N00217.003708
HUNTERS POINT
SSIC NO. 5090.3

SUMMARY REPORT
PARCEL A
SUPPLEMENTAL SOIL LEAD SAMPLING
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

CONTRACT NO. N62474-93-D-2151
DELIVERY ORDER NO. 111

Submitted to:

Department of the Navy
Engineering Field Activity West
900 Commodore Drive
San Bruno, California 94066-2402

Submitted by:

IT Corporation
4585 Pacheco Boulevard
Martinez, California 94553

March 10, 1998

PARCEL A
SUPPLEMENTAL SOIL LEAD SAMPLING
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

Regional Office

INTERNATIONAL TECHNOLOGY CORPORATION

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March 10, 1998

773497-ITNHO-0007

Mr. Albert Chan, Code 0625AC
Procuring Contracting Officer
Engineering Field Activity, West
Naval Facilities Engineering Command
900 Commodore Drive, Building 208/1
San Bruno, California 94066-2402

Attention: Ms. Jil Finnegan

Contract: N62474-93-D-2151, Environmental Remediation Contract for Sites in Northern and Central California and in Nevada

Subject: Transmittal of Revised Sampling Report for Parcel A Supplemental Soil Lead Sampling, Delivery Order 111, Hunters Point Shipyard, San Francisco, California

Dear Ms. Finnegan:

Enclosed are eight (8) copies of the revised report for Parcel A, Supplemental Soil Lead Sampling, Hunters Point Shipyard, San Francisco, California Delivery Order No. 111. At your request, IT has addressed and incorporated the comments submitted by the United States Environmental Protection Agency (USEPA). Specific responses to comments are addressed in Appendix E.

If you have questions concerning the content of the enclosed report, please me at (510) 372-5216.

Sincerely,

IT CORPORATION

Daniel W. Baden
Project Manager
Delivery Order 111

for Valerie Crooks, P.E.
Program Manager
EFA-West PMO

Enclosures

cc: Mr. Myles Jones, RAC ACO, Code 7561MJ, w/o enclosure
Mr. Lee Cherry, RAC COTR, Code 18131LC, w/o enclosure

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HUNTERS POINT
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LEAD-BASED PAINT AND SOIL SAMPLING: PARCEL A QUARTERS DATED AUGUST 1993

SUMMARY REPORT, PARCEL A SUPPLEMENTAL SOIL LEAD SAMPLING

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QUESTIONS MAY BE DIRECTED TO:

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1.0 Introduction

On October 24, 1997 limited soil sampling and analysis tasks were undertaken within Parcel A of Hunters Point Shipyard. This effort was conducted to evaluate selected areas of Parcel A Quarters Area that have previously exhibited elevated concentrations of lead in soil. The elevated concentrations of lead in the soil were first described in a report prepared by Tetra Tech in August 1993. During the final review of the Finding Of Suitability for Transfer (FOST) documentation for Parcel A, the results of the Tetra Tech report were further evaluated by the United States Environmental Protection Agency (USEPA) and the California Environmental Protection Agency, Department of Toxic Substances Control (Cal EPA-DTSC). The final review was conducted in 1997. The 1997 limited soil sampling was conducted to address concerns raised by USEPA about the adequacy of sampling at specific locations in the 1993 study.

The initial survey of Parcel A soils, conducted in 1993, revealed an elevated lead concentration in the soils around the water tank location. The reported lead concentration from the initial survey was suspect because it was based upon a single analysis of a composite soil sample. The results were further questioned because very little detail is known about the collection of the samples that were composited for analysis in the 1993 survey. Prior to the 1997 sampling effort, there was uncertainty about the existence and distribution of elevated lead concentrations in the soils around the water tank.

The initial survey of soils surrounding housing units within Parcel A , conducted in 1993, revealed an elevated lead concentration near one residential structure. The concentration of lead reported in the initial survey was suspect because field screening measurements were contradictory to the laboratory analyses. The field screening analyses revealed no lead concentrations in the soil that were elevated, however, a laboratory analysis of a discrete soil sample collected from the same location revealed an elevated concentration of lead in the soil. The disparity between these results created an uncertainty about the existence and distribution of elevated lead concentrations in the soils around one residential structure.

As a result of discussions with the USEPA, the Navy agreed to resample two areas of Parcel A in an effort to clarify the distribution of elevated lead concentrations in the soils around one residential structure and the water tank. The remainder of the 1993 sampling effort was not disputed.

The Parcel A Supplemental Soil Lead Sampling and Analysis task was completed under Delivery Order 111 (DO - 111) under U. S. Navy Contract N62474-93-D-2151 - Environmental Remedial Action Contract For Sites In Northern And Central California And Nevada. The work conducted under this delivery order, is based upon information presented and referenced in the Navy's Order For Supplies or Services to IT Corporation (Dated October 22, 1997). The Scope of Work portion of the Order For Supplies or Services references figures and analytical results from a previous report prepared by Tetra Tech (1993). Existing site information, accompanying drawings, and other relevant details were derived from that document. Details of the initial lead sampling studies are available in the Tetra Tech 1993 document.

1.1 Site Description

Hunters Point Shipyard (HPS) is a former naval shipyard in southeastern San Francisco encompassing some 936 acres, which has been operated as a shipyard since about 1869. The general location of HPS is shown on Figure 1. The Navy used HPS from 1939 through 1974 to produce, modify, maintain, and repair various Navy vessels. The base was placed on inactive status in 1974. Between 1976 and 1986 the Navy reportedly leased about 98 percent of HPS to Triple A. Several portions of the base have been used for small scale commercial and industrial activity since 1976. The specific areas that were sampled under this delivery order are situated upon the bluffs within Parcel A, located along the northern boundary of the shipyard.

1.2 Summary of Site Investigations

In August 1993, Tetra Tech prepared a report for the U. S. Navy, Western Division Naval Facilities Engineering Command, entitled: LEAD-BASED PAINT AND SOIL SAMPLING: PARCEL "A" QUARTERS HUNTERS POINT NAVAL BASE. That report details the findings

and results of a survey that included eight housing units, two community areas, and the water tank. The soil survey for lead was reportedly "designed according to the guidelines provided by Part II of the Federal Register, June 29, 1992,"....."referred to as the Housing and Urban Development, Notice of Funding Availability Document (HUD NOFA)". The bulk of the 1993 lead survey was conducted using a hand-held X-Ray Fluorescence (XRF) Spectrophotometer, while results at selected locations were confirmed by analytical laboratory analyses conducted by Atomic Absorption Spectrophotometry (AAS) methods. The results from two samples collected for analysis by AAS revealed lead concentrations greater than 400 parts per million (ppm). Sampling methods and sample locations are provided in the Tetra Tech 1993 document.

