodifluoromethane	1.0 U	1.0 U	µg/L
:hloromethane	2.0 U	2.0 U	µg/L
'inyl Chloride	1.0 U	1.0 U	µg/L
;romomethane	1.0 U	1.0 U	µg/L
:hloroethane	2.0 U	2.0 U	µg/L
'richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
lethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-[illegible]2-Dichloroethene	1.0 U	1.0 U	µg/L
:[illegible]roform	1.0 U	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
'arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	1.0 U	1.0 U	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
hlorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
urrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	92	68	52-167
ate Analyzed	03/30/00	03/31/00	

[illegible] Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX10459
DATE REPORTED: March 31, 2000
REFERENCE : SITE 11
PROJECT NAME : NSB Kings Bay

QUALITY CONTROL DATA

'arameter	% RECOVERY MS/MSD/LCS	ACCEPT LIMITS	% RPD MS/MSD	ACCEPT LIMITS
:PA Method 8021				
Iethylene Chloride	109/106/ 94	51-155	3	29
:hloroform	101/ 96/ 88	63-145	5	16
:arbon Tetrachloride	110/ 98/ 88	64-146	12	21
'richloroethene	115/104/ 94	60-140	10	24
'etrachloroethene	105/ 95/ 89	66-146	10	21
:hlorobenzene	102/ 96/ 86	70-137	6	19
PA Method 8021				
:ethylene Chloride	106/102/110	51-155	4	29
hl oform	106/106/107	63-145	<1	16
a n Tetrachloride	106/108/115	64-146	2	21
richloroethene	108/110/114	60-140	2	24
etrachloroethene	100/107/107	66-146	7	21
hlorobenzene	98/ 96/104	70-137	2	19

nvironmental Conservation Laboratories Comprehensive QA Plan #910190

= Less Than
S = Matrix Spike
SD = Matrix Spike Duplicate
CS = Laboratory Control Standard
PD = Relative Percent Difference

his report shall not be reproduced except in full, without the written al of the laboratory. Results for these procedures apply only to amples as submitted.

CHAIN OF CUSTODY RECORD

BECHTEL

Site Name: Site 11, NSB Kings Bay
Delivery Order No.:
Cooler/Crate No.:

SEIR No.:
COC Number:
Lab: ENCO
Field Logbook No.:
Logbook Pg. No.:

Sampled by: M. A. Gage (Print) M. A. Gage (Sign) ____ (Print) ____ (Sign)

Legend — SAMPLE TYPE

PSB	Preservative Blank	BLS	Blind Spike
FDP	Field Duplicate	BLB	Blink Blank
ENV	Environmental	PTS	Point Source
FDB	Field Blank	FRP	Field Replicate
GEO	Geotechnical Sample	RSB	Rinsate Blank
MXD	Matrix Spike Duplicate	SPL	Split
MXS	Matrix Spike	TRP	Trip Blank

MATRIX

AIR	Air	SBS	Subsurface Soil	PTW	Potable Water
FLO	Flora	SED	Sediment	SEP	Seeps
FAU	Fauna	SFS	Surface Soil	SOL	Solid
GWT	Groundwater	SPW	Surface Water	WWT	Waste Water
LCH	Leachate	SLG	Sludge	SLW	Solid Waste
OIL	Oil	SST	Surface Water Storm Event		

QC LEVELS

S Sample Results and QC
C Reported
D Sample results, QC and raw data reported
E Sample resuts, blanks, and calibration reportred
S Screening level analysis

Station ID	BEI Sample ID	Sample Type	Matrix Code	Collection Date/Time	Container ID	Preservative	Pay Item	Parameter	Priority	QC Code
I-11	I-11	ENV	GWT	3-25-00/0800	01, 02	HCL		8021	7-Day TAT	
I-12	I-12	↓	↓	1 0830	↓	↓		↓	↓	
I-13	I-13	↓	↓	1 0930	↓	↓		↓	↓	
I-14	I-14	↓	↓	1 1200	↓	↓		↓	↓	
I-18	~~I-18~~ I-18	↓	↓	1 0900	↓	↓		↓	↓	
I-24	~~I-24~~ I-24	↓	↓	1 1710	↓	↓		↓	↓	

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR TRANSFER
M. A. Gage	Dominic Patti	3/26/00	10:00 AM	Transfer to Lab

COMMENTS/INSTRUCTIONS: Report results to Mark Gage

CONTAMINATION	YES	NO
Radiological		✓
Chemical	✓	

Shipper: N/A
Ship to:

Airbill No. N/A Traffic Report No.

JAX10459

This package conforms to the conditions and limitations specified in 49 CFR 173.421 for excepted radioactive material, limited quantity, n.o.s., UN2910.

CHAIN OF CUSTODY RECORD (continued)

COC Number _____

JAX10459

Station ID	BEI Sample ID	Sample Type	Matrix Code	Collection Date/Time	Container ID	Preservative	Pay Item	Parameter	Priority	QC Level
I-25	I-25	ENV	GWT	3-25-00/1100	01,02	HCL		8021 MALW	7-D	
I-26	I-26			/1030						
I-27	I-27			/1000						
I-60	I-~~28~~ 60			/1345						
I-61	I-~~29~~ 61			/1245						
I-62	I-62			/1525						
I-63	I-63			/1625						
I-64	I-64			/1315						
I-65	I-65			/1450						
I-66	I-66			/1555						
I-67	I-67			/1420						
I-68	I-68			/1655						
I-69	I-69			/1130						
DUP-01	DUP-01			/—						

NFS

O:\AFCEE\NORTON\COCR.W51

Environmental Conservation Laboratories, Inc.
[illegible]0 Executive Park Court, Suite 211
[illegible]sonville, Florida 32216-6069
904 / 296-3007
Fax 904 / 296-6210
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ENCO Laboratories

DHRS Certification No. E82277

CLIENT : Bechtel Environmental, Inc.
ADDRESS: NAS Jacksonville
P.O. Box 171
Jacksonville, FL 32215

REPORT # : JAX11037
DATE SUBMITTED: April 28, 2000
DATE REPORTED : May 4, 2000

ATTENTION: Mr. Mark Gage

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

PROJECT : SITE 11

22567-005-SC-0834A

#1	- I-11	@ 15:05	(04/27/00)
#2	- I-12	@ 14:15	(04/27/00)
#3	- I-13	@ 13:30	(04/27/00)
#4	- I-14	@ 12:40	(04/27/00)
#5	- I-18	@ 14:40	(04/27/00)
#6	- I-24	@ 09:15	(04/28/00)
#7	- I-25	@ 13:05	(04/27/00)
#8	- I-26	@ 15:45	(04/27/00)
#10	- I-60	@ 16:15	(04/27/00)
#11	- I-61	@ 11:30	(04/27/00)
#12	- I-62	@ 16:50	(04/27/00)
#13	- I-63	@ 18:10	(04/27/00)
#14	- I-64	@ 17:30	(04/27/00)
#15	- I-65	@ 18:00	(04/27/00)
#16	- I-66	@ 07:55	(04/28/00)

CONTINUED

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ksonville, Florida 32216-6069
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CLIENT : Bechtel Environmental, Inc.
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REPORT # : JAX11037
DATE SUBMITTED: April 28, 2000
DATE REPORTED : May 4, 2000

ATTENTION: Mr. Mark Gage

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

PROJECT : SITE 11

22567-005-SC-0834A

#17 - I-67 @ 08:20 (04/28/00)
#18 - I-68 @ 08:45 (04/28/00)
#19 - I-69 @ 09:10 (04/28/00)
#20 - DUP-01 @ 00:00 (04/27/00)

:T MANAGER _____
Scott D. Martin

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-11	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
,1-Dichloroethane	1.0 U	µg/L
2-Dichloroethene	1.0 U	µg/L
roform	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	µg/L
arbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
richloroethene	1.0 U	µg/L
,2-Dichloropropane	1.0 U	µg/L
romodichloromethane	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
etrachloroethene	11	µg/L
ibromochloromethane	1.0 U	µg/L
hlorobenzene	1.0 U	µg/L
romoform	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	µg/L
urrogate:	**% RECOV**	**LIMITS**
romofluorobenzene	92	52-167
ate Analyzed	05/01/00	

= Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-12	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
,1-Dichloroethane	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
Chloroform	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	1.0 U	µg/L
,2-Dichloropropane	1.0 U	µg/L
Bromodichloromethane	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	49	µg/L
Dibromochloromethane	1.0 U	µg/L
Chlorobenzene	1.0 U	µg/L
Bromoform	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	µg/L
Surrogate:	**% RECOV**	**LIMITS**
Bromofluorobenzene	94	52-167
Date Analyzed	05/01/00	

Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-13	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	**1.0** I	µg/L
,1-Dichloroethane	**6.9**	µg/L
-1,2-Dichloroethene	**38**	µg/L
Chloroform	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	1.0 U	µg/L
,2-Dichloropropane	1.0 U	µg/L
Bromodichloromethane	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	**12**	µg/L
Dibromochloromethane	1.0 U	µg/L
Chlorobenzene	1.0 U	µg/L
Bromoform	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	µg/L

Surrogate:	% RECOV	LIMITS
Bromofluorobenzene	96	52-167
Date Analyzed	05/01/00	

= Compound was analyzed for but not detected to the level shown.
Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-14	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
,1-Dichloroethene	1.0 U	µg/L
ethylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
,1-Dichloroethane	1.0 U	µg/L
-1,2-Dichloroethene	**2.0** I	µg/L
h[illegible]form	**1.6** I	µg/L
,[illegible]-Trichloroethane	1.0 U	µg/L
arbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
richloroethene	1.0 U	µg/L
,2-Dichloropropane	1.0 U	µg/L
romodichloromethane	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
etrachloroethene	1.0 U	µg/L
ibromochloromethane	**15**	µg/L
hlorobenzene	1.0 U	µg/L
romoform	1.0 U	µg/L
1,2,2-Tetrachloroethane	1.0 U	µg/L
3-Dichlorobenzene	1.0 U	µg/L
4-Dichlorobenzene	1.0 U	µg/L
2-Dichlorobenzene	1.0 U	µg/L
	1.0 U	µg/L

Surrogate:	% RECOV	LIMITS
romofluorobenzene	96	52-167
ate Analyzed	05/01/00	

= Compound was analyzed for but not detected to the level shown.
= [illegible]alyte detected; value is between the Method Detection Level (MDL) [illegible]d the Practical Quantitation Level (PQL).

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-18	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
,1-Dichloroethane	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
roform	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	µg/L
arbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
richloroethene	1.0 U	µg/L
,2-Dichloropropane	1.0 U	µg/L
romodichloromethane	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
etrachloroethene	62	µg/L
ibromochloromethane	1.0 U	µg/L
hlorobenzene	1.0 U	µg/L
romoform	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	µg/L
urrogate:	**% RECOV**	**LIMITS**
romofluorobenzene	91	52-167
ate Analyzed	04/30/00	

Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-24	Units
)ichlorodifluoromethane	1.0 U	µg/L
:hloromethane	2.0 U	µg/L
'inyl Chloride	1.0 U	µg/L
;romomethane	1.0 U	µg/L
:hloroethane	2.0 U	µg/L
'richlorofluoromethane	2.0 U	µg/L
,1-Dichloroethene	1.0 U	µg/L
[ethylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
,1-Dichloroethane	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
[illegible]oform	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	µg/L
arbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
richloroethene	1.0 U	µg/L
,2-Dichloropropane	1.0 U	µg/L
romodichloromethane	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
etrachloroethene	1.0 U	µg/L
ibromochloromethane	**3.2**	µg/L
hlorobenzene	1.0 U	µg/L
romoform	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	µg/L
	1.0 U	µg/L

ırrogate:	% RECOV	LIMITS
romofluorobenzene	94	52-167
ate Analyzed	04/30/00	

ompound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

:PA METHOD 8021 - 'OLATILE ORGANICS	I-25	Units
)ichlorodifluoromethane	1.0 U	µg/L
:hloromethane	2.0 U	µg/L
'inyl Chloride	1.0 U	µg/L
;romomethane	1.0 U	µg/L
'hloroethane	2.0 U	µg/L
'richlorofluoromethane	2.0 U	µg/L
,1-Dichloroethene	1.0 U	µg/L
:ethylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
,1-Dichloroethane	1.0 U	µg/L
-1,2-Dichloroethene	**1.3** I	µg/L
[illegible]roform	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	µg/L
arbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
richloroethene	1.0 U	µg/L
,2-Dichloropropane	1.0 U	µg/L
romodichloromethane	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
etrachloroethene	**27**	µg/L
ibromochloromethane	1.0 U	µg/L
hlorobenzene	1.0 U	µg/L
romoform	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	µg/L
urrogate:	**% RECOV**	**LIMITS**
romofluorobenzene	93	52-167
ate Analyzed	05/01/00	

= Compound was analyzed for but not detected to the level shown.
Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-26	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	µg/L
c-1,2-Dichloroethene	1.0 U	µg/L
Chloroform	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	µg/L
Bromodichloromethane	1.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	17	µg/L
Dibromochloromethane	1.0	µg/L
Chlorobenzene	1.0 U	µg/L
Bromoform	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	µg/L
1,4-Dichlorobenzene	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	µg/L

Surrogate:	% RECOV	LIMITS
Bromofluorobenzene	96	52-167
Date Analyzed	05/01/00	

U Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-60			Units
Dichlorodifluoromethane	5.0	U	D1	µg/L
Chloromethane	10	U	D1	µg/L
Vinyl Chloride	5.0	U	D1	µg/L
Bromomethane	5.0	U	D1	µg/L
Chloroethane	10	U	D1	µg/L
Trichlorofluoromethane	10	U	D1	µg/L
1,1-Dichloroethene	5.0	U	D1	µg/L
Methylene Chloride	10	U	D1	µg/L
t-1,2-Dichloroethene	5.0	U	D1	µg/L
1,1-Dichloroethane	5.0	U	D1	µg/L
c-1,2-Dichloroethene	5.0	U	D1	µg/L
Chloroform	**24**		D1	µg/L
1,1,1-Trichloroethane	5.0	U	D1	µg/L
Carbon Tetrachloride	5.0	U	D1	µg/L
1,2-Dichloroethane	5.0	U	D1	µg/L
Trichloroethene	5.0	U	D1	µg/L
1,2-Dichloropropane	5.0	U	D1	µg/L
Bromodichloromethane	5.0	U	D1	µg/L
c-1,3-Dichloropropene	5.0	U	D1	µg/L
t-1,3-Dichloropropene	5.0	U	D1	µg/L
1,1,2-Trichloroethane	5.0	U	D1	µg/L
Tetrachloroethene	**180**		D1	µg/L
Dibromochloromethane	5.0	U	D1	µg/L
Chlorobenzene	5.0	U	D1	µg/L
Bromoform	5.0	U	D1	µg/L
1,1,2,2-Tetrachloroethane	5.0	U	D1	µg/L
1,3-Dichlorobenzene	5.0	U	D1	µg/L
1,4-Dichlorobenzene	5.0	U	D1	µg/L
1,2-Dichlorobenzene	5.0	U	D1	µg/L

Surrogate:	% RECOV	LIMITS
Bromofluorobenzene	96	52-167
Date Analyzed	05/01/00	

U Compound was analyzed for but not detected to the level shown.
D Analyte value determined from a 1:5 dilution.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

:PA METHOD 8021 - 'OLATILE ORGANICS	I-61	Units
)ichlorodifluoromethane	1.0 U	µg/L
:hloromethane	2.0 U	µg/L
'inyl Chloride	1.0 U	µg/L
;romomethane	1.0 U	µg/L
:hloroethane	2.0 U	µg/L
'richlorofluoromethane	2.0 U	µg/L
,1-Dichloroethene	1.0 U	µg/L
ethylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
,1-Dichloroethane	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
[illegible]oform	**2.2**	µg/L
,1,1-Trichloroethane	1.0 U	µg/L
arbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
richloroethene	1.0 U	µg/L
,2-Dichloropropane	1.0 U	µg/L
romodichloromethane	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
etrachloroethene	**44**	µg/L
ibromochloromethane	1.0 U	µg/L
hlorobenzene	1.0 U	µg/L
romoform	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	µg/L

urrogate:	% RECOV	LIMITS
romofluorobenzene	95	52-167
ate Analyzed	05/01/00	

ompound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-62			Units
Dichlorodifluoromethane	5.0	U	D1	µg/L
Chloromethane	10	U	D1	µg/L
Vinyl Chloride	5.0	U	D1	µg/L
Bromomethane	5.0	U	D1	µg/L
Chloroethane	10	U	D1	µg/L
Trichlorofluoromethane	10	U	D1	µg/L
,1-Dichloroethene	5.0	U	D1	µg/L
Methylene Chloride	10	U	D1	µg/L
-1,2-Dichloroethene	5.0	U	D1	µg/L
,1-Dichloroethane	5.0	U	D1	µg/L
2-Dichloroethene	5.0	U	D1	µg/L
roform	**5.0**	I	D1	µg/L
,1,1-Trichloroethane	5.0	U	D1	µg/L
arbon Tetrachloride	5.0	U	D1	µg/L
,2-Dichloroethane	5.0	U	D1	µg/L
richloroethene	5.0	U	D1	µg/L
,2-Dichloropropane	5.0	U	D1	µg/L
romodichloromethane	5.0	U	D1	µg/L
-1,3-Dichloropropene	5.0	U	D1	µg/L
-1,3-Dichloropropene	5.0	U	D1	µg/L
,1,2-Trichloroethane	5.0	U	D1	µg/L
etrachloroethene	**160**		D1	µg/L
ibromochloromethane	5.0	U	D1	µg/L
hlorobenzene	5.0	U	D1	µg/L
romoform	5.0	U	D1	µg/L
,1,2,2-Tetrachloroethane	5.0	U	D1	µg/L
,3-Dichlorobenzene	5.0	U	D1	µg/L
,4-Dichlorobenzene	5.0	U	D1	µg/L
,2-Dichlorobenzene	5.0	U	D1	µg/L

urrogate:	% RECOV	LIMITS
romofluorobenzene	94	52-167
ate Analyzed	05/01/00	

= Compound was analyzed for but not detected to the level shown.
= Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
1 = Analyte value determined from a 1:5 dilution.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-63	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
c-1,2-Dichloroethene	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	µg/L
Chloroform	8.8	µg/L
1,1,1-Trichloroethane	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	µg/L
Bromodichloromethane	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	54	µg/L
Dibromochloromethane	1.0 U	µg/L
Chlorobenzene	1.0 U	µg/L
Bromoform	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	µg/L
1,4-Dichlorobenzene	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	µg/L
Surrogate:	**% RECOV**	**LIMITS**
Bromofluorobenzene	93	52-167
Date Analyzed	05/01/00	

U Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-64	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	µg/L
c-1,2-Dichloroethene	1.0 U	µg/L
Chloroform	**4.8**	µg/L
1,1,1-Trichloroethane	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	µg/L
Bromodichloromethane	1.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	**57**	µg/L
Dibromochloromethane	1.0 U	µg/L
Chlorobenzene	1.0 U	µg/L
Bromoform	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	µg/L
1,4-Dichlorobenzene	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	µg/L

Surrogate:	% RECOV	LIMITS
Bromofluorobenzene	96	52-167
Date Analyzed	05/01/00	

U - Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-65	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
,1-Dichloroethene	1.0 U	µg/L
ethylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
,1-Dichloroethane	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
h[illegible]form	1.0 U	µg/L
,[illegible]-Trichloroethane	1.0 U	µg/L
arbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
richloroethene	1.0 U	µg/L
,2-Dichloropropane	1.0 U	µg/L
romodichloromethane	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
etrachloroethene	1.0 U	µg/L
ibromochloromethane	**28**	µg/L
hlorobenzene	**1.9**	µg/L
romoform	1.0 U	µg/L
,1,2,2-Tetrachloroethane	**2.2**	µg/L
,3-Dichlorobenzene	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	µg/L
	1.0 U	µg/L

urrogate:	% RECOV	LIMITS
romofluorobenzene	96	52-167
ate Analyzed	05/01/00	

[illegible]mpound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-66	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	µg/L
c-1,2-Dichloroethene	1.0 U	µg/L
Chloroform	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	µg/L
Bromodichloromethane	**1.2**	µg/L
t-1,3-Dichloropropene	1.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	**40**	µg/L
Dibromochloromethane	**2.1**	µg/L
Chlorobenzene	1.0 U	µg/L
Bromoform	**2.2**	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	µg/L
1,4-Dichlorobenzene	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	µg/L

Surrogate:	% RECOV	LIMITS
Bromofluorobenzene	94	52-167
Date Analyzed	05/01/00	

U Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-67	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
,1-Dichloroethane	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
oform	**1.0** I	µg/L
,1,1-Trichloroethane	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	**3.3**	µg/L
,2-Dichloropropane	1.0 U	µg/L
Bromodichloromethane	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	**62**	µg/L
Dibromochloromethane	1.0 U	µg/L
Chlorobenzene	1.0 U	µg/L
Bromoform	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	µg/L

Surrogate:	% RECOV	LIMITS
Bromofluorobenzene	92	52-167
Date Analyzed	05/02/00	

= Compound was analyzed for but not detected to the level shown.
Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-68	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
,1-Dichloroethane	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
Chloroform	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	1.0 U	µg/L
,2-Dichloropropane	1.0 U	µg/L
romodichloromethane	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
etrachloroethene	12	µg/L
ibromochloromethane	1.0 U	µg/L
hlorobenzene	1.0 U	µg/L
romoform	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	µg/L
urrogate:	**% RECOV**	**LIMITS**
romofluorobenzene	94	52-167
ate Analyzed	05/02/00	

Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-69	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	µg/L
c-1,2-Dichloroethene	1.0 U	µg/L
Chloroform	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	µg/L
Bromodichloromethane	1.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	2.9	µg/L
Dibromochloromethane	1.0 U	µg/L
Chlorobenzene	1.0 U	µg/L
Bromoform	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	µg/L
1,4-Dichlorobenzene	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	µg/L
Surrogate:	**% RECOV**	**LIMITS**
Bromofluorobenzene	95	52-167
Date Analyzed	05/02/00	

U Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	DUP-01	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
,1-Dichloroethane	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
roform	**26**	µg/L
,1,1-Trichloroethane	1.0 U	µg/L
arbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
richloroethene	**1.0** I	µg/L
,2-Dichloropropane	1.0 U	µg/L
romodichloromethane	**1.2** I	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
etrachloroethene	**69**	µg/L
ibromochloromethane	1.0 U	µg/L
hlorobenzene	1.0 U	µg/L
romoform	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	µg/L

urrogate:	% RECOV	LIMITS
romofluorobenzene	92	52-167
ate Analyzed	05/01/00	

= Compound was analyzed for but not detected to the level shown.
Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	LAB BLANK	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	µg/L
c-1,2-Dichloroethene	1.0 U	µg/L
Chloroform	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	µg/L
Bromodichloromethane	1.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	1.0 U	µg/L
Dibromochloromethane	1.0 U	µg/L
Chlorobenzene	1.0 U	µg/L
Bromoform	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	µg/L
1,4-Dichlorobenzene	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	µg/L

Surrogate:	% RECOV	LIMITS
Bromofluorobenzene	92	52-167
Date Analyzed	04/30/00	

U - Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	LAB BLANK	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
roform	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	1.0 U	µg/L
,2-Dichloropropane	1.0 U	µg/L
Bromodichloromethane	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	1.0 U	µg/L
Dibromochloromethane	1.0 U	µg/L
Chlorobenzene	1.0 U	µg/L
Bromoform	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	µg/L

urrogate:	% RECOV	LIMITS
romofluorobenzene	93	52-167
ate Analyzed	05/01/00	

Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	LAB BLANK	Units
Dichlorodifluoromethane	1.0 U	µg/L
Chloromethane	2.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	1.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	µg/L
Methylene Chloride	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	µg/L
oform	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	µg/L
,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	1.0 U	µg/L
,2-Dichloropropane	1.0 U	µg/L
Bromodichloromethane	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	1.0 U	µg/L
Dibromochloromethane	1.0 U	µg/L
Chlorobenzene	1.0 U	µg/L
Bromoform	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	µg/L

Surrogate:	% RECOV	LIMITS
Bromofluorobenzene	95	52-167
Date Analyzed	05/02/00	

Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11037
DATE REPORTED: May 4, 2000
REFERENCE : SITE 11
PROJECT NAME : 22567-005-SC-0834A

QUALITY CONTROL DATA

Parameter	% RECOVERY MS/MSD/LCS	ACCEPT LIMITS	% RPD MS/MSD	ACCEPT LIMITS
EPA Method 8021				
Methylene Chloride	118/126/120	51-155	6	29
Chloroform	123/130/122	63-145	6	16
Carbon Tetrachloride	135/137/133	64-146	1	21
Trichloroethene	132/136/132	60-140	3	24
Tetrachloroethene	108/108/118	66-146	<1	21
Chlorobenzene	120/117/118	70-137	2	19

Environmental Conservation Laboratories Comprehensive QA Plan #910190

< = Less Than
MS = Matrix Spike
MSD = Matrix Spike Duplicate
LCS = Laboratory Control Standard
RPD = Relative Percent Difference

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ENCO Laboratories

DHRS Certification No. E82277

CLIENT : Bechtel Environmental, Inc.
ADDRESS: NAS Jacksonville
P.O. Box 171
Jacksonville, FL 32215

REPORT # : JAX11540
DATE SUBMITTED: May 31, 2000
DATE REPORTED : June 8, 2000

ATTENTION: Mr. Mark Gage

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

PROJECT : SITE 11 KINGS BAY

#1	- I-11	@ 12:48 (05/31/00)
#2	- I-12	@ 12:15 (05/31/00)
#3	- I-13	@ 11:40 (05/31/00)
#4	- I-14	@ 07:40 (05/31/00)
#5	- I-18	@ 13:20 (05/31/00)
#6	- I-24	@ 07:25 (05/31/00)
#7	- I-25	@ 14:45 (05/30/00)
#8	- I-26	@ 11:08 (05/31/00)
#9	- I-60	@ 17:14 (05/30/00)
#10	- I-61	@ 10:00 (05/31/00)

CONTINUED

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REPORT # : JAX11540
DATE SUBMITTED: May 31, 2000
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ATTENTION: Mr. Mark Gage

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

PROJECT : SITE 11 KINGS BAY

#11	- I-62	@ 16:20	(05/30/00)
#12	- I-63	@ 08:00	(05/31/00)
#13	- I-64	@ 18:25	(05/30/00)
#14	- I-65	@ 15:48	(05/30/00)
#15	- I-66	@ 16:45	(05/30/00)
#16	- I-67	@ 07:50	(05/31/00)
#17	- I-68	@ 17:50	(05/30/00)
#18	- I-69	@ 10:37	(05/31/00)
#19	- I-64 (DUP)	@ 18:25	(05/30/00)
#20	- I-12 (DUP)	@ 12:15	(05/31/00)

[illegible]ECT MANAGER Scott D. Martin
Scott D. Martin

ENCO LABORATORIES
REPORT # : JAX11540
DATE REPORTED: June 8, 2000
REFERENCE : SITE 11 KINGS BAY

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-11			I-12		Units
Dichlorodifluoromethane	5.0	U	D1	1.0	U	µg/L
Chloromethane	10	U	D1	2.0	U	µg/L
Vinyl Chloride	5.0	U	D1	1.0	U	µg/L
Bromomethane	5.0	U	D1	1.0	U	µg/L
Chloroethane	10	U	D1	2.0	U	µg/L
Trichlorofluoromethane	10	U	D1	2.0	U	µg/L
,1-Dichloroethene	5.0	U	D1	1.0	U	µg/L
Methylene Chloride	10	U	D1	2.0	U	µg/L
-1,2-Dichloroethene	5.0	U	D1	1.0	U	µg/L
,1-Dichloroethane	5.0	U	D1	1.0	U	µg/L
-1,2-Dichloroethene	**6.5**	I	D1	1.0	U	µg/L
[illegible]oform	5.0	U	D1	**1.1**	I	µg/L
,1,1-Trichloroethane	5.0	U	D1	1.0	U	µg/L
Carbon Tetrachloride	5.0	U	D1	1.0	U	µg/L
,2-Dichloroethane	5.0	U	D1	1.0	U	µg/L
Trichloroethene	**7.0**	I	D1	**1.8**	I	µg/L
,2-Dichloropropane	5.0	U	D1	1.0	U	µg/L
Bromodichloromethane	5.0	U	D1	1.0	U	µg/L
-1,3-Dichloropropene	5.0	U	D1	1.0	U	µg/L
-1,3-Dichloropropene	5.0	U	D1	1.0	U	µg/L
,1,2-Trichloroethane	5.0	U	D1	1.0	U	µg/L
Tetrachloroethene	**170**		D1	**47**		µg/L
Dibromochloromethane	5.0	U	D1	1.0	U	µg/L
Chlorobenzene	5.0	U	D1	1.0	U	µg/L
Bromoform	5.0	U	D1	1.0	U	µg/L
,1,2,2-Tetrachloroethane	5.0	U	D1	1.0	U	µg/L
,3-Dichlorobenzene	5.0	U	D1	1.0	U	µg/L
,4-Dichlorobenzene	5.0	U	D1	1.0	U	µg/L
,2-Dichlorobenzene	5.0	U	D1	1.0	U	µg/L

Surrogate:	% RECOV	% RECOV	LIMITS
Bromofluorobenzene	75	75	52-167
Date Analyzed	06/03/00	06/03/00	

U = Compound was analyzed for but not detected to the level shown.
I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
D1 = Analyte value determined from a 1:5 dilution.

