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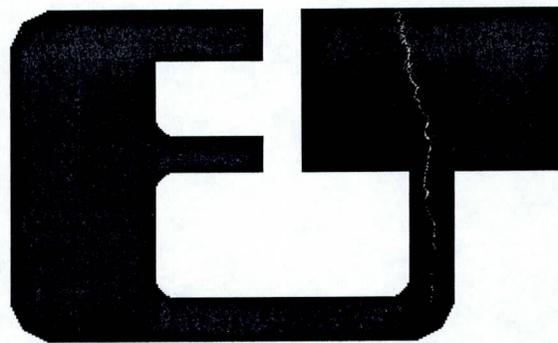
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**PHASE II
ENVIRONMENTAL SITE ASSESSMENT
SOIL AND GROUNDWATER SAMPLING

FOR

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY**

The Environmental Service Company



EXCELTECH

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Phoenix, AZ 85009*

**PHASE II
ENVIRONMENTAL SITE ASSESSMENT
SOIL AND GROUNDWATER SAMPLING**

FOR

**FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY**

**FORMER CROSS CUT CANAL
EXCELTECH PROJECT NO. 5-50077-51
MAY 29, 1991**

1520 West Mineral Road, Suite A-1
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May 29, 1991

Mr. Olin Sutton
Environmental Planner
Flood Control District of Maricopa County
3335 West Durango
Phoenix, Arizona 85009

Subject: Phase II.I Environmental Site Investigation, Former Cross Cut Canal
ET Project No. 5-50077-51

Dear Mr. Sutton:

Enclosed please find three copies of our report for the Phase II.I Environmental Site Investigation for the FCDMC Cross Cut Canal Project, The canal is located along 48th Street between Indian School and McDowell Roads in Phoenix, Arizona.

The report includes the results of the physical site investigation, sampling and analytical procedures, an interpretation of the analytical results, conclusions, and recommendations.

ET appreciates the opportunity to have performed this work for FCDMC. Please call if you have any questions regarding the report or if you require further information.

Sincerely,
Exceltech, Inc.

Janice Petticrew
Biologist

Marilyn Moots
Manager of Assessments, Compliance, and Training

Enclosures

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FINANCE	FILE
1 020	2 035
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REMARKS	

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EXECUTIVE SUMMARY

The Flood Control District of Maricopa County (FCDMC), in participation with the Salt River Project (SRP), is renovating and remediating the Former Cross Cut Canal located along 48th Street between Indian School Road and McDowell Road in Phoenix, Arizona. FCDMC has retained Exceltech, Inc. (ET), to perform additional soil and groundwater sampling to supplement the ET Phase II Environmental Site Investigation dated February 13, 1991. The property is located within or is contiguous with two WQARF Sites and one NPL Site. There have been several chemical contaminants identified in the area of the property. The contaminants identified included volatile organic compounds and heavy metals. The additional sampling was conducted to evaluate the health and safety hazards that employees of FCDMC may be exposed to during excavation and construction of the canal.

The additional Phase II investigation was conducted on March 13 and 14, 1991, and included the following: sampling of the soil, from the bottom of the canal, in the area from Oak Street to Osborn Road in the Former Cross Cut Canal (hereafter Canal); and sampling of the groundwater beneath the Property, utilizing the five piezometer wells established by Thomas-Hartig and Associates along the Canal. The soil and groundwater samples were analyzed to evaluate concentrations of selected metals and organic compounds. The FCDMC was interested in these compounds from an employee exposure standpoint.

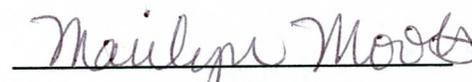
The analytical results of the soil and groundwater samples indicated that there is a high level of iron present in the soil samples and elevated levels of iron in the groundwater samples. In addition, low levels of boron and zinc were detected in the soil samples analyzed. There were low levels of arsenic, chromium, chloroform, lead, and selenium detected in the groundwater samples collected and analyzed for the piezometer wells.

Based on the results of the assessment, ET considers potential for employee exposure to the compounds detected to be minimal with the exception of iron, which is moderate.

Drafted By:


Janice Petticrew, Biologist

Reviewed By:


Marilyn Moots, Manager ACT

1.0 INTRODUCTION AND PURPOSE

The Flood Control District of Maricopa County (FCDMC), in participation with the Salt River Project (SRP), is renovating and remediating the Former Cross Cut Canal located along 48th Street between Indian School Road and McDowell Road in Phoenix, Arizona (hereafter Property). FCDMC has retained Exceltech, Inc. (ET), to perform additional soil and groundwater sampling to supplement the ET Phase II Environmental Site Investigation dated February 13, 1991. The Property is located within or is contiguous with two WQARF Sites and one NPL Site. There have been several chemical contaminants identified in the area of the Property. The contaminants identified included volatile organic compounds and heavy metals. The additional sampling was conducted to evaluate the health and safety hazards that employees of FCDMC may be exposed to during excavation and construction of the canal.

ET performed a Phase II Environmental Site Investigation of the Property on January 8, 1991. The initial Phase II Investigation consisted of sampling and analysis of the near surface soil in the canal located near the Safeguard Security Company. Following the investigation, a more extensive Phase II Investigation of the Property was then requested by the FCDMC. The additional Phase II investigation was conducted on March 13 and 14, 1991, and included the following: sampling of the soil, from the bottom of the canal, in the area from Oak Street to Osborn Road in the Former Cross Cut Canal (hereafter Canal); and sampling of the groundwater beneath the Property, utilizing the five piezometer wells established by Thomas-Hartig and Associates along the Canal.

The Property and sample locations are identified in Appendices A and B; Site Location Map and Site Specific Maps. Copies of the analytical results and chain-of-custody forms are included in Appendix C. This report documents the findings of the investigation.

2.0 SITE DESCRIPTION AND SCOPE OF WORK

The Property is an undeveloped earthen canal used for the collection of storm water run-off and was formerly used to divert water from the Arizona Canal. The Property is composed of approximately 37 acres and is approximately 60 feet wide. The boundaries

of the Property extend from the Arizona Canal, north of Indian School Road, south to McDowell Road and parallels 48th Street. The Property intersects portions of Sections 19, 20, 30, and 31 in Township 2 North, Range 4 East, of the Gila and Salt River, Baseline and Meridian, Maricopa County, within the city limits of Phoenix, Arizona.

2.1 SCOPE OF WORK

The objective of the soil sampling process was to evaluate the potential soil contamination in the Canal and the potential safety hazards associated with this contamination to County employees during excavation of the Canal. A 4 foot depth was established as the soil sample collection depth since this was believed to be the maximum depth the excavation would reach during excavation of the Canal. The maximum 4 foot depth was selected since groundwater was expected to be encountered at approximately 4.5 to 5 feet below the surface of the canal. A total of five soil samples were to be collected along the length of the Canal, between Oak Street and Osborn Road, which is the area identified as most likely to have contamination from the 56th Street Motorola Facility, due to the underground drain system located in the area. The sample locations were determined based on the results of the Stage III Report by Dames and Moore, Job No. 09448-099-033, dated May 4, 1990, on the investigation of the groundwater quality for the 56th Street Motorola Facility. The soil samples were collected at one-half mile intervals along this section of the Canal.

The objective of the groundwater sampling process was to evaluate the potential safety hazard to County employees during excavation of the Canal if, and when groundwater was encountered. Results from the Dames and Moore report indicated that groundwater contamination is flowing away from the 56th Street Motorola Facility toward the Former Cross Cut Canal, and the extent of the movement of the contaminants has been aided by the existence of an old drainage system that had been installed to provide drainage from citrus groves in the area to the Canal. A total of five piezometer wells exist along the Canal between McDowell and Indian School Roads. The piezometer wells were installed by Thomas-Hartig and Associates to observe the groundwater levels along the canal. Therefore, a total of five groundwater samples were to be collected, one from each of the piezometer wells. However, one piezometer well, No. 3, was dry on the day of sample collection. In addition to the four groundwater samples collected, one equipment blank,

and one trip blank were also submitted for analysis. The purpose of the equipment blank is to evaluate the effectiveness of the decontamination procedures used in the field between groundwater sample collection. The purpose of the trip blank is to determine if any contaminants enter the samples during sampling and shipping.

The soil and water samples were recorded on chain-of-custody forms and in field logbooks. The samples were then shipped to an United States Environmental Protection Agency (EPA) contract laboratory for analysis.

3.0 PHYSICAL INVESTIGATION

3.1 SAMPLE LOCATION DESCRIPTION

The soil samples were collected on March 13, 1991. The groundwater samples were collected on March 14, 1991. During the sample collection of the groundwater samples, a representative from Dames and Moore, Robert Harklau, was present to collect split samples of the groundwater.

3.1.1 SOIL SAMPLES

A total of five soil samples were collected from the Canal between Oak Street and Osborn Road. The samples were collected at approximately one-half mile intervals along this stretch of the Canal. Sample locations are illustrated in the Site Specific Maps included in Appendix B.

The first soil sample was collected at the intersection of Lewis Street and the Canal. The sample was located in the center of the Canal bottom approximately in line with the north side of Lewis Street. Water was encountered at 2 feet below the surface. The soil sample was collected at 4 feet below the surface and was labeled No. 50077-313-1. The soil sample collection procedures are described in Section 3.2.1 of this report.

The second soil sample was collected at the intersection of Edmont Street and the Canal. The sample was located in the center of the Canal bottom approximately in line with the

north side of Edmont Street. Water was encountered at 2 feet below the surface. The soil sample was collected at 4 feet below the surface and was labeled No. 50077-313-2. There was too much water in the soil to collect two jars of soil using the hand auger, therefore, only one jar was collected.

The third soil sample was collected near the intersection of Pinchot Street and the Canal. The sample was located on the east side of the Canal bottom next to the cement slab approximately 50 feet north of Pinchot Street. Water was again encountered in the ground at 2 feet below the surface. The soil sample was collected at 4 feet below the surface and was labeled No. 50077-313-3.

The fourth soil sample was collected on top of the west bank of the Canal, approximately 20 feet north of Earll Street. No groundwater was encountered. The soil sample was collected at 4 feet below ground level (bgl) and was labeled No. 50077-313-4.

The fifth soil sample was located near the intersection of Osborn Road and the Canal. The sample was located in the center of the Canal bottom, approximately 50 yards south of Osborn Road. Groundwater was encountered at 2 feet below the surface. The soil sample was collected at 4 feet below the surface and was labeled No. 50077-313-5.

3.1.2 GROUNDWATER WELL SAMPLES

A total of four groundwater samples were collected from the piezometer wells located along the bank of the Canal between McDowell Road and Indian School Road. Piezometer Well No. 3 was dry on the day of sample collection. In addition, an equipment blank to evaluate decontamination procedures, and a trip blank to evaluate condition during collection and transport, were also collected and submitted for analysis. The piezometer well construction consists of 5 feet of 4 inch diameter steel surface casing, 10 feet of 2 inch diameter PVC casing, and 10 feet of 2 inch diameter slotted fabric wrapped PVC casing. The wells were installed to a depth of 25 feet bgl. All of the piezometer wells have a locking cap.

Prior to sampling, each well was purged of three to five well-casing volumes of groundwater prior to each sample. The proper amount of water required to sufficiently purge the well was calculated using the following formula:

$$\pi r^2 \times \text{well depth} \times \text{gallons/ cubic inch, where } r = \text{radius of the well}$$

Following each purging, the water was tested in the field for pH, specific conductance and temperature. Once these field measurements stabilized, the groundwater was sampled. Well locations are illustrated in the Site Specific Maps included in Appendix B.

3.2 SAMPLING STRATEGY

3.2.1 SOIL SAMPLES

To collect each soil sample a decontaminated, stainless steel hand auger was used to bore a hole down to a 3 foot depth below the ground level. Then a decontaminated stainless steel slide hammer, lined with a brass sleeve, was driven the final foot of depth to collect the soil sample. The soil from the sampler was then placed into two laboratory cleaned 8-ounce glass jars. Each sample container was sealed with a Teflon-lined plastic lid, logged onto a chain-of-custody form, and placed into a chilled cooler. The samples were then stored in a refrigerated sample storage area at the ET offices to await transport to the laboratory for analysis.