The Tetra Tech 1993 report resulted in uncertainties that warranted further evaluation. The laboratory data did not confirm the results of the field analyses at Residence R-105 and the Water Tank locations. At Residence R-105, located at Jerrold Avenue and Friedell Street, a single discrete sample collected for analysis by AAS methods, revealed a lead concentration of 2700 ppm. Three XRF analyses of the soil at this residence ranged from 154 ppm up to [illegible] ppm. XRF analyses were not conducted at the water tank location. At the water tank location, west of Coleman Street and Innes Avenue, four samples were composited into a single sample for laboratory analysis by AAS methods. The result from these composite samples revealed a lead concentration of 815 ppm.

The focus of the resampling effort was elevated lead concentrations in the soil samples obtained from the water tank location, and the discrepancy between the XRF analyses and the analytical laboratory results from Residence R-105. The reevaluation was directed at determining the need for remedial measures at either location. The Navy conducted this sampling to document that, per the CERCLA covenant, all necessary remedial action at Parcel A had been completed. The USEPA had previously indicated that resolution of the lead concentration discrepancy was necessary to gain USEPA concurrence at the time of property transfer.

1.3 Project Objectives

The work performed under this delivery order serves to confirm existing conditions regarding lead concentrations in soil at selected locations surrounding Residence R-105 and the Water Tank, in Parcel A, at Hunters Point Shipyard.

2.0 Soil Sampling

As per the scope of work, IT Corporation resampled two locations in the Quarters at Hunters Point Shipyard. These locations, the south side of Residence R-105, and the soil surrounding the water tank, had been identified as areas with potentially elevated lead concentrations in the soil (Tetra Tech 1993). Six discrete samples and a duplicate sample were collected from the water tank area, while one discrete sample and a duplicate sample were collected from the south side of Residence R-105. A summary of sample collection details is provided in Table 1.

It is unclear if a site specific Sampling and Analysis Plan (SAP) was developed for the 1993 sampling effort. It is probable that the HUD guidelines were used in place of a site specific SAP. A site specific SAP developed for the 1997 sampling effort: due to time constraints the Navy and a USEPA representative informally agreed to a general sampling approach that included the general locations of the samples, number of samples, and type of analyses. This sampling effort also utilized HUD guidelines as a basis of sampling protocol.

2.1 Sampling Locations

Two locations were sampled during this limited sampling effort. The water tank is located west of Coleman Street and Innes Avenue, while the R-105 residence is located at Jerrold Avenue and Friedell Street.

Water Tank and Vicinity

IT Corporation's sampling locations were chosen to verify the results of Tetra Tech's initial sampling activity. During the 1993 sampling effort, Tetra Tech collected four samples from the perimeter of the water tank. These samples were composited in the laboratory to yield a single result. IT's resampling effort included the collection of six discrete, and a duplicate sample, from the perimeter of the water tank. Each sample was analyzed as a discrete sample yielding seven discrete results. These samples were obtained at distances varying between [illegible] - [illegible] 6.5 feet from the base of the water tank. Figures 2 through 9 of Appendix A contain a photo log of sampling locations. Samples obtained from the water tank location were consecutive

numbered WT 001 through WT 006, the letter D was appended to the sample number to designate a duplicate sample (Table 1).

Residence R-105

The sampling location at Residence R-105 was focused on a more restricted surficial area. IT collected one sample and a duplicate from a location that repeated the Tetra Tech sample location as closely as possible. These samples were collected from the south side of the building within a small alcove area. See Figure 1 of Appendix A for a photo log of the sampling location. Samples obtained from the Residence R-105 location were numbered DO111- R-105-RS and DO111- R-105-H, the letter H was appended to the sample number to designate a duplicate sample (Table 1).

2.2 Sampling Procedures

Soil sampling was conducted in accordance with the Navy approved, IT Standard Operating Procedures (SOPs). Copies of the applicable SOPs are provided in Appendix B. Discrete samples were collected from locations around the two structures. Each soil sample was collected using a new, stainless steel, laboratory spatula to scoop the soil into a new 2-inch diameter lexan tube. Each sampling spatula and lexan tube was rinsed with HPLC quality water prior to use. A new pair of nitrile gloves were worn for the collection of each sample; in order to prevent cross contamination between samples, the gloves were changed for each sample collection event. Upon filling the lexan tube with soil, both ends of the tube were sealed with Teflon tape and plastic end caps. Samples were uniquely labeled and individually sealed in a ziplock type plastic bag. The samples were transported to the IT Martinez office, where they were relinquished to a laboratory courier.

All samples were collected from a depth of one to two inches below ground surface (bgs). The soil for each sample was collected from a carefully cleared area of approximately one square foot. The upper inch of the ground surface was not sampled because a moderately heavy blanket of organic material overlies the soil in most of the sampling locations. In the 1995 HUD

Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (Appendix 13.3.2) this sampling protocol was specifically described with respect to sampling potential play areas. Visible chips of paint were not observed on any of the stratum that were cleared for sample collection.

Duplicate sample sets, (sample numbers: WT002 & WT002D, and DO111-R-105-RS & DO111-R-105-H) were obtained from a single cleared area. One entire sample was collected from one side of a cleared sampling area, while the duplicate sample was collected from the opposite side of the cleared sample collection area. The cleared sample collection areas for the duplicate samples were slightly larger than those created for the other samples.

Analytical laboratory reports and Chain-of-Custody records for each of the samples, from both sampling locations, are provided in Appendix C. Sample collection logs are provided in Appendix D.

2.3 Sampling Results

All of the samples taken by IT were tested for lead by EPA methods 3010A / 3050A / 6010A using atomic absorption spectrophotometry. Chromalab Inc., a Navy- and IT- approved analytical laboratory, performed the requested analyses. Eight of the nine samples that were obtained under this delivery order revealed lead concentrations lower than 400 mg/Kg. One sample obtained from the water tank area revealed a result of 440 mg/Kg, slightly higher than the USEPA Preliminary Remediation Goal (PRG) for unrestricted residential use. Table 2 provides a summary of the analytical results.

Samples collected from the water tank area revealed lead concentration results that ranged from 76 to 440 mg/Kg. The average concentration of the seven samples is calculated to be approximately 301 mg/Kg. Results from the duplicate samples WT002 and WT002D have a minor difference of only about 5.5 percent (20 mg/Kg). The results of the laboratory blanks indicated non-detectable concentrations, and the blank spikes revealed a 98.6 percent recovery.