ENCO LABORATORIES
REPORT # : JAX11540
DATE REPORTED: June 8, 2000
REFERENCE : SITE 11 KINGS BAY

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-13			I-14		Units
Dichlorodifluoromethane	5.0	U	D1	1.0	U	µg/L
Chloromethane	10	U	D1	2.0	U	µg/L
Vinyl Chloride	5.0	U	D1	1.0	U	µg/L
Bromomethane	5.0	U	D1	1.0	U	µg/L
Chloroethane	10	U	D1	2.0	U	µg/L
Trichlorofluoromethane	10	U	D1	2.0	U	µg/L
,1-Dichloroethene	5.0	U	D1	1.0	U	µg/L
Methylene Chloride	10	U	D1	2.0	U	µg/L
-1,2-Dichloroethene	5.0	U	D1	1.0	U	µg/L
,1-Dichloroethane	5.0	U	D1	1.0	U	µg/L
-1,2-Dichloroethene	5.0	U	D1	**1.6**	I	µg/L
Chloroform	**13**		D1	1.0	U	µg/L
,1,1-Trichloroethane	5.0	U	D1	1.0	U	µg/L
arbon Tetrachloride	5.0	U	D1	1.0	U	µg/L
,2-Dichloroethane	5.0	U	D1	1.0	U	µg/L
richloroethene	5.0	U	D1	**2.8**		µg/L
,2-Dichloropropane	5.0	U	D1	1.0	U	µg/L
romodichloromethane	5.0	U	D1	1.0	U	µg/L
-1,3-Dichloropropene	5.0	U	D1	1.0	U	µg/L
-1,3-Dichloropropene	5.0	U	D1	1.0	U	µg/L
,1,2-Trichloroethane	5.0	U	D1	1.0	U	µg/L
etrachloroethene	**410**		D1	**32**		µg/L
ibromochloromethane	5.0	U	D1	1.0	U	µg/L
hlorobenzene	5.0	U	D1	1.0	U	µg/L
romoform	5.0	U	D1	1.0	U	µg/L
,1,2,2-Tetrachloroethane	5.0	U	D1	1.0	U	µg/L
,3-Dichlorobenzene	5.0	U	D1	1.0	U	µg/L
,4-Dichlorobenzene	5.0	U	D1	1.0	U	µg/L
,2-Dichlorobenzene	5.0	U	D1	1.0	U	µg/L

urrogate:	% RECOV	% RECOV	LIMITS
romofluorobenzene	76	78	52-167
ate Analyzed	06/01/00	06/02/00	

= Compound was analyzed for but not detected to the level shown.
= Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
Analyte value determined from a 1:5 dilution.

ENCO LABORATORIES
REPORT # : JAX11540
DATE REPORTED: June 8, 2000
REFERENCE : SITE 11 KINGS BAY

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-18	I-24	Units
Dichlorodifluoromethane	1.0 U	1.0 U	µg/L
Chloromethane	2.0 U	2.0 U	µg/L
Vinyl Chloride	1.0 U	1.0 U	µg/L
Bromomethane	1.0 U	1.0 U	µg/L
Chloroethane	2.0 U	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	1.0 U	µg/L
Methylene Chloride	2.0 U	2.0 U	µg/L
c-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	1.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	**1.3** I	µg/L
Chloroform	1.0 U	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	1.0 U	µg/L
Trichloroethene	**1.6** I	**1.4** I	µg/L
1,2-Dichloropropane	1.0 U	1.0 U	µg/L
Bromodichloromethane	1.0 U	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
Tetrachloroethene	**99**	**13**	µg/L
Dibromochloromethane	1.0 U	1.0 U	µg/L
Chlorobenzene	1.0 U	1.0 U	µg/L
Bromoform	1.0 U	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
1,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
Surrogate:	**% RECOV**	**% RECOV**	**LIMITS**
Bromofluorobenzene	83	81	52-167
Date Analyzed	06/03/00	06/02/00	

U = Compound was analyzed for but not detected to the level shown.
I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

ENCO LABORATORIES
REPORT # : JAX11540
DATE REPORTED: June 8, 2000
REFERENCE : SITE 11 KINGS BAY

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-25	I-26	Units
Dichlorodifluoromethane	1.0 U	1.0 U	µg/L
Chloromethane	2.0 U	2.0 U	µg/L
Vinyl Chloride	1.0 U	1.0 U	µg/L
Bromomethane	1.0 U	1.0 U	µg/L
Chloroethane	2.0 U	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
Methylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	**1.1** I	1.0 U	µg/L
-1,2-Dichloroethene	**2.0**	**1.5** I	µg/L
Chloroform	**4.6**	**3.3**	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	**81**	**49**	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
hlorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
urrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	75	79	52-167
ate Analyzed	06/03/00	06/02/00	

= Compound was analyzed for but not detected to the level shown.
Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

ENCO LABORATORIES
REPORT # : JAX11540
DATE REPORTED: June 8, 2000
REFERENCE : SITE 11 KINGS BAY

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-60			I-61			Units
Dichlorodifluoromethane	100	U	D2	20	U	D3	µg/L
Chloromethane	200	U	D2	40	U	D3	µg/L
Vinyl Chloride	100	U	D2	20	U	D3	µg/L
Bromomethane	100	U	D2	20	U	D3	µg/L
Chloroethane	200	U	D2	40	U	D3	µg/L
Trichlorofluoromethane	200	U	D2	40	U	D3	µg/L
1,1-Dichloroethene	100	U	D2	20	U	D3	µg/L
Methylene Chloride	200	U	D2	40	U	D3	µg/L
-1,2-Dichloroethene	100	U	D2	20	U	D3	µg/L
1,1-Dichloroethane	100	U	D2	20	U	D3	µg/L
-1,2-Dichloroethene	100	U	D2	20	U	D3	µg/L
oform	100	U	D2	20	U	D3	µg/L
1,1-Trichloroethane	100	U	D2	20	U	D3	µg/L
Carbon Tetrachloride	100	U	D2	20	U	D3	µg/L
1,2-Dichloroethane	100	U	D2	20	U	D3	µg/L
Trichloroethene	100	U	D2	20	U	D3	µg/L
1,2-Dichloropropane	100	U	D2	20	U	D3	µg/L
Bromodichloromethane	100	U	D2	20	U	D3	µg/L
-1,3-Dichloropropene	100	U	D2	20	U	D3	µg/L
-1,3-Dichloropropene	100	U	D2	20	U	D3	µg/L
1,1,2-Trichloroethane	100	U	D2	20	U	D3	µg/L
Tetrachloroethene	**10000**		D2	**820**		D3	µg/L
Dibromochloromethane	100	U	D2	20	U	D3	µg/L
Chlorobenzene	100	U	D2	20	U	D3	µg/L
Bromoform	100	U	D2	20	U	D3	µg/L
1,1,2,2-Tetrachloroethane	100	U	D2	20	U	D3	µg/L
1,3-Dichlorobenzene	100	U	D2	20	U	D3	µg/L
1,4-Dichlorobenzene	100	U	D2	20	U	D3	µg/L
1,2-Dichlorobenzene	100	U	D2	20	U	D3	µg/L

Surrogate:	% RECOV	% RECOV	LIMITS
Bromofluorobenzene	64	69	52-167
Date Analyzed	06/03/00	06/07/00	

U = Compound was analyzed for but not detected to the level shown.
D2 = Analyte value determined from a 1:100 dilution.
D3 = Analyte value determined from a 1:20 dilution.

ENCO LABORATORIES
REPORT # : JAX11540
DATE REPORTED: June 8, 2000
REFERENCE : SITE 11 KINGS BAY

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-62			I-63			Units
Dichlorodifluoromethane	5.0	U	D1	5.0	U	D1	µg/L
Chloromethane	10	U	D1	10	U	D1	µg/L
Vinyl Chloride	5.0	U	D1	5.0	U	D1	µg/L
Bromomethane	5.0	U	D1	5.0	U	D1	µg/L
Chloroethane	10	U	D1	10	U	D1	µg/L
Trichlorofluoromethane	10	U	D1	10	U	D1	µg/L
1,1-Dichloroethene	5.0	U	D1	5.0	U	D1	µg/L
Methylene Chloride	10	U	D1	10	U	D1	µg/L
-1,2-Dichloroethene	5.0	U	D1	5.0	U	D1	µg/L
1,1-Dichloroethane	5.0	U	D1	5.0	U	D1	µg/L
-1,2-Dichloroethene	5.0	U	D1	5.0	U	D1	µg/L
roform	5.0	U	D1	5.0	U	D1	µg/L
,1,1-Trichloroethane	5.0	U	D1	5.0	U	D1	µg/L
Carbon Tetrachloride	5.0	U	D1	5.0	U	D1	µg/L
,2-Dichloroethane	5.0	U	D1	5.0	U	D1	µg/L
Trichloroethene	5.0	U	D1	5.0	U	D1	µg/L
,2-Dichloropropane	5.0	U	D1	5.0	U	D1	µg/L
Bromodichloromethane	5.0	U	D1	5.0	U	D1	µg/L
-1,3-Dichloropropene	5.0	U	D1	5.0	U	D1	µg/L
-1,3-Dichloropropene	5.0	U	D1	5.0	U	D1	µg/L
,1,2-Trichloroethane	5.0	U	D1	5.0	U	D1	µg/L
Tetrachloroethene	**120**		D1	**130**		D1	µg/L
Dibromochloromethane	5.0	U	D1	5.0	U	D1	µg/L
Chlorobenzene	5.0	U	D1	5.0	U	D1	µg/L
Bromoform	5.0	U	D1	5.0	U	D1	µg/L
,1,2,2-Tetrachloroethane	5.0	U	D1	5.0	U	D1	µg/L
,3-Dichlorobenzene	5.0	U	D1	5.0	U	D1	µg/L
,4-Dichlorobenzene	5.0	U	D1	5.0	U	D1	µg/L
,2-Dichlorobenzene	5.0	U	D1	5.0	U	D1	µg/L
urrogate:	**% RECOV**			**% RECOV**			**LIMITS**
romofluorobenzene	60			96			52-167
ate Analyzed	06/07/00			06/08/00			

Compound was analyzed for but not detected to the level shown.
Analyte value determined from a 1:5 dilution.

ENCO LABORATORIES
REPORT # : JAX11540
DATE REPORTED: June 8, 2000
REFERENCE : SITE 11 KINGS BAY

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-64			I-65			Units
)ichlorodifluoromethane	5.0	U	D1	5.0	U	D1	µg/L
:hloromethane	10	U	D1	10	U	D1	µg/L
'inyl Chloride	5.0	U	D1	5.0	U	D1	µg/L
;romomethane	5.0	U	D1	5.0	U	D1	µg/L
:hloroethane	10	U	D1	10	U	D1	µg/L
'richlorofluoromethane	10	U	D1	10	U	D1	µg/L
,1-Dichloroethene	5.0	U	D1	5.0	U	D1	µg/L
lethylene Chloride	10	U	D1	10	U	D1	µg/L
-1,2-Dichloroethene	5.0	U	D1	5.0	U	D1	µg/L
,1-Dichloroethane	5.0	U	D1	5.0	U	D1	µg/L
-1,2-Dichloroethene	5.0	U	D1	5.0	U	D1	µg/L
[illegible]oform	5.0	U	D1	5.0	U	D1	µg/L
,1,1-Trichloroethane	5.0	U	D1	5.0	U	D1	µg/L
arbon Tetrachloride	5.0	U	D1	5.0	U	D1	µg/L
,2-Dichloroethane	5.0	U	D1	5.0	U	D1	µg/L
richloroethene	5.0	U	D1	5.0	U	D1	µg/L
,2-Dichloropropane	5.0	U	D1	5.0	U	D1	µg/L
romodichloromethane	5.0	U	D1	5.0	U	D1	µg/L
-1,3-Dichloropropene	5.0	U	D1	5.0	U	D1	µg/L
-1,3-Dichloropropene	5.0	U	D1	5.0	U	D1	µg/L
,1,2-Trichloroethane	5.0	U	D1	5.0	U	D1	µg/L
etrachloroethene	**92**		D1	**210**		D1	µg/L
ibromochloromethane	5.0	U	D1	5.0	U	D1	µg/L
hlorobenzene	5.0	U	D1	5.0	U	D1	µg/L
romoform	5.0	U	D1	5.0	U	D1	µg/L
,1,2,2-Tetrachloroethane	5.0	U	D1	5.0	U	D1	µg/L
,3-Dichlorobenzene	5.0	U	D1	5.0	U	D1	µg/L
,4-Dichlorobenzene	5.0	U	D1	5.0	U	D1	µg/L
,2-Dichlorobenzene	5.0	U	D1	5.0	U	D1	µg/L
ırrogate:	**% RECOV**			**% RECOV**			**LIMITS**
romofluorobenzene	94			96			52-167
ate Analyzed	06/08/00			06/09/00			

[illegible]mpound was analyzed for but not detected to the level shown.
[illegible] Analyte value determined from a 1:5 dilution.

ENCO LABORATORIES
REPORT # : JAX11540
DATE REPORTED: June 8, 2000
REFERENCE : SITE 11 KINGS BAY

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-66			I-67			Units
Dichlorodifluoromethane	5.0	U	D1	5.0	U	D1	µg/L
Chloromethane	10	U	D1	10	U	D1	µg/L
Vinyl Chloride	5.0	U	D1	5.0	U	D1	µg/L
Bromomethane	5.0	U	D1	5.0	U	D1	µg/L
Chloroethane	10	U	D1	10	U	D1	µg/L
Trichlorofluoromethane	10	U	D1	10	U	D1	µg/L
1,1-Dichloroethene	5.0	U	D1	5.0	U	D1	µg/L
Methylene Chloride	10	U	D1	10	U	D1	µg/L
-1,2-Dichloroethene	5.0	U	D1	5.0	U	D1	µg/L
1,1-Dichloroethane	5.0	U	D1	5.0	U	D1	µg/L
-1,2-Dichloroethene	5.0	U	D1	**5.2**	I	D1	µg/L
roform	5.0	U	D1	5.0	U	D1	µg/L
,1,1-Trichloroethane	5.0	U	D1	5.0	U	D1	µg/L
Carbon Tetrachloride	5.0	U	D1	5.0	U	D1	µg/L
,2-Dichloroethane	5.0	U	D1	5.0	U	D1	µg/L
Trichloroethene	5.0	U	D1	5.0	U	D1	µg/L
,2-Dichloropropane	5.0	U	D1	5.0	U	D1	µg/L
Bromodichloromethane	5.0	U	D1	5.0	U	D1	µg/L
-1,3-Dichloropropene	5.0	U	D1	5.0	U	D1	µg/L
-1,3-Dichloropropene	5.0	U	D1	5.0	U	D1	µg/L
,1,2-Trichloroethane	5.0	U	D1	5.0	U	D1	µg/L
Tetrachloroethene	**260**		D1	**72**		D1	µg/L
Dibromochloromethane	5.0	U	D1	5.0	U	D1	µg/L
Chlorobenzene	5.0	U	D1	5.0	U	D1	µg/L
Bromoform	5.0	U	D1	5.0	U	D1	µg/L
,1,2,2-Tetrachloroethane	5.0	U	D1	5.0	U	D1	µg/L
,3-Dichlorobenzene	5.0	U	D1	5.0	U	D1	µg/L
,4-Dichlorobenzene	5.0	U	D1	5.0	U	D1	µg/L
,2-Dichlorobenzene	5.0	U	D1	5.0	U	D1	µg/L

Surrogate:	% RECOV	% RECOV	LIMITS
Bromofluorobenzene	98	98	52-167
Date Analyzed	06/08/00	06/08/00	

= Compound was analyzed for but not detected to the level shown.
= Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).
Analyte value determined from a 1:5 dilution.

ENCO LABORATORIES
REPORT # : JAX11540
DATE REPORTED: June 8, 2000
REFERENCE : SITE 11 KINGS BAY

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-68	I-69	Units
Dichlorodifluoromethane	1.0 U	1.0 U	µg/L
Chloromethane	2.0 U	2.0 U	µg/L
Vinyl Chloride	1.0 U	1.0 U	µg/L
Bromomethane	1.0 U	1.0 U	µg/L
Chloroethane	2.0 U	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	1.0 U	µg/L
Methylene Chloride	2.0 U	2.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	1.0 U	µg/L
c-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
Chloroform	1.0 U	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	1.0 U	µg/L
Trichloroethene	1.0 U	**1.8** I	µg/L
1,2-Dichloropropane	1.0 U	1.0 U	µg/L
Bromodichloromethane	1.0 U	1.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
Tetrachloroethene	**4.0**	**36**	µg/L
Dibromochloromethane	1.0 U	1.0 U	µg/L
Chlorobenzene	1.0 U	1.0 U	µg/L
Bromoform	1.0 U	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
1,4-Dichlorobenzene	**1.9** I	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
Surrogate:	**% RECOV**	**% RECOV**	**LIMITS**
Bromofluorobenzene	83	67	52-167
Date Analyzed	06/01/00	06/06/00	

U = Compound was analyzed for but not detected to the level shown.
I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

ENCO LABORATORIES
REPORT # : JAX11540
DATE REPORTED: June 8, 2000
REFERENCE : SITE 11 KINGS BAY

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	I-64 (DUP)	I-12 (DUP)	Units
)ichlorodifluoromethane	1.0 U	1.0 U	µg/L
:hloromethane	2.0 U	2.0 U	µg/L
/inyl Chloride	1.0 U	1.0 U	µg/L
3romomethane	1.0 U	1.0 U	µg/L
:hloroethane	2.0 U	2.0 U	µg/L
'richlorofluoromethane	2.0 U	**2.0** I	µg/L
.,1-Dichloroethene	1.0 U	1.0 U	µg/L
Iethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
roform	1.0 U	**1.4** I	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
'arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
'richloroethene	**1.5** I	**1.8** I	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	**93**	**50**	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
hlorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
urrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	71	64	52-167
ate Analyzed	06/06/00	06/04/00	

= Compound was analyzed for but not detected to the level shown.
Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

ENCO LABORATORIES
REPORT # : JAX11540
DATE REPORTED: June 8, 2000
REFERENCE : SITE 11 KINGS BAY

RESULTS OF ANALYSIS

PA METHOD 8021 - OLATILE ORGANICS	LAB BLANK	LAB BLANK	Units
ichlorodifluoromethane	1.0 U	1.0 U	µg/L
hloromethane	2.0 U	2.0 U	µg/L
inyl Chloride	1.0 U	1.0 U	µg/L
romomethane	1.0 U	1.0 U	µg/L
hloroethane	2.0 U	2.0 U	µg/L
richlorofluoromethane	2.0 U	2.0 U	µg/L
,1-Dichloroethene	1.0 U	1.0 U	µg/L
ethylene Chloride	2.0 U	2.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
,1-Dichloroethane	1.0 U	1.0 U	µg/L
-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
h form	1.0 U	1.0 U	µg/L
,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
arbon Tetrachloride	1.0 U	1.0 U	µg/L
,2-Dichloroethane	1.0 U	1.0 U	µg/L
richloroethene	1.0 U	1.0 U	µg/L
,2-Dichloropropane	1.0 U	1.0 U	µg/L
romodichloromethane	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
etrachloroethene	1.0 U	1.0 U	µg/L
ibromochloromethane	1.0 U	1.0 U	µg/L
ılorobenzene	1.0 U	1.0 U	µg/L
romoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
ırrogate:	**% RECOV**	**% RECOV**	**LIMITS**
romofluorobenzene	81	81	52-167
ıte Analyzed	06/01/00	06/02/00	

ompound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11540
DATE REPORTED: June 8, 2000
REFERENCE : SITE 11 KINGS BAY

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	LAB BLANK	LAB BLANK	Units
Dichlorodifluoromethane	1.0 U	1.0 U	µg/L
Chloromethane	2.0 U	2.0 U	µg/L
Vinyl Chloride	1.0 U	1.0 U	µg/L
Bromomethane	1.0 U	1.0 U	µg/L
Chloroethane	2.0 U	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	1.0 U	µg/L
Methylene Chloride	2.0 U	2.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	1.0 U	µg/L
c-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
Chloroform	1.0 U	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	1.0 U	µg/L
Trichloroethene	1.0 U	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	1.0 U	µg/L
Bromodichloromethane	1.0 U	1.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
Tetrachloroethene	1.0 U	1.0 U	µg/L
Dibromochloromethane	1.0 U	1.0 U	µg/L
Chlorobenzene	1.0 U	1.0 U	µg/L
Bromoform	1.0 U	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
1,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
Surrogate:	**% RECOV**	**% RECOV**	**LIMITS**
Bromofluorobenzene	76	76	52-167
Date Analyzed	06/06/00	06/07/00	

U Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11540
DATE REPORTED: June 8, 2000
REFERENCE : SITE 11 KINGS BAY

RESULTS OF ANALYSIS

EPA METHOD 8021 - VOLATILE ORGANICS	LAB BLANK	LAB BLANK	Units
Dichlorodifluoromethane	1.0 U	1.0 U	µg/L
Chloromethane	2.0 U	2.0 U	µg/L
Vinyl Chloride	1.0 U	1.0 U	µg/L
Bromomethane	1.0 U	1.0 U	µg/L
Chloroethane	2.0 U	2.0 U	µg/L
Trichlorofluoromethane	2.0 U	2.0 U	µg/L
1,1-Dichloroethene	1.0 U	1.0 U	µg/L
Methylene Chloride	2.0 U	2.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	1.0 U	µg/L
c-1 2-Dichloroethene	1.0 U	1.0 U	µg/L
C oform	1.0 U	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
Carbon Tetrachloride	1.0 U	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	1.0 U	µg/L
Trichloroethene	1.0 U	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	1.0 U	µg/L
Bromodichloromethane	1.0 U	1.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
Tetrachloroethene	1.0 U	1.0 U	µg/L
Dibromochloromethane	1.0 U	1.0 U	µg/L
Chlorobenzene	1.0 U	1.0 U	µg/L
Bromoform	1.0 U	1.0 U	µg/L
,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
,4-Dichlorobenzene	1.0 U	1.0 U	µg/L
,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
Surrogate:	**% RECOV**	**% RECOV**	**LIMITS**
Bromofluorobenzene	78	99	52-167
Date Analyzed	06/08/00	06/09/00	

Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JAX11540
DATE REPORTED: June 8, 2000
REFERENCE : SITE 11 KINGS BAY

QUALITY CONTROL DATA

Parameter	% RECOVERY MS/MSD/LCS	ACCEPT LIMITS	% RPD MS/MSD	ACCEPT LIMITS
EPA Method 8021				
Methylene Chloride	76/ 80/ 89	51-155	5	29
Chloroform	86/ 84/100	63-145	2	16
Carbon Tetrachloride	98/ 88/104	64-146	11	21
Trichloroethene	88/ 78/100	60-140	12	24
Tetrachloroethene	112/103/108	66-146	8	21
Chlorobenzene	93/ 83/100	70-137	11	19

Environmental Conservation Laboratories Comprehensive QA Plan #910190

< = Less Than
MS = Matrix Spike
MSD = Matrix Spike Duplicate
LCS = Laboratory Control Standard
RPD = Relative Percent Difference

This report shall not be reproduced except in full, without the written approval of the laboratory. Results for these procedures apply only to the samples as submitted.