3.2.2 GROUNDWATER WELL SAMPLES

The depth to groundwater was measured in each well using a sealed sampling tape or scaled electric sounder prior to purging and sampling. Measurements were collected and recorded to the nearest 0.1 foot.

Before sampling the groundwater, each piezometer well was purged of "standing" groundwater. Each piezometer well was purged of at least three well-casing volumes of groundwater using a portable pump. The amount of purging was dependent on the well yield. Samples were then collected once normal field measurements, that included temperature, pH, and specific conductance stabilized, provided a minimum of three

well-casing volumes of water had been removed. Field measurements were taken after each well volume was purged.

The groundwater samples were collected using a decontaminated Teflon bailer, and transferred to laboratory-supplied bottles containing the appropriate preservatives. The sample bottles and caps remained sealed until actual usage at the site. All equipment which came in contact with the well or groundwater was thoroughly cleaned with an Alconox soap solution, rinsed with deionized water, followed by cleaning with acetone, rinsed with deionized water, next cleaned with hexane, and a final rinse with deionized water, before use on the Property. This cleaning procedure was followed between each well sampled. A new piece of nylon cord was used on the bailer in each of the wells. The equipment blank was collected at the end of the sampling. The blank was analyzed along with the samples to ensure proper cleaning. The sample containers were labeled with a unique sample number, location, project number, samplers initials, date and time of collection. All samples were logged onto a chain-of-custody form and placed in a chilled ice chest for shipment to the laboratory.

4.0 METHODS AND RESULTS

Five soil samples were collected 4 feet below the bottom surface of the Former Cross Cut Canal and one soil sample was collected 4 feet below the top surface of the Canal bank. A total of four groundwater samples were collected from the piezometer wells located along the Canal between McDowell Road and Indian School Road. In addition, one equipment blank was collected during the well sampling activities.

4.1 METHODS

The soil samples were analyzed for TCLP metals, total metals, and volatile organics. The samples were analyzed according to the protocols described in US EPA SW-846, Test Methods for Evaluating Solid Waste, 3rd Edition. The soil samples were extracted for the Toxicity Characteristic Leaching Procedure (TCLP), according to Method 1311.

The water samples were analyzed for total metals and volatile organics. The water samples were analyzed according to the protocols described in US EPA SW-846, Test Methods for Evaluating Solid Waste, 3rd Edition, and Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-02.

The analytical methodologies used for the soil samples and their reporting limits are listed below:

Volatile Organics - Methods 8010, Halogenated Volatile Organics, and 8020, Aromatic Volatile Organics; reporting limits range from 0.0002 to 0.002 milligrams per kilogram (mg/Kg = ppm).

Toxicity Characteristic Leaching Procedure Metals (TCLP Metals): Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium and Silver - EPA Method 1311, Extraction; Analysis Methods used are: EPA Method 7060, Arsenic; EPA Method 7080, Barium; EPA Method 7130, Cadmium; EPA Method 7190, Chromium; EPA Method 7420, Lead; EPA Method 7470, Mercury; EPA Method 7744, Selenium; EPA Method 7760, Silver. The reporting limits range from 0.02 to 0.5 milligrams per liter (mg/L = ppm).

Total Metals:

Boron, Iron, and Zinc. EPA Method 6010. The reporting limits range from 2.0 to 10.0 mg/Kg.

The analytical methodologies used for the groundwater samples and their reporting limits are listed below:

Volatile Organics - Methods 8010, Halogenated Volatile Organics, and 8020, Aromatic Volatile Organics; reporting limits range from 0.0002 to 0.002 milligrams per kilogram (mg/Kg = ppm).

Total Metals: Arsenic, Barium, Boron, Cadmium, Chromium, Iron, Lead, Mercury, Selenium, Silver, and Zinc. Analysis Methods used are: EPA

Method 206.2, Arsenic; EPA Method 200.7, Barium; EPA Method 200.7, Boron; EPA Method 200.7, Cadmium; EPA Method 200.7, Chromium; EPA Method 200.7, Iron; EPA Method 239.2, Lead; EPA Method 245.1, Mercury; EPA Method 270.2, Selenium; EPA Method 200.7, Silver; and EPA Method 200.7, Zinc. The reporting limits range from 0.0002 to 0.2 milligrams per liter (mg/L = ppm).

4.2 ANALYTICAL RESULTS

A brief listing of the results are presented below. The results indicated that there are high concentrations of iron in the soil samples and moderate concentrations of iron in the groundwater samples. There were low levels of zinc detected in the soil samples also. There were low levels of arsenic, barium, boron, chromium, lead, and zinc detected in all of the groundwater samples. There were no volatile organic compounds detected in the soil samples or groundwater samples with the exception of a small amount of chloroform in the groundwater sample collected from Piezometer Well No. 8. There were no metals, volatile or aromatic volatile compounds detected in the trip blank, sample No. 50077-313-6. A small amount of toluene was detected in the equipment blank. The toluene detected is most likely the result of laboratory contamination since there was no toluene used on the site for decontamination purposes.

The following is a brief summary of the results for the soil samples. The Health Based Guidance Levels (HBGLs) are suggested by ADEQ and are given for ingestion of soil.

Sample No. 50077-313-1:

Total Metals (mg/kg=ppm)

Analyte	Result	HGBL
Boron	<	none given
Iron	4,350	none given
Zinc	13	200,000 mg/kg

< = Analyte not detected at or above laboratory detection limits.

There were no RCRA eight metals (arsenic, barium, cadmium, chromium, lead, mercury selenium and silver), halogenated volatile or aromatic volatile organic compounds detected in this sample.

Sample No. 50077-313-2:

Total Metals (mg/kg=ppm)

Analyte	Result	HBGL
Boron	<	none given
Iron	5,300	none given
Zinc	15	200,000 mg/kg

< = Analyte not detected at or above laboratory detection limits.

There were no RCRA eight metals (arsenic, barium, cadmium, chromium, lead, mercury selenium and silver), halogenated volatile or aromatic volatile organic compounds detected in this sample.

Sample No. 50077-313-3:

Total Metals (mg/kg=ppm)

Analyte	Result	HBGL
Boron	<	none given
Iron	4,900	none given
Zinc	13	200,000 mg/kg

< = Analyte not detected at or above laboratory detection limits.

There were no RCRA eight metals (arsenic, barium, cadmium, chromium, lead, mercury selenium and silver), halogenated volatile or aromatic volatile organic compounds detected in this sample.

Sample No. 50077-313-4:

Total Metals (mg/kg=ppm)

Analyte	Result	HBGL
Boron	<	none given
Iron	6,350	none given
Zinc	20	200,000 mg/kg

< = Analyte not detected at or above laboratory detection limits.

There were no RCRA eight metals (arsenic, barium, cadmium, chromium, lead, mercury selenium and silver), halogenated volatile or aromatic volatile organic compounds detected in this sample.

Sample No. 50077-313-5:

Total Metals (mg/kg=ppm)

Analyte	Result	HBGL
Boron	<	none given
Iron	8,410	none given
Zinc	25	200,000 mg/kg

< = Analyte not detected at or above laboratory detection limits.

There were no halogenated volatile or aromatic volatile organic compounds detected in this sample.

The following is a brief summary of the results of the water samples:

Sample No. 50077-314-1:

Total Metals (mg/l=ppm)

Analyte	Result	HBGL	EPA PMCL*
Arsenic	0.015	0.050	0.05
Barium	<	5.0	1.0
Boron	2.4	none	none
Cadmium	<	5.0	0.010
Chromium	0.02	0.10	0.05
Iron	8.0	none	0.3**
Lead	0.010	0.020	0.05
Mercury	<	0.002	0.002
Selenium	<	0.045	0.01
Silver	<	0.05	0.05
Zinc	0.06	10	5**

- * Primary EPA Maximum Contaminant Levels (MCLs)
- ** Secondary EPA MCLs (Guidelines)
- < = Analyte not detected at or above laboratory detection limits.

There were no halogenated volatile or aromatic volatile organic compounds detected in this sample.

Sample No. 50077-314-2:

Total Metals (mg/l=ppm)

Analyte	Result	HBGL	EPA PMCL*
Arsenic	0.009	0.050	0.05
Barium	<	5.0	1.0
Boron	0.4	none	none
Cadmium	<	5.0	0.010
Chromium	<	0.10	0.05
Iron	2.7	none	0.3**
Lead	<	0.020	0.05
Mercury	<	0.002	0.002
Selenium	<	0.045	0.01
Silver	<	0.05	0.05
Zinc	0.09	10	5**

- * Primary EPA Maximum Contaminant Levels (MCLs)
- ** Secondary EPA MCLs (Guidelines)
- < = Analyte not detected at or above laboratory detection limits.

Method 8010 (mg/L=ppm)

Analyte	Result	HBGL	EPA SMCL
Chloromethane	<		
Bromomethane	<		
Dichlorodifluoromethane	<		
Vinyl Chloride	<		
Chloroethane	<		

Methylene Chloride	<			
Trichlorofluoromethane	<			
1,1-Dichloroethene	<			
1,1-Dichloroethane	<			
Trans-1,2-Dichloroethene	<			
Chloroform	0.0094	0.006	0.10	
1,2-Dichloroethane	<			
1,1,1-Trichloroethane	<			
Carbon Tetrachloride	<			
Bromodichloromethane	<			
1,2-Dichloropropane	<			
Trans-1,3-Dichloropropene	<			
Trichloroethene	<			
1,1,2-Trichloroethane	<			
cis-1,3-Dichloropropene	<			
Dibromochloromethane	<			
2-Chloroethyl Vinyl Ether	<			
Bromoform	<			
1,1,2,2-Tetrachloroethane	<			
Tetrachloroethene	<			
1,4-Dichlorobenzene	<			
1,3-Dichlorobenzene	<			
1,2-Dichlorobenzene	<			

< = Analyte not detected at or above laboratory detection limits.

There were no aromatic volatile organic compounds detected in this sample.

Sample No. 50077-314-3:

Total Metals (mg/l=ppm)

Analyte	Result	HBGL	EPA PMCL*
Arsenic	0.020	0.050	0.05
Barium	<	5.0	1.0
Boron	3.3	none	none

Cadmium	<	5.0	0.010
Chromium	0.02	0.10	0.05
Iron	16.0	none	0.3**
Lead	0.0006	0.020	0.05
Mercury	<	0.002	0.002
Selenium	<	0.045	0.01
Silver	<	0.05	0.05
Zinc	0.07	10	5**

* Primary EPA Maximum Contaminant Levels (MCLs)

** Secondary EPA MCLs (Guidelines)

< = Analyte not detected at or above laboratory detection limits.

There were no halogenated volatile or aromatic volatile organic compounds detected in this sample.

Sample No. 50077-314-4:

Total Metals (mg/l=ppm)

Analyte	Result	HBGL	EPA PMCL*
Arsenic	0.010	0.050	0.05
Barium	0.7	5.0	1.0
Boron	0.5	none	none
Cadmium	<	5.0	0.010
Chromium	0.09	0.10	0.05
Iron	51.0	none	0.3**
Lead	0.005	0.020	0.05
Mercury	<	0.002	0.002
Selenium	0.02	0.045	0.01
Silver	<	0.05	0.05
Zinc	0.18	10	5**

* Primary EPA Maximum Contaminant Levels (MCLs)

** Secondary EPA MCLs (Guidelines)

< = Analyte not detected at or above laboratory detection limits.

There were no halogenated volatile or aromatic volatile organic compounds detected in this sample.

Sample No. 50077-314-5:

Method 8020

Analyte	Result	Units
Benzene	<	mg/L
Toluene	0.0011	mg/L
Ethylbenzene	<	mg/L
Chlorobenzene	<	mg/L
Total Xylenes	<	mg/L
1,4-Dichlorobenzene	<	mg/L
1,3-Dichlorobenzene	<	mg/L
1,2-Dichlorobenzene	<	mg/L

< = Analyte not detected at or above laboratory detection limits.

There were no metals or halogenated volatile organics detected in this sample.

Sample No. 50077-314-6:

There were no halogenated volatile or aromatic volatile organic compounds detected in this sample. Metals analyses were not performed on this sample.

All analytes detected with the exception of iron, were detected below the safe drinking water standards and the ADEQ suggested HBGLs for water ingestion.