The lead concentrations in the soil samples from this 1997 resampling effort at Residence R-105, are very similar to the XRF values reported in the 1993 sampling effort at Residence R-105. The current set of samples collected from the Residence R-105 area revealed lead concentration results of 180 mg/Kg and 240 mg/Kg, while the XRF analyses from the 1993 sampling effort ranged from 154 ppm to 190 ppm. The average concentration of the two samples collected for the 1997 effort, is calculated to be approximately 210 mg/Kg. Results from the duplicate sample have a difference of about 33 percent (60 mg/Kg). The results of the laboratory blanks indicated non-detectable concentrations, and the blank spikes revealed a 98.6 percent recovery.

3.0 Conclusion

The lead in soil data that were collected under this delivery order appear to be statistically valid and of good quality. The data collected for the original lead survey of the Parcel A Quarters Area, was also assumed to be statistically valid and of good quality. The central point of contention between the two sampling efforts is focused on the elevated concentrations of lead in soil that were observed at the water tank and the Residence R-105 locations during the initial 1993 lead survey.

The concentration of lead in soil at Residence R-105, as measured by the XRF method in 1993 (range 154 ppm to 190 ppm), and the lead concentrations in soil reported from an analytical laboratory in the 1997 sampling effort at Residence R-105 (range 180 mg/Kg to 240 mg/Kg) are very similar. These results refute the concentration of 2,700 mg/Kg initially detected in the 1993 laboratory analysis. The similarity between the most recent sample results and the original XRF measurements lead to the conclusion that the representative lead concentration in the soil at Residence R-105 probably lies within the 150 - 240 mg/Kg. The results from the discrete sample collected for the 1993 lead survey were apparently anomalous, and were likely caused by a paint chip possibly contained within the sample.

The concentration of lead in soil at the water tank location was reported at 815 ppm in the 1993 lead survey. Available documentation did not allow for duplication of the exact location of the four samples that were collected for composite during that effort. The current sampling effort at this location included the collection of six discrete soil samples for lead analyses. The current sampling and analysis effort resulted in a range of lead concentrations in the soil (range 76 mg/Kg to 440 mg/Kg) that are substantially lower than the previous composite sample. A higher density of samples coupled with the known collection conditions, leads to the conclusion that the current (1997) set of concentrations of lead in the soil at the water tank location are more representative than the previous (1993) sampling results.

The differences between the lead concentrations of the two data sets could be explained by many factors, however, the largest single documented differences between the two data sets appears to be in the sample collection technique and sample density. Tetra Tech intentionally made no effort to remove organic matter from the ground surface, while IT carefully cleared away the organic matter, to obtain a sample free of organic material. As specified in the current HUD guidelines. By clearing the organic matter from the sample area, the probability of introducing stray paint chips to the sample are minimized, while inclusion of organic matter in the sample may have inadvertently included paint chips. Sample density in the 1997 sampling effort was greater than the density of the 1993 sampling effort. The higher sample density lends to a higher degree of confidence in the range of reported values.

Table 1

Sample Collection Summary

Parcel A

Lead in Soil Analyses - Delivery Order 111

Hunters Point Shipyard

Sample Number	Date / Time	Location	Depth	Matrix	Composite (Yes / No)
DO-111-R-105-RS	10-24-97 1450	2.3' south of Building R-105	1" to 2"	Soil	No
DO-111-R-105-H	10-24-97 1455	2.3' south of Building R-105	1" to 2"	Soil	No
WT001	10-24-97 1355	5' off west side of water tank	1" to 2"	Soil	No
WT002	10-24-97 1400	4.5' off southwest side of water tank	1" to 2"	Soil	No
WT002D	10-24-97 1405	4.5' off southwest side of water tank	1" to 2"	Soil	No
WT003	10-24-97 1410	6' off southeast side of water tank	1" to 2"	Soil	No
WT004	10-24-97 1415	6.5' off east side of water tank	1" to 2"	Soil	No
WT005	10-24-97 1420	4' off northeast side of water tank	1" to 2"	Soil	No
WT006	10-24-97 1425	5' off northwest side of water tank	1" to 2"	Soil	No

Table 2

Summary of Laboratory Results

Parcel A

Lead in Soil Analyses - Delivery Order 111

Hunters Point Shipyard

Atomic Absorption Spectrophotometry

(EPA Method 3010A/3050A/6010A)

Sample Number	Date	Analyte	Result (mg/Kg)
DO-111-R-105-RS	10/24/97	Lead	240
DO-111-R-105-H	10/24/97	Lead	180
WT001	10/24/97	Lead	120
WT002	10/24/97	Lead	380
WT002D	10/24/97	Lead	360
WT003	10/24/97	Lead	340
WT004	10/24/97	Lead	76
WT005	10/24/97	Lead	440
WT006	10/24/97	Lead	390