Attachment 2

Effectiveness Evaluation Report
Geo-Cleanse Treatment Program
Phase III
Naval Submarine Base Kings Bay
Site 11 Kings Bay, Georgia

Geo-Cleanse International, Inc.

FINAL
Effectiveness Evaluation Report
Geo-Cleanse® Treatment Program

PHASE III

Naval Submarine Base Kings Bay
Site 11
Kings Bay, Georgia

Prepared for:
Bechtel Environmental, Inc.
Quarters E on G Avenue
NAS Cecil Field
Jacksonville, FL

July 24, 2000

Geo-Cleanse International, Inc.
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Geo-Cleanse International, Inc.

FINAL
Effectiveness Evaluation Report
Geo-Cleanse® Treatment Program

PHASE III

Naval Submarine Base Kings Bay
Site 11
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1.0 Introduction

1.1 Background

Geo-Cleanse International, Inc. (GCI), on behalf of Bechtel Environmental, Inc. (Bechtel), was contracted to perform an in-situ chemical oxidation treatment to address volatile organic constituents (VOCs) in groundwater at Site 11 of the Naval Submarine Base (NSB) Kings Bay in Kings Bay, Georgia. A Geo-Cleanse® Treatment at Site 11 was completed on February 14, 1999. Based upon the results of this treatment (referred to as Phase I), the scope of work was expanded to include additional areas and Phase II was completed on July 15, 1999. Site characterization activities following Phase II identified an additional area of concern for which a Phase III treatment was completed on April 19, 2000. The current contracted tasks were performed as a modification under Bechtel Subcontract Agreement No. 22567-625-SC-0830, under Bechtel Job No. 22567 and Contract No. N62467-93-D-0936 with the Department of the Navy. The purposes of this Effectiveness Evaluation Report are to summarize the goals, describe the observations and results, and provide conclusions regarding the efficiency of the Phase III Geo-Cleanse® Treatment Program at Site 11. The following documents were reviewed in preparation for the Phase III Geo-Cleanse® Treatment:

- Bechtel Environmental, Inc. *Request for Proposal (RFP) 22567-625-SC-0830, In-Situ Chemical Oxidation Deployment, NSB Kings Bay, GA.* Dated July 17, 1998.
- Geo-Cleanse International, Inc. *Effectiveness Evaluation Report, Geo-Cleanse® Treatment Program, Naval Submarine Base Kings Bay Site 11, Kings Bay, Georgia.* Dated May 7, 1999.
- Geo-Cleanse International, Inc. *Effectiveness Evaluation Report, Geo-Cleanse® Treatment Program, Phase II, Naval Submarine Base Kings Bay Site 11, Kings Bay, Georgia.* Dated October 7, 1999.
- Additional site characterization and delineation data provided by Bechtel.

The remainder of this Effectiveness Evaluation Report is organized as follows:

Section 1, Introduction (this section)— Further in Section 1 is an overview of the Geo-Cleanse® Process and application to contaminants reported at the site, a description of the site including geologic and hydrogeologic setting, summary of Phase II results, nature and extent of remaining VOC contamination, and treatment goals.

Section 2, Treatment Program Operations and Observations— Describes the field operations conducted at the site, with summaries of all analytical and field data collected prior to, during, and after the field operations, hydrogen peroxide injection totals by location and date, and injector installation data.

Section 3, Treatment Program Results— Describes and interprets the analytical results generated by the treatment program, and evaluates overall treatment performance.

Section 4, Conclusions— Presents a summary of the Geo-Cleanse® Treatment Program at the site, describes lessons learned by application at the site, and draws conclusions regarding overall performance and success.

Section 5, References Cited— Presents a bibliographic list of references cited in the text.

1.1.1 Overview of the Geo-Cleanse® Process

The Geo-Cleanse® Process is a patented, in-situ chemical oxidation process intended to reduce organic contaminant concentrations in soil and groundwater. The Geo-Cleanse Process® is an aggressive, pressurized injection of concentrated hydrogen peroxide and ferrous iron catalyst, which together are known as Fenton's reagent and generate a hydroxyl free radical that acts as the active oxidizing agent. The basic radical-producing reaction is characterized as:

$$H_2O_2 + Fe^{+2} \rightarrow OH\cdot + OH^- + Fe^{+3}$$

where H_2O_2 is hydrogen peroxide, Fe^{+2} is ferrous iron, OH· is hydroxyl free radical, OH^- is hydroxyl ion, and Fe^{+3} is ferric iron. The hydroxyl free radical generated by Fenton's reagent is a powerful, non-selective oxidant. Oxidation of an organic compound by Fenton's reagent is a rapid and exothermic (heat-producing) reaction. Rate constants for reactions of hydroxyl free radical with common environmental pollutants are typically in the range of 10^7 to 10^{10} $M^{-1}s^{-1}$ (e.g., Haag and Yao, 1992), and 100% mineralization is generally complete in minutes.

Site characterization data provided by Bechtel indicate that the primary VOC within the treatment area at the NSB Kings Bay site is tetrachloroethene (PCE). Fenton's reagent oxidizes chlorinated organic contaminants such as PCE to substituent carbon dioxide, water, and chloride. Reported rate constants for reaction of hydroxyl free radicals with PCE range from 2.3 to 2.8 x 10^9 $M^{-1}s^{-1}$ (Buxton et al., 1988), indicating an extremely rapid reaction. Leung et al. (1992) and Sato et al. (1993) have analyzed PCE destruction by Fenton's reagent, and have reported that mineralization is rapid and complete. The only

significant intermediate product of Fenton's reagent oxidation of PCE ($Cl_2C{=}CCl_2$) is dichloroacetic acid ($CHCl_2COOH$), which is further oxidized to water (H_2O), carbon dioxide (CO_2), hydrogen ions (H^+) and chloride ions (Cl^-) (Figure 1-1):

$$Cl_2C{=}CCl_2 + OH^- + H_2O \rightarrow CHCl_2COOH + H^+ + Cl^- + Cl^-$$
$$CHCl_2COOH + 4OH^- \rightarrow 2H^+ + 2Cl^- + 2H_2O + 2CO_2$$

(Leung et al., 1992; Sato et al., 1992). Residual hydrogen peroxide not consumed by oxidation of organic compounds naturally decomposes to oxygen and water. Soluble ferrous iron catalyst amendments will naturally precipitate as ferric iron compounds.

1.1.2 Site History

The NSB Kings Bay occupies approximately 16,168 acres in Camden County, Georgia. Site 11 is identified as the Old Camden County Landfill, which is now incorporated in the NSB. The Old Camden County Landfill was used for municipal waste disposal in the 1960's and 1970's. Waste was disposed by digging trenches and filling with waste. The trenches were then covered with fill. Tetrachloroethene was disposed in the landfill at some point during waste disposal operations, resulting in groundwater contamination at the site. The only facilities remaining in the area are part of ongoing environmental investigation and remediation activities.

The shallow soils in the region of NSB Kings Bay are typified as fine sands interbedded with silty and/or clayey fine sands and some medium sands, with water encountered at approximately 6 feet below grade. An unconfined surficial aquifer is approximately 90 ft thick in the vicinity of Site 11. Within the Site 11 area, the lithology of the surficial zone is described as gray to light brown, fine to medium quartz sand with intermittent gray clay lenses, extending to a depth of at least 50 ft below grade. Depth to water is approximately 6 ft below grade.

Site delineation within the treatment area, upon which the Phase I and II treatment programs were designed, was derived from direct-push sampling of groundwater conducted in March and September 1997, groundwater sampling (associated with the Geo-Cleanse® Treatment programs) from a network of 6 monitoring wells, 4 peizometers, 2 recovery wells, 44 injection wells, and 24 cone penetrometer test locations (Figure 1-2). Results indicated that chlorinated aliphatic compounds (CACs) were present in groundwater and that the impacted zone was primarily restricted to between 30 and 40 ft depth below grade, within a zone of relatively high transmissivity. An additional area of relatively high CAC concentrations was detected extending at least as shallow as 25 feet in the eastern portion of treatment area near Phase I injector location I-14. The CACs reported and their maximum concentrations were

8,500 μg/L for PCE, 1,140 μg/L for trichloroethene (TCE), 1,300 μg/L for cis-1,2-dichloroethene (cis-1,2-DCE), and 327 μg/L for vinyl chloride (VC). The average total concentration of CACs (taken as the sum of PCE, TCE, cis-1,2-DCE, and VC concentrations) within the treatment area was estimated by Bechtel to be approximately 5,000 μg/L. Hydraulic conductivity was reported as 30 ft/day in the 30 ft to 40 ft depth interval, with flow direction generally to the northwest.

The Geo-Cleanse® Treatment Program was conducted in order to reduce CAC concentrations in groundwater within the source area at the site. For Phase I, 23 specially-designed injectors were installed under the State of Georgia Department of Natural Resources Injection Well Operating Permit #89. The Phase I treatment was completed on February 14, 1999 after injection of 12,063 gallons of 50% hydrogen peroxide solution. Groundwater samples were collected from every monitoring well and injector within and adjacent to the treatment area. Overall, the cleanup objectives were met within the primary treatment area, with a reduction to 9 μg/L of total CACs in KBA-11-34 (>99% reduction) and an average reduction in total CACs to 53 μg/L (98% reduction). However, injector I-14, located upgradient of the Phase I primary treatment area (Figure 1-1), yielded a post-treatment total CAC concentration of 3,800 μg/L. The PCE concentration in I-14 was 3,500 μg/L, indicative of the likely presence of a residual dense nonaqueous phase liquid (DNAPL) near I-14. In addition, relatively high CAC concentrations remained downgradient of the primary treatment area, particularly in the area of the four USGS peizometers (USGS-1, USGS-2, USGS-3, and USGS-15). Based upon these results, a Phase II treatment was conducted to target the upgradient area near I-14 and the downgradient area near the four USGS peizometers.

The Phase II injection program included installation of 21 additional injectors, primarily in the upgradient area near I-14 and the downgradient area near the USGS peizometers. After injection of 11,247 gallons of 50% hydrogen peroxide solution during two mobilizations in June and July 1999, the total CAC level in 55 out of 56 sampling points was below 100 μg/L and maintained for at least 30 days after the injection was concluded. The remaining sample point exceeding 100 μg/L was injector I-14, which yielded 2,180 μg/L (average of two field duplicate samples) 32 days after the July injection. The surrounding sampling points yielded less than 100 μg/L of total CACs. Injector I-14 was, therefore, very likely located directly within the source area. The relatively high CAC levels indicate the presence of a persistent source remaining after the Geo-Cleanse® Treatment Program. However, the source is possibly not within the targeted depth intervals.

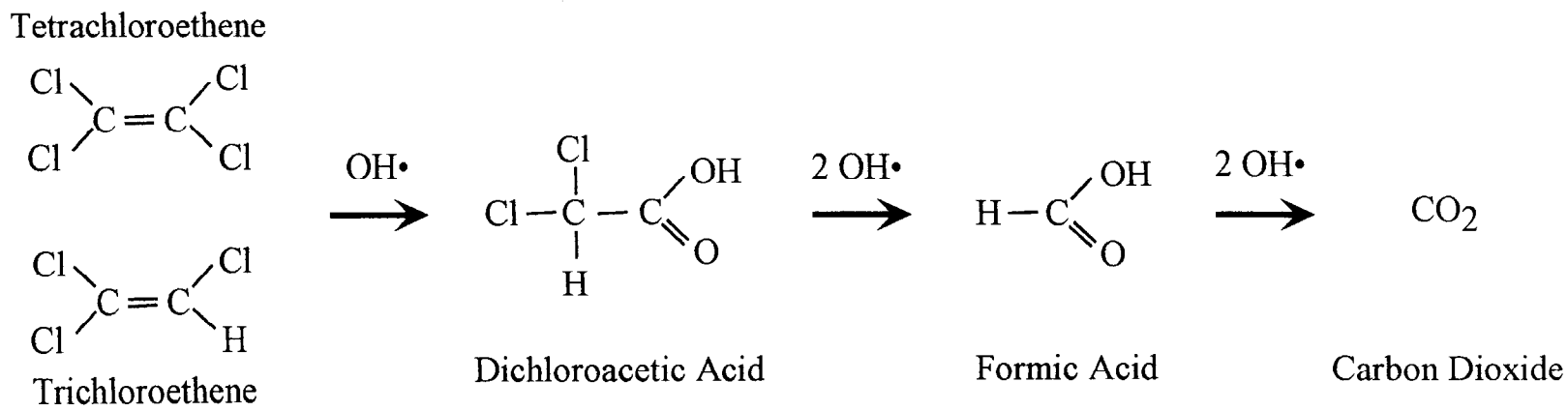
1.2 Phase III Delineation Activities

Following the Phase II treatment and subsequent rebound of CACs in I-14, Bechtel conducted additional field delineation activities at the site including advancement of 16 Geoprobe® borings at the site from which a total of 69 groundwater samples were collected at depths ranging from 11 to 42 feet below grade. The results (reported separately by Bechtel) identified an approximately 25 ft x 25 ft area located east of I-14 and north of monitoring well KBA-11-35 with relatively high CAC contamination, centered at a location identified as GP-10 (approximately 10 ft southeast of I-14 and 20 ft north of KBA-11-35). Groundwater samples from GP-10 yielded PCE concentrations ranging from 5,000 μg/L at the 11-14 ft depth interval, increasing progressively with depth to a maximum of 99,000 μg/L at the 27-30 ft depth interval (the deepest depth investigated at this location). Based upon these results, a 20 ft x 30 ft area centered at GP-10 was excavated to approximately 8 ft (the base of the trash trenches as identified during the excavation), and excavated soils were screened with a photoionization detector. Containers reportedly containing PCE-contaminated materials were identified and removed from the excavated soils, and the soils were backfilled into the excavation. Additional details regarding the Geoprobe site investigation, excavation, and post-excavation sampling are reported separately by Bechtel.

1.3 Treatment Program Objectives

Data provided by Bechtel indicated that CACs (primarily PCE, TCE, cis-1,2-DCE and VC) were concentrated in the groundwater in Site 11 at NSB Kings Bay in areas outside of the Phase I and II treatment areas. The goals of the Phase III Geo-Cleanse® Treatment at the site were to treat groundwater within the contaminated plume source area identified by Bechtel near I-14, to achieve reduction of CACs. Natural attenuation modeling results indicated that source area reduction of CACs to 100 μg/L for each compound would be sufficient for natural attenuation to achieve compliance levels in the groundwater plume prior to leaving the base boundaries and reaching offsite monitoring points (Chapelle and Bradley, 1998). Thus a more conservative target of 100 μg/L of total CACs (taken as the sum of PCE, TCE, cis-1,2-DCE and VC concentrations) was established as the remedial goal.

Tetrachloroethene & Trichloroethene Oxidation Pathway



References: Leung et al. 1992; Sato et al. 1993

FIGURE 1-1. FENTON'S REAGENT OXIDATION PATHWAY FOR TETRACHLOROETHENE AND TRICHLOROETHENE

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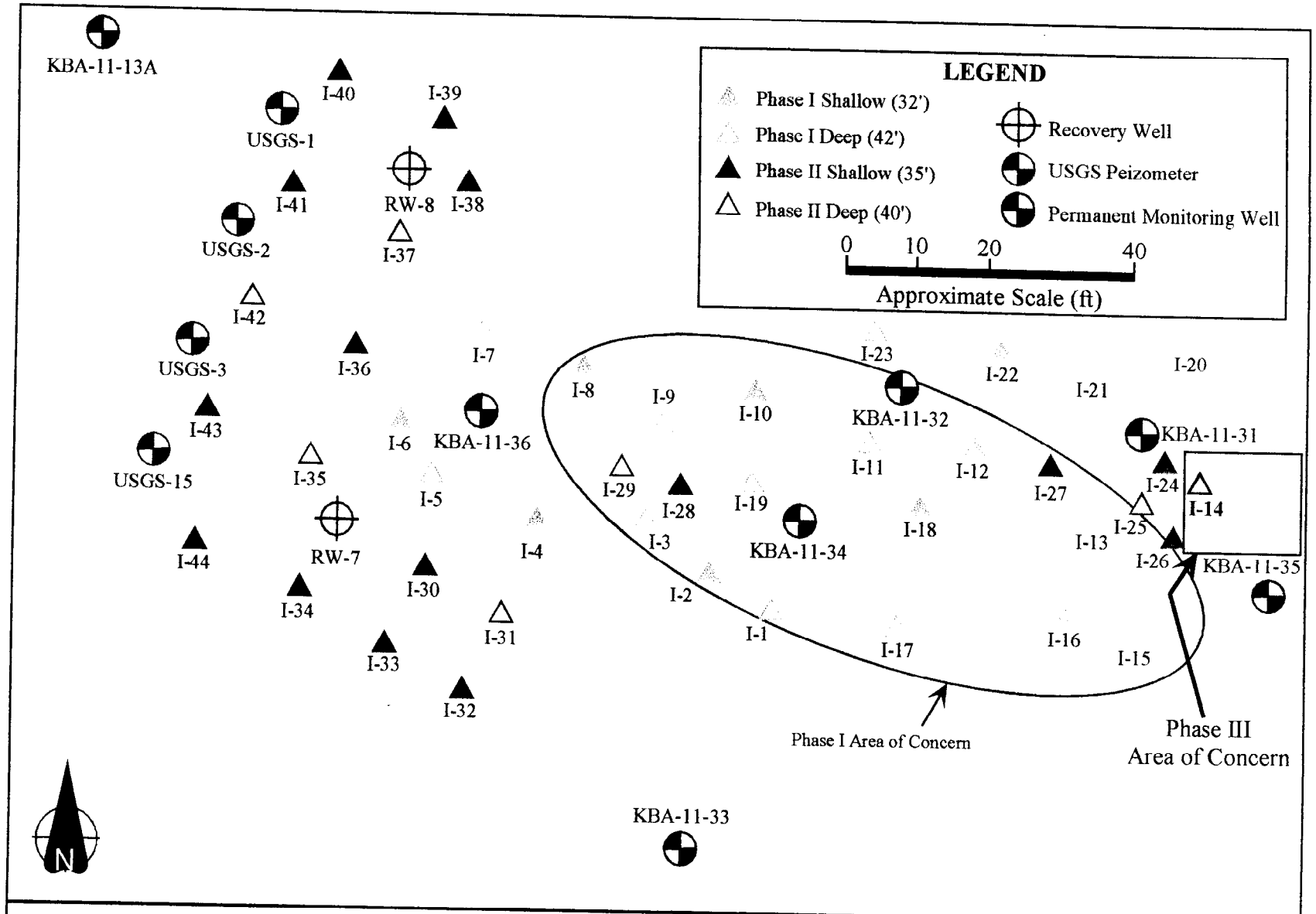

FIGURE 1-2. NSB Kings Bay Phase I and II Injector and Monitoring Well Location Map

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2.0 Treatment Program Operations and Observations

2.1 Injector Installation

Prior to the Phase I treatment, the State of Georgia Department of Natural Resources issued Injection Well Operating Permit #089 (dated October 26, 1998) to the Department of the Navy on behalf of Bechtel for installation and operation of injectors for the Geo-Cleanse® Treatment Program. Under this permit and in preparation for the Phase III treatment, an additional 10 injectors distributed in four vertical levels were installed from January 4-6, 2000 at the locations indicated in Figure 2-1. Boreholes were drilled by hollow stem auger. Three injectors were installed in each of three vertical levels at depths of approximately 24 ft, 30 ft, and 33 ft below grade, and one injector was installed at 39 ft below grade. Injector construction depths and screened intervals are summarized in Table 2-1. Soil boring and injector construction logs are included as Appendix A.

The riser, screen, and completion materials were selected and designed for resistance to the chemical reagents used, and the heat and pressure generated by the Geo-Cleanse® Process. The injectors were constructed with 3 ft of 1¼-inch diameter, 0.010-slot stainless steel screens. The riser pipe is composed of 1¼-inch diameter Schedule 80 black steel riser pipe and couplings and extends approximately 1 ft above grade The screens were packed with filter sand and a layer of bentonite pellets was installed to seal the screened interval. The annulus was then sealed to grade with a Portland cement and bentonite grout. The injector risers have threaded caps. The injectors are designed to accommodate the patented Geo-Cleanse® Mixing Head, which was attached directly to the riser (Figure 2-2). This mixing head is designed to deliver a stabilized mixture of reagents to the subsurface.

2.2 Pre-Injection Sampling Results

After Phase III injector installation was completed, Bechtel personnel collected a round of groundwater samples from every injector within or adjacent to the treatment area on January 6 and 7, 2000, prior to the Phase III injection. The analytical results for the January 6-7, 2000 sampling event (Table 2-2 and Figure 2-3) indicated that the CAC concentrations within the central part of the plume (e.g., near I-60) were considerably greater than previously anticipated from the Geoprobe® investigation (Section 1.2). Injector I-60 (the deepest injector, installed at the location of GP-10) yielded the highest CAC concentration, 130,000 μg/L of PCE with no breakdown products. Three adjacent injectors, (I-61, I-62, and I-65) yielded between 12,000 and 28,000 μg/L of PCE with relatively low concentrations of cis-

1,2-DCE. Six injectors yielded CAC concentrations between 1,000 and 10,000 μg/L of CACs, primarily PCE with relatively higher cis-1,2-DCE. Dissolved PCE concentrations greater than approximately 2,200 mg/L indicate the likely presence of a DNAPL phase within the treatment area. Historical analytical results for all sampling points at Site 11 are compiled in Appendix B.

2.3 Injection Operations and Observations

The field injection program was conducted in three phases: January 18-25, March 7-9, and April 17-19, 2000. Groundwater samples were collected periodically to assess the treatment progress. Samples were collected on January 22 during the first injection, February 2-3 after the first injection, and March 25 after the second injection. The results of these sampling rounds allowed refinement of the injection plan to ensure the oxidant distribution was optimized. Post-treatment samples after the third injection were collected on April 27 and May 30.

For each mobilization, the first day was devoted primarily to site preparation activities, including positioning the GCI mobile treatment unit, hydrogen peroxide tanker, and generator, establishing an exclusion zone, preparing the safety shower and eyewash, and conducting a health and safety meeting for all personnel. Pre-treatment injection activities included pneumatic and hydraulic tests of the injectors and aquifer to determine permeability. Hydrogen peroxide was injected on the first day of each mobilization. Process monitoring conducted during the treatment was generally at a much lower frequency than during the Phase I and II treatments because two monitoring wells within the treatment area were abandoned, and the injectors flooded during the injection and could not be uncapped (to control fluid loss) as a result of groundwater mounding.

2.3.1 January Injection

A total of 7,036 gallons of 50% hydrogen peroxide solution plus a similar volume of catalyst were injected during the January mobilization (Table 2-3). Every injector with greater than 75 μg/L of total CACs was targeted for injection, and the injection volumes reflect the CAC concentrations. Based upon the pre-injection analytical data (Figure 2-3), injector I-60 received the greatest volume of hydrogen peroxide with 2,036 gallons (29% of the total volume of peroxide staged at the site). Cumulatively, the five injectors with >2,000 μg/L CACs (I-60, I-61, I-62, I-64, and I-65) received 4,220 gallons (60% of the total volume of peroxide staged at the site). Injectors I-12, I-13, I-18 and I-68, which were sampled but yielded <50 μg/L CACs, were not targeted for injection. Injector I-26, with 78 μg/L CACs, received 88 gallons of peroxide.

A round of groundwater samples was collected on January 22, 2000 from the 60-series injectors (with the exception of I-68) and analyzed for CACs with 24-hour turnaround time. The purposes of these samples were to evaluate the treatment progress and to ensure proper allocation of the peroxide, prior to the conclusion of the treatment. The results (Figure 2-4) indicate that four injectors (I-14, I-60, I-61, I-62) within the central portion of the source area still exceeded the 100 μg/L target. Over the remaining two days of injection, three of those injectors (I-14, I-60, and I-62) received an additional 1,782 gallons of peroxide (75% of the total volume injected on January 24-25).

A round of groundwater samples was collected on February 2-3, 2000 to evaluate treatment results. The data (Table 2-2 and Figure 2-5) indicate that total CAC concentrations were reduced to <700 μg/L within the plume source area near I-60. Site-wide, total CACs experienced an average overall reduction of 97% (the average total CAC concentration from the 19 sampling points was reduced to 283 μg/L from 10,687 μg/L). The five injectors with >2,000 μg/L total CACs prior to injection (I-60, I-61, I-62, I-64 and I-65) exhibited an average 99% reduction (the average total CAC concentration from the five sampling points was reduced to 314 μg/L from 38,546 μg/L). Five injectors (I-12, I-13, I-18, I-26 and I-68) within the central portion of the treatment area between I-11 and the I-60, which were not targeted during the January injection, exhibited modest CAC increases relative to the pre-injection data (Figure 2-3) and exceeded the 100 μg/L target. The CAC increases were to levels less than historic maxima (Appendix B) in three of the five injectors (I-12, I-18 and I-26), and no long-term historic data are available for one of the five injectors (I-68). Injector I-25, which received 638 gallons of peroxide, exhibited an increase from 1,260 μg/L to 1,700 μg/L.

2.3.2 March Injection

An additional treatment was conducted March 7-9, 2000 to further reduce the total CAC concentrations. An additional 3,012 gallons of 50% hydrogen peroxide plus a similar volume of catalyst solution were injected (Table 2-3), targeting the six injectors in which total CACs increased after the January treatment (I-12, I-13, I-18, I-25, I-26 and I-68) and the four injectors near I-60 which remained above the 100 μg/L target (I-60, I-62, I-66, and I-67). The six injectors that increased after the January treatment received 2,031 gallons of peroxide (67% of the peroxide staged at the site) and the four injectors near I-60 received a total of 981 gallons of peroxide (33% of the total staged at the site).