4.3 INTERPRETATION OF ANALYTICAL RESULTS

The solubility of metal compounds in water is highly pH dependant and in highly alkaline soils, such as those in the Southwestern United States, the metal salts are not very soluble in water. This accounts for why none of the RCRA eight metals were detected in the TCLP analysis which is a water extractable procedure. The low amounts of halogenated volatile and aromatic volatile compounds detected indicates that the

groundwater in the area of the Canal may not yet have been impacted by the groundwater contamination in the area.

The most significant information gathered from the analytical results is that there are high concentrations of iron in the soil samples and moderate concentrations of iron in the groundwater samples. The principle compounds of iron found in soils are ferric (Fe^{3+}) and ferrous (Fe^{2+}). In general, these forms are mutually convertible. A large portion of iron salts are water soluble; exceptions are carbonates, oxides, hydroxides, phosphates, sulfides, and ferrous fluoride. However, the solubility of iron compounds in water is highly pH dependent and in highly alkaline soils, such as those in the Southwestern United States, the iron salts are not very soluble in water. Iron has a strong tendency to combine with oxygen, as in the form of hydroxy groups, with resultant stable compounds, especially chelates. Orally, iron salts of both valence forms are not acutely toxic; on the other hand, when introduced directly into the blood stream iron salts are highly and instantaneously toxic. Much of the long-term exposure effects of iron, or lack of them, have been evaluated in humans. Soluble iron salts are cutaneous irritants and their aerosols are irritating to the respiratory tract. Iron compounds as a class are not associated with any particular industrial risk. The secondary drinking water standard established by the EPA for iron is 0.3 mg/l.

Zinc is widely distributed and occurs in small amounts in almost all igneous rocks. Zinc has a low oral toxicity. The concentrations of zinc detected in the soil and groundwater samples is not significant.

The levels of arsenic, boron, chromium, lead, and selenium detected in the samples are not considered significant quantities in terms of employee exposure since the acute toxicity from these chemicals would result from ingestion of the material. However, the dusts of the chemicals can be irritating to the skin and respiratory tract.

4.3 GUIDANCE LEVELS FOR EMPLOYEE EXPOSURE

There are no soil or water ingestion Health Based Guidance Levels (HBGLs) established by ADEQ for boron and iron. There are HBGL established for the other contaminants identified in the samples. The Occupational Safety and Health Administration (OSHA) and

American Council of Governmental Industrial Hygienists (ACGIH) have established a permissible exposure limit (PEL) or time-weighted average (TWA) for an eight hour workday for certain contaminants in the air. These PELs or TWAs are listed below.

Compound	HBGL SOIL	HBGL WATER	PEL or TWA
Arsenic	1,000 ppm	0.050 ppm	0.5 mg/m ³
Chromium	2,000 ppm	0.10 ppm	50 ppm
Chloroform	120 ppm	0.006	50 ppm
Boron	none	none	none
Iron	none	none	none
Lead	400 ppm	0.020 ppm	0.2 mg/m ³
Selenium	900 ppm	0.045 ppm	0.2 mg/m ³
Zinc	100,000 ppm	5.0 ppm	none

5.0 CONCLUSIONS

On March 13 and 14, 1991, Exceltech, Inc. (ET), performed an extensive Phase II Environmental Site Investigation of the Former Cross Cut Canal for the Flood Control District of Maricopa County. The area under investigation, the Former Cross Cut Canal, is located along 48th Street between Indian School Road and McDowell Road in Phoenix, Arizona. The investigation consisted of sampling the soil and groundwater along the length of the Canal to evaluate concentrations of selected metals and organic compounds. The FCDMC was interested in these compounds from an employee exposure standpoint.

The analytical results of the soil and groundwater samples indicated that there is a high level of iron present in the soil samples and elevated levels of iron in the groundwater samples. In addition, low levels of boron and zinc were detected in the soil samples analyzed. There were low levels of arsenic, chromium, chloroform, lead, and selenium detected in the groundwater samples collected and analyzed for the piezometer wells.

Based on the results of the assessment, ET considers potential for employee exposure to the compounds detected to be minimal with the exception of iron, which is moderate.

6.0 RECOMMENDATIONS

Since the major route of exposure to the identified contaminants is expected to be from inhalation or skin contact and not ingestion, the following recommendations are made. To minimize employee exposure to iron and the other identified compounds, ET recommends that all employees working on the Former Cross Cut Canal wear dust masks; work gloves; change clothes daily; and wash clothes daily.

7.0 LIMITATIONS

Environmental regulations on a Federal, state or local level can vary significantly over a period of time. Similarly, Property conditions will inevitably change over time. Consequently, the conclusions presented in the environmental assessment are strictly applicable to the status of the environmental regulations and the Property conditions existing at the time that Exceltech, Inc., performs the assessment. Exceltech believes the data obtained and the inferences made in the course of this investigation are reasonably representative of the Property.

Exceltech, Inc., makes no warranty, expressed or implied, except that these services have been performed in accordance with generally accepted existing environmental engineering, health, and safety principles and applicable regulations at the time and location of the proposed study.

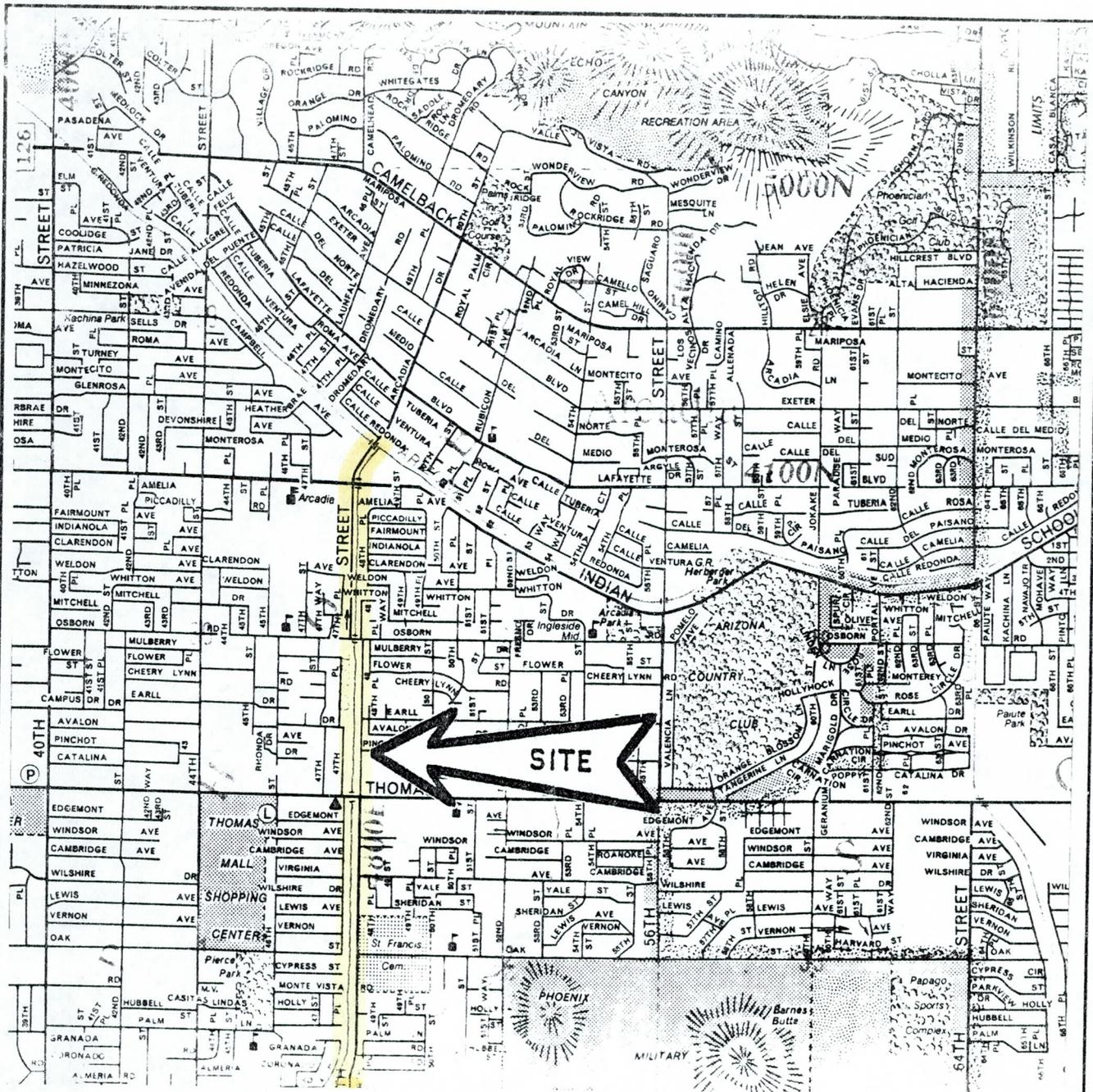
APPENDIX A

SITE LOCATION MAP

FOUR STAR FORD

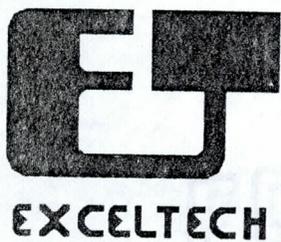
SOUTH WORTH CO, MS

2500 COTTON FIELD



LEGEND

SCALE
1 mile



SITE LOCATION MAP

FCDMC - FORMER CROSS CUT CANAL

48TH ST. FROM MCDOWELL RD. TO
INDIAN SCHOOL RD.

PHOENIX, ARIZONA

REVIEWED BY:

[Signature]

JOB #:

5-50077-51

DATE:

23 MAY 91

APPROVED BY:

[Signature]

DRAWN BY:

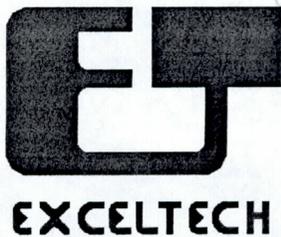
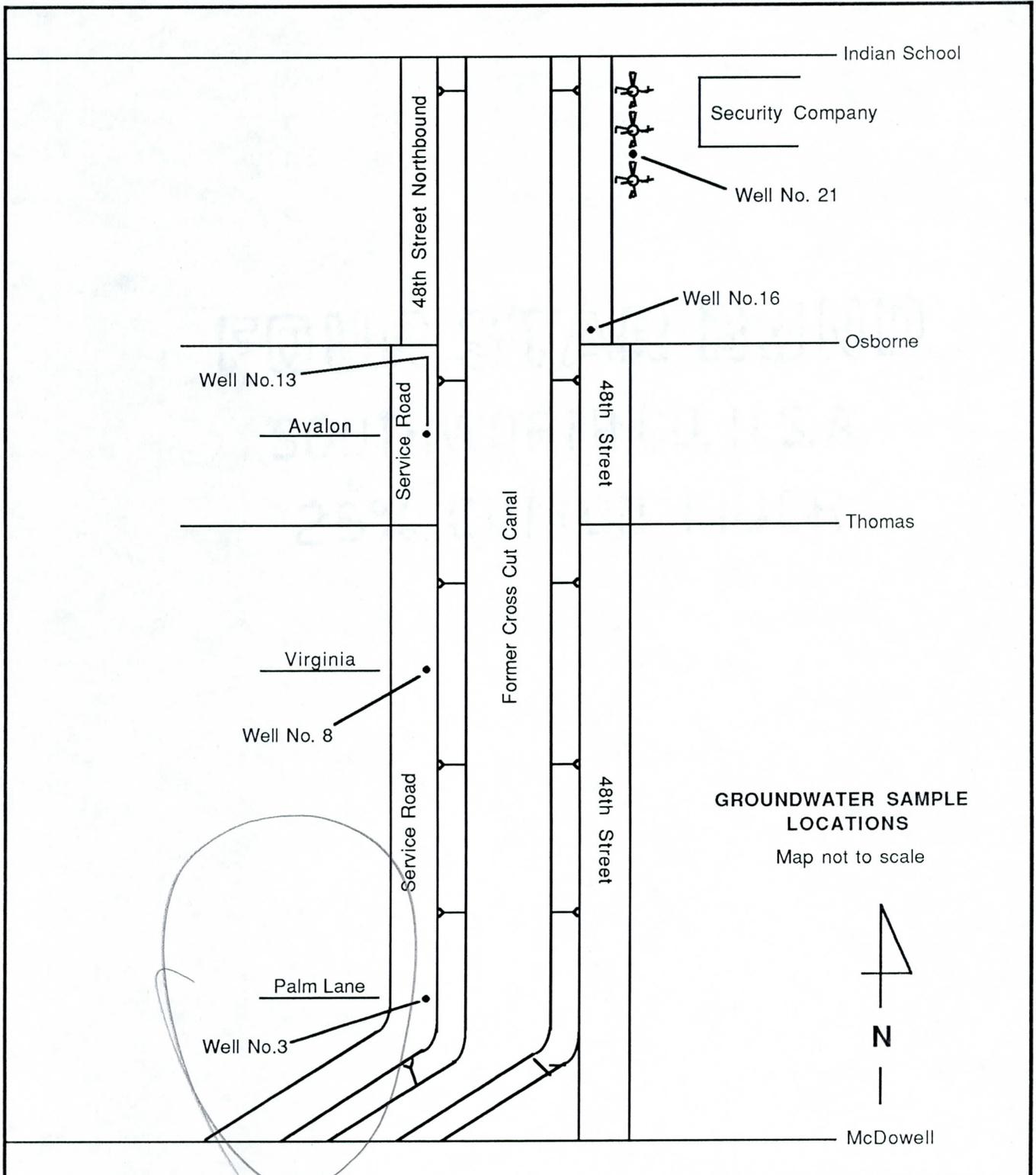
JAB

DRAWING #:

50077-A1

APPENDIX B

SITE SPECIFIC MAPS



SITE SPECIFIC MAP

FCDMC- FORMER CROSS CUT CANAL

MCDOWELL RD. & INDIAN SCHOOL RD.