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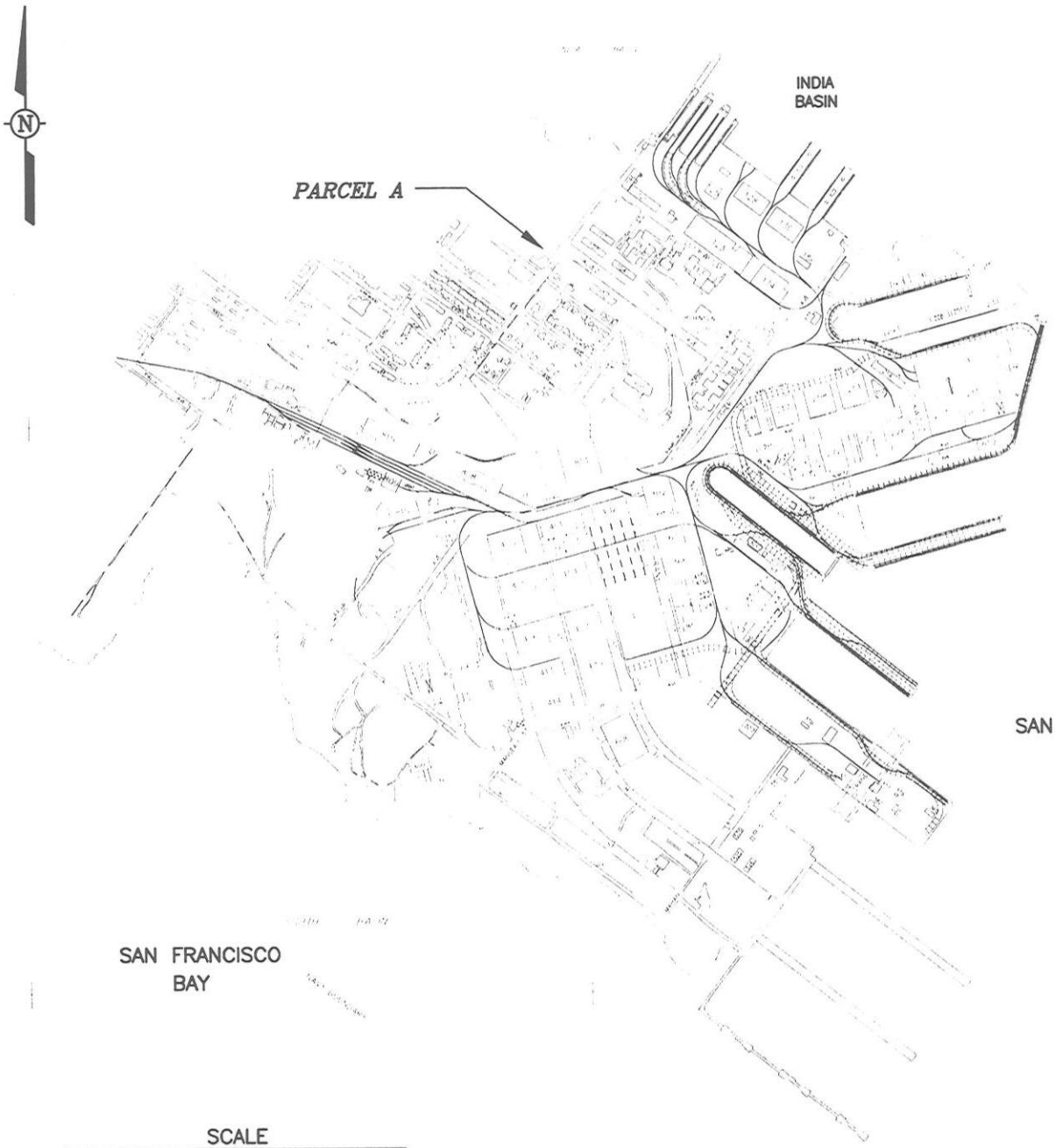

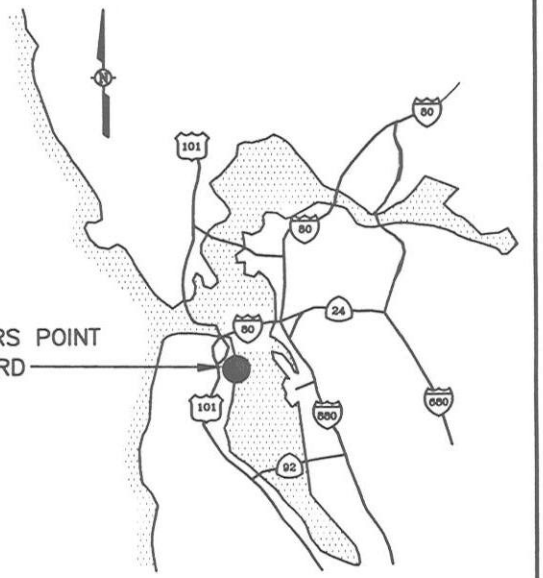

SITE VICINITY MAP
NOT TO SCALE

FIGURE 1

HUNTERS POINT SHIPYARD
PARCEL A
LOCATION MAP
PREPARED FOR
DELIVERY ORDER 111
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

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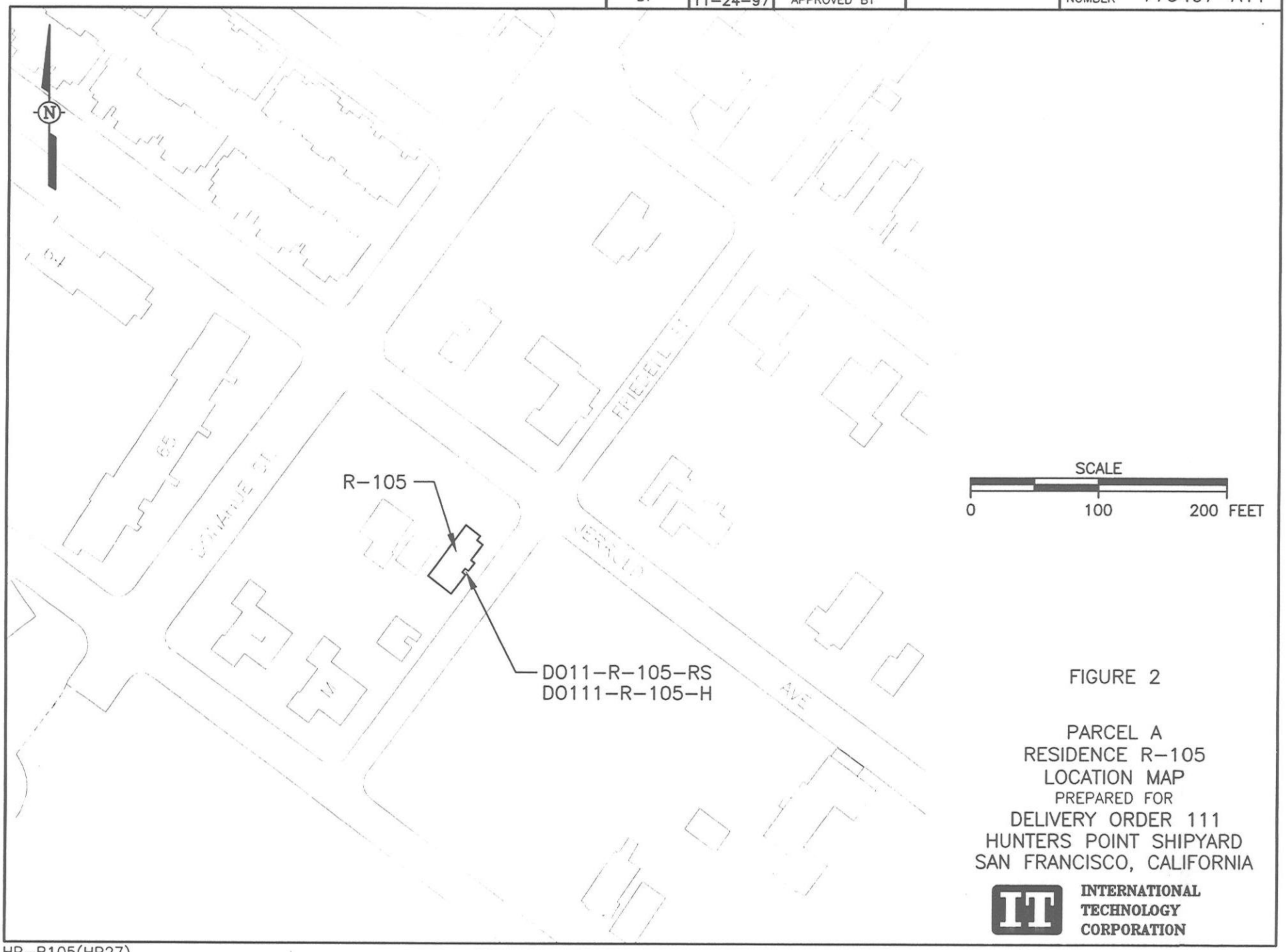