A round of groundwater samples was collected on March 25, 2000 to evaluate treatment results. The data (Table 2-2 and Figure 2-6) indicate that total CAC concentrations were generally lower, with the site-wide average CAC concentration from the 19 sampling points further reduced to 194 μg/L on March 25 from 283 μg/L on February 2-3 (31% reduction relative to the February 2-3 round, and 98% relative to

the pre-injection data). Injector I-60 continued to yield high total contaminant concentrations, with 1,550 μg/L (mean of two duplicates) in the March 25 round despite receiving an additional 327 gallons of peroxide in the March injection and a total of 2,363 gallons between the January and March treatments. The only CAC compound present at I-60 is PCE (i.e., no breakdown products are present), suggesting the continued presence of a DNAPL phase near I-60 that provides the CAC source.

2.3.3 April Injection

An additional injection was conducted from April 17-19 to target the injectors remaining above 100 μg/L total CACs. A total of 1,442 gallons of 50% hydrogen peroxide plus a similar volume of catalyst solution were injected, targeting I-11, I-13, I-25, I-60, I-62, I-65, I-66 and I-69 (Table 2-3). During treatment, injector I-27 became fouled on April 19 to a depth of approximately 6 ft below grade, indicating likely screen failure and sand influx, and was no longer available for injection or sampling. A round of groundwater samples was collected on April 27-28 to evaluate the treatment. The results (Table 2-2 and Figure 2-7) indicate continued CAC reductions, and only two injectors (I-60 and I-62) remained above the 100 μg/L target. The site-wide average CAC concentration from 18 sampling points (injector I-27 could not be sampled) was further reduced to 46 μg/L on April 27-28 from 194 μg/L on March 25 (76% reduction relative to the March 25 round, and 99.5% relative to the pre-injection data). The core plume area was reduced to a small area centered near I-60 as in all previous sampling rounds.

2.4 Post-Treatment Sampling Results

A final round of groundwater samples was collected on May 30-31, 2000 (41 days after injection was concluded). The results (Table 2-2 and Figure 2-8) indicate that CACs in the I-60 area rebounded significantly, with 10,000 μg/L of PCE in I-60. The site-wide average CAC concentration increased to 704 μg/L on May 30-31 from 46 mg/L on April 27-28. Among the 60-series injectors, significant CAC rebound has occurred only in injectors I-60 and I-61 (Figures 2-9 and 2-10).

Table 2-1. NSB Kings Bay Phase III Injector Construction Summary

Injector	Borehole Depth (ft)	Screened Interval (ft)
I-60	39	36-39
I-61	33	30-33
I-62	33	30-33
I-63	33	30-33
I-64	30	27-30
I-65	30	27-30
I-66	30	27-30
I-67	24	21-24
I-68	24	21-24
I-69	24	21-24

Table 2-2. Phase III Groundwater Sampling Results

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total CACs (µg/L)[1,2]
I-11	1/6/2000	130	<10	<10	<10	130
	2/3/2000	11	<1	1	<1	12
	3/25/2000	150	<5	35	<5	185
	4/27/2000	11	<1	<1	<1	11
	5/31/2000	170	7	7	<5	184
I-12	1/6/2000	43	3	<1	<1	46
	2/3/2000	150	4	<1	<1	154
	3/25/2000	16	<1	<1	<1	16
	4/27/2000	49	<1	<1	<1	49
	5/31/2000	47	2	<1	<1	49
	5/31/00 (dup)	50	2	<1	<1	52
I-13	1/6/2000	18	1	1	<1	20
	2/3/2000	370	3	1	<1	374
	3/25/2000	560	<5	<5	<5	560
	4/27/2000	12	<1	38	<1	50
	5/31/2000	410	<5	<5	<5	410
I-14	1/6/2000	2,800	240	15	<10	3,055
	1/22/2000	200	<20	<20	<20	200
	2/3/2000	7	<1	<1	<1	7
	3/25/2000	11	<1	<1	<1	11
	4/27/2000	15	<1	2	<1	17
	5/31/2000	32	3	2	<1	37
I-18	1/6/2000	31	3	<1	<1	34
	2/3/2000	110	2	<1	<1	112
	3/25/2000	5	<1	<1	<1	5
	4/27/2000	62	<1	<1	<1	62
	5/31/2000	99	2	<1	<1	101
I-24	1/6/2000	86	12	4	<1	102
	2/3/2000	71	4	<1	<1	75
	3/25/2000	22	<1	<1	<1	22
	4/28/2000	3	<1	<1	<1	3
	5/31/2000	13	1	1	<1	15
I-25	1/6/2000	1,100	160	<10	<10	1,260
	2/3/2000	1,700	<10	<10	<10	1,700
	3/25/2000	77	<1	110	<1	187
	4/27/2000	27	<1	1	<1	28
	5/30/2000	81	<1	2	<1	83
I-26	1/6/2000	71	2	<1	<1	73
	2/3/2000	100	<1	<1	<1	100
	3/25/2000	5	<1	<1	<1	5
	4/27/2000	17	<1	<1	<1	17
	5/30/2000	49	<1	2	<1	51
I-27	1/6/2000	270	20	<5	<5	290
	2/3/2000	78	<5	<5	<5	78
	3/25/2000	130	<5	<5	<5	130
I-60	1/7/2000	130,000	<5,000	<5,000	<5,000	130,000
	1/22/2000	20,000	<20	88	<20	20,088
	1/22/00 (dup)	27,000	40	110	<20	27,150
	2/2/2000	660	<10	26	<10	686
	2/2/00 (dup)	670	3	23	1	697
	3/25/2000	1,700	<20	<20	<20	1,700
	3/25/00 (dup)	1,400	<25	<25	<25	1,400
	4/27/2000	180	<5	<5	<5	180
	4/27/00 (dup)	69	1	<1	<1	70
	5/30/2000	10,000	<100	<100	<100	10,000

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total CACs (µg/L)[1,2]
I-61	1/7/2000	16,000	3,500	<10	<10	19,500
	1/7/00 (dup)	14,000	2,300	<20	<10	16,300
	1/22/2000	290	<20	<20	<20	290
	2/2/2000	32	<10	<10	<10	32
	3/25/2000	16	<1	<1	<1	16
	4/27/2000	44	<1	<1	<1	44
	5/31/2000	820	<20	<20	<20	820
I-62	1/7/2000	12,000	290	<20	<20	12,290
	1/22/2000	950	<1	<1	<1	950
	2/2/2000	830	<200	<200	<200	830
	3/25/2000	320	<5	<5	<5	320
	4/27/2000	160	<5	<5	<5	160
	5/30/2000	120	<5	<5	<5	120
I-63	1/7/2000	1,800	<20	<20	<20	1,800
	1/22/2000	20	<1	<1	<1	20
	2/2/2000	51	<20	<20	<20	51
	3/25/2000	77	<1	<1	<1	77
	4/27/2000	54	<1	<1	<1	54
	5/31/2000	130	<5	<5	<5	130
I-64	1/7/2000	2,300	62	<10	<10	2,362
	1/22/2000	35	<1	<1	<1	35
	2/2/2000	12	<1	<1	<1	12
	3/25/2000	86	<1	<1	<1	86
	4/27/2000	57	<1	<1	<1	57
	5/30/2000	92	<5	<5	<5	92
	5/30/00 (dup)	93	2	<1	<1	95
I-65	1/7/2000	28,000	580	<10	<10	28,580
	1/22/2000	28	<1	<1	<1	28
	2/2/2000	5	<1	<1	<1	5
	3/25/2000	120	<5	<5	<5	120
	4/27/2000	28	<1	<1	<1	28
	5/30/2000	210	<5	<5	<5	210
I-66	1/7/2000	1,200	<20	<20	<20	1,200
	1/22/2000	2	<1	<1	<1	2
	2/2/2000	120	<5	<5	<5	120
	3/25/2000	200	<20	<20	<20	200
	4/28/2000	40	<1	<1	<1	40
	5/30/2000	260	<5	<5	<5	260
I-67	1/7/2000	1,800	49	<10	<10	1,849
	1/22/2000	28	3	<1	<1	31
	2/2/2000	220	28	<5	<5	248
	3/25/2000	17	<1	<1	<1	17
	4/28/2000	62	3	<1	<1	65
	5/31/2000	72	<5	<5	<5	72
I-68	1/7/2000	1	<1	<1	<1	1
	2/2/2000	730	9	1	<1	740
	3/25/2000	5	<1	<1	<1	5
	4/28/2000	12	<1	<1	<1	12
	5/30/2000	4	<1	<1	<1	4
I-69	1/7/2000	450	17	<10	<10	467
	1/22/2000	36	<1	<1	<1	36
	2/2/2000	31	<1	<1	<1	31
	3/25/2000	170	<5	<5	<5	170
	4/28/2000	3	<1	<1	<1	3
	5/31/2000	36	2	<1	<1	38

Notes:

1. Total Chlorinated Aliphatics (CACs) = sum of tetrachloroethene, trichloroethene, cis-1,2-dichloroethene, and vinyl chloride concentrations.
2. For computation of Total Chlorinated Aliphatics (CACs), all non-detect values were assumed to be zero.

Table 2-3. Phase III Hydrogen Peroxide Injection Totals by Location and Date

	January Mobilization						March Mobilization			April Mobilization			
Station / Date	**1/18/2000**	**1/19/2000**	**1/20/2000**	**1/21/2000**	**1/24/2000**	**1/25/2000**	**3/7/2000**	**3/8/2000**	**3/9/2000**	**4/17/2000**	**4/18/2000**	**4/19/2000**	**Total (gal)**
I-11				110						101			**211**
I-12								76	243				**319**
I-13								9		101	393	90	**593**
I-14		185				155							**340**
I-18									75				**75**
I-25				121	517		73	670	367			100	**1,848**
I-26				88					75				**163**
I-27				228									**228**
I-60	392	443			671	530		24	303	47	33		**2,443**
I-61	310	178											**488**
I-62		396	121		219	208	54	408		28	119		**1,553**
I-63			414		81								**495**
I-64			264										**264**
I-65	310	178									107		**595**
I-66			274	130					67		145		**616**
I-67				300					125				**425**
I-68							73	370					**443**
I-69		32	181								78	100	**391**
Daily Total (gal)	**1,012**	**1,412**	**1,254**	**977**	**1,488**	**893**	**200**	**1,557**	**1,255**	**277**	**875**	**290**	**11,490**
Total to Date (gal)	**1,012**	**2,424**	**3,678**	**4,655**	**6,143**	**7,036**	**7,236**	**8,793**	**10,048**	**10,325**	**11,200**	**11,490**	

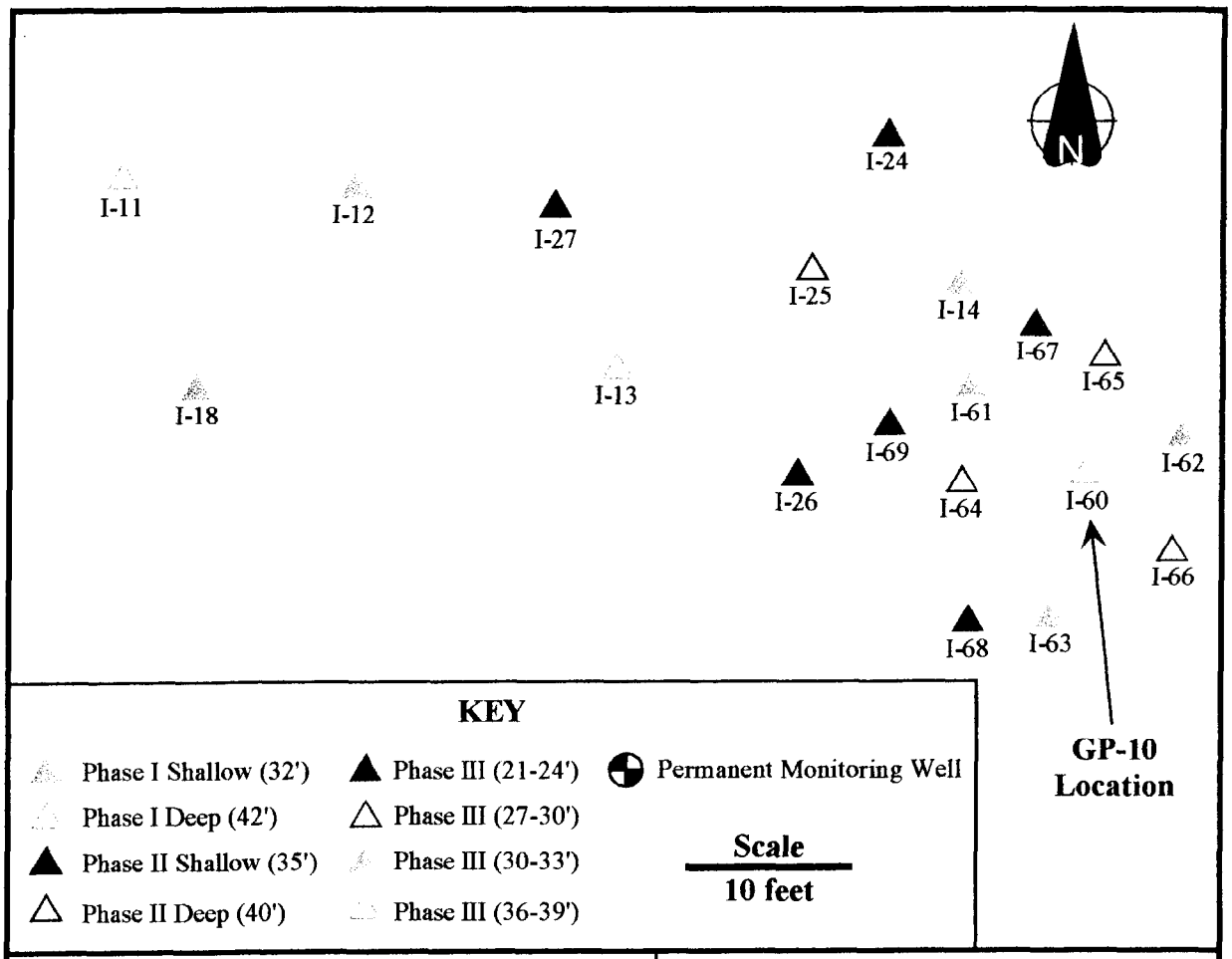

FIGURE 2-1. NSB Kings Bay Phase III Injector Location Map

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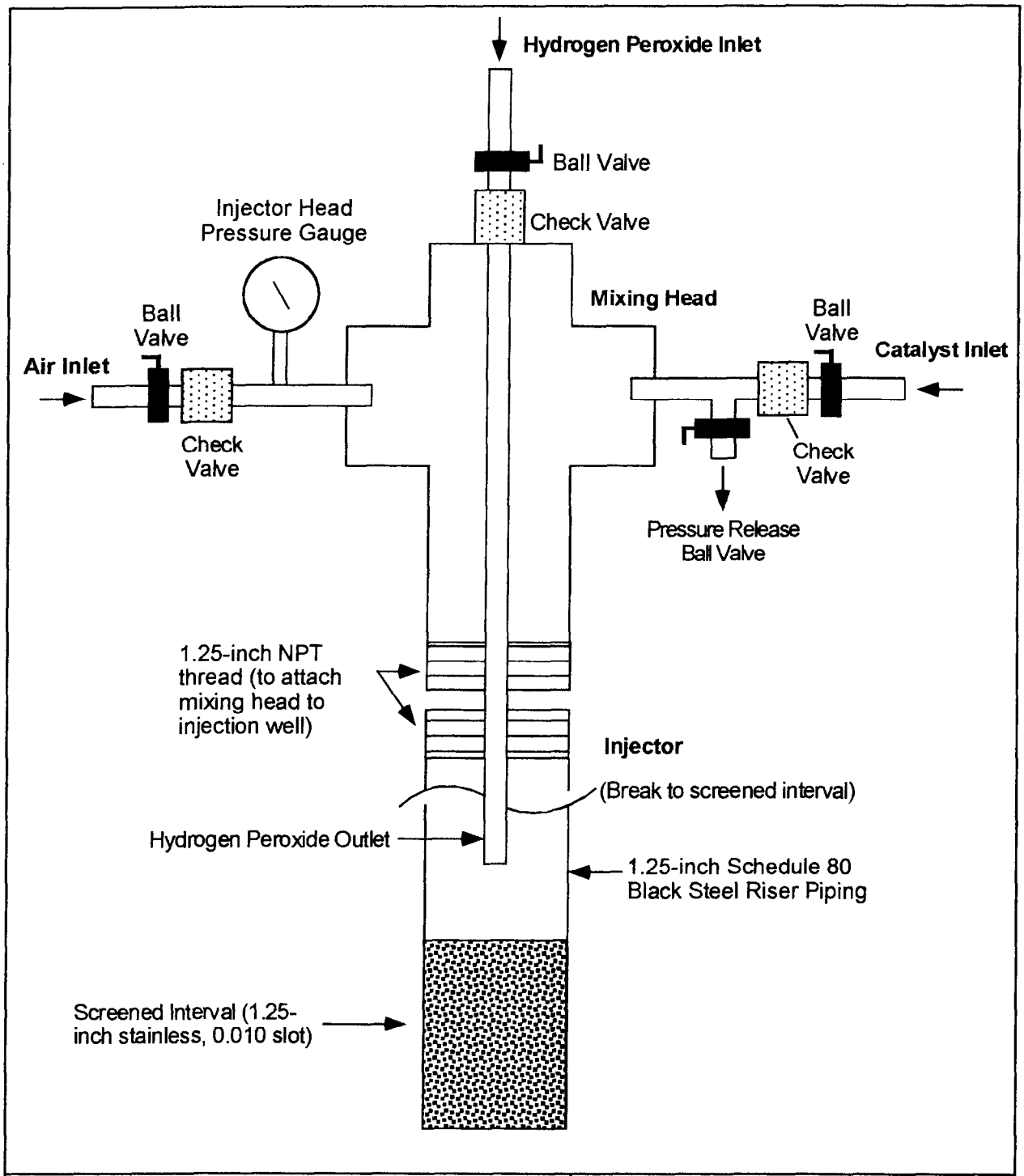

FIGURE 2-2. Geo-Cleanse® Patented Injector and Mixing Head Design Schematic (U.S. Patents 5,525,008 and 5,611,642)

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4 Mark Road, Suite C
Kenilworth, NJ 07033

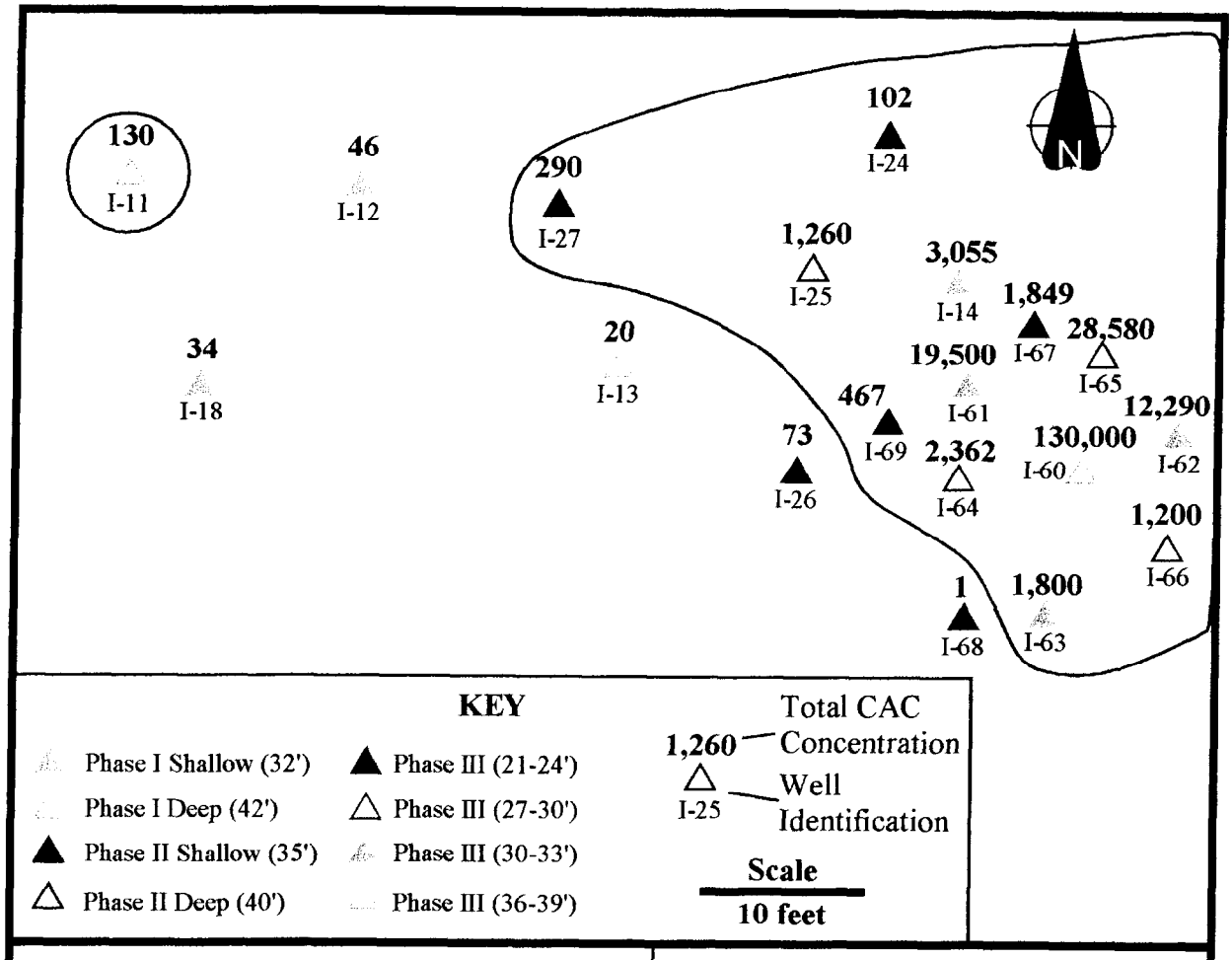


FIGURE 2-3. Pre-Injection Analytical Results (January 6-7, 2000)

Geo-Cleanse International, Inc.
4 Mark Road, Suite C
Kenilworth, NJ 07033

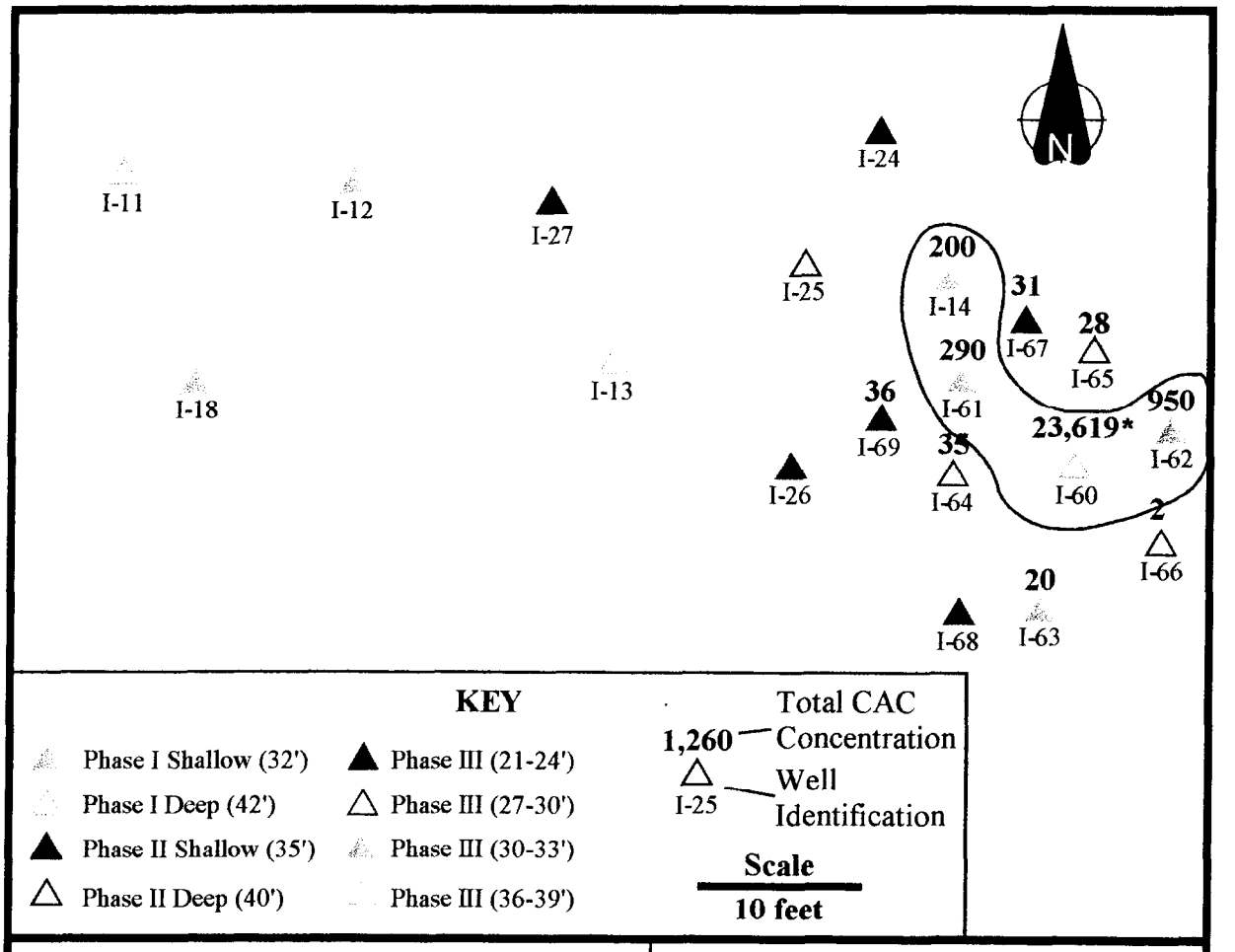


FIGURE 2-4 Analytical Results During Injection (January 22, 2000)