PHOENIX, ARIZONA

REVIEWED BY:

JMP

JOB #:
5-50077-51

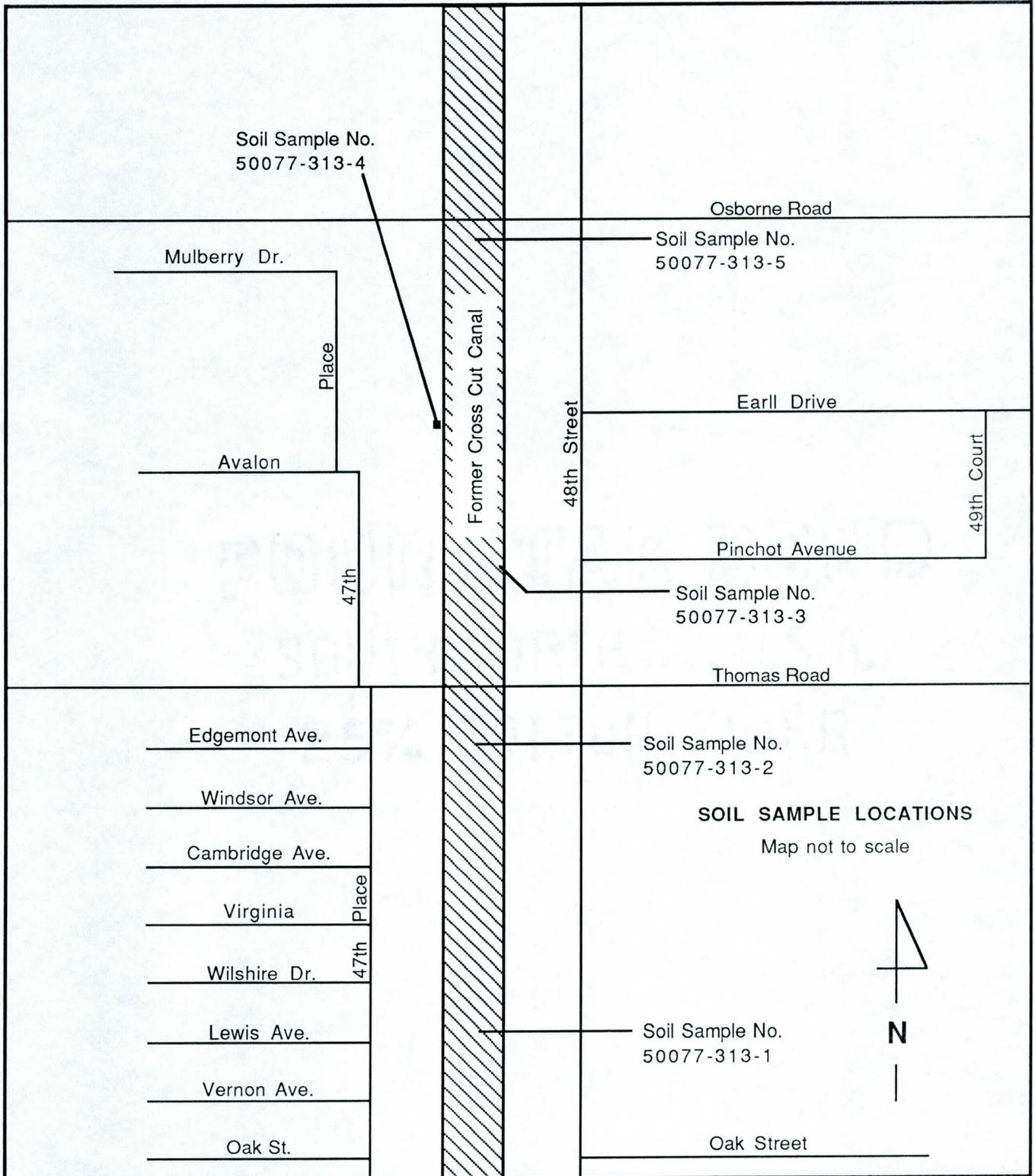
DATE:
22 MAY 91

APPROVED BY:

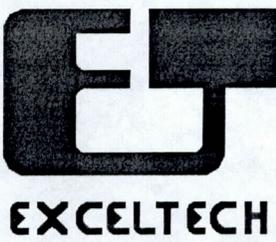
M

DRAWN BY:
JAB

DRAWING #:
50077-B1



SOIL SAMPLE LOCATIONS
Map not to scale



SITE SPECIFIC MAP FCDMC- FORMER CROSS CUT CANAL OAK STREET & OSBORN ROAD PHOENIX, ARIZONA	REVIEWED BY:	APPROVED BY:
	<i>[Signature]</i>	<i>[Signature]</i>
	JOB #: 5-50077-51	DRAWN BY: JAB
	DATE: 23 MAY 91	DRAWING #: 50077-B2

APPENDIX C

**COPIES OF ANALYTICAL RESULTS
AND CHAIN-OF-CUSTODY FORMS**



VISTA Laboratories Inc.

3830 High Court
Wheat Ridge, CO 80033
(303) 467-0630

Chain of Custody Record Analytical Services Request

(enclose with each shipping container)

Client: Exceltech Contact: Marilyn Moots Address: 1520 W Mineral Rd,
 Program/Site: 5-50077-5-1 Phone: (602) 345-6640 Tempe, AZ 85283

VISTA Project Number

913355 -

Collected by: Bill Newman
Bill Newman

These fields may be used for field test results

Sample Identification	Date Sampled	Time	Sample Type	ROA Metals + B Fe, Zn	SO ₁₀	8020												Total	
50077-314-1	3/14/91	10:09 am	water	X	X													3	001
50077-314-2	3/14/91	2:00 pm		X	X													3	002
50077-314-3	3/14/91	2:30 pm		X	X													3	003
50077-314-4	3/14/91	2:45 pm	✓	X	X													3	004
50077-314-5	3/14/91	3:00 pm	↓	X	X													2	005
50077-314-6	3/14/91	10:15 pm	water	X	X													1	006
<u>Bill Newman</u>																			

Condition on Receipt/Temp: Preserved L poly with HNO₃ for Metals (DM 3-15-91)
 Comments: Verbals to office to Marilyn Moots #50077-314-2 Use that broken in Receiving,
Use P.O. number on invoice = P.O. #22507 3-15-91 DM

Relinquished by: Bill Newman Representing: Exceltech To Whom: Jeff Moore ARX Date/Time: 3/14/91 16:55
 Relinquished by: _____ Representing: _____ To Whom: _____ Date/Time: _____
 Relinquished by: _____ Representing: _____ Rec. at VISTA By: [Signature] Date/Time: 3-15/91 12:50

WHITE COPY : Accompanies Samples

CANARY COPY : Lab

PINK COPY : Sampler



VISTA
Laboratories Inc.

3830 High Court
Wheat Ridge, CO 80033
(303) 467-0630

APR 11 1991

April 9, 1991

Ms. Marilyn Moots
Exceltech, Inc.
1520 West Mineral Road, Suite A-1
Tempe, Arizona 85283

Dear Ms. Moots:

Enclosed are the results from the analyses of six water samples, received on March 15, 1991, for the determination of metals and volatile organic compounds. Please feel free to call if you have any questions regarding these analyses.

Sincerely,

Michael G. Brooks
President

MGB/CLB:lk
Enclosures

Reviewed by,

Corinne L. Bogert
Technical Director

VISTA Project # 913355



Sample Description

<u>Laboratory ID</u>	<u>Client ID</u>	<u>Type</u>	<u>Date Received</u>
913355-001	50077-314-1	Water	03/15/91
913355-002	50077-314-2	Water	03/15/91
913355-003	50077-314-3	Water	03/15/91
913355-004	50077-314-4	Water	03/15/91
913355-005	50077-314-5	Water	03/15/91
913355-006	50077-314-6	Water	03/15/91



Results and Discussion

VISTA Project # 913355

Six water samples were received on March 15, 1991, for the determination of metals and volatile organic compounds. The samples were analyzed according to the protocols described in USEPA SW-846, Test Methods for Evaluating Solid Waste, 3rd Ed., and Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-02.

Quality control (QC) results are reported for another client's samples which were prepared and analyzed with these samples. Sample information for the QC samples is withheld to maintain client confidentiality.

Total Metals

Client: Exceltech, Inc.
Client Sample ID: 50077-314-1
VISTA Sample ID: 913355-001
Date Sampled : 03/14/91

Sample Type: Water
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Arsenic	0.015	0.005	mg/L	206.2
Barium	<	0.2	mg/L	200.7
Boron	2.4	0.1	mg/L	200.7
Cadmium	<	0.005	mg/L	200.7
Chromium	0.02	0.01	mg/L	200.7
Iron	8.0	0.1	mg/L	200.7
Lead	0.010	0.003	mg/L	239.2
Mercury	<	0.0002	mg/L	245.1
Selenium	<	0.01	mg/L	270.2
Silver	<	0.01	mg/L	200.7
Zinc	0.06	0.02	mg/L	200.7

< = Analyte not detected at or above the listed reporting limit.

Halogenated Volatile Organics
EPA Method 8010

Client: Exceltech, Inc.
 Client Sample ID: 50077-314-1
 VISTA Sample ID: 913355-001
 Date Sampled : 03/14/91
 Date Analyzed: 03/21/91

Sample Type: Water
 Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Chloromethane	<	0.2	ug/L
Bromomethane	<	0.2	ug/L
Dichlorodifluoromethane	<	0.2	ug/L
Vinyl Chloride	<	0.2	ug/L
Chloroethane	<	0.2	ug/L
Methylene Chloride	<	2.0	ug/L
Trichlorofluoromethane	<	0.2	ug/L
1,1-Dichloroethene	<	0.2	ug/L
1,1-Dichloroethane	<	0.2	ug/L
Trans-1,2-Dichloroethene	<	0.2	ug/L
Chloroform	<	0.2	ug/L
1,2-Dichloroethane	<	0.2	ug/L
1,1,1-Trichloroethane	<	0.2	ug/L
Carbon Tetrachloride	<	0.2	ug/L
Bromodichloromethane	<	0.2	ug/L
1,2-Dichloropropane	<	0.2	ug/L
Trans-1,3-Dichloropropene	<	0.2	ug/L
Trichloroethene	<	0.2	ug/L
1,1,2-Trichloroethane	<	0.2	ug/L
cis-1,3-Dichloropropene	<	0.2	ug/L
Dibromochloromethane	<	0.2	ug/L
2-Chloroethyl Vinyl Ether	<	0.2	ug/L
Bromoform	<	0.2	ug/L
1,1,2,2-Tetrachloroethane	<	0.2	ug/L
Tetrachloroethene	<	0.2	ug/L
Chlorobenzene	<	0.2	ug/L
1,4-Dichlorobenzene	<	1.0	ug/L
1,3-Dichlorobenzene	<	1.0	ug/L
1,2-Dichlorobenzene	<	1.0	ug/L

< = Compound not detected at or above the listed reporting limit.