FIGURE 2

PARCEL A
RESIDENCE R-105
LOCATION MAP
PREPARED FOR
DELIVERY ORDER 111
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

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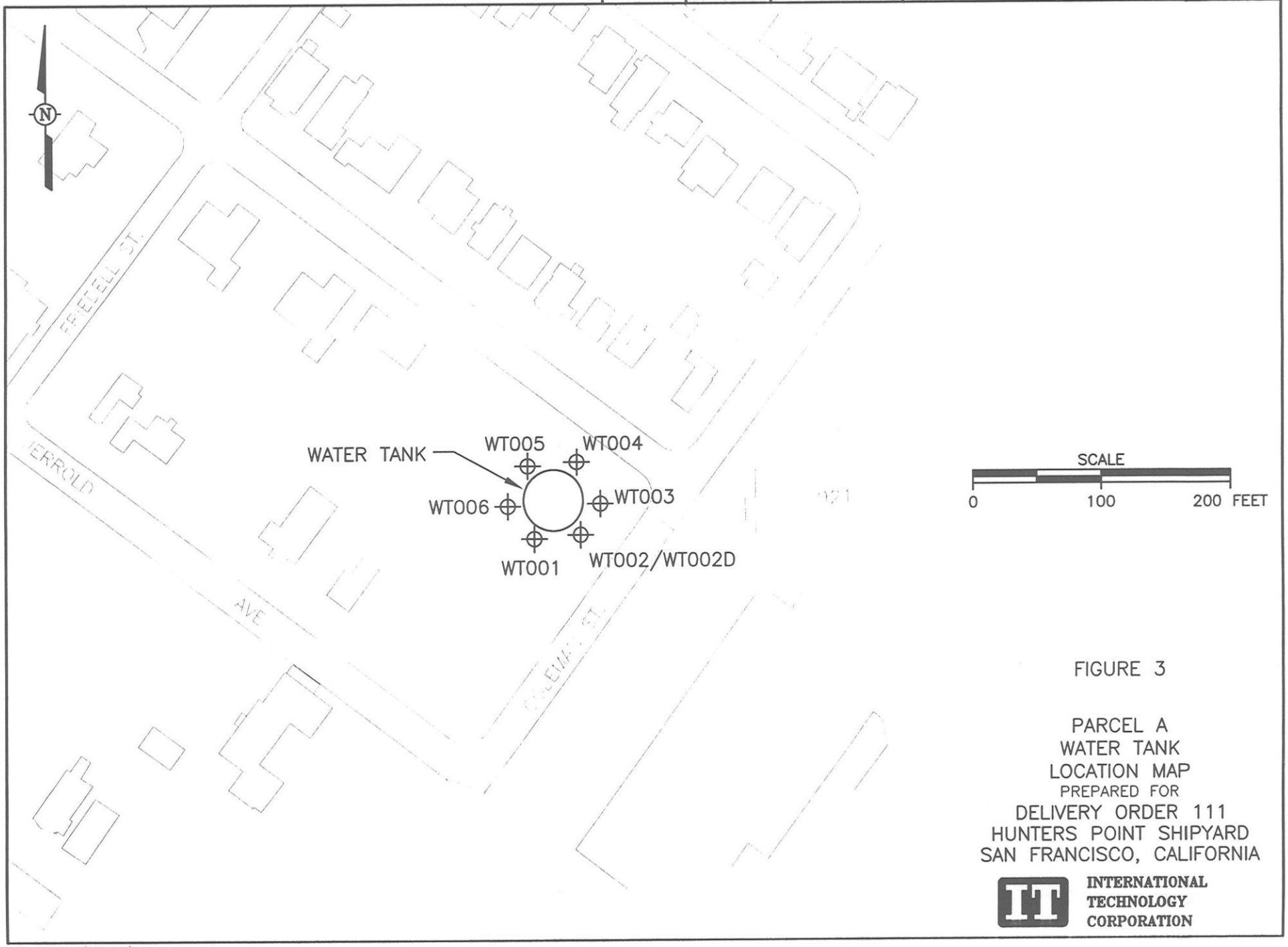

FIGURE 3

PARCEL A
WATER TANK
LOCATION MAP
PREPARED FOR
DELIVERY ORDER 111
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

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Appendix A

Photograph Logs

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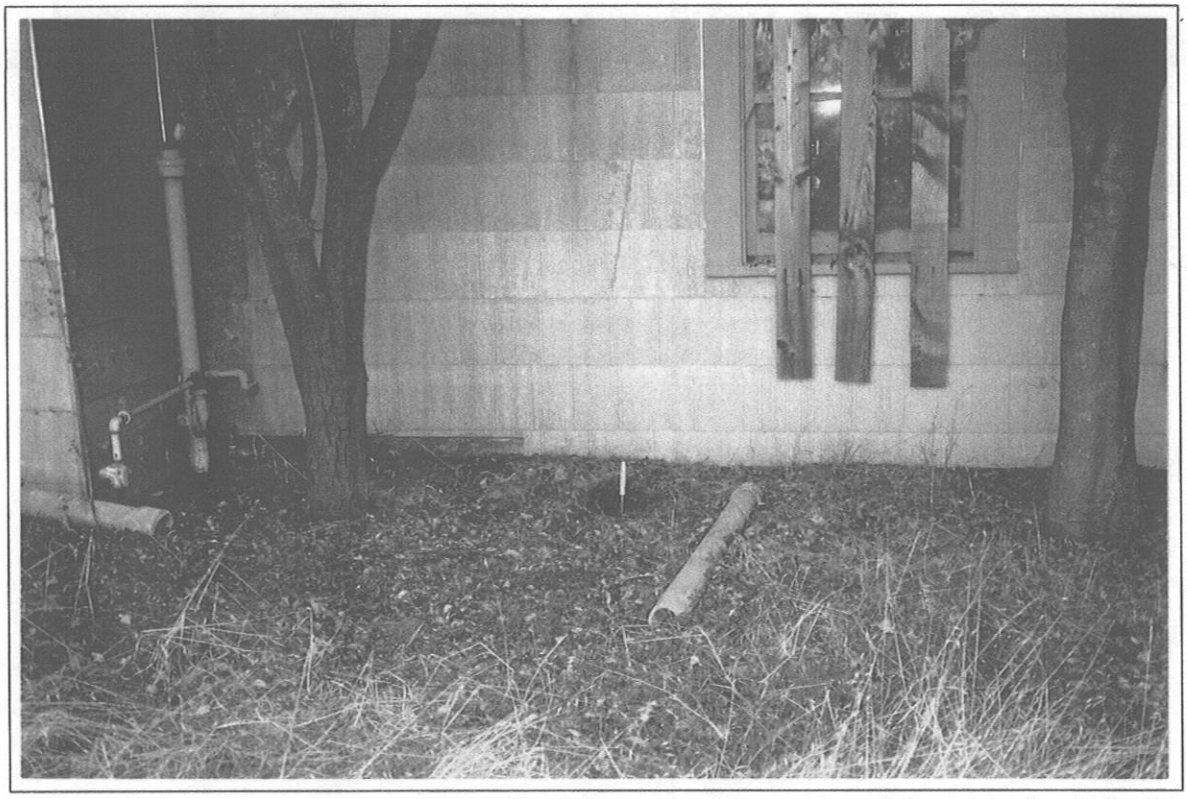