Geo-Cleanse International, Inc.
4 Mark Road, Suite C
Kenilworth, NJ 07033

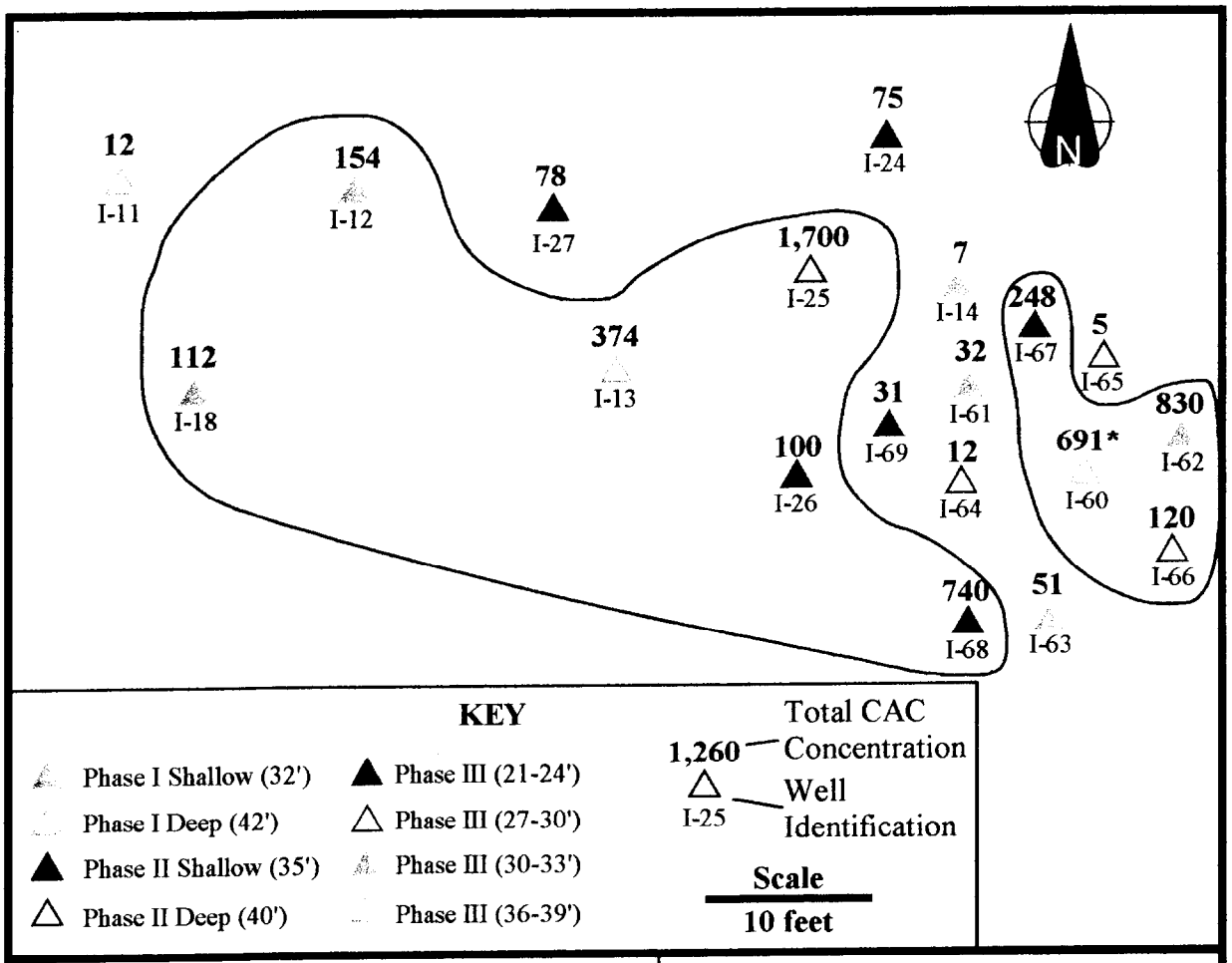


FIGURE 2-5. First Post-Injection Analytical Results (February 2-3, 2000)

Geo-Cleanse International, Inc.
4 Mark Road, Suite C
Kenilworth, NJ 07033

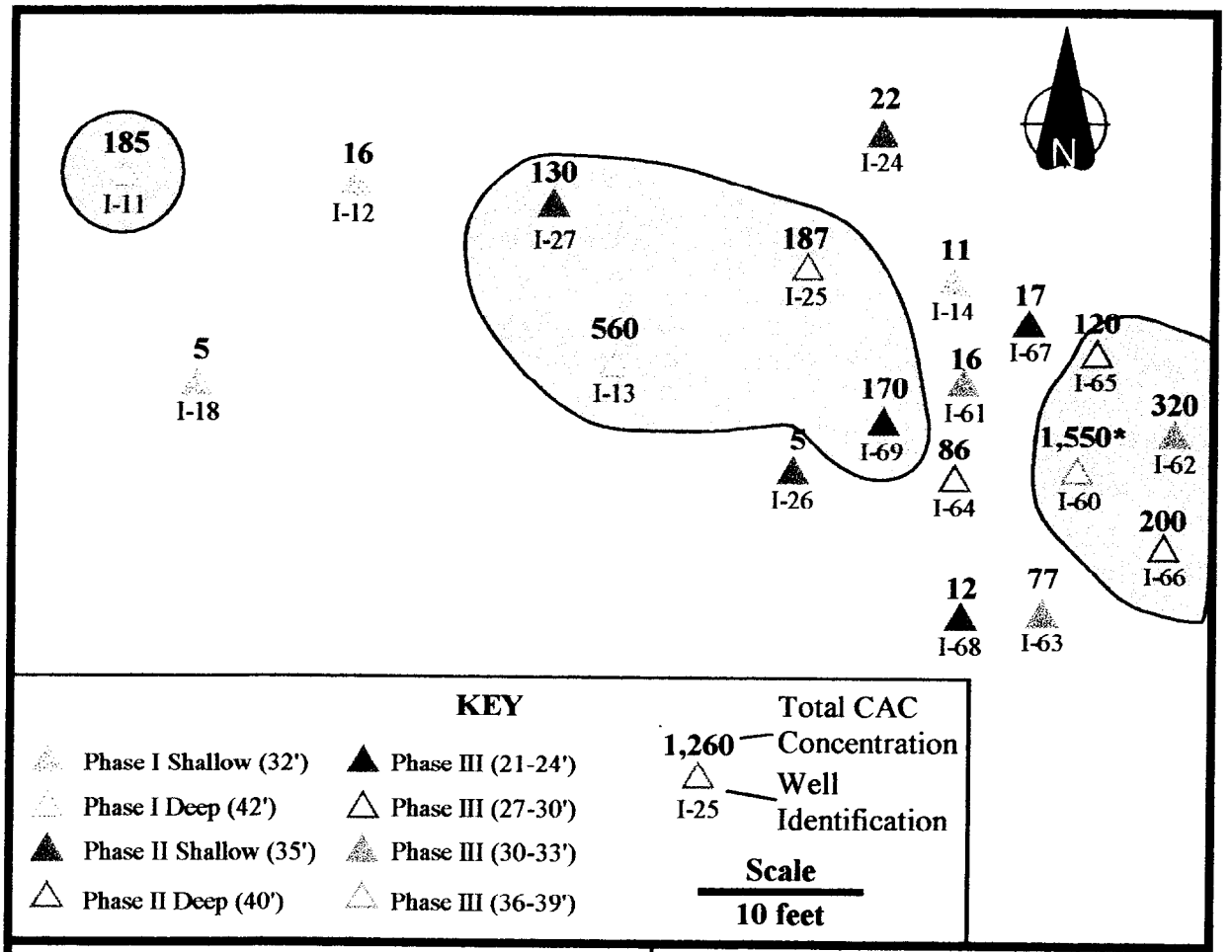


FIGURE 2-6. Second Post-Injection Analytical Results (March 25, 2000)

Geo-Cleanse International, Inc.
4 Mark Road, Suite C
Kenilworth, NJ 07033

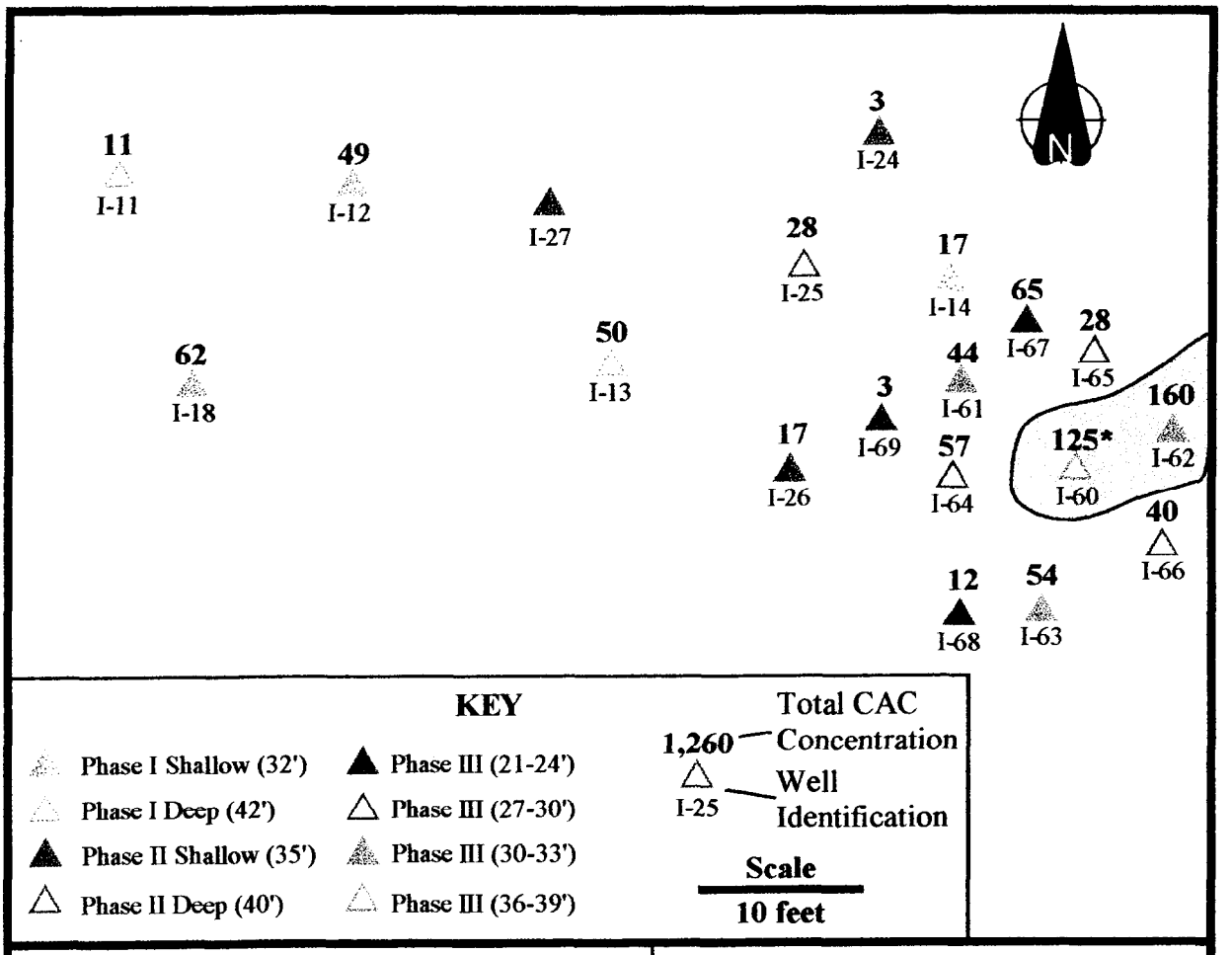


FIGURE 2-7. Third Post-Injection Analytical Results (April 27-28, 2000)

Geo-Cleanse International, Inc.
4 Mark Road, Suite C
Kenilworth, NJ 07033

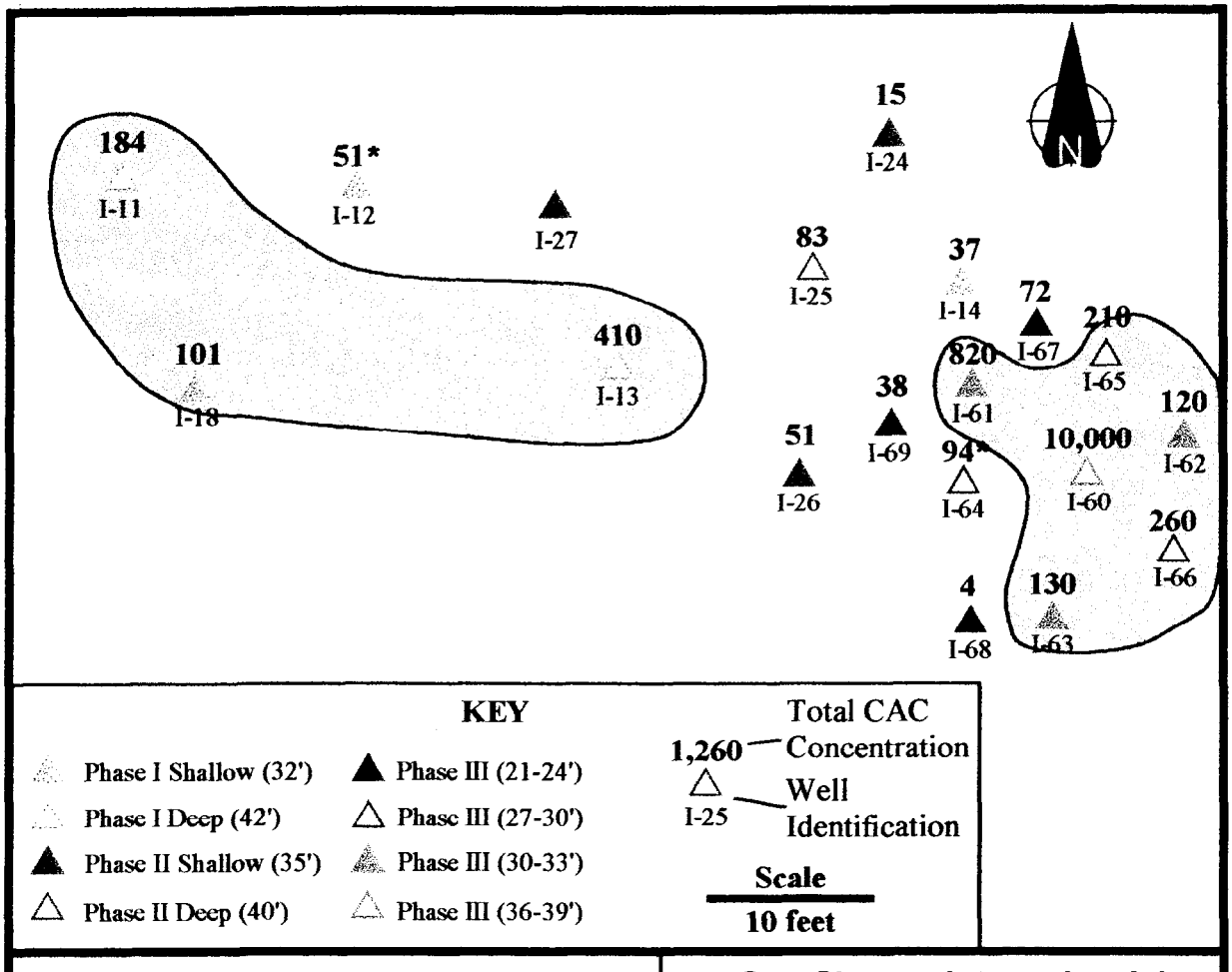


FIGURE 2-8. Final Post-Injection Analytical Results (May 30-31, 2000)

Geo-Cleanse International, Inc.
4 Mark Road, Suite C
Kenilworth, NJ 07033

FIGURE 2-9. Analytical Results for 60-Series Injectors (with baseline >2,000 ug/L Total CACs)

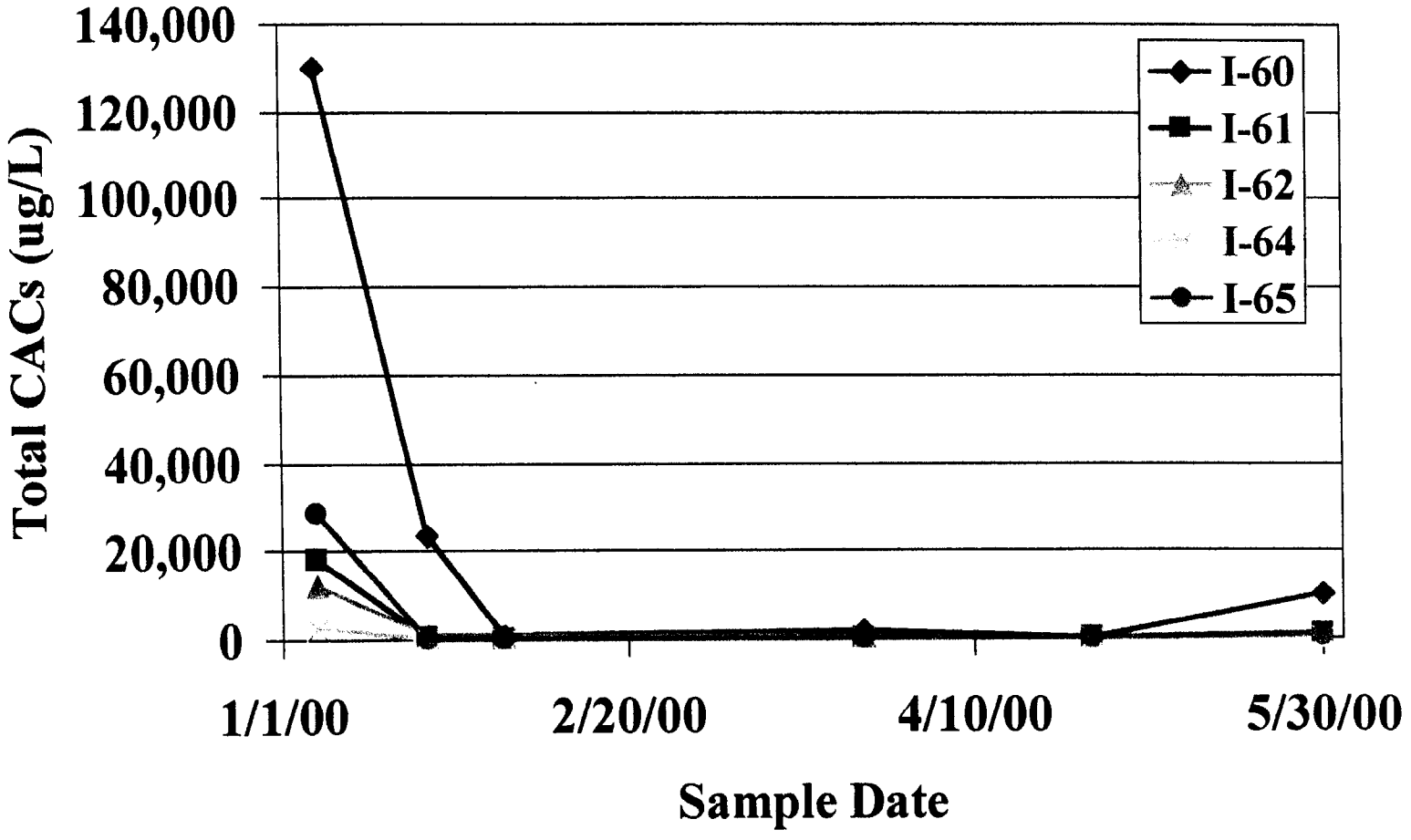
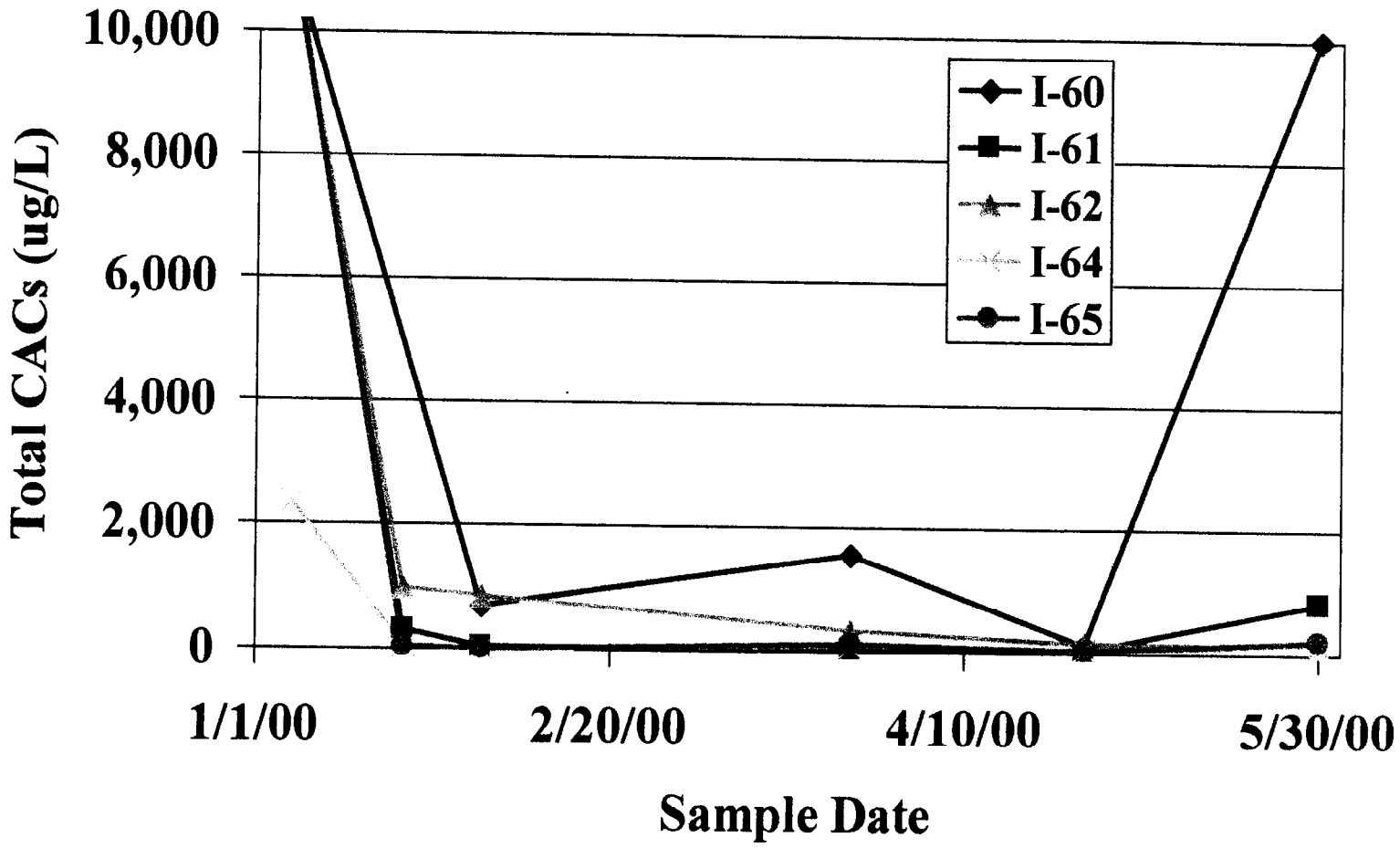


FIGURE 2-10. Expanded Scale Plot of Analytical Results for 60-Series Injectors (with baseline >2,000 ug/L total CACs)



3.0 Treatment Program Results and Discussion

The post-treatment analytical data indicate that the 100 μg/L remedial objective could be achieved but not maintained at all sampling points except I-60 and I-62. Each treatment resulted in successively lower CAC concentrations and contraction in the area exceeding the 100 μg/L objective (compare Figures 2-3 through 2-7). The rapid and relatively high rebound of CACs in I-60 indicate the likely continued presence of a DNAPL. The following observations suggest a DNAPL phase is located at a depth of approximately 35 feet or deeper near I-60:

(1) PCE is the only measurable CAC present in I-60. If the contaminants were derived from an untreated or upgradient source of dissolved CACs, then the microbial breakdown products of PCE (TCE, cis-1,2-DCE, and VC) are expected to be present, assuming an active microbial population exists at the site. PCE degradation products are observed in the downgradient plume areas targeted in Phase I and II, indicating that the natural microbial processes are active at the site.

(2) PCE is present at concentrations exceeding 5% of the water solubility in the May 30-31 sampling round. As a general rule of thumb promulgated under U.S. Environmental Protection Agency guidance (U.S. E.P.A., 1992), a NAPL phase is likely present if the dissolved contaminant concentration exceeds 1% of the water solubility of the product. The 1% solubility threshold for PCE is approximately 2,000 μg/L.

(3) Injector I-60, the deepest injector in the upgradient source area targeted for Phase III, exhibits the strongest CAC rebound. Rebound has either not occurred or is much lower in shallower injectors surrounding I-60 (e.g., Figures 2-9 and 2-10).

4.0 Conclusions

Phase III of the Geo-Cleanse® Treatment Program at NSB Kings Bay Site 11 was implemented between January and April 2000. The Phase III treatment targeted an area at the site upgradient of the areas treated in Phase I and II, and was selected based upon rebound observed in injectors along the upgradient margin of the Phase I and II treatment area. Further site investigation work conducted by Bechtel identified an area of shallow soil contamination. An excavation was conducted and containers with residual PCE were removed. Further groundwater investigation work performed by Bechtel identified an area of impacted groundwater with up to 130,000 μg/L of PCE underlying the excavated area, which was targeted for the Phase III treatment.

A total of approximately 11,490 gallons of hydrogen peroxide and a similar volume of catalyst solution were injected over the course of three mobilizations. Groundwater samples collected after each mobilization indicated successive reduction in CAC concentrations and contraction of the area exceeding the 100 μg/L treatment objective. Site-wide, the average CAC concentration was reduced after the third mobilization to 46 mg/L (with a maximum of 160 μg/L) from 10,687 μg/L (with a maximum of 130,000 μg/L), representing a 99.6% reduction in total CACs. However, total CACs rebounded over the 41-day period following injection, primarily within the identified source area near injector I-60, to a maximum of 10,000 μg/L. The site-wide average CAC concentration rebounded to 704 μg/L, representing a 93% reduction from the pre-injection condition. Based upon observations of the spatial pattern of the rebound, the contaminants detected, and their concentration, a residual DNAPL phase is likely still present at depths of greater than 35 feet below grade in the area directly around I-60. Based upon successful remediation of most of the Site 11 area and contraction of the source area to a single location during the Phase I, II, and III treatments, further Geo-Cleanse® Treatment in the I-60 area may be warranted if further delineation identifies the presence of CACs at levels deeper than the depth of I-60 (39 feet).