Aromatic Volatile Organics
EPA Method 8020

Client: Exceltech, Inc.
Client Sample ID: 50077-314-1
VISTA Sample ID: 913355-001
Date Sampled : 03/14/91
Date Analyzed: 03/21/91

Sample Type: Water
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Benzene	<	0.5	ug/L
Toluene	<	0.5	ug/L
Ethylbenzene	<	0.5	ug/L
Chlorobenzene	<	0.5	ug/L
Total Xylenes	<	1.0	ug/L
1,4-Dichlorobenzene	<	1.0	ug/L
1,3-Dichlorobenzene	<	1.0	ug/L
1,2-Dichlorobenzene	<	1.0	ug/L
<u>Surrogate Recoveries</u>			<u>QC Limits</u>
1-Chloro-2-fluorobenzene	96	%	88-110

< = Compound not detected at or above the listed reporting limit.

Total Metals

Client: Exceltech, Inc.
Client Sample ID: 50077-314-2
VISTA Sample ID: 913355-002
Date Sampled : 03/14/91

Sample Type: Water
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Arsenic	0.009	0.005	mg/L	206.2
Barium	<	0.2	mg/L	200.7
Boron	0.4	0.1	mg/L	200.7
Cadmium	<	0.005	mg/L	200.7
Chromium	<	0.01	mg/L	200.7
Iron	2.7	0.1	mg/L	200.7
Lead	<	0.003	mg/L	239.2
Mercury	<	0.0002	mg/L	245.1
Selenium	<	0.005	mg/L	270.2
Silver	<	0.01	mg/L	200.7
Zinc	0.09	0.02	mg/L	200.7

< = Analyte not detected at or above the listed reporting limit.

**Halogenated Volatile Organics
EPA Method 8010**

Client: Exceltech, Inc.
 Client Sample ID: 50077-314-2
 VISTA Sample ID: 913355-002
 Date Sampled : 03/14/91
 Date Analyzed: 03/21/91

Sample Type: Water
 Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Chloromethane	<	0.2	ug/L
Bromomethane	<	0.2	ug/L
Dichlorodifluoromethane	<	0.2	ug/L
Vinyl Chloride	<	0.2	ug/L
Chloroethane	<	0.2	ug/L
Methylene Chloride	<	2.0	ug/L
Trichlorofluoromethane	<	0.2	ug/L
1,1-Dichloroethene	<	0.2	ug/L
1,1-Dichloroethane	<	0.2	ug/L
Trans-1,2-Dichloroethene	<	0.2	ug/L
Chloroform	9.4	0.2	ug/L
1,2-Dichloroethane	<	0.2	ug/L
1,1,1-Trichloroethane	<	0.2	ug/L
Carbon Tetrachloride	<	0.2	ug/L
Bromodichloromethane	<	0.2	ug/L
1,2-Dichloropropane	<	0.2	ug/L
Trans-1,3-Dichloropropene	<	0.2	ug/L
Trichloroethene	<	0.2	ug/L
1,1,2-Trichloroethane	<	0.2	ug/L
cis-1,3-Dichloropropene	<	0.2	ug/L
Dibromochloromethane	<	0.2	ug/L
2-Chloroethyl Vinyl Ether	<	0.2	ug/L
Bromoform	<	0.2	ug/L
1,1,2,2-Tetrachloroethane	<	0.2	ug/L
Tetrachloroethene	<	0.2	ug/L
Chlorobenzene	<	0.2	ug/L
1,4-Dichlorobenzene	<	1.0	ug/L
1,3-Dichlorobenzene	<	1.0	ug/L
1,2-Dichlorobenzene	<	1.0	ug/L

< = Compound not detected at or above the listed reporting limit.

Aromatic Volatile Organics
EPA Method 8020

Client: Exceltech, Inc.
Client Sample ID: 50077-314-2
VISTA Sample ID: 913355-002
Date Sampled : 03/14/91
Date Analyzed: 03/21/91

Sample Type: Water
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Benzene	<	0.5	ug/L
Toluene	<	0.5	ug/L
Ethylbenzene	<	0.5	ug/L
Chlorobenzene	<	0.5	ug/L
Total Xylenes	<	1.0	ug/L
1,4-Dichlorobenzene	<	1.0	ug/L
1,3-Dichlorobenzene	<	1.0	ug/L
1,2-Dichlorobenzene	<	1.0	ug/L
<u>Surrogate Recoveries</u>			<u>QC Limits</u>
1-Chloro-2-fluorobenzene	97	%	88-110

< = Compound not detected at or above the listed reporting limit.

Total Metals

Client: Exceltech, Inc.
Client Sample ID: 50077-314-3
VISTA Sample ID: 913355-003
Date Sampled : 03/14/91

Sample Type: Water
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Arsenic	0.020	0.005	mg/L	206.2
Barium	<	0.2	mg/L	200.7
Boron	3.3	0.1	mg/L	200.7
Cadmium	<	0.005	mg/L	200.7
Chromium	0.02	0.01	mg/L	200.7
Iron	16	0.1	mg/L	200.7
Lead	0.006	0.003	mg/L	239.2
Mercury	<	0.0002	mg/L	245.1
Selenium	<	0.005	mg/L	270.2
Silver	<	0.01	mg/L	200.7
Zinc	0.07	0.02	mg/L	200.7

< = Analyte not detected at or above the listed reporting limit.

Halogenated Volatile Organics
EPA Method 8010

Client: Exceltech, Inc.
Client Sample ID: 50077-314-3
VISTA Sample ID: 913355-003
Date Sampled : 03/14/91
Date Analyzed: 03/21/91

Sample Type: Water
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Chloromethane	<	0.2	ug/L
Bromomethane	<	0.2	ug/L
Dichlorodifluoromethane	<	0.2	ug/L
Vinyl Chloride	<	0.2	ug/L
Chloroethane	<	0.2	ug/L
Methylene Chloride	<	2.0	ug/L
Trichlorofluoromethane	<	0.2	ug/L
1,1-Dichloroethene	<	0.2	ug/L
1,1-Dichloroethane	<	0.2	ug/L
Trans-1,2-Dichloroethene	<	0.2	ug/L
Chloroform	<	0.2	ug/L
1,2-Dichloroethane	<	0.2	ug/L
1,1,1-Trichloroethane	<	0.2	ug/L
Carbon Tetrachloride	<	0.2	ug/L
Bromodichloromethane	<	0.2	ug/L
1,2-Dichloropropane	<	0.2	ug/L
Trans-1,3-Dichloropropene	<	0.2	ug/L
Trichloroethene	<	0.2	ug/L
1,1,2-Trichloroethane	<	0.2	ug/L
cis-1,3-Dichloropropene	<	0.2	ug/L
Dibromochloromethane	<	0.2	ug/L
2-Chloroethyl Vinyl Ether	<	0.2	ug/L
Bromoform	<	0.2	ug/L
1,1,2,2-Tetrachloroethane	<	0.2	ug/L
Tetrachloroethene	<	0.2	ug/L
Chlorobenzene	<	0.2	ug/L
1,4-Dichlorobenzene	<	1.0	ug/L
1,3-Dichlorobenzene	<	1.0	ug/L
1,2-Dichlorobenzene	<	1.0	ug/L

< = Compound not detected at or above the listed reporting limit.

Aromatic Volatile Organics
EPA Method 8020

Client: Exceltech, Inc.
Client Sample ID: 50077-314-3
VISTA Sample ID: 913355-003
Date Sampled : 03/14/91
Date Analyzed: 03/21/91

Sample Type: Water
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Benzene	<	0.5	ug/L
Toluene	<	0.5	ug/L
Ethylbenzene	<	0.5	ug/L
Chlorobenzene	<	0.5	ug/L
Total Xylenes	<	1.0	ug/L
1,4-Dichlorobenzene	<	1.0	ug/L
1,3-Dichlorobenzene	<	1.0	ug/L
1,2-Dichlorobenzene	<	1.0	ug/L

Surrogate Recoveries

QC Limits

1-Chloro-2-fluorobenzene

93 %

88-110

< = Compound not detected at or above the listed reporting limit.

Total Metals

Client: Exceltech, Inc.
Client Sample ID: 50077-314-4
VISTA Sample ID: 913355-004
Date Sampled : 03/14/91

Sample Type: Water
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Arsenic	0.010	0.005	mg/L	206.2
Barium	0.7	0.2	mg/L	200.7
Boron	0.5	0.1	mg/L	200.7
Cadmium	<	0.005	mg/L	200.7
Chromium	0.09	0.01	mg/L	200.7
Iron	51	0.1	mg/L	200.7
Lead	0.005	0.003	mg/L	239.2
Mercury	<	0.0002	mg/L	245.1
Selenium	0.02	0.01	mg/L	270.2
Silver	<	0.01	mg/L	200.7
Zinc	0.18	0.02	mg/L	200.7

< = Analyte not detected at or above the listed reporting limit.

Halogenated Volatile Organics
EPA Method 8010

Client: Exceltech, Inc.
Client Sample ID: 50077-314-4
VISTA Sample ID: 913355-004
Date Sampled : 03/14/91
Date Analyzed: 03/21/91

Sample Type: Water
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Chloromethane	<	0.2	ug/L
Bromomethane	<	0.2	ug/L
Dichlorodifluoromethane	<	0.2	ug/L
Vinyl Chloride	<	0.2	ug/L
Chloroethane	<	0.2	ug/L
Methylene Chloride	<	2.0	ug/L
Trichlorofluoromethane	<	0.2	ug/L
1,1-Dichloroethene	<	0.2	ug/L
1,1-Dichloroethane	<	0.2	ug/L
Trans-1,2-Dichloroethene	<	0.2	ug/L
Chloroform	<	0.2	ug/L
1,2-Dichloroethane	<	0.2	ug/L
1,1,1-Trichloroethane	<	0.2	ug/L
Carbon Tetrachloride	<	0.2	ug/L
Bromodichloromethane	<	0.2	ug/L
1,2-Dichloropropane	<	0.2	ug/L
Trans-1,3-Dichloropropene	<	0.2	ug/L
Trichloroethene	<	0.2	ug/L
1,1,2-Trichloroethane	<	0.2	ug/L
cis-1,3-Dichloropropene	<	0.2	ug/L
Dibromochloromethane	<	0.2	ug/L
2-Chloroethyl Vinyl Ether	<	0.2	ug/L
Bromoform	<	0.2	ug/L
1,1,2,2-Tetrachloroethane	<	0.2	ug/L
Tetrachloroethene	<	0.2	ug/L
Chlorobenzene	<	0.2	ug/L
1,4-Dichlorobenzene	<	1.0	ug/L
1,3-Dichlorobenzene	<	1.0	ug/L
1,2-Dichlorobenzene	<	1.0	ug/L

< = Compound not detected at or above the listed reporting limit.

Aromatic Volatile Organics
EPA Method 8020

Client: Exceltech, Inc.
Client Sample ID: 50077-314-4
VISTA Sample ID: 913355-004
Date Sampled : 03/14/91
Date Analyzed: 03/21/91

Sample Type: Water
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Benzene	<	0.5	ug/L
Toluene	<	0.5	ug/L
Ethylbenzene	<	0.5	ug/L
Chlorobenzene	<	0.5	ug/L
Total Xylenes	<	1.0	ug/L
1,4-Dichlorobenzene	<	1.0	ug/L
1,3-Dichlorobenzene	<	1.0	ug/L
1,2-Dichlorobenzene	<	1.0	ug/L

Surrogate Recoveries

QC Limits

1-Chloro-2-fluorobenzene

94 %

88-110

< = Compound not detected at or above the listed reporting limit.