Photo 1: South side of building R-105; sample number DO-111-R-105-RS and DO-111-R-105-H.

Photo 2: Close-up of sample location DO-111-R-105-RS and -H 2.3 feet to south of building R-105.

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FIGURE 1
HUNTERS POINT SHIPYARD
DELIVERY ORDER #111

HP497-01(HP24)

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DRAWING NUMBER 773497-A2

Photo 3: West side of water tank showing stairs, entry hatch, and sample number WT001.

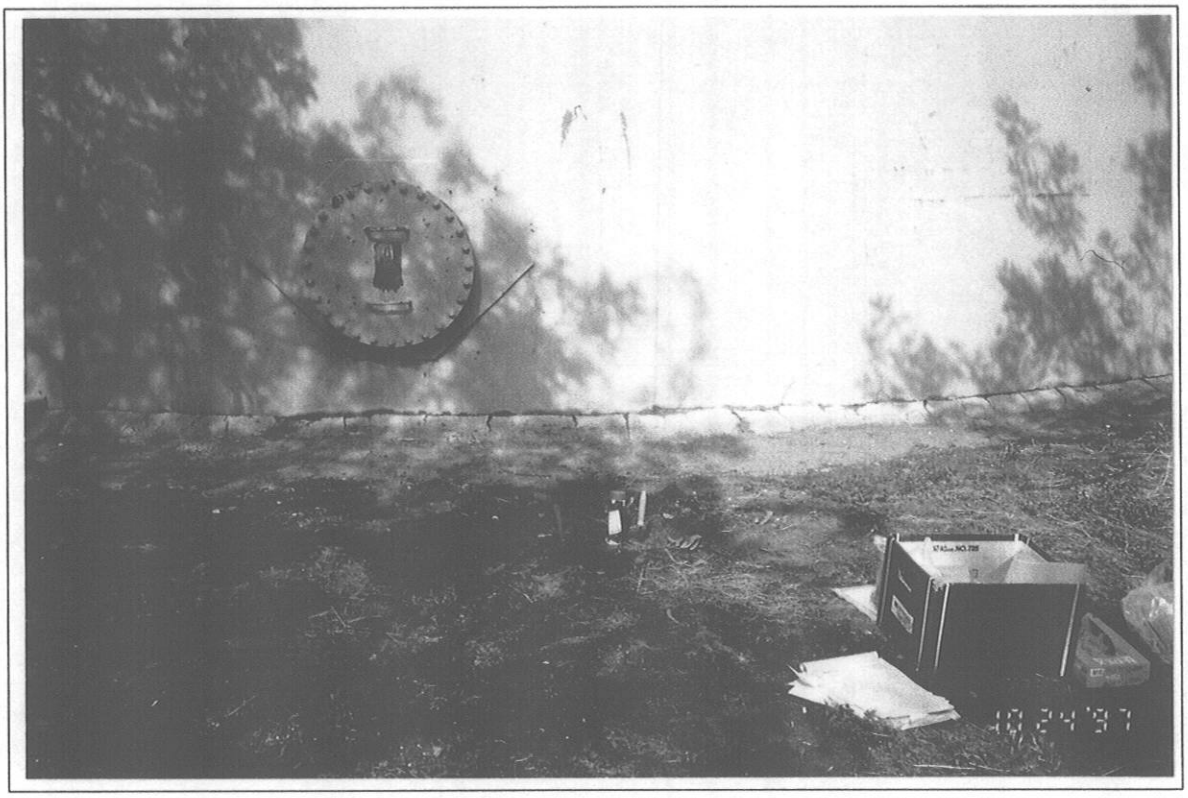

Photo 4: Close-up of sample location WT001 approximately 5 feet west of water tank.

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FIGURE 2
HUNTERS POINT SHIPYARD
DELIVERY ORDER #111

HP497-02(HP24)

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Photo 5: Southwest side of water tank showing inlet pipe, electrical equipment, and sample number WT002 and WT002D.

Photo 6: Close-up of sample location WT002 and WT002D approximately 4.5 feet southwest of water tank.

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FIGURE 3
HUNTERS POINT SHIPYARD
DELIVERY ORDER #111

HP497-03(HP24)

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Photo 7: Close-up of sample location WT003 approximately 6 feet southeast of water tank adjacent to electrical equipment.