5.0 References Cited

Buxton, G. V., Greenstock, C. L., Helman, W. P., and Ross, A. B. 1988. Critical review of rate constants for reactions of hydrated electrons, hydrogen atoms and hydroxyl radicals (·OH/ O^-) in aqueous solution. *Journal of Physical Chemical Reference Data*, v. 17, p. 513-886.

Chapelle, F. H., and Bradley, P. M. 1998. Selecting remediation goals by assessing the natural attenuation capacity of groundwater systems. *Bioremediation Journal*, v. 2, p. 227-238.

Haag, W.R., and Yao, C.C.D. 1992. Rate constants for reaction of hydroxyl radicals with several drinking water contaminants. *Environmental Science and Technology*, v. 26, p. 1005-1013.

Leung, S. W., Watts, R. J., and Miller, G. C. 1992. Degradation of perchloroethylene by Fenton's reagent: Speciation and pathway. *Journal of Environmental Quality*, v. 21, p. 377-381.

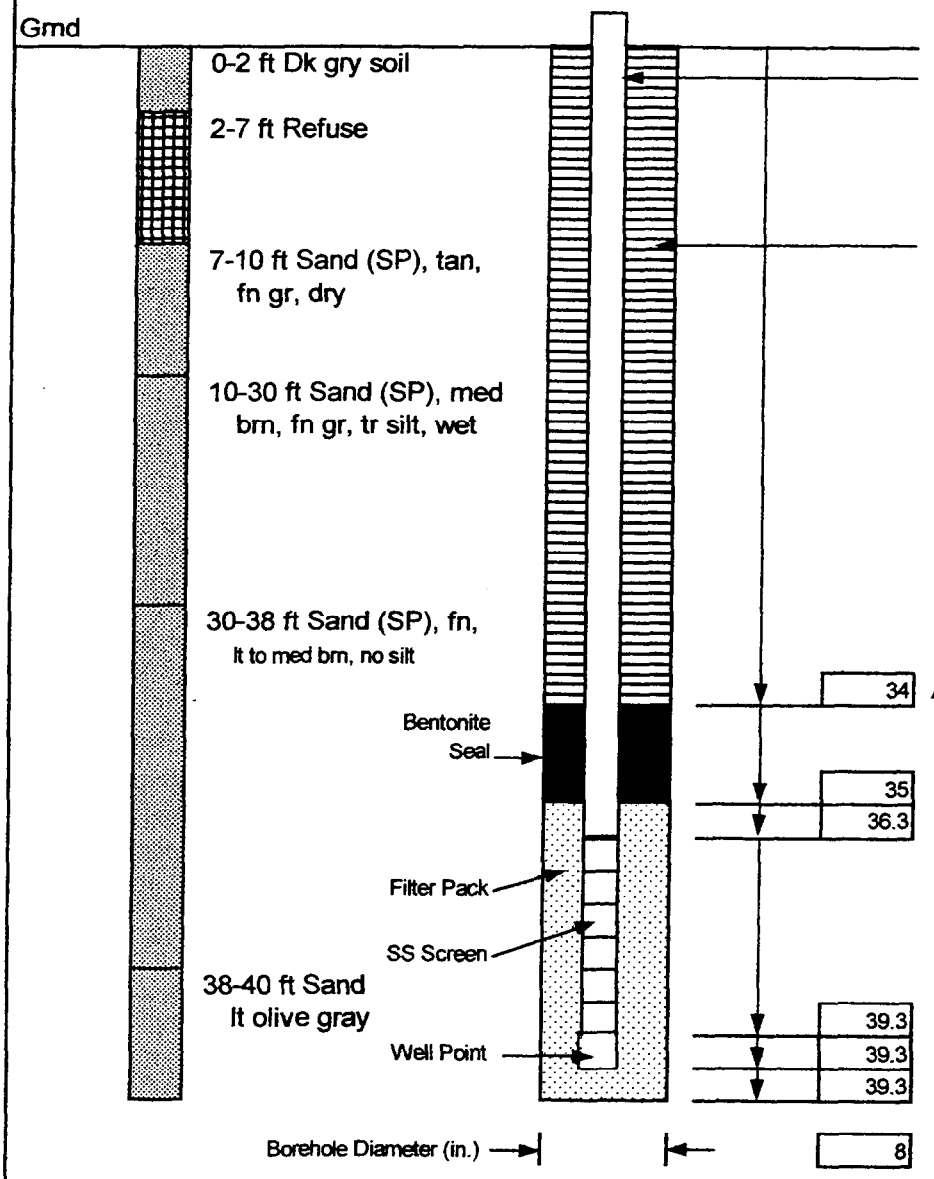
Sato, C., Leung, S. W., Bell, H., Burkett, W. A., and Watts, R. J. 1993. Decomposition of perchloroethylene and polychlorinated biphenyls with Fenton's reagent. *Emerging Technologies in Waste Management*, III, p. 343-356.

U.S. E.P.A. 1992. *Estimating Potential for Occurrence of DNAPL at Superfund Sites.* Office of Solid Waste and Emergency Response, Quick Reference Fact Sheet, EPA Publication No. 9355.4-07FS.

Injector Construction Log

Navy RAC		Site:	Site 11, NSB Kings Bay, GA	Well No.:	I-60
Drilling Company:	Partridge Well Drilling	Project No.:	22567-625	Logged By:	M. Gage
Driller:	Jeff Weatherford	Date Started:	1/4/2000	Coordinates:	
Drilling Equipment:	Failing Speedstar	Date Completed:	1/4/2000		
Drilling Method:	HAS	Depth to Water:	10 ft bgs		
Drilling Fluid:	None	TOC Elevation:			

Generalized Drill Log



MATERIALS

Riser Pipe

Type	Sch. 80 Black Iron
Diameter (in.)	1.25
Length (ft)	37

Backfill

Type	Cement/bentonite Grout
Length (ft)	35
Placement	Tremie

Seal

Type	Bentonite Pellets
Length (ft)	1
Placement	Pour

Filter Pack

Type	6/20 Silica Sd
Length (ft)	4 ft
Placement	tremie
Amount Placed	2.5 sx

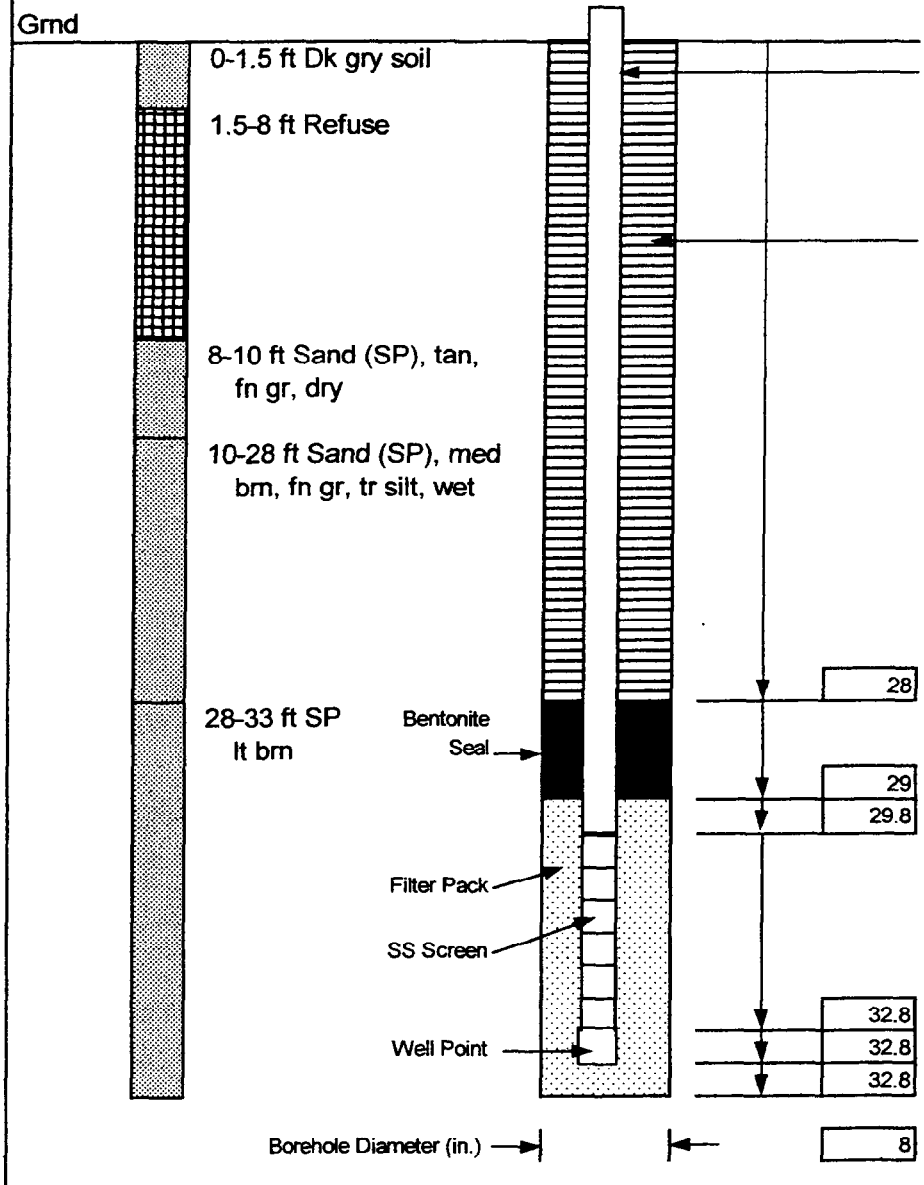
Screen

Type	GA 60 SS
Length (ft)	3 ft
Diameter (in.)	1.25
Slot Size (in.)	0.01
Slot Type	Machine Slotted

Injector Construction Log

Navy RAC		Site:	Site 11, NSB Kings Bay, GA	Well No.:	I-61
Drilling Company:	Partridge Well Drilling	Project No.:	22567-625	Logged By:	M. Gage
Driller:	Jeff Weatherford	Date Started:	1/5/2000	Coordinates:	
Drilling Equipment:	Failing Speedstar	Date Completed:	1/5/2000		
Drilling Method:	HAS	Depth to Water:	10 ft bgs		
Drilling Fluid:	None	TOC Elevation:			

Generalized Drill Log



MATERIALS

Riser Pipe

Type	Sch. 80 Black Iron
Diameter (in.)	1.25
Length (ft)	30

Backfill

Type	Cement/bentonite Grout
Length (ft)	28
Placement	Tremie

Seal

Type	Bentonite Chips
Length (ft)	1
Placement	Pour

Filter Pack

Type	6/20 Silica Sd
Length (ft)	4 ft
Placement	tremie
Amount Placed	2.5 sx

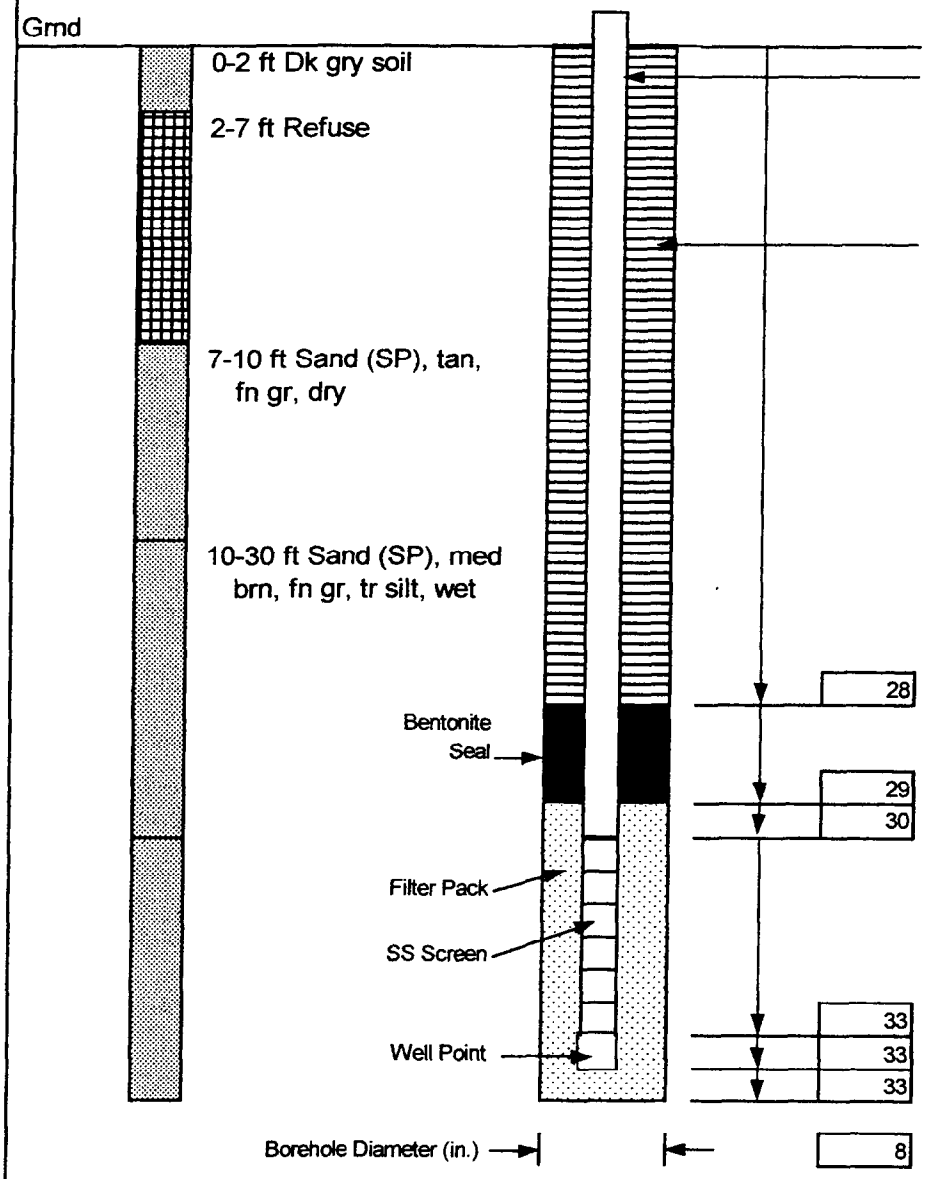
Screen

Type	GA 60 SS
Length (ft)	3 ft
Diameter (in.)	1.25
Slot Size (in.)	0.01
Slot Type	Machine Slotted

Injector Construction Log

Navy RAC		Site:	Site 11, NSB Kings Bay, GA	Well No.:	I-62
Drilling Company:	Partridge Well Drilling	Project No.:	22567-625	Logged By:	M. Gage
Driller:	Jeff Weatherford	Date Started:	1/4/2000	Coordinates:	
Drilling Equipment:	Failing Speedstar	Date Completed:	1/4/2000		
Drilling Method:	HAS	Depth to Water:	10 ft bgs		
Drilling Fluid:	None	TOC Elevation:			

Generalized Drill Log



MATERIALS

Riser Pipe

Type	Sch. 80 Black Iron
Diameter (in.)	1.25
Length (ft)	30

Backfill

Type	Cement/bentonite Grout
Length (ft)	27
Placement	Tremie

Seal

Type	Bentonite Chips
Length (ft)	1
Placement	Pour

Filter Pack

Type	6/20 Silica Sd
Length (ft)	4 ft
Placement	tremie
Amount Placed	2.5 sx

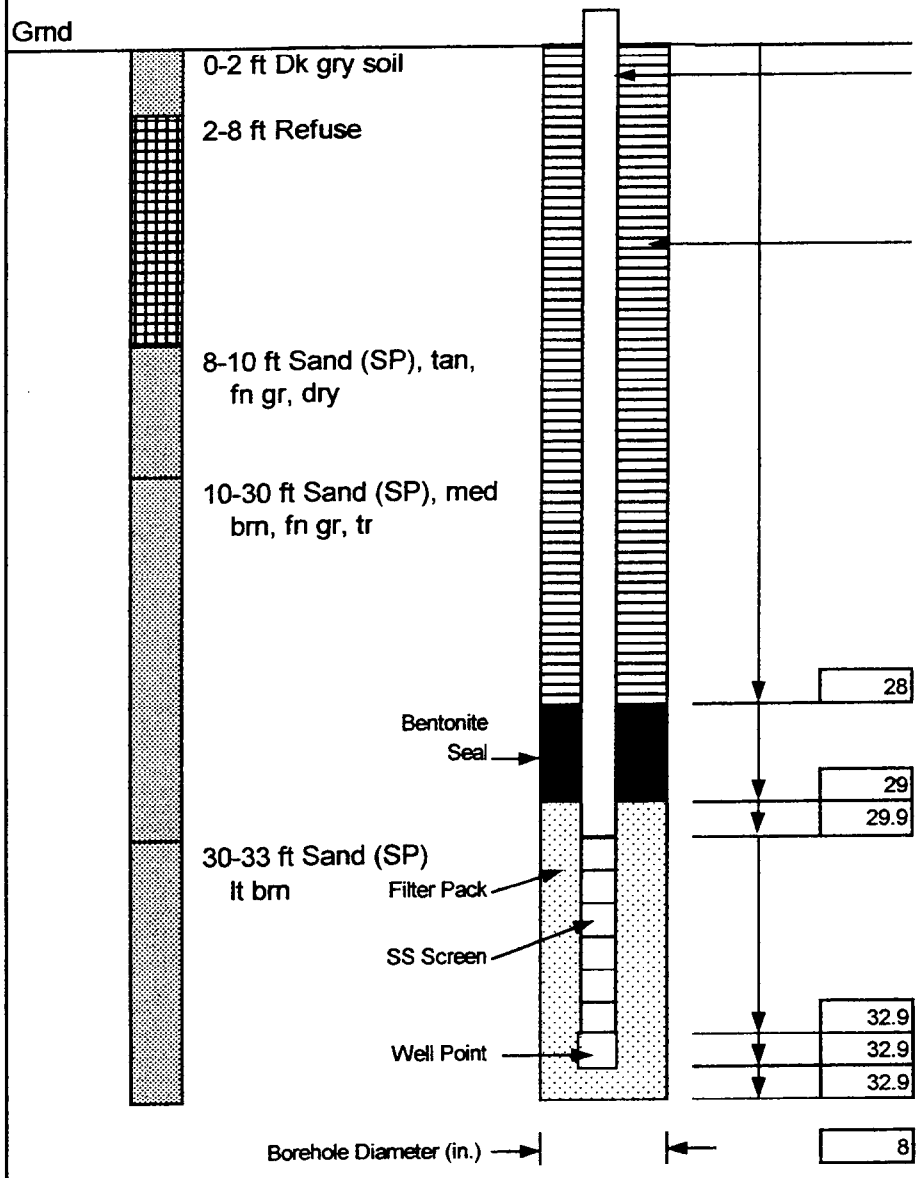
Screen

Type	GA 60 SS
Length (ft)	3 ft
Diameter (in.)	1.25
Slot Size (in.)	0.01
Slot Type	Machine Slotted

Injector Construction Log

Navy RAC		Site: Site 11, NSB Kings Bay, GA		Well No.: I-63
Drilling Company:	Partridge Well Drilling	Project No.:	22567-625	Logged By: M. Gage
Driller:	Jeff Weatherford	Date Started:	1/5/2000	Coordinates:
Drilling Equipment:	Failing Speedstar	Date Completed:	1/5/2000	
Drilling Method:	HAS	Depth to Water:	10 bgs	
Drilling Fluid:	None	TOC Elevation:		

Generalized Drill Log



MATERIALS

Riser Pipe

Type	Sch. 80 Black Iron
Diameter (in.)	1.25
Length (ft)	30

Backfill

Type	Cement/bentonite Grout
Length (ft)	28
Placement	Tremie

Seal

Type	Bentonite Pellets
Length (ft)	1
Placement	Pour

Filter Pack

Type	6/20 Silica Sd
Length (ft)	4 ft
Placement	tremie
Amount Placed	2.5 sx

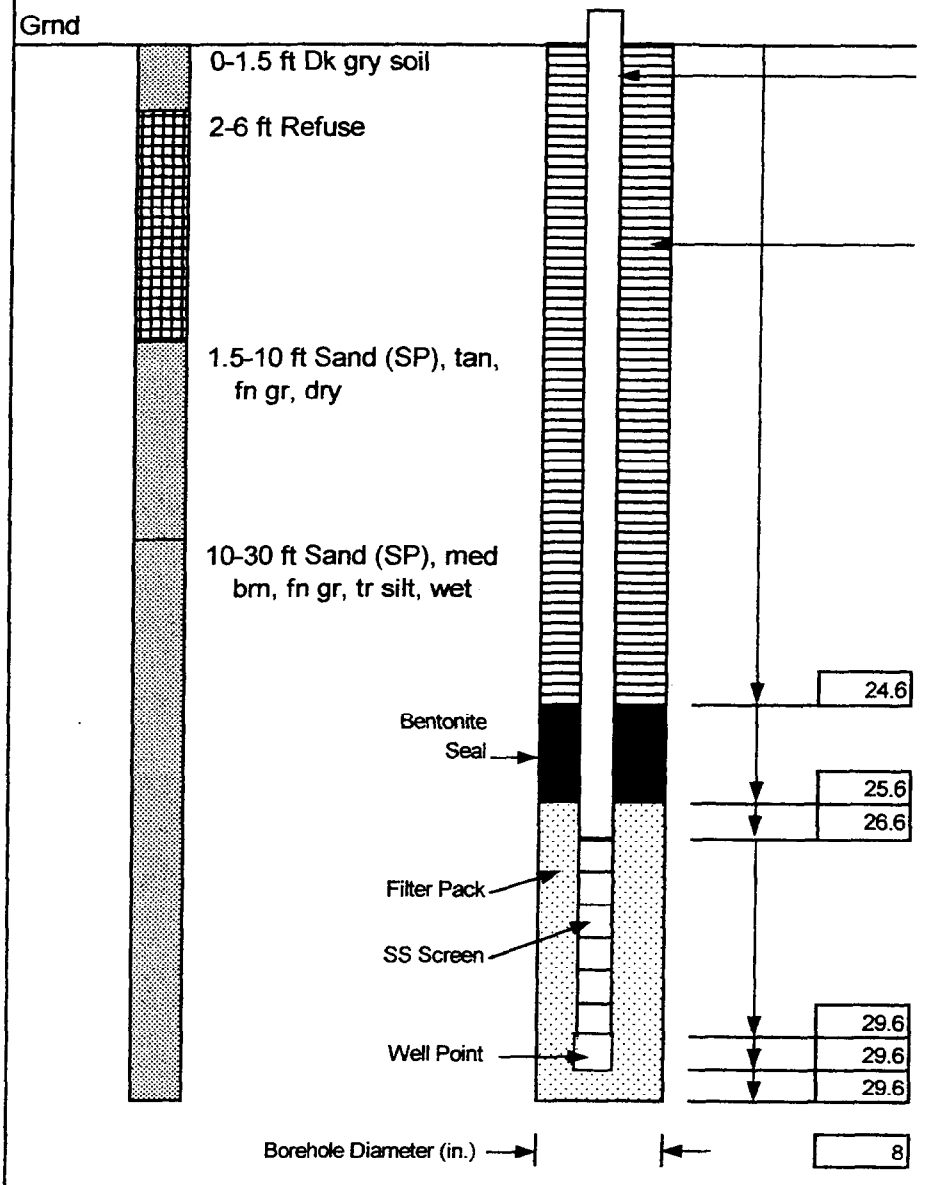
Screen

Type	GA 60 SS
Length (ft)	3 ft
Diameter (in.)	1.25
Slot Size (in.)	0.01
Slot Type	Machine Slotted

Injector Construction Log

Navy RAC		Site:	Site 11, NSB Kings Bay, GA	Well No.:	I-64
Drilling Company:	Partridge Well Drilling	Project No.:	22567-625	Logged By:	M. Gage
Driller:	Jeff Weatherford	Date Started:	1/6/2000	Coordinates:	
Drilling Equipment:	Failing Speedstar	Date Completed:	1/6/2000		
Drilling Method:	HAS	Depth to Water:	10 ft bgs		
Drilling Fluid:	None	TOC Elevation:			