Halogenated Volatile Organics
EPA Method 8010

Client: Exceltech, Inc.
Client Sample ID: 50077-314-5
VISTA Sample ID: 913355-005
Date Sampled : 03/14/91
Date Analyzed: 03/21/91

Sample Type: Water
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Chloromethane	<	0.2	ug/L
Bromomethane	<	0.2	ug/L
Dichlorodifluoromethane	<	0.2	ug/L
Vinyl Chloride	<	0.2	ug/L
Chloroethane	<	0.2	ug/L
Methylene Chloride	<	2.0	ug/L
Trichlorofluoromethane	<	0.2	ug/L
1,1-Dichloroethene	<	0.2	ug/L
1,1-Dichloroethane	<	0.2	ug/L
Trans-1,2-Dichloroethene	<	0.2	ug/L
Chloroform	<	0.2	ug/L
1,2-Dichloroethane	<	0.2	ug/L
1,1,1-Trichloroethane	<	0.2	ug/L
Carbon Tetrachloride	<	0.2	ug/L
Bromodichloromethane	<	0.2	ug/L
1,2-Dichloropropane	<	0.2	ug/L
Trans-1,3-Dichloropropene	<	0.2	ug/L
Trichloroethene	<	0.2	ug/L
1,1,2-Trichloroethane	<	0.2	ug/L
cis-1,3-Dichloropropene	<	0.2	ug/L
Dibromochloromethane	<	0.2	ug/L
2-Chloroethyl Vinyl Ether	<	0.2	ug/L
Bromoform	<	0.2	ug/L
1,1,2,2-Tetrachloroethane	<	0.2	ug/L
Tetrachloroethene	<	0.2	ug/L
Chlorobenzene	<	0.2	ug/L
1,4-Dichlorobenzene	<	1.0	ug/L
1,3-Dichlorobenzene	<	1.0	ug/L
1,2-Dichlorobenzene	<	1.0	ug/L

< = Compound not detected at or above the listed reporting limit.

Aromatic Volatile Organics
EPA Method 8020

Client: Exceltech, Inc.
Client Sample ID: 50077-314-5
VISTA Sample ID: 913355-005
Date Sampled : 03/14/91
Date Analyzed: 03/21/91

Sample Type: Water
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Benzene	<	0.5	ug/L
Toluene	1.1	0.5	ug/L
Ethylbenzene	<	0.5	ug/L
Chlorobenzene	<	0.5	ug/L
Total Xylenes	<	1.0	ug/L
1,4-Dichlorobenzene	<	1.0	ug/L
1,3-Dichlorobenzene	<	1.0	ug/L
1,2-Dichlorobenzene	<	1.0	ug/L

Surrogate Recoveries

QC Limits

1-Chloro-2-fluorobenzene

96 %

88-110

< = Compound not detected at or above the listed reporting limit.

**Halogenated Volatile Organics
EPA Method 8010**

Client: Exceltech, Inc.
 Client Sample ID: 50077-314-6
 VISTA Sample ID: 913355-006
 Date Sampled : 03/14/91
 Date Analyzed: 03/21/91

Sample Type: Water
 Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Chloromethane	<	0.2	ug/L
Bromomethane	<	0.2	ug/L
Dichlorodifluoromethane	<	0.2	ug/L
Vinyl Chloride	<	0.2	ug/L
Chloroethane	<	0.2	ug/L
Methylene Chloride	<	2.0	ug/L
Trichlorofluoromethane	<	0.2	ug/L
1,1-Dichloroethene	<	0.2	ug/L
1,1-Dichloroethane	<	0.2	ug/L
Trans-1,2-Dichloroethene	<	0.2	ug/L
Chloroform	<	0.2	ug/L
1,2-Dichloroethane	<	0.2	ug/L
1,1,1-Trichloroethane	<	0.2	ug/L
Carbon Tetrachloride	<	0.2	ug/L
Bromodichloromethane	<	0.2	ug/L
1,2-Dichloropropane	<	0.2	ug/L
Trans-1,3-Dichloropropene	<	0.2	ug/L
Trichloroethene	<	0.2	ug/L
1,1,2-Trichloroethane	<	0.2	ug/L
cis-1,3-Dichloropropene	<	0.2	ug/L
Dibromochloromethane	<	0.2	ug/L
2-Chloroethyl Vinyl Ether	<	0.2	ug/L
Bromoform	<	0.2	ug/L
1,1,2,2-Tetrachloroethane	<	0.2	ug/L
Tetrachloroethene	<	0.2	ug/L
Chlorobenzene	<	0.2	ug/L
1,4-Dichlorobenzene	<	1.0	ug/L
1,3-Dichlorobenzene	<	1.0	ug/L
1,2-Dichlorobenzene	<	1.0	ug/L

< = Compound not detected at or above the listed reporting limit.

**Aromatic Volatile Organics
EPA Method 8020**

Client: Exceltech, Inc.
Client Sample ID: 50077-314-6
VISTA Sample ID: 913355-006
Date Sampled : 03/14/91
Date Analyzed: 03/21/91

Sample Type: Water
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Benzene	<	0.5	ug/L
Toluene	<	0.5	ug/L
Ethylbenzene	<	0.5	ug/L
Chlorobenzene	<	0.5	ug/L
Total Xylenes	<	1.0	ug/L
1,4-Dichlorobenzene	<	1.0	ug/L
1,3-Dichlorobenzene	<	1.0	ug/L
1,2-Dichlorobenzene	<	1.0	ug/L

Surrogate Recoveries

QC Limits

1-Chloro-2-fluorobenzene

95 %

88-110

< = Compound not detected at or above the listed reporting limit.

QUALITY ASSURANCE

Total Metals

Client: Exceltech, Inc.
Client Sample ID: NA
VISTA Sample ID: 913355-Blank
Date Sampled : NA

Sample Type: Water
Date Received: NA

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Arsenic	<	0.005	mg/L	206.2
Barium	<	0.2	mg/L	200.7
Boron	<	0.1	mg/L	200.7
Cadmium	<	0.005	mg/L	200.7
Chromium	<	0.01	mg/L	200.7
Iron	<	0.1	mg/L	200.7
Lead	<	0.003	mg/L	239.2
Mercury	<	0.0002	mg/L	245.1
Selenium	<	0.005	mg/L	270.2
Silver	<	0.01	mg/L	200.7
Zinc	<	0.02	mg/L	200.7

NA = Not Applicable

< = Analyte not detected at or above the listed reporting limit.

**Quality Assurance
Total Metals
Duplicate Analyses**

Client: Exceltech, Inc.

Client Sample ID: NA

VISTA Sample ID: NA

Date Sampled : NA

Sample Type: Water

Date Received: NA

<u>Analyte</u>	<u>Sample Result (mg/L)</u>	<u>Duplicate Result (mg/L)</u>	<u>RPD</u>	<u>Method</u>
Arsenic	ND	0.007	NA	206.2
Barium	ND	ND	NA	200.7
Boron	0.6	0.5	18	200.7
Cadmium	0.005	ND	NA	200.7
Chromium	ND	ND	NA	200.7
Iron	ND	ND	NA	200.7
Lead	ND	ND	NA	239.2
Mercury	ND	ND	NA	245.1
Selenium	ND	ND	NA	270.2
Silver	ND	ND	NA	200.7
Zinc	0.18	0.17	6	200.7

RPD = Relative Percent Difference

ND = Not detected at or above the reporting limit.

NA = Not Applicable

**Quality Assurance
Total Metals
Spike Sample Recovery**

Client: Exceltech, Inc.

Client Sample ID: NA

VISTA Sample ID: NA

Date Sampled : NA

Sample Type: Water

Date Received: NA

<u>Analyte</u>	<u>Spike Added (mg/L)</u>	<u>Sample Conc. (mg/L)</u>	<u>Spike Conc. (mg/L)</u>	<u>% Rec</u>	<u>QC Limits % Rec</u>
Arsenic	0.050	0.038	0.086	96	75-125
Barium	2.0	0.2	2.3	105	75-125
Boron	5.0	0.5	5.5	100	75-125
Cadmium	0.50	ND	0.49	98	75-125
Chromium	0.50	ND	0.47	94	75-125
Iron	1.0	ND	0.99	99	75-125
Lead	0.050	ND	0.042	84	75-125
Mercury	0.0020	ND	0.0022	110	75-125
Selenium	0.050	ND	0.044	88	75-125
Silver	0.50	ND	0.48	96	50-150
Zinc	1.0	0.09	1.1	101	75-125

NA = Not Applicable

< = Analyte not detected at or above the listed reporting limit.

Quality Assurance
Total Metals
Laboratory Control Sample Results

Client: Exceltech, Inc.
VISTA Sample ID: 913355-LCS

<u>Analyte</u>	<u>True Value (mg/L)</u>	<u>Sample Result (mg/L)</u>	<u>% Rec</u>	<u>QC Limits % Rec</u>
Arsenic	0.050	0.047	94	75-125
Barium	2.0	2.0	100	75-125
Boron	5.0	5.1	102	75-125
Cadmium	0.50	0.49	98	75-125
Chromium	0.50	0.46	92	75-125
Iron	1.0	0.94	94	75-125
Lead	0.050	0.047	94	75-125
Mercury	0.0020	0.0021	105	75-125
Selenium	0.050	0.043	86	75-125
Silver	0.50	0.48	96	50-150
Zinc	1.0	0.99	99	75-125

**Halogenated Volatile Organics
EPA Method 8010**

Client: Exceltech, Inc.
 Client Sample ID: NA
 VISTA Sample ID: 913355-Blank
 Date Sampled : NA
 Date Analyzed: 03/21/91

Sample Type: Water
 Date Received: NA

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Chloromethane	<	0.2	ug/L
Bromomethane	<	0.2	ug/L
Dichlorodifluoromethane	<	0.2	ug/L
Vinyl Chloride	<	0.2	ug/L
Chloroethane	<	0.2	ug/L
Methylene Chloride	<	2.0	ug/L
Trichlorofluoromethane	<	0.2	ug/L
1,1-Dichloroethene	<	0.2	ug/L
1,1-Dichloroethane	<	0.2	ug/L
Trans-1,2-Dichloroethene	<	0.2	ug/L
Chloroform	<	0.2	ug/L
1,2-Dichloroethane	<	0.2	ug/L
1,1,1-Trichloroethane	<	0.2	ug/L
Carbon Tetrachloride	<	0.2	ug/L
Bromodichloromethane	<	0.2	ug/L
1,2-Dichloropropane	<	0.2	ug/L
Trans-1,3-Dichloropropene	<	0.2	ug/L
Trichloroethene	<	0.2	ug/L
1,1,2-Trichloroethane	<	0.2	ug/L
cis-1,3-Dichloropropene	<	0.2	ug/L
Dibromochloromethane	<	0.2	ug/L
2-Chloroethyl Vinyl Ether	<	0.2	ug/L
Bromoform	<	0.2	ug/L
1,1,2,2-Tetrachloroethane	<	0.2	ug/L
Tetrachloroethene	<	0.2	ug/L
Chlorobenzene	<	0.2	ug/L
1,4-Dichlorobenzene	<	1.0	ug/L
1,3-Dichlorobenzene	<	1.0	ug/L
1,2-Dichlorobenzene	<	1.0	ug/L

NA = Not Applicable

< = Analyte not detected at or above the listed reporting limit.

Quality Assurance
Chlorinated Volatile Organics - EPA Method 8010
Matrix Spike Recovery and Precision

Client: Exceltech, Inc.
Client Sample ID: 50077-314-4
VISTA Sample ID: 913355-004
Date Sampled : 03/14/91
Date Analyzed: 03/21/91

Sample Type: Water
Date Received: 03/15/91

<u>Compound</u>	<u>Spike Added (ug/L)</u>	<u>Sample Conc. (ug/L)</u>	<u>MS Conc. (ug/L)</u>	<u>MS % Rec</u>	<u>QC Limits % Rec</u>
1,1-Dichloroethene	20	ND	23.6	118	44-158
Trichloroethene	20	ND	23.2	116	80-133
Chlorobenzene	20	ND	21.4	107	81-115

<u>Compound</u>	<u>Spike Added (ug/L)</u>	<u>MSD Conc. (ug/L)</u>	<u>MSD % Rec</u>	<u>RPD</u>	<u>QC Limits RPD % Rec</u>
1,1-Dichloroethene	20	21.2	106	11	12 44-158
Trichloroethene	20	22.0	110	5	11 80-133
Chlorobenzene	20	20.0	100	7	8 81-115

ND = Not Detected
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference

Aromatic Volatile Organics
EPA Method 8020

Client: Exceltech, Inc.
Client Sample ID: NA
VISTA Sample ID: 913355-Blank
Date Sampled : NA
Date Analyzed: 03/21/91

Sample Type: Water
Date Received: NA

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Benzene	<	0.5	ug/L
Toluene	<	0.5	ug/L
Ethylbenzene	<	0.5	ug/L
Chlorobenzene	<	0.5	ug/L
Total Xylenes	<	1.0	ug/L
1,4-Dichlorobenzene	<	1.0	ug/L
1,3-Dichlorobenzene	<	1.0	ug/L
1,2-Dichlorobenzene	<	1.0	ug/L

Surrogate Recoveries

QC Limits

1-Chloro-2-fluorobenzene

96 %

88-110

NA = Not Applicable

< = Analyte not detected at or above the listed reporting limit.