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FIGURE 4
HUNTERS POINT SHIPYARD
DELIVERY ORDER #111

HP497-04(HP24)

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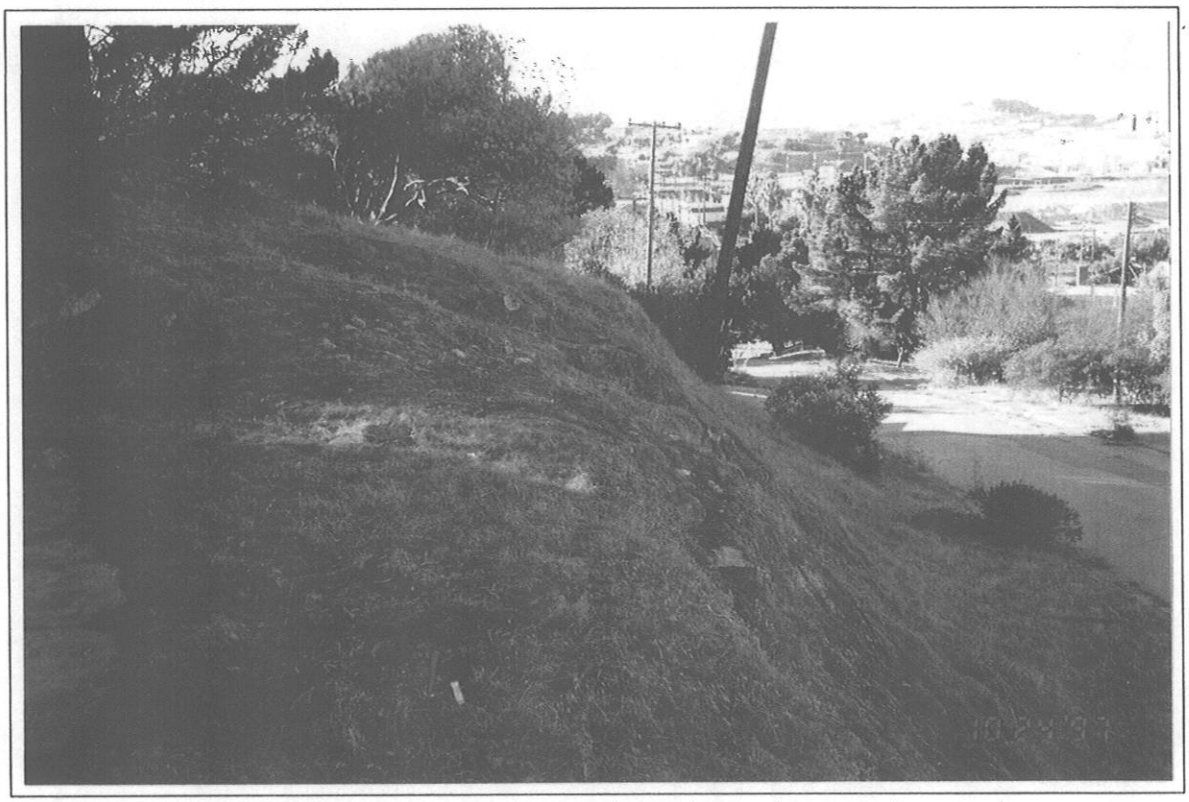

Photo 8: East side of water tank showing slope face and sample number WT004.

Photo 9: Close-up of sample location WT004 approximately 6.5 feet east of water tank and adjacent to 8 inch pipe.

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FIGURE 5
HUNTERS POINT SHIPYARD
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HP497-05(HP24)

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Photo 10: Northeast side of water tank showing berm and sample number WT005.

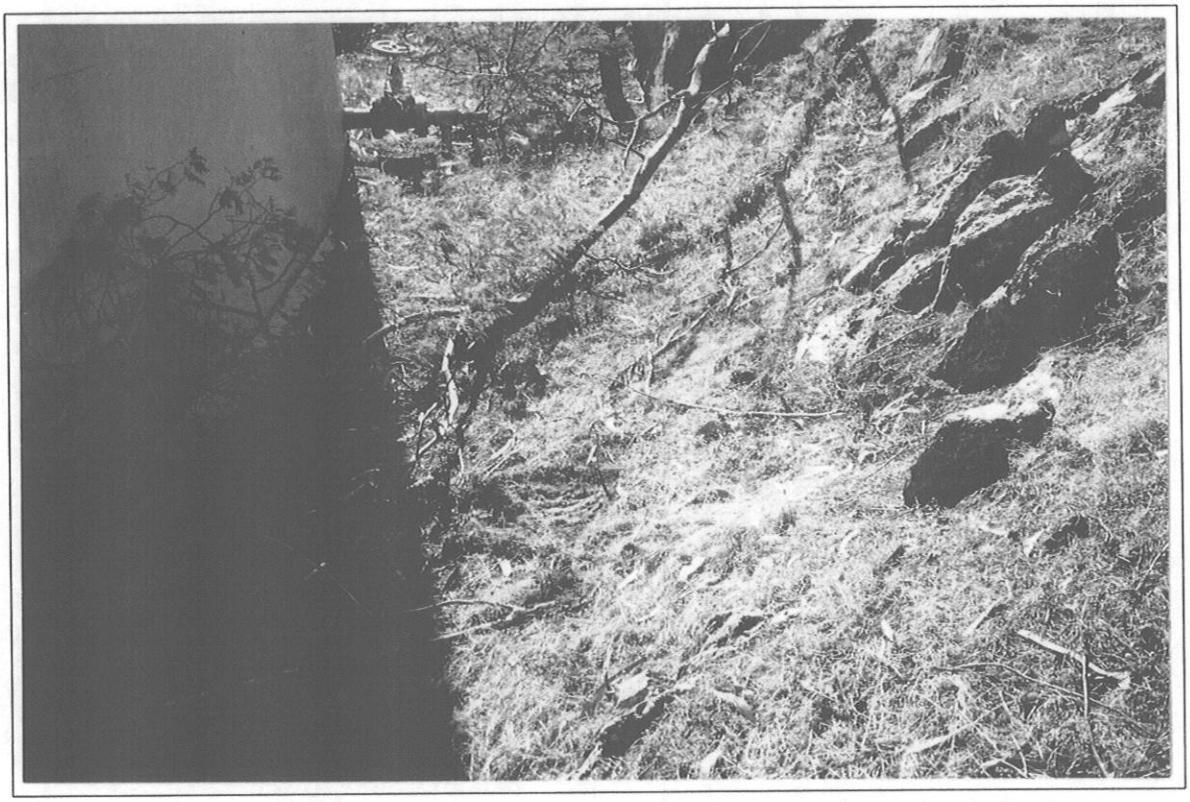

Photo 11: Close-up of sample location WT005 approximately 4 feet northeast of water tank.

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FIGURE 6
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HP497-06(HP24)

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	11-24-97	APPROVED BY	

DRAWING NUMBER 773497-A7

Photo 12: Northwest side of water tank showing sample number WT006.

Photo 13: Close-up of sample location WT006 approximately 5 feet northwest of water tank.