Generalized Drill Log



MATERIALS

Riser Pipe

Type	Sch. 80 Black Iron
Diameter (in.)	1.25
Length (ft)	27

Backfill

Type	Cement/bentonite Grout
Length (ft)	25
Placement	Tremie

Seal

Type	Bentonite Pellets
Length (ft)	1
Placement	Pour

Filter Pack

Type	6/20 Silica Sd
Length (ft)	4 ft
Placement	tremie
Amount Placed	2.5 sx

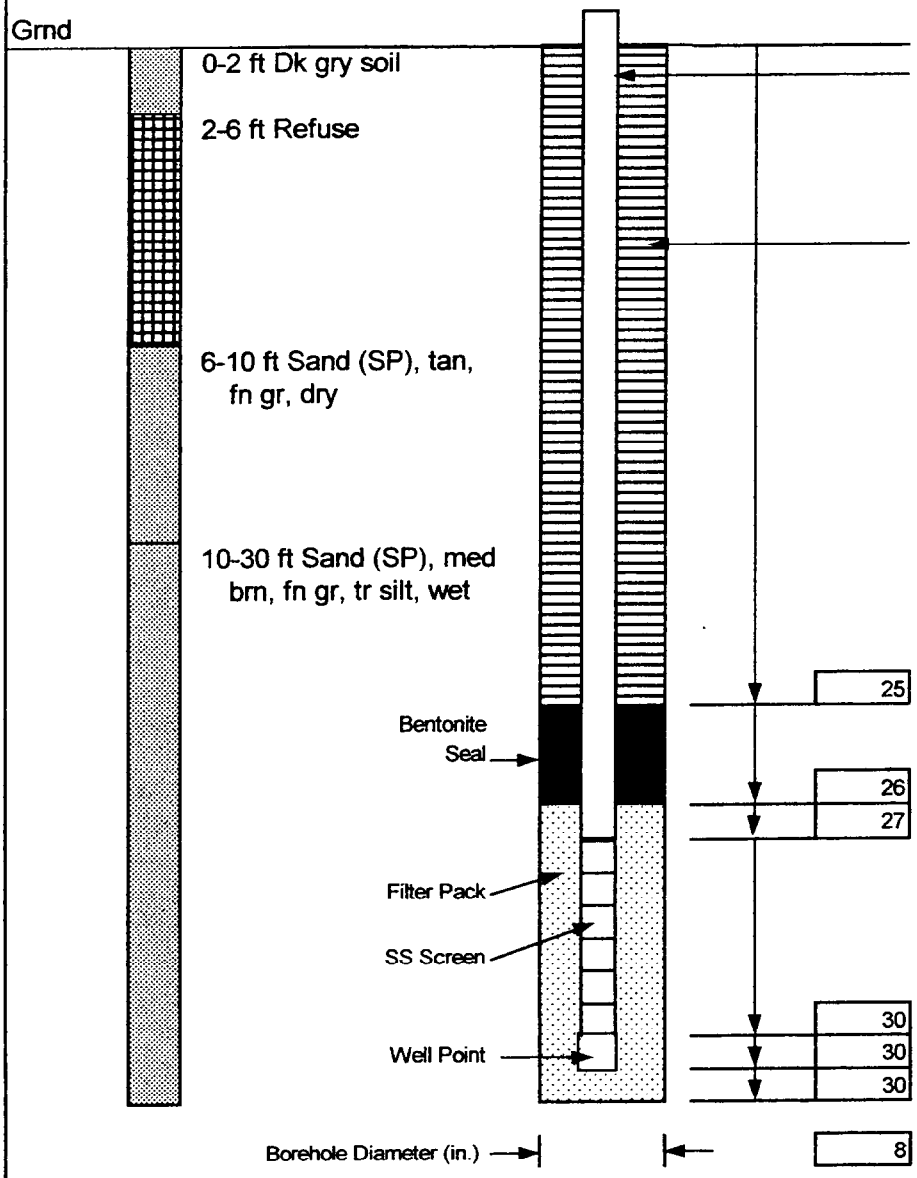
Screen

Type	GA 60 SS
Length (ft)	3 ft
Diameter (in.)	1.25
Slot Size (in.)	0.01
Slot Type	Machine Slotted

Injector Construction Log

Navy RAC		Site: Site 11, NSB Kings Bay, GA		Well No.: I-65
Drilling Company:	Partridge Well Drilling	Project No.:	22567-625	Logged By: M. Gage
Driller:	Jeff Weatherford	Date Started:	1/4/2000	Coordinates:
Drilling Equipment:	Failing Speedstar	Date Completed:	1/4/2000	
Drilling Method:	HAS	Depth to Water:	10 ft bgs	
Drilling Fluid:	None	TOC Elevation:		

Generalized Drill Log



MATERIALS

Riser Pipe

Type	Sch. 80 Black Iron
Diameter (in.)	1.25
Length (ft)	27

Backfill

Type	Cement/bentonite Grout
Length (ft)	25
Placement	Tremie

Seal

Type	Bentonite Chips
Length (ft)	1
Placement	Pour

Filter Pack

Type	6/20 Silica Sd
Length (ft)	4 ft
Placement	tremie
Amount Placed	2.5 sx

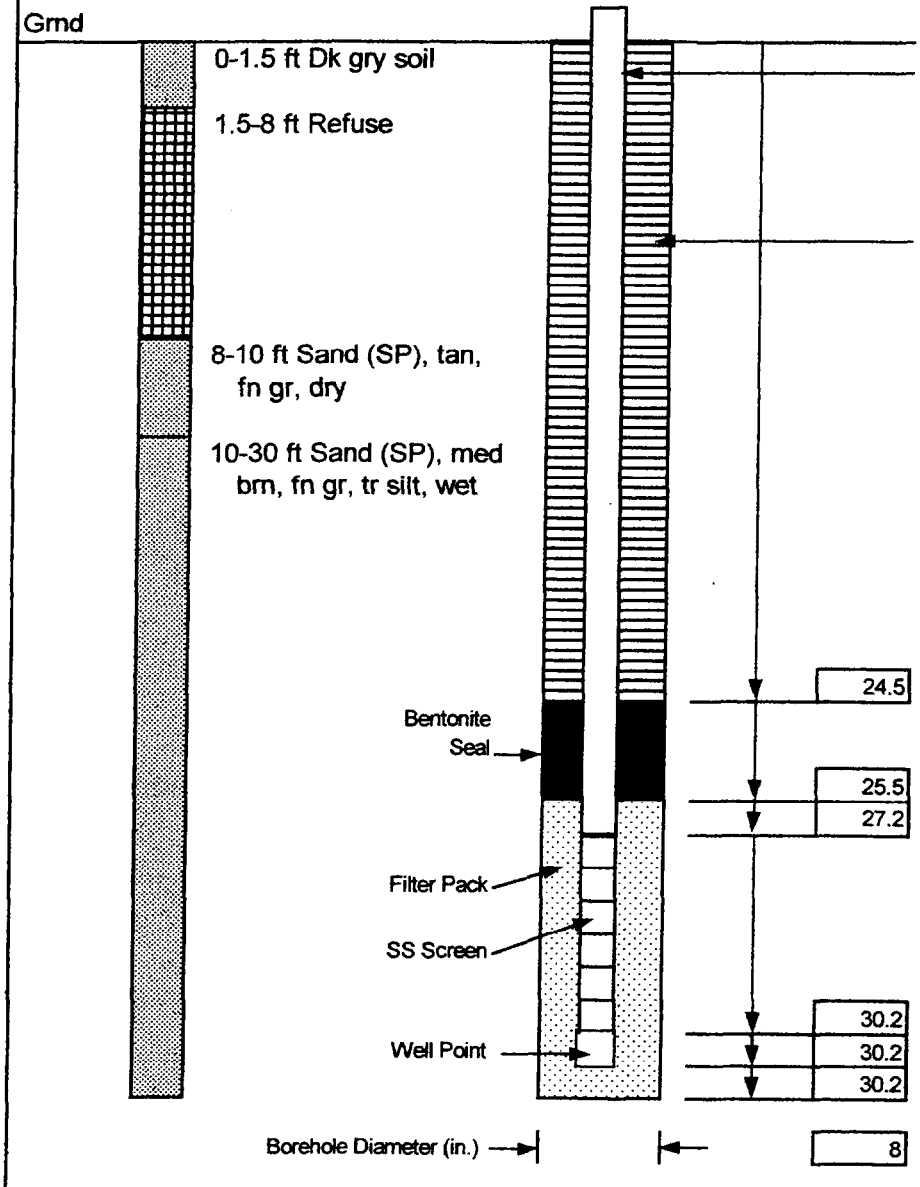
Screen

Type	GA 60 SS
Length (ft)	3 ft
Diameter (in.)	1.25
Slot Size (in.)	0.01
Slot Type	Machine Slotted

Injector Construction Log

Navy RAC		Site:	Site 11, NSB Kings Bay, GA	Well No.:	I-66
Drilling Company:	Partridge Well Drilling	Project No.:	22567-625	Logged By:	M. Gage
Driller:	Jeff Weatherford	Date Started:	1/5/2000	Coordinates:	
Drilling Equipment:	Failing Speedstar	Date Completed:	1/5/2000		
Drilling Method:	HAS	Depth to Water:	10 ft bgs		
Drilling Fluid:	None	TOC Elevation:			

Generalized Drill Log



MATERIALS

Riser Pipe

Type	Sch. 80 Black Iron
Diameter (in.)	1.25
Length (ft)	28

Backfill

Type	Cement/bentonite Grout
Length (ft)	24.5
Placement	Tremie

Seal

Type	Bentonite Pellets
Length (ft)	1
Placement	Pour

Filter Pack

Type	6/20 Silica Sd
Length (ft)	4 ft
Placement	tremie
Amount Placed	2.5 sx

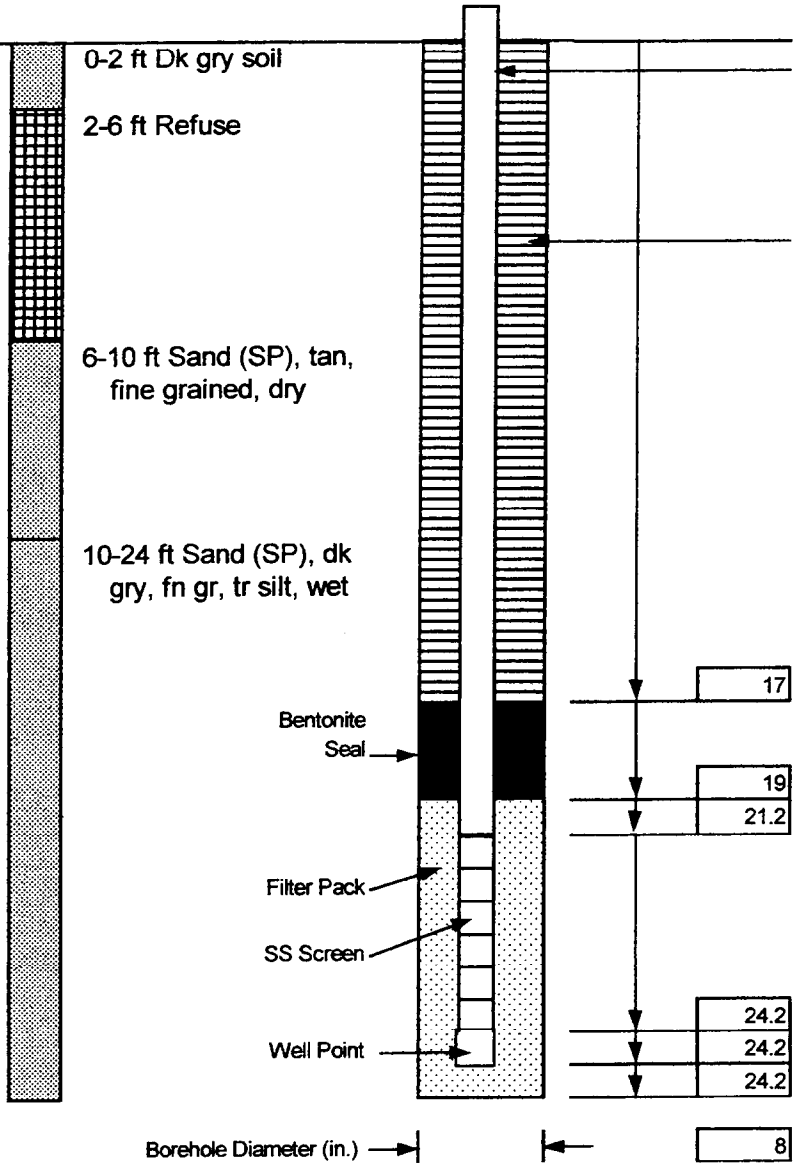
Screen

Type	GA 60 SS
Length (ft)	3 ft
Diameter (in.)	1.25
Slot Size (in.)	0.01
Slot Type	Machine Slotted

Injector Construction Log

Navy RAC		Site: Site 11, NSB Kings Bay, GA		Well No.: I-67
Drilling Company:	Partridge Well Drilling	Project No.:	22567-625	Logged By: M. Gage
Driller:	Jeff Weatherford	Date Started:	1/4/2000	Coordinates:
Drilling Equipment:	Failing Speedstar	Date Completed:	1/4/2000	
Drilling Method:	HAS	Depth to Water:	10 ft bgs	
Drilling Fluid:	None	TOC Elevation:		

Generalized Drill Log



MATERIALS

Riser Pipe

Type	Sch. 80 Black Iron
Diameter (in.)	1.25
Length (ft)	21

Backfill

Type	Cement/bentonite Grout
Length (ft)	17
Placement	Tremie

Seal

Type	Bentonite Chips
Length (ft)	2
Placement	Pour

Filter Pack

Type	6/20 Silica Sd
Length (ft)	5 ft
Placement	tremie
Amount Placed	3.5 sx

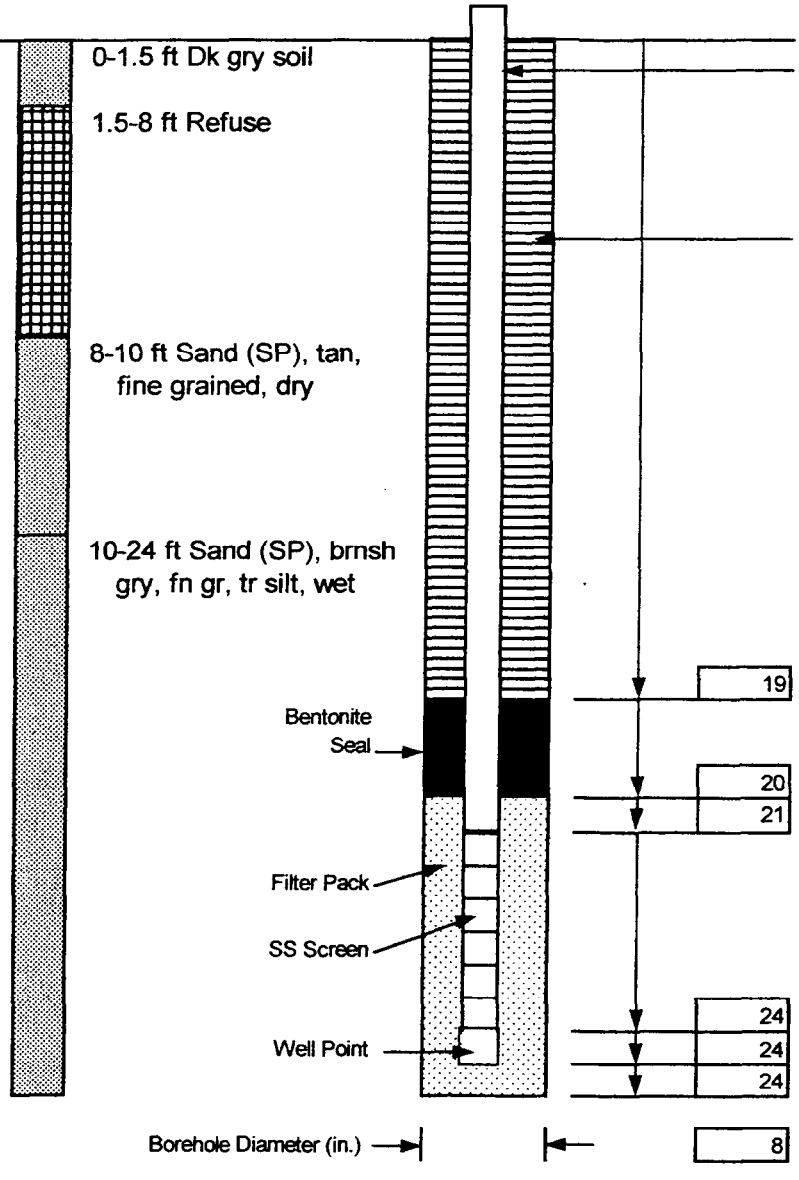
Screen

Type	Schedule 40 SS
Length (ft)	3 ft
Diameter (in.)	1.25
Slot Size (in.)	0.01
Slot Type	Machine Slotted

Injector Construction Log

Navy RAC		Site: Site 11, NSB Kings Bay, GA	Well No.: I-68
Drilling Company:	Partridge Well Drilling	Project No.: 22567-625	Logged By: M. Gage
Driller:	Jeff Weatherford	Date Started: 1/6/2000	Coordinates:
Drilling Equipment:	Failing Speedstar	Date Completed: 1/6/2000	
Drilling Method:	HAS	Depth to Water:	
Drilling Fluid:	None	TOC Elevation:	

Generalized Drill Log



MATERIALS

Riser Pipe

Type	Sch. 80 Black Iron
Diameter (in.)	1.25
Length (ft)	21

Backfill

Type	Cement/bentonite Grout
Length (ft)	19
Placement	Tremie

Seal

Type	Bentonite Pellets
Length (ft)	2
Placement	Pour

Filter Pack

Type	6/20 Silica Sd
Length (ft)	4
Placement	tremie
Amount Placed	3.5 sx

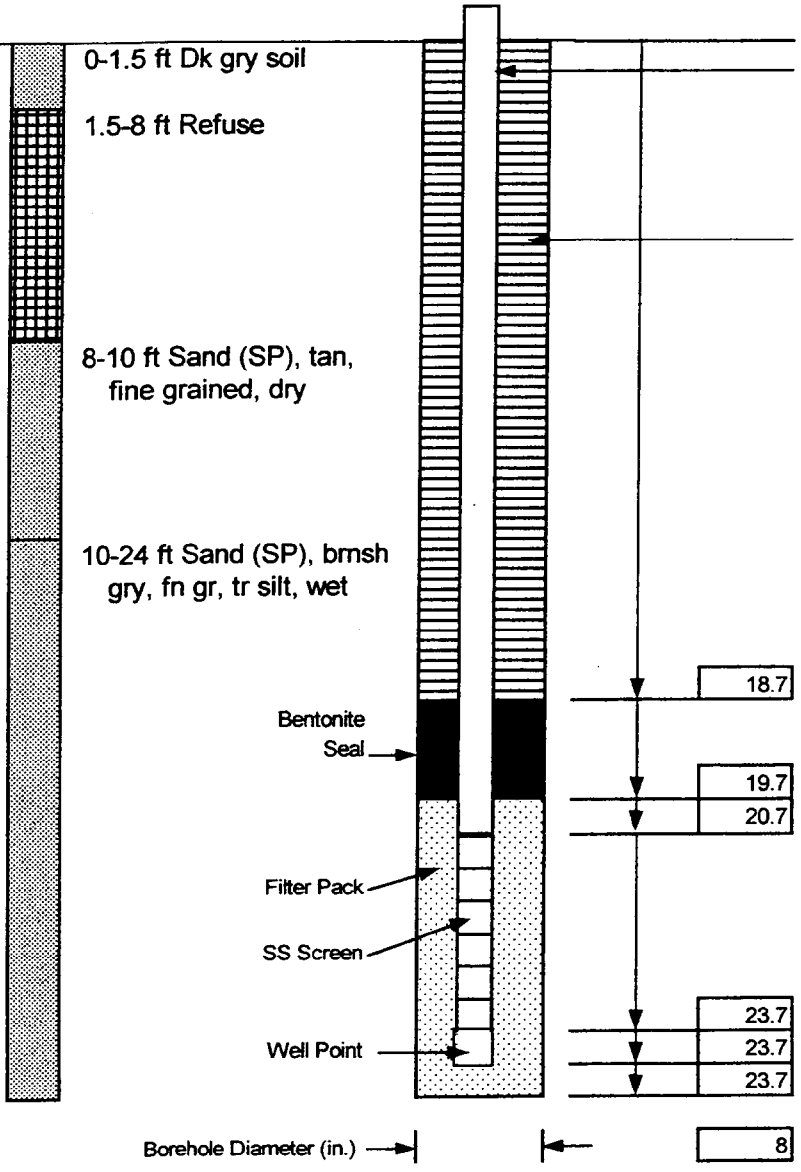
Screen

Type	Schedule 40 SS
Length (ft)	3
Diameter (in.)	1.25
Slot Size (in.)	0.01
Slot Type	Machine Slotted

Injector Construction Log

Navy RAC		Site: Site 11, NSB Kings Bay, GA		Well No.: I-69
Drilling Company:	Partridge Well Drilling	Project No.:	22567-625	Logged By: M. Gage
Driller:	Jeff Weatherford	Date Started:	1/5/2000	Coordinates:
Drilling Equipment:	Failing Speedstar	Date Completed:	1/5/2000	
Drilling Method:	HAS	Depth to Water:	10 ft bgs	
Drilling Fluid:	None	TOC Elevation:		

Generalized Drill Log



MATERIALS

Riser Pipe

Type	Sch. 80 Black Iron
Diameter (in.)	1.25
Length (ft)	21

Backfill

Type	Cement/bentonite Grout
Length (ft)	18.7
Placement	Tremie

Seal

Type	Bentonite Pellets
Length (ft)	1
Placement	Pour

Filter Pack

Type	6/20 Silica Sd
Length (ft)	4
Placement	tremie
Amount Placed	3.5 sx

Screen

Type	Schedule 40 SS
Length (ft)	3
Diameter (in.)	1.25
Slot Size (in.)	0.01
Slot Type	Machine Slotted

Appendix B. Compilation of NSB Kings Bay Groundwater Chlorinated Aliphatic Compound (CAC) Results

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total CACs (µg/L)[2,3]
KBA-11-31	9/17/1998	<1	9	6	2	17
	10/30/1998	<1	1	7	<1	8
	11/6/1998	1	<1	<1	<1	1
	11/24/1998	8	7	2	<1	17
	12/22/1998	12	12	6	<1	30
	1/27/1999	14	15	4	<1	33
	2/18/1999	23	17	5	<1	45
	3/15/1999	15	12	7	<1	34
	5/20/1999	69	57	73	5	204
	6/21/1999	6	<1	<1	<1	6
	7/26/1999	4	<1	<1	<1	4
	8/16/1999	7	<1	<1	<1	7
KBA-11-32	9/17/1998	3	91	30	9	133
	10/30/1998	<1	110	54	4	168
	11/13/1998	<1	<1	<1	<1	0
	11/24/1998	4	9	3	<1	16
	12/22/1998	7	13	5	<1	25
	1/27/1999	9	17	5	<1	31
	2/18/1999	6	8	3	<1	17
	3/15/1999	11	11	4	<1	26
	5/20/1999	18	13	<1	<5	31
	6/21/1999	12	6	1	<1	19
	7/26/1999	9	4	<1	<1	13
	8/16/1999	10	2	<1	<1	12
KBA-11-33	9/17/1998	<1	<1	<1	<1	0
	10/30/1998	<1	<1	<1	<1	0
	11/24/1998	<1	<1	<1	<1	0
	12/22/1998	<1	<1	<1	<1	0
	1/27/1999	<3	<1	<1	<1	0
	2/18/1999	<1	<1	<1	<1	0
	3/15/1999	<1	<1	<1	<1	0
	5/20/1999	<3	<1	<1	<5	0
	6/22/1999	<3	<1	<1	<1	0
	7/26/1999	<3	<1	<1	<1	0
	8/16/1999	<1	<1	<1	<1	0
KBA-11-34	9/17/1998	3,200	350	8	<1	3,558
	9/17/98 (dup)	2,500	320	8	<1	2,828
	10/30/1998	8,500	550	24	<1	9,074
	11/13/1998	180	30	<5	<5	210
	11/24/1998	200	19	<1	<1	219
	11/24/98 (dup)	130	15	<1	<1	145
	12/22/1998	87	6	<1	<1	93
	1/27/1999	83	7	<1	<1	90
	2/18/1999	9	<1	<1	<1	9
	3/15/1999	62	3	<1	<1	65
	3/15/99 (dup)	57	2	<1	<1	59
	5/20/1999	83	3	<1	<5	86
	6/22/1999	10	<1	<1	<1	10
	7/26/1999	24	<1	<1	<1	24
	8/16/1999	16	<	<1	<1	16

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total CACs (µg/L)[2,3]
KBA-11-35	9/17/1998	<1	<1	<1	<1	0
	10/30/1998	<1	<1	<1	<1	0
	11/6/1998	<1	<1	<1	<1	0
	11/24/1998	<1	<1	<1	<1	0
	12/22/1998	<1	<1	<1	<1	0
	1/27/1999	<3	<1	<1	<1	0
	2/18/1999	<1	<1	<1	<1	0
	3/15/1999	<1	<1	<1	<1	0
	5/20/1999	<3	<1	<1	<5	0
	6/21/1999	18	1	<1	<1	19
	7/26/1999	<3	<1	1	<1	1
	8/16/1999	2	<1	<1	<1	2
KBA-11-36	9/17/1998	7	440	60	5	512
	10/30/1998	5	360	60	<1	424
	10/30/98 (dup)	4	330	59	1	394
	11/24/1998	17	55	3	<1	75
	12/22/1998	370	44	2	<1	416
	1/27/1999	380	44	2	<1	426
	2/18/1999	3	<1	3	<1	6
	3/15/1999	51	3	<1	<1	54
	5/20/1999	90	10	<1	<5	100
	6/22/1999	<3	<1	<1	<1	0
	7/26/1999	14	3	<1	<1	17
	8/16/1999	28	2	<1	<1	30
KBA-11-13A	9/17/1998	<1	24	160	78	262
	10/30/1998	<10	16	130	10	156
	11/4/1998	<3	15	5	28	48
	11/24/1998	<1	16	100	22	138
	11/25/1998	<5	16	79	26	121
	12/22/1998	<1	14	230	22	266
	1/7/1999	<5	<5	34	60	94
	1/27/1999	<3	20	110	22	152
	2/18/1999	<1	15	150	22	187
	3/15/1999	<10	13	150	15	178
	4/7/1999	<1	7	49	93	149
	5/20/1999	<3	29	350	61	440
	6/23/1999	<3	25	280	45	350
	7/26/1999	<15	26	240	57	323
	8/17/1999	<1	24	240	26	290
RW7	10/30/1998	720	160	66	<1	946
	11/24/1998	220	62	110	<1	392
	1/27/99[1]	<3	2	2	<1	4
	2/18/1999	120	10	5	<1	135
	2/18/99 (dup)	120	10	6	<1	136
	3/15/1999	69	10	7	<1	86
	5/20/1999	77	6	<1	<5	83
	5/20/99 (dup)	76	6	<1	<5	82
	6/23/1999	9	2	2	<1	13
	6/23/99 (dup)	10	2	2	<1	14
	7/27/1999	11	2	<1	<1	13
	8/17/1999	18	<1	<1	<1	18
	8/17/99 (dup)	18	2	<1	<1	20