Quality Assurance
 Aromatic Volatile Organics - EPA Method 8020
 Matrix Spike Recovery and Precision

Client: Exceltech, Inc.
 Client Sample ID: 50077-314-4
 VISTA Sample ID: 913355-004
 Date Sampled : 03/14/91
 Date Analyzed: 03/21/91

Sample Type: Water
 Date Received: 03/15/91

<u>Compound</u>	<u>Spike Added (ug/L)</u>	<u>Sample Conc. (ug/L)</u>	<u>MS Conc. (ug/L)</u>	<u>MS % Rec</u>	<u>QC Limits % Rec</u>
Benzene	20	ND	20.5	103	82-127
Toluene	20	ND	21.6	108	82-120
Chlorobenzene	20	ND	21.9	110	86-124

<u>Compound</u>	<u>Spike Added (ug/L)</u>	<u>MSD Conc. (ug/L)</u>	<u>MSD % Rec</u>	<u>RPD</u>	<u>QC Limits RPD % Rec</u>
Benzene	20	20.4	102	1	5 82-127
Toluene	20	21.0	105	3	6 82-120
Chlorobenzene	20	21.4	107	3	6 86-124

ND = Not Detected
 MS = Matrix Spike
 MSD = Matrix Spike Duplicate
 RPD = Relative Percent Difference



3830 High Court
Wheat Ridge, CO 80033
(303) 467-0630

Chain of Custody Record Analytical Services Request

(enclose with each shipping container)

Client: Exceltech Contact: Marilyn Moots Address: 1520 W Mineral Rd.
 Program/Site: 5-50077-51 Phone: _____ Tempe, AZ 85283

VISTA Project Number

913356

Collected by: Bill Newman
B. Newman

These fields may be used
for field test results

Sample Identification	Date Sampled	Time	Sample Type	TCLP Extraction	ROA Metals + Zn, Fe, B	SOID	8020											Total	
50077-313-1	3/13/91	12:45 pm	Soil	X	X	X												2	001
50077-313-2		1:32 pm		X	X													1	002
50077-313-3		2:14 pm		X	X													2	003
50077-313-4		2:46 pm		X	X													2	004
50077-313-5	↓	3:20 pm	↓	X	X													2	005
B. Newman																			

Condition on Receipt/Temp: TCLP Metal & Total L. Zn, Fe, B

Comments: Verbals to Marilyn Moots at office.
Use P.O. # on all invoices, = P.O. # 22507

Relinquished by: B. Newman Representing: Exceltech To Whom: Jeff Moore ARB X Date/Time: 3/14/91 1655
 Relinquished by: _____ Representing: _____ To Whom: _____ Date/Time: _____
 Relinquished by: _____ Representing: _____ Rec. at VISTA By: [Signature] Date/Time: 3-15-91 10:5

APR - 3 1991



VISTA
Laboratories Inc.

3830 High Court
Wheat Ridge, CO 80033
(303) 467-0630

March 30, 1991

Ms. Marilyn Moots
Exceltech, Inc.
1520 West Mineral Road
Suite A-1
Tempe, Arizona 85283

Dear Ms. Moots:

Enclosed are the results from the analyses of five soil samples, received on March 15, 1991, for the determination of TCLP metals, total metals, and volatile organics. Please feel free to call if you have any questions regarding these analyses.

Sincerely,

Michael G. Brooks
President

MGB/CLB/rt
Enclosures

Reviewed by,

Corinne L. Bogert
Technical Director

VISTA Project # 913356



Sample Description

<u>Laboratory ID</u>	<u>Client ID</u>	<u>Type</u>	<u>Date Received</u>
913356-001	50077-313-1	Soil	03/15/91
913356-002	50077-313-2	Soil	03/15/91
913356-003	50077-313-3	Soil	03/15/91
913356-004	50077-313-4	Soil	03/15/91
913356-005	50077-313-5	Soil	03/15/91



Results and Discussion

VISTA Project # 913356

Five soil samples were received on March 15, 1991, for the determination of TCLP metals, total metals, and volatile organics. The samples were analyzed according to the protocols described in USEPA SW-846, Test Methods for Evaluating Solid Waste, 3rd Ed. The samples were extracted for the Toxicity Characteristic Leaching Procedure (TCLP) according to Method 1311.

Quality control (QC) results are reported for another client's samples which were prepared and analyzed with these samples. Sample information for the QC samples is withheld to maintain client confidentiality.

TCLP Metals

Client: Exceltech, Inc.
Client Sample ID: 50077-313-1
VISTA Sample ID: 913356-001
Date Sampled : 03/13/91
TCLP Preparation: 03/18/91

Sample Type: TCLP Leachate
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Arsenic	<	0.5	mg/L	6010
Barium	<	5	mg/L	6010
Cadmium	<	0.1	mg/L	6010
Chromium	<	0.1	mg/L	6010
Lead	<	0.5	mg/L	6010
Mercury	<	0.02	mg/L	7470
Selenium	<	0.5	mg/L	6010
Silver	<	0.1	mg/L	6010

< = Analyte not detected at or above the listed reporting limit.

Total Metals

Client: Exceltech, Inc.
Client Sample ID: 50077-313-1
VISTA Sample ID: 913356-001
Date Sampled : 03/13/91

Sample Type: Soil
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Boron	<	10	mg/kg	6010
Iron	4,350	10	mg/kg	6010
Zinc	13	2	mg/kg	6010

< = Analyte not detected at or above the listed reporting limit.

Halogenated Volatile Organics
EPA Method 8010

Client: Exceltech, Inc.
Client Sample ID: 50077-313-1
VISTA Sample ID: 913356-001
Date Sampled : 03/13/91
Date Analyzed: 03/15/91

Sample Type: Soil
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Chloromethane	<	0.2	ug/kg
Bromomethane	<	0.2	ug/kg
Dichlorodifluoromethane	<	0.2	ug/kg
Vinyl Chloride	<	0.2	ug/kg
Chloroethane	<	0.2	ug/kg
Methylene Chloride	<	2.0	ug/kg
Trichlorofluoromethane	<	0.2	ug/kg
1,1-Dichloroethene	<	0.2	ug/kg
1,1-Dichloroethane	<	0.2	ug/kg
Trans-1,2-Dichloroethene	<	0.2	ug/kg
Chloroform	<	0.2	ug/kg
1,2-Dichloroethane	<	0.2	ug/kg
1,1,1-Trichloroethane	<	0.2	ug/kg
Carbon Tetrachloride	<	0.2	ug/kg
Bromodichloromethane	<	0.2	ug/kg
1,2-Dichloropropane	<	0.2	ug/kg
Trans-1,3-Dichloropropene	<	0.2	ug/kg
Trichloroethene	<	0.2	ug/kg
1,1,2-Trichloroethane	<	0.2	ug/kg
cis-1,3-Dichloropropene	<	0.2	ug/kg
Dibromochloromethane	<	0.2	ug/kg
2-Chloroethyl Vinyl Ether	<	0.2	ug/kg
Bromoform	<	0.2	ug/kg
1,1,2,2-Tetrachloroethane	<	0.2	ug/kg
Tetrachloroethene	<	0.2	ug/kg
Chlorobenzene	<	0.2	ug/kg
1,4-Dichlorobenzene	<	1.0	ug/kg
1,3-Dichlorobenzene	<	1.0	ug/kg
1,2-Dichlorobenzene	<	1.0	ug/kg

< = Compound not detected at or above the listed reporting limit.

Aromatic Volatile Organics
EPA Method 8020

Client: Exceltech, Inc.
Client Sample ID: 50077-313-1
VISTA Sample ID: 913356-001
Date Sampled : 03/13/91
Date Analyzed: 03/15/91

Sample Type: Soil
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Benzene	<	0.5	ug/kg
Toluene	<	0.5	ug/kg
Ethylbenzene	<	0.5	ug/kg
Chlorobenzene	<	0.5	ug/kg
Total Xylenes	<	1.0	ug/kg
1,4-Dichlorobenzene	<	1.0	ug/kg
1,3-Dichlorobenzene	<	1.0	ug/kg
1,2-Dichlorobenzene	<	1.0	ug/kg
<u>Surrogate Recoveries</u>			QC Limits
1-Chloro-2-fluorobenzene	98	%	59-128

< = Compound not detected at or above the listed reporting limit.

TCLP Metals

Client: Exceltech, Inc.
 Client Sample ID: 50077-313-2
 VISTA Sample ID: 913356-002
 Date Sampled : 03/13/91
 TCLP Preparation: 03/18/91

Sample Type: TCLP Leachate
 Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Arsenic	<	0.5	mg/L	6010
Barium	<	5	mg/L	6010
Cadmium	<	0.1	mg/L	6010
Chromium	<	0.1	mg/L	6010
Lead	<	0.5	mg/L	6010
Mercury	<	0.02	mg/L	7470
Selenium	<	0.5	mg/L	6010
Silver	<	0.1	mg/L	6010

< = Analyte not detected at or above the listed reporting limit.

Total Metals

Client: Exceltech, Inc.
Client Sample ID: 50077-313-2
VISTA Sample ID: 913356-002
Date Sampled : 03/13/91

Sample Type: Soil
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Boron	<	10	mg/kg	6010
Iron	5,300	10	mg/kg	6010
Zinc	15	2	mg/kg	6010

< = Analyte not detected at or above the listed reporting limit.

TCLP Metals

Client: Exceltech, Inc.
Client Sample ID: 03/13/91
VISTA Sample ID: 913356-003
Date Sampled : 03/18/91
TCLP Preparation: 03/18/91

Sample Type: Soil
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Arsenic	<	0.5	mg/L	6010
Barium	<	5	mg/L	6010
Cadmium	<	0.1	mg/L	6010
Chromium	<	0.1	mg/L	6010
Lead	<	0.5	mg/L	6010
Mercury	<	0.02	mg/L	7470
Selenium	<	0.5	mg/L	6010
Silver	<	0.1	mg/L	6010

< = Analyte not detected at or above the listed reporting limit.

Total Metals

Client: Exceltech, Inc.
Client Sample ID: 03/13/91
VISTA Sample ID: 913356-003
Date Sampled : 03/18/91

Sample Type: Soil
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Boron	<	10	mg/kg	6010
Iron	4,900	10	mg/kg	6010
Zinc	13	2	mg/kg	6010

< = Analyte not detected at or above the listed reporting limit.

TCLP Metals

Client: Exceltech, Inc.
 Client Sample ID: 50077-313-4
 VISTA Sample ID: 913356-004
 Date Sampled : 03/13/91
 TCLP Preparation: 03/18/91

Sample Type: TCLP Leachate
 Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Arsenic	<	0.5	mg/L	6010
Barium	<	5	mg/L	6010
Cadmium	<	0.1	mg/L	6010
Chromium	<	0.1	mg/L	6010
Lead	<	0.5	mg/L	6010
Mercury	<	0.02	mg/L	7470
Selenium	<	0.5	mg/L	6010
Silver	<	0.1	mg/L	6010

< = Analyte not detected at or above the listed reporting limit.

Total Metals

Client: Exceltech, Inc.
Client Sample ID: 50077-313-4
VISTA Sample ID: 913356-004
Date Sampled : 03/13/91

Sample Type: Soil
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Boron	<	10	mg/kg	6010
Iron	6,350	10	mg/kg	6010
Zinc	20	2	mg/kg	6010

< = Analyte not detected at or above the listed reporting limit.

TCLP Metals

Client: Exceltech, Inc.
 Client Sample ID: 50077-313-5
 VISTA Sample ID: 913356-005
 Date Sampled : 03/13/91
 TCLP Preparation: 03/18/91

Sample Type: TCLP Leachate
 Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Arsenic	<	0.5	mg/L	6010
Barium	<	5	mg/L	6010
Cadmium	<	0.1	mg/L	6010
Chromium	<	0.1	mg/L	6010
Lead	<	0.5	mg/L	6010
Mercury	<	0.02	mg/L	7470
Selenium	<	0.5	mg/L	6010
Silver	<	0.1	mg/L	6010

< = Analyte not detected at or above the listed reporting limit.

Total Metals

Client: Exceltech, Inc.
Client Sample ID: 50077-313-5
VISTA Sample ID: 913356-005
Date Sampled : 03/13/91

Sample Type: Soil
Date Received: 03/15/91

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Boron	<	10	mg/kg	6010
Iron	8,410	10	mg/kg	6010
Zinc	25	2	mg/kg	6010

< = Analyte not detected at or above the listed reporting limit.

QUALITY ASSURANCE

TCLP Metals

Client: Exceltech, Inc.
Client Sample ID: NA
VISTA Sample ID: 913356-Blank
Date Sampled : NA
TCLP Preparation: 03/18/91

Sample Type: TCLP Leachate
Date Received: NA

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Arsenic	<	0.5	mg/L	6010
Barium	<	5	mg/L	6010
Cadmium	<	0.1	mg/L	6010
Chromium	<	0.1	mg/L	6010
Lead	<	0.5	mg/L	6010
Mercury	<	0.02	mg/L	7470
Selenium	<	0.5	mg/L	6010
Silver	<	0.1	mg/L	6010

NA = Not Applicable

< = Analyte not detected at or above the listed reporting limit.

Quality Assurance
TCLP Metals
Duplicate Analyses

Client: Exceltech, Inc.
Client Sample ID: 50077-313-1
VISTA Sample ID: 913356-001
Date Sampled : 03/13/91

Sample Type: TCLP Leachate
Date Received: 03/15/91

<u>Analyte</u>	<u>Sample Result (mg/L)</u>	<u>Duplicate Result (mg/L)</u>	<u>RPD</u>	<u>Method</u>
Arsenic	ND	ND	NA	6010
Barium	ND	ND	NA	6010
Cadmium	ND	ND	NA	6010
Chromium	ND	ND	NA	6010
Lead	ND	ND	NA	6010
Mercury	ND	ND	NA	7470
Selenium	ND	ND	NA	6010
Silver	ND	ND	NA	6010

RPD = Relative Percent Difference
ND = Not detected at or above the reporting limit.
NA = Not Applicable

Quality Assurance
TCLP Metals
Spike Sample Recovery

Client: Exceltech, Inc.
Client Sample ID: 50077-313-1
VISTA Sample ID: 913356-001
Date Sampled : 03/13/91

Sample Type: TCLP Leachate
Date Received: 03/15/91

<u>Analyte</u>	<u>Spike Added (mg/L)</u>	<u>Sample Conc. (mg/L)</u>	<u>Spike Conc. (mg/L)</u>	<u>% Rec</u>	<u>QC Limits % Rec</u>
Arsenic	2.0	ND	1.9	95	75-125
Barium	2.0	ND	2.1	105	75-125
Cadmium	0.50	ND	0.52	104	75-125
Chromium	0.50	ND	0.50	100	75-125
Lead	1.0	ND	0.97	97	75-125
Mercury	0.0020	ND	0.0022	110	75-125
Selenium	2.0	ND	2.1	105	75-125
Silver	0.50	ND	0.43	86	50-150

ND = Not detected at or above the reporting limit.

Quality Assurance
 TCLP Metals
 Laboratory Control Sample Results

Client: Exceltech, Inc.
 VISTA Sample ID: 913356-LCS

<u>Analyte</u>	<u>True Value (mg/L)</u>	<u>Sample Result (mg/L)</u>	<u>% Rec</u>	<u>QC Limits % Rec</u>
Arsenic	2.0	2.1	105	75-125
Barium	2.0	2.0	100	75-125
Cadmium	0.50	0.52	104	75-125
Chromium	0.50	0.51	102	75-125
Lead	1.0	1.04	104	75-125
Mercury	0.0020	0.0021	105	75-125
Selenium	2.0	2.0	100	75-125
Silver	0.50	0.45	90	50-150

Total Metals

Client: Exceltech, Inc.
Client Sample ID: NA
VISTA Sample ID: 913356-Blank
Date Sampled : NA

Sample Type: Soil
Date Received: NA

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>	<u>Method</u>
Boron	<	10	mg/kg	6010
Iron	<	10	mg/kg	6010
Zinc	<	2	mg/kg	6010

NA = Not Applicable
< = Analyte not detected at or above the listed reporting limit.

Quality Assurance
Total Metals
Duplicate Analyses

Client: Exceltech, Inc.
Client Sample ID: NA
VISTA Sample ID: NA
Date Sampled : NA

Sample Type: Soil
Date Received: NA

<u>Analyte</u>	<u>Sample Result (mg/kg)</u>	<u>Duplicate Result (mg/kg)</u>	<u>RPD</u>	<u>Method</u>
Boron	ND	ND	NA	6010
Iron	11,600	10,200	13	6010
Zinc	220	200	10	6010

RPD = Relative Percent Difference
ND = Not detected at or above the reporting limit.
NA = Not Applicable

Quality Assurance
Total Metals
Spike Sample Recovery

Client: Exceltech, Inc.
Client Sample ID: NA
VISTA Sample ID: NA
Date Sampled : NA

Sample Type: Soil
Date Received: NA

<u>Analyte</u>	<u>Spike Added (mg/kg)</u>	<u>Sample Conc. (mg/kg)</u>	<u>Spike Conc. (mg/kg)</u>	<u>% Rec</u>	<u>QC Limits % Rec</u>
Boron	500	ND	480	96	75-125
Iron	100	11,600	11,200	*	75-125
Zinc	100	220	310	90	75-125

* Sample concentration greater than spike level.
NA = Not Applicable
ND = Not detected at or above the reporting limit.

Quality Assurance
Total Metals
Laboratory Control Sample Results

Client: Exceltech, Inc.
VISTA Sample ID: 913356-LCS

<u>Analyte</u>	<u>True Value</u> <u>(mg/L)</u>	<u>Sample Result</u> <u>(mg/L)</u>	<u>% Rec</u>	<u>QC Limits</u> <u>% Rec</u>
Boron	5.0	5.2	104	75-125
Iron	1.0	1.04	104	75-125
Zinc	1.0	1.00	100	75-125

Halogenated Volatile Organics
EPA Method 8010

Client: Exceltech, Inc.
Client Sample ID: NA
VISTA Sample ID: 913356-Blank
Date Sampled : NA
Date Analyzed: 03/15/91

Sample Type: Soil
Date Received: NA

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Chloromethane	<	0.2	ug/kg
Bromomethane	<	0.2	ug/kg
Dichlorodifluoromethane	<	0.2	ug/kg
Vinyl Chloride	<	0.2	ug/kg
Chloroethane	<	0.2	ug/kg
Methylene Chloride	<	2.0	ug/kg
Trichlorofluoromethane	<	0.2	ug/kg
1,1-Dichloroethene	<	0.2	ug/kg
1,1-Dichloroethane	<	0.2	ug/kg
Trans-1,2-Dichloroethene	<	0.2	ug/kg
Chloroform	<	0.2	ug/kg
1,2-Dichloroethane	<	0.2	ug/kg
1,1,1-Trichloroethane	<	0.2	ug/kg
Carbon Tetrachloride	<	0.2	ug/kg
Bromodichloromethane	<	0.2	ug/kg
1,2-Dichloropropane	<	0.2	ug/kg
Trans-1,3-Dichloropropene	<	0.2	ug/kg
Trichloroethene	<	0.2	ug/kg
1,1,2-Trichloroethane	<	0.2	ug/kg
cis-1,3-Dichloropropene	<	0.2	ug/kg
Dibromochloromethane	<	0.2	ug/kg
2-Chloroethyl Vinyl Ether	<	0.2	ug/kg
Bromoform	<	0.2	ug/kg
1,1,2,2-Tetrachloroethane	<	0.2	ug/kg
Tetrachloroethene	<	0.2	ug/kg
Chlorobenzene	<	0.2	ug/kg
1,4-Dichlorobenzene	<	1.0	ug/kg
1,3-Dichlorobenzene	<	1.0	ug/kg
1,2-Dichlorobenzene	<	1.0	ug/kg

NA = Not Applicable

< = Compound not detected at or above the listed reporting limit.

Quality Assurance
Chlorinated Volatile Organics - EPA Method 8010
Matrix Spike Recovery and Precision

Client: Exceltech, Inc.
Client Sample ID: NA
VISTA Sample ID: NA
Date Sampled : NA
Date Analyzed: 03/15/91

Sample Type: Soil
Date Received: NA

<u>Compound</u>	<u>Spike Added (ug/kg)</u>	<u>Sample Conc. (ug/kg)</u>	<u>MS Conc. (ug/kg)</u>	<u>MS % Rec</u>	<u>QC Limits % Rec</u>
1,1-Dichloroethene	20	ND	21.7	109	34-156
Trichloroethene	20	ND	22.5	113	68-146
Chlorobenzene	20	ND	19.5	98	52-143

<u>Compound</u>	<u>Spike Added (ug/kg)</u>	<u>MSD Conc. (ug/kg)</u>	<u>MSD % Rec</u>	<u>RPD</u>	<u>QC Limits RPD</u>	<u>% Rec</u>
1,1-Dichloroethene	20	24.3	122	11	20	34-156
Trichloroethene	20	22.3	112	1	10	68-146
Chlorobenzene	20	19.2	96	2	13	52-143

NA = Not Applicable
ND = Not Detected
MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference

Aromatic Volatile Organics
EPA Method 8020

Client: Exceltech, Inc.
Client Sample ID: NA
VISTA Sample ID: 913356-Blank
Date Sampled : NA
Date Analyzed: 03/15/91

Sample Type: Soil
Date Received: NA

<u>Analyte</u>	<u>Result</u>	<u>Reporting Limit</u>	<u>Units</u>
Benzene	<	0.5	ug/kg
Toluene	<	0.5	ug/kg
Ethylbenzene	<	0.5	ug/kg
Chlorobenzene	<	0.5	ug/kg
Total Xylenes	<	1.0	ug/kg
1,4-Dichlorobenzene	<	1.0	ug/kg
1,3-Dichlorobenzene	<	1.0	ug/kg
1,2-Dichlorobenzene	<	1.0	ug/kg
<u>Surrogate Recoveries</u>			QC Limits
1-Chloro-2-fluorobenzene	95	%	59-128

NA = Not Applicable

< = Compound not detected at or above the listed reporting limit.

Quality Assurance
 Aromatic Volatile Organics - EPA Method 8020
 Matrix Spike Recovery and Precision

Client: Exceltech, Inc.
 Client Sample ID: NA
 VISTA Sample ID: NA
 Date Sampled : NA
 Date Analyzed: 03/15/91

Sample Type: Soil
 Date Received: NA

<u>Compound</u>	<u>Spike Added (ug/kg)</u>	<u>Sample Conc. (ug/kg)</u>	<u>MS Conc. (ug/kg)</u>	<u>MS % Rec</u>	<u>QC Limits % Rec</u>
Benzene	20	ND	21.9	110	83-132
Toluene	20	ND	21.6	108	87-120
Chlorobenzene	20	ND	22.3	112	85-123

<u>Compound</u>	<u>Spike Added (ug/kg)</u>	<u>MSD Conc. (ug/kg)</u>	<u>MSD % Rec</u>	<u>RPD</u>	<u>QC Limits RPD % Rec</u>
Benzene	20	21.1	106	4	10 83-132
Toluene	20	21.0	105	3	7 87-120
Chlorobenzene	20	22.0	110	2	8 85-123

NA = Not Applicable
 ND = Not Detected
 MS = Matrix Spike
 MSD = Matrix Spike Duplicate
 RPD = Relative Percent Difference