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total CACs (µg/L)[2,3]
RW8	10/30/1998	<1	83	57	10	150
	11/24/1998	<1	57	110	10	177
	1/27/99[1]	<3	2	2	<1	4
	2/18/1999	5	17	110	7	139
	5/20/1999	11	14	22	22	69
	6/23/1999	4	4	23	<1	31
	7/27/1999	<3	5	7	<1	12
	8/17/1999	1	2	3	<1	6
USGS-1	8/6/1998	<5	1,140	919	314	2,373
	11/4/1998	<3	28	340	33	401
	11/25/1998	<5	120	580	61	761
	1/7/1999	<5	78	213	<5	291
	4/7/1999	<1	198	731	64	993
	5/20/99[4]	500	240	25	<5	765
	5/26/1999	<3	190	820	120	1,130
	6/23/1999	<30	150	400	21	571
	6/23/99 (dup)	<30	170	420	21	611
	7/27/1999	<3	13	77	<1	90
	8/17/1999	<1	8	34	<1	42
USGS-2	8/6/1998	<5	160	290	219	669
	11/4/1998	<3	560	660	45	1,265
	11/25/1998	<5	180	300	22	502
	1/7/1999	<5	34	293	39	366
	4/7/1999	<1	49	500	56	605
	5/20/99[4]	15	96	190	16	317
	6/3/1999	<3	130	440	11	581
	6/23/1999	4	57	170	<1	231
	7/27/1999	<3	2	34	<1	36
	8/17/1999	<1	3	13	<1	16
USGS-3	8/6/1998	<5	45	328	327	700
	11/4/1998	<3	350	1,300	74	1,724
	11/25/1998	<5	260	860	26	1,146
	1/7/1999	<5	290	1,070	64	1,424
	4/7/1999	5	97	492	54	648
	5/20/99[4]	6	71	430	24	531
	6/3/1999	20	130	130	9	289
	6/23/1999	70	67	60	<1	197
	7/27/1999	<3	1	15	<1	16
	8/17/1999	<1	2	10	<1	12
USGS-15	11/4/1998	<1	9	3	7	19
	11/25/1998	<5	7	34	6	47
	1/7/1999	<5	25	29	<5	54
	4/7/1999	29	42	8	<1	79
	5/20/99[4]	<3	160	840	110	1,110
	6/3/1999	330	170	13	<1	513
	6/23/1999	310	160	25	<5	495
	7/27/1999	6	7	2	<1	15
	8/17/1999	26	28	7	<1	61
I-1	10/30/1998	<1	<1	9	<1	9
	12/22/1998	<1	<1	<1	<1	0
	3/16/1999	<1	<1	<1	<1	0
	5/20/1999	<3	<1	<1	<5	0
	6/22/1999	4	<1	<1	<1	4

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total CACs (µg/L)[2,3]
I-2	12/22/1998	290	9	<1	<1	299
	1/27/1999	4	<1	4	<1	8
	2/18/1999	52	1	<1	<1	53
	3/16/1999	230	3	<1	<1	233
	3/16/99 (dup)	250	4	<1	<1	254
	5/20/1999	27	3	5	<5	35
	6/22/1999	10	<1	7	<1	17
	7/27/1999	<3	<1	2	<1	2
	8/16/1999	15	<1	<1	<1	15
I-3	12/22/1998	<1	<1	1	<1	1
	3/16/1999	56	2	<1	<1	58
	5/20/1999	8	<1	<1	<5	8
	6/22/1999	22	<1	<3	<1	22
I-4	11/24/1998	290	43	<1	<1	333
	12/22/1998	900	30	1	<1	931
	1/27/1999	230	18	17	<1	265
	2/18/1999	97	2	<1	<1	99
	3/16/1999	88	2	<1	<1	90
	3/16/99 (dup)	87	2	<1	<1	89
	5/20/1999	13	3	3	<5	19
	6/22/1999	32	1	<1	<1	33
	6/22/99 (dup)	21	<1	<1	<1	21
	7/27/1999	<3	1	15	<1	16
	8/17/1999	30	<1	<1	<1	30
	8/17/99 (dup)	6	<1	<1	<1	6
I-5	2/18/1999	<1	<1	1	<1	1
	3/16/1999	<1	<1	<1	<1	0
	5/20/1999	77	4	1	<5	82
	6/22/1999	<3	<1	3	<1	3
I-6	2/18/1999	2	<1	<1	<1	2
	3/16/1999	2	<1	<1	<1	2
	5/20/1999	<3	<1	<1	<5	0
	6/22/1999	<3	<1	<1	<1	0
I-7	2/18/1999	<1	<1	210	3	213
	3/16/1999	<1	<1	85	2	87
	5/21/1999	4	1	240	<1	245
	6/22/1999	<3	<1	13	<1	13
	7/27/1999	<3	<1	16	<1	16
	8/16/1999	6	1	10	<1	17
I-8	12/22/1998	13	15	1	<1	29
	3/16/1999	7	<1	<1	<1	7
	5/20/1999	3	2	5	<5	10
	6/22/1999	5	<1	<1	<1	5
I-9	12/22/1998	9	1	37	1	48
	1/27/1999	<3	1	13	<1	14
	3/16/1999	8	3	12	<1	23
	5/20/1999	<3	<1	20	<5	20
	6/22/1999	70	3	2	<1	75
I-10	12/22/1998	27	8	<1	<1	35
	1/27/1999	25	4	<1	<1	29
	3/16/1999	22	1	<1	<1	23
	5/20/1999	22	3	<1	<5	25
	6/22/1999	<3	<1	<1	<1	0

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total CACs (µg/L)[2,3]
I-11	11/13/1998	<1	<1	200	<1	200
	12/22/1998	5	<1	66	<1	71
	12/22/98 (dup)	3	<1	57	<1	60
	2/18/1999	1	<1	27	1	29
	3/16/1999	<1	<1	10	<1	10
	5/21/1999	<3	<1	4	<1	4
	6/21/1999	5	<1	4	<1	9
	7/26/1999	4	<1	4	<1	8
	8/16/1999	3	<1	2	<1	5
	1/6/2000	130	<10	<10	<10	130
	2/3/2000	11	<1	1	<1	12
	3/25/2000	150	<5	35	<5	185
	4/27/2000	11	<1	<1	<1	11
	5/31/2000	170	7	7	<5	184
I-12	11/13/1998	170	44	<5	<5	214
	11/24/1998	29	8	<1	<1	37
	12/22/1998	76	2	<1	<1	78
	12/22/98 (dup)	65	1	<1	<1	66
	1/27/1999	43	2	<1	<1	45
	2/18/1999	25	<1	<1	<1	25
	3/16/1999	44	<1	<1	<1	44
	5/20/1999	27	<1	<1	<5	27
	6/21/1999	22	<1	<1	<1	22
	7/26/1999	8	<1	<1	<1	8
	8/16/1999	13	<1	<1	<1	13
	1/6/2000	43	3	<1	<1	46
	2/3/2000	150	4	<1	<1	154
	3/25/2000	16	<1	<1	<1	16
	4/27/2000	49	<1	<1	<1	49
	5/31/2000	47	2	<1	<1	49
	5/31/00 (dup)	50	2	<1	<1	52
I-13	12/22/1998	<1	<1	33	2	35
	1/27/1999	<3	<1	14	<1	14
	2/18/1999	<1	<1	79	<1	79
	2/18/99 (dup)	<1	<1	61	2	63
	3/16/1999	6	<1	12	<1	18
	5/21/1999	<3	<1	8	<1	8
	6/21/1999	4	<1	4	<1	8
	1/6/2000	18	1	1	<1	20
	2/3/2000	370	3	1	<1	374
	3/25/2000	560	<5	<5	<5	560
	4/27/2000	12	<1	38	<1	50
	5/31/2000	410	<5	<5	<5	410

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total CACs (µg/L)[2,3]
I-14	3/16/1999	3,500	300	<10	<10	3,800
	3/31/1999	3,200	200	<50	<50	3,400
	4/12/1999	2,420	220	11	5	2,656
	5/20/1999	5,000	870	15	<5	5,885
	5/20/99 (dup)	4,600	730	12	<5	5,342
	6/21/1999	48	14	<1	<1	62
	6/21/99 (dup)	59	18	<1	<1	77
	7/26/1999	110	26	<1	<1	136
	7/26/99 (dup)	110	27	<1	<1	137
	8/16/1999	1,600	100	<50	<50	1,700
	8/16/99 (dup)	2,500	160	<50	<50	2,660
	1/6/2000	2,800	240	15	<10	3,055
	1/22/2000	200	<20	<20	<20	200
	2/3/2000	7	<1	<1	<1	7
	3/25/2000	11	<1	<1	<1	11
	4/27/2000	15	<1	2	<1	17
	5/31/2000	32	3	2	<1	37
I-15	3/16/1999	<1	<1	<1	<1	0
	5/20/1999	<3	<1	<1	<5	0
	6/21/1999	<3	<1	<1	<1	0
I-16	10/30/1998	<1	<1	<1	<1	0
	12/22/1998	71	<1	<1	<1	71
	1/27/1999	33	<1	<1	<1	33
	3/16/1999	140	<10	<10	<10	140
	3/31/1999	68	<1	<1	<1	68
	5/20/1999	17	<1	<1	<5	17
	6/21/1999	210	2	<1	<1	212
	7/26/1999	<3	<1	<1	<1	0
	8/16/1999	56	<1	<1	<1	56
I-17	12/22/1998	<1	<1	<1	<1	0
	3/16/1999	4	<1	<1	<1	4
	5/20/1999	22	<1	1	<5	23
	6/21/1999	51	<1	<1	<1	51
I-18	12/22/1998	16	<1	<1	<1	16
	3/16/1999	96	3	<1	<1	99
	5/20/1999	180	7	<1	<5	187
	6/21/1999	<3	<1	<1	<1	0
	7/26/1999	15	<1	<1	<1	15
	8/16/1999	31	<1	<1	<1	31
	1/6/1999	31	3	<1	<1	34
	2/3/2000	110	2	<1	<1	112
	3/25/2000	5	<1	<1	<1	5
	4/27/2000	62	<1	<1	<1	62
	5/31/2000	99	2	<1	<1	101
I-19	12/22/1998	<1	<1	100	<1	100
	2/18/1999	<1	<1	110	2	112
	3/16/1999	1	<1	8	2	11
	5/21/1999	7	<1	34	<1	41
	6/22/1999	<3	<1	18	<1	18
	7/26/1999	<3	<1	3	<1	3
	8/16/1999	4	<1	6	<1	10
I-20	3/16/1999	<1	<1	<1	<1	0
	5/20/1999	<3	3	1	<5	4
	6/21/1999	<3	<1	6	<1	6

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total CACs (µg/L)[2,3]
I-21	3/16/1999	<1	<1	210	13	223
	5/21/1999	4	<1	110	7	121
	6/21/1999	<3	1	110	5	116
	7/26/1999	<3	<1	100	<1	100
	8/16/1999	<1	<1	14	<1	14
I-22	3/16/1999	14	30	28	<1	72
	5/20/1999	33	24	12	5	74
	6/21/1999	4	1	<1	<1	5
I-23	3/16/1999	6	8	4	<1	18
	5/21/1999	19	13	5	<1	37
	6/22/1999	24	21	5	<1	50
I-24	5/21/1999	30	15	4	<1	49
	6/21/1999	8	5	<1	<1	13
	1/6/2000	86	12	4	<1	102
	2/3/2000	71	4	<1	<1	75
	3/25/2000	22	<1	<1	<1	22
	4/28/2000	3	<1	<1	<1	3
	5/31/2000	13	1	1	<1	15
I-25	5/25/1999	390	42	2	<1	434
	6/21/1999	<3	<1	9	<1	9
	7/26/1999	<3	<1	<1	<1	0
	8/16/1999	<1	<1	1	<1	1
	1/6/2000	1,100	160	<10	<10	1,260
	2/3/2000	1,700	<10	<10	<10	1,700
	3/25/2000	77	<1	110	<1	187
	4/27/2000	27	<1	1	<1	28
	5/30/2000	81	<1	2	<1	83
I-26	5/25/1999	550	11	1	<1	562
	6/21/1999	73	<1	<1	<1	73
	7/26/1999	12	<1	<1	<1	12
	8/16/1999	18	<1	<1	<1	18
	1/6/2000	71	2	<1	<1	73
	2/3/2000	100	<1	<1	<1	100
	3/25/2000	5	<1	<1	<1	5
	4/27/2000	17	<1	<1	<1	17
	5/30/2000	49	<1	2	<1	51
I-27	5/21/1999	1,400	220	2	<1	1,622
	6/21/1999	26	3	<1	<1	29
	7/26/1999	4	<1	<1	<1	4
	8/16/1999	34	<1	<1	<1	34
	1/6/2000	270	20	<5	<5	290
	2/3/2000	78	<5	<5	<5	78
	3/25/2000	130	<5	<5	<5	130
I-28	5/24/1999	84	4	<1	<1	88
	6/22/1999	5	<1	<1	<1	5
	7/26/1999	14	<1	<1	<1	14
	8/16/1999	26	<1	<1	<1	26
I-29	5/25/1999	150	8	<1	<1	158
	6/22/1999	7	<1	5	<1	12
	7/27/1999	30	3	<1	<1	33
	8/16/1999	40	1	<1	<1	41

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total CACs (µg/L)[2,3]
I-30	5/25/1999	250	18	<1	<1	268
	6/22/1999	16	1	<1	<1	17
	7/27/1999	6	<1	<1	<1	6
	8/16/1999	17	<1	<1	<1	17
I-31	5/26/1999	14	1	1	<1	16
	6/22/1999	24	3	1	<1	28
I-32	5/26/1999	<3	<1	<1	<1	0
	6/22/1999	11	<1	<1	<1	11
I-33	5/26/1999	<3	<1	<1	<1	0
	6/22/1999	17	3	1	<1	21
I-34	5/26/1999	9	<1	<1	<1	9
	6/23/1999	9	3	1	<1	13
I-35	5/27/1999	11	49	150	23	233
	6/23/1999	<3	<1	<1	<1	0
	7/27/1999	6	1	<1	<1	7
	8/17/1999	11	2	<1	<1	13
I-36	5/26/1999	26	15	10	<1	51
	6/23/1999	20	5	2	<1	27
I-37	5/27/1999	13	5	170	<1	188
	6/22/1999	<3	3	43	<1	46
	7/27/1999	3	3	11	<1	17
	8/17/1999	10	3	5	<1	18
I-38	5/27/1999	9	34	31	<1	74
	6/23/1999	9	15	8	<1	32
	7/27/1999	<3	6	7	<1	13
	8/16/1999	2	7	9	<1	18
I-39	5/27/1999	<3	17	73	23	113
	6/23/1999	<3	26	220	<1	246
	7/27/1999	<3	3	2	<1	5
	8/17/1999	<1	3	3	<1	6
I-40	5/27/1999	<3	130	810	140	1,080
	6/23/1999	3	22	12	<1	37
	7/27/1999	<3	7	16	<1	23
	8/17/1999	2	14	50	<1	66
I-41	5/27/1999	<3	23	560	53	636
	6/23/1999	<30	27	330	<10	357
	7/27/1999	<3	6	32	<1	38
	8/17/1999	<1	10	40	<1	50
I-42	5/27/1999	<3	4	31	<1	35
	6/23/1999	<3	3	33	<1	36
I-43	5/27/1999	120	210	79	<1	409
	6/23/1999	15	11	4	<1	30
	7/27/1999	3	2	3	<1	8
	8/17/1999	2	2	1	<1	5
I-44	5/27/1999	120	16	1	<1	137
	6/23/1999	23	8	2	<1	33
	7/27/1999	20	7	<1	<1	27
	8/17/1999	15	4	<1	<1	19

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total CACs (µg/L)[2,3]
I-60	1/7/2000	130,000	<5,000	<5,000	<5,000	130,000
	1/22/2000	20,000	<20	88	<20	20,088
	1/22/00 (dup)	27,000	40	110	<20	27,150
	2/2/2000	660	<10	26	<10	686
	2/2/00 (dup)	670	3	23	1	697
	3/25/2000	1,700	<20	<20	<20	1,700
	3/25/00 (dup)	1,400	<25	<25	<25	1,400
	4/27/2000	180	<5	<5	<5	180
	4/27/00 (dup)	69	1	<1	<1	70
	5/30/2000	10,000	<100	<100	<100	10,000
I-61	1/7/2000	16,000	3,500	<10	<10	19,500
	1/7/00 (dup)	14,000	2,300	<20	<10	16,300
	1/22/2000	290	<20	<20	<20	290
	2/2/2000	32	<10	<10	<10	32
	3/25/2000	16	<1	<1	<1	16
	4/27/2000	44	<1	<1	<1	44
	5/31/2000	820	<20	<20	<20	820
I-62	1/7/2000	12,000	290	<20	<20	12,290
	1/22/2000	950	<1	<1	<1	950
	2/2/2000	830	<200	<200	<200	830
	3/25/2000	320	<5	<5	<5	320
	4/27/2000	160	<5	<5	<5	160
	5/30/2000	120	<5	<5	<5	120
I-63	1/7/2000	1,800	<20	<20	<20	1,800
	1/22/2000	20	<1	<1	<1	20
	2/2/2000	51	<20	<20	<20	51
	3/25/2000	77	<1	<1	<1	77
	4/27/2000	54	<1	<1	<1	54
	5/31/2000	130	<5	<5	<5	130
I-64	1/7/2000	2,300	62	<10	<10	2,362
	1/22/2000	35	<1	<1	<1	35
	2/2/2000	12	<1	<1	<1	12
	3/25/2000	86	<1	<1	<1	86
	4/27/2000	57	<1	<1	<1	57
	5/30/2000	92	<5	<5	<5	92
	5/30/00 (dup)	93	2	<1	<1	95
I-65	1/7/2000	28,000	580	<10	<10	28,580
	1/22/2000	28	<1	<1	<1	28
	2/2/2000	5	<1	<1	<1	5
	3/25/2000	120	<5	<5	<5	120
	4/27/2000	28	<1	<1	<1	28
	5/30/2000	210	<5	<5	<5	210
I-66	1/7/2000	1,200	<20	<20	<20	1,200
	1/22/2000	2	<1	<1	<1	2
	2/2/2000	120	<5	<5	<5	120
	3/25/2000	200	<20	<20	<20	200
	4/28/2000	40	<1	<1	<1	40
	5/30/2000	260	<5	<5	<5	260
I-67	1/7/2000	1,800	49	<10	<10	1,849
	1/22/2000	28	3	<1	<1	31
	2/2/2000	220	28	<5	<5	248
	3/25/2000	17	<1	<1	<1	17
	4/28/2000	62	3	<1	<1	65
	5/31/2000	72	<5	<5	<5	72

Location	Date	Tetrachloroethene (µg/L)	Trichloroethene (µg/L)	cis-1,2-Dichloroethene (µg/L)	Vinyl Chloride (µg/L)	Total CACs (µg/L)[2,3]
I-68	1/7/2000	1	<1	<1	<1	1
	2/2/2000	730	9	1	<1	740
	3/25/2000	5	<1	<1	<1	5
	4/28/2000	12	<1	<1	<1	12
	5/30/2000	4	<1	<1	<1	4
I-69	1/7/2000	450	17	<10	<10	467
	1/22/2000	36	<1	<1	<1	36
	2/2/2000	31	<1	<1	<1	31
	3/25/2000	170	<5	<5	<5	170
	4/28/2000	3	<1	<1	<1	3
	5/31/2000	36	2	<1	<1	38

Notes:

1. Results for RW7 and RW8 on 1/27/99 are not considered valid due to inadequate purging prior to sample collection.
2. Total Chlorinated Aliphatics (CACs) = sum of tetrachloroethene, trichloroethene, cis-1,2-dichloroethene, and vinyl chloride concentrations.
3. For computation of Total Chlorinated Aliphatics (CACs), all non-detect values were assumed to be zero.
4. Data are considered suspect, and the wells were re-sampled on 5/26/99 or 6/3/99.

Appendix C. Compiled Process Monitoring Field Data

Date	Time	Location	Offgas Measurements			Groundwater Measurements					Comment
			CO_2 (%)	O_2 (%)	PID (ppm)	pH	Fe (mg/L)	Cl (mg/L)	H_2O_2 (mg/L)	PID (ppm)	
1/17/2000	15:00	I-60				5.6	9.0	15	0	221	
1/18/2000	11:50	I-26	0.0	20.9	1.9						
		I-69	3.2	>30	32						
		I-14	2.4	>30	285						
		I-66	0.8	27.6	10						
		I-64	0.4	23.2	42						
	13:20	I-14				3.5	>10		>25	19	
1/19/2000	9:15	I-14				3.5			0	2.5	
		I-69				4.0			>25	35	
		I-64				5.5			0	53	
		I-62				4.0			0	460	
		I-63				4.0			0	7	
		I-67				4.5			>25	30	
		I-66				6.0			0	548	
	11:35	I-65				3.0			>25	67	
		I-61				3.0			>25	0	
	15:00	I-66				4.25			>25	149	
1/20/2000	8:27	I-66				4.00			2	116	Cool
		I-65				3.50			0	48	Hot
		I-60				4.00			0	209	Hot
		I-61				3.50			0	133	Hot
		I-64				5.00			0	84	Cool
		I-14				3.50			0	153	Hot
	12:00	I-14			164						
		I-65			13						
		I-62			2						
		I-60			63						
		I-61			140						
	14:00	I-65				3.5			0	7	Warm
		I-60				4.0			0	20	Warm
		I-14				3.5			0	11	Hot
		I-61				3.5			0	2	Hot
1/21/2000	NR	I-62				3.5			0	12	Hot
		I-63				3.5			0	11	Hot
		I-65				3.5			0	15	Hot
		I-64				3.5			0	9	
		I-61				3.5			0	12	Warm
		I-14								21	
	15:00	I-66				3.5			>25	2	Hot
1/22/2000	NR	I-60								275	
		I-61								4	
		I-62								22	
		I-63								1.5	
		I-64								1	
		I-65								15	
		I-66								0	
		I-67								10	
		I-69								1	
		I-14								8	
1/24/2000	NR	I-60					10	30			

Date	Time	Location	Offgas Measurements			Groundwater Measurements					Comment
			CO_2 (%)	O_2 (%)	PID (ppm)	pH	Fe (mg/L)	Cl (mg/L)	H_2O_2 (mg/L)	PID (ppm)	
3/7/2000	13:30	I-25				5.0	>10		0	23	
		I-62				5.0	>10		0	8	
3/8/2000	9:39	I-64				4.5			0	24	No odor
		I-61				4.5			0	10	No odor
		I-14				4.5			0	3	No odor
		I-13				3.5			>25	3	No odor
3/9/2000	NR	I-64				4.0			0	15	Warm
		I-62				4.5			>25	0	
		I-18				4.5			0	0	No odor
		I-66				4.0			0	8	No odor
3/10/2000	6:45	I-25								0	No odor
		I-62								0	No odor
4/17/2000	16:10	I-25				5.0			0	2.6	
		I-27				4.0			0	0.8	
4/18/2000	10:10	I-25				4	>10		0	7.8	
		I-27				3.5	>10		0	1	
	14:30	I-11				3.5			0	0	
		I-60				3.5			0	1	Hot
	15:10	I-25								4	
4/19/2000	NR	I-62								1	Hot
		I-66								11	Hot
		I-65								3	Hot

Note:
NR indicates data not recorded

Georgia Department of Natural Resources

205 Butler Street, S. E., Suite 1162, Atlanta, Georgia 30334
Lonice C. Barrett, Commissioner
Environmental Protection Division
Harold F. Reheis, Director
404-656-2833

September 13, 2000

Commanding Officer
Naval Submarine Base
1063 USS Tennessee Avenue
Kings Bay, GA 31547-2606

Re: Final Completion Report for In-Situ Chemical Oxidation
Site 11 Old Camden County Landfill, Naval Submarine Base Kings Bay
Reference 5090 Ser FE4/1464

Dear Sir:

We have reviewed the above-referenced document describing the progress the Naval Submarine Base Kings Bay has achieved in remediating contamination at the Old Camden County Landfill. The document is acceptable as submitted.

We commend the Sub Base for the impressive progress it has made in this project. You have reduced the contaminant levels in the most contaminated area by more than ninety per cent, but, more importantly, have reduced the size of the contaminated area by more than ninety per cent, in less than two years. This is an accomplishment of which you should be proud.

Thank you for your continuing interest in Georgia's environment. If you have questions or comments, please contact Mr. Hendricks at 404-656-2833.

Sincerely,

Bruce Khaleghi, Unit Coordinator
Hazardous Waste Management Branch

c: Anthony Robinson, Southdiv
John Garner, Subase FE

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DEPARTMENT OF THE NAVY
NAVAL SUBMARINE BASE
1063 USS TENNESSEE AVENUE
KINGS BAY, GEORGIA 31547-2606

IN REPLY REFER TO:

5090
Ser FE4/1464
07 AUG 2000

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Bruce Khaleghi
Georgia Department of Natural Resources
Environmental Protection Division
205 Butler Street, SE, Suite 1252
Atlanta, GA 30334

Dear Mr. Khaleghi:

Please find for your review, enclosure (1), the Final Completion Report for In-Situ Chemical Oxidation, dated July 2000 for Site 11, Old Camden County Landfill Naval Submarine Base (SUBASE), Kings Bay as required by SUBASE Hazardous Waste Permit HW-014(S&T)-3. This completed report covers the work accomplished by Bechtel Corporation. Another contractor will complete the remediation work required by the Hazardous Waste Permit.

I certify under the penalty of law that this document and all attachments were prepared under my direct supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

The SUBASE Kings Bay point of contact is Mr. John R. Garner, (912) 673-2001, extension 4048. Please address all correspondence to "Commanding Officer, 1063 USS TENNESSEE Avenue, Naval Submarine Base, Kings Bay, GA 31547-2606."

Sincerely,

Neil C Rader

NEIL C. RADER
LTJG, CEC, USNR
F&E Directorate
By direction of the
Commanding Officer

Enclosure: 1. Final Completion Report for In-Situ Chemical Oxidation, Site 11 Old Camden County Landfill, dated July 2000

FILE DELTA

Blind copy to w/o encl:
SOUTHNAVFACENGCOM (Anthony Robinson)
USGS (Chris Leeth)
COMNAVREG SE (Laila Capers)