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FIGURE 7
HUNTERS POINT SHIPYARD
DELIVERY ORDER #111

HP497-07(HP24)

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	11-24-97	APPROVED BY			

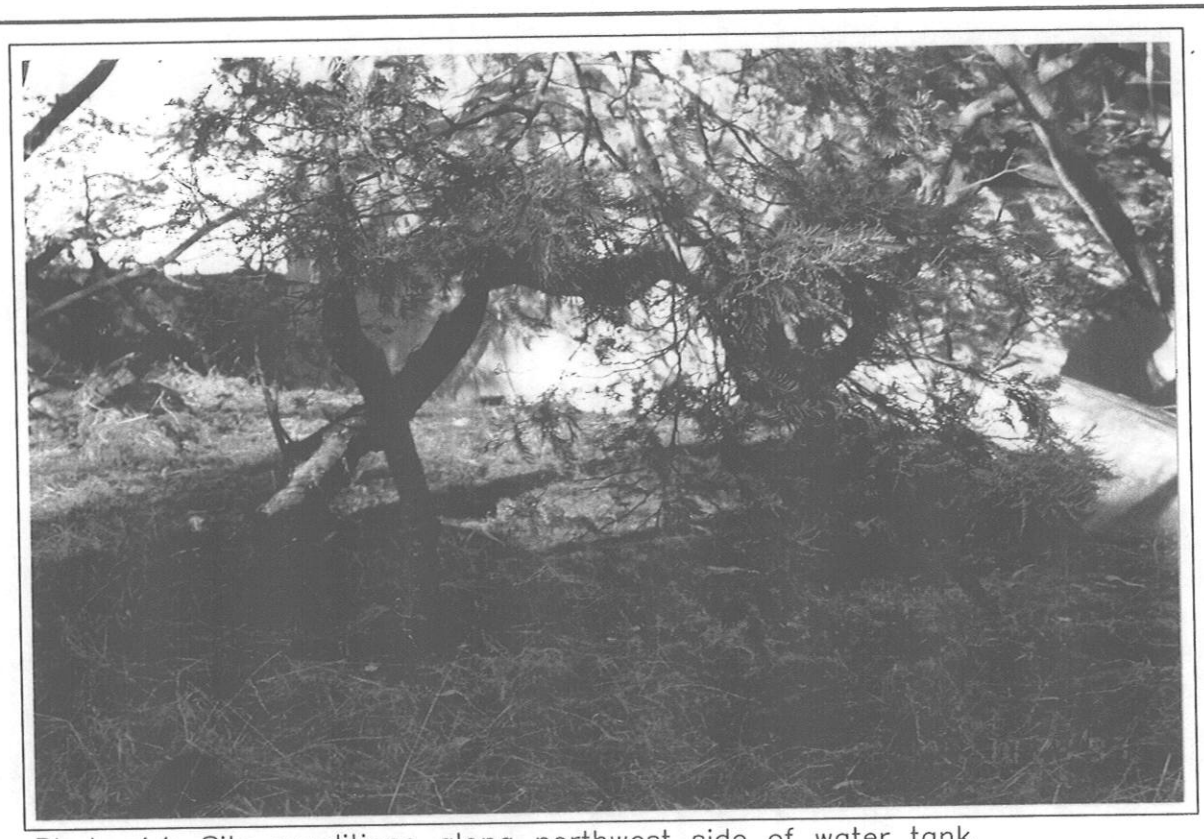

Photo 14: Site conditions along northwest side of water tank.

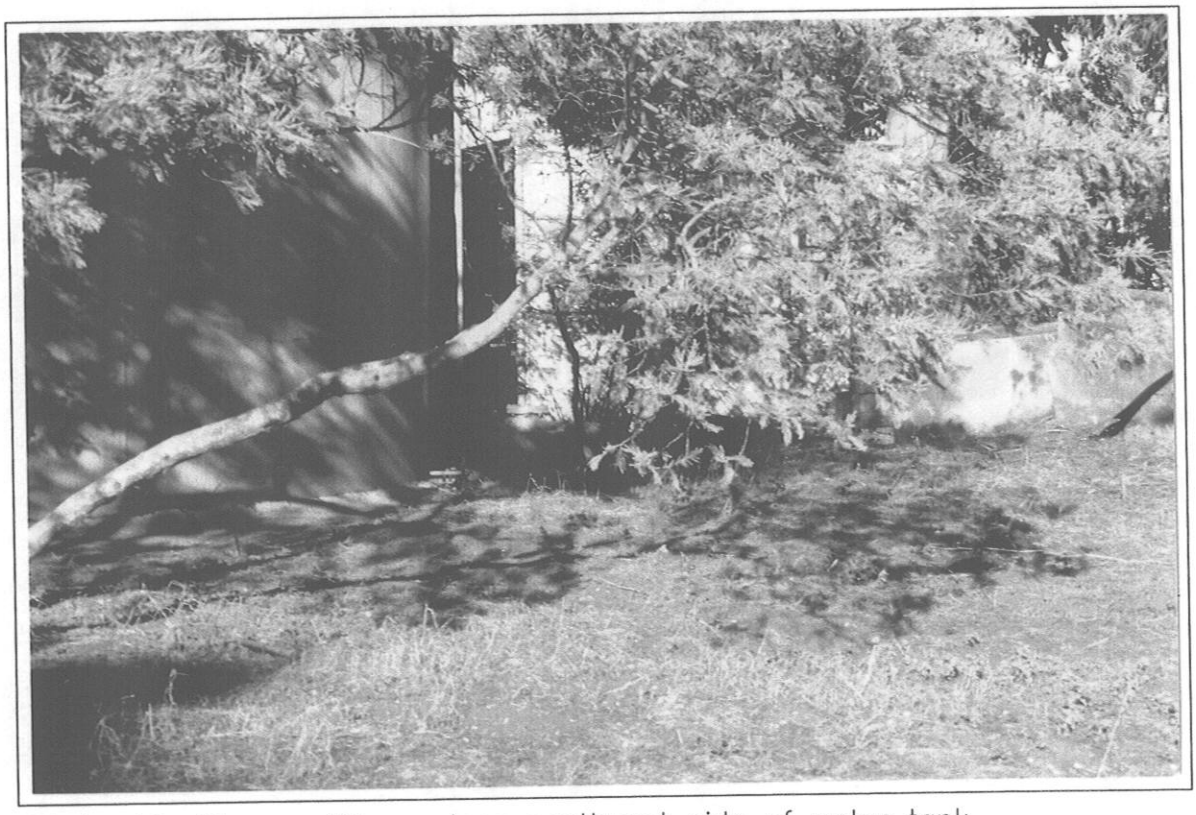

Photo 15: Site conditions along southwest side of water tank.

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FIGURE 8
HUNTERS POINT SHIPYARD
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HP497-08(HP24)

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	11-24-97	APPROVED BY			

Photo 16: Site conditions along northeast side of water tank.

Photo 17: Site conditions along north side of water tank.

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FIGURE 9
HUNTERS POINT SHIPYARD
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HP497-09(HP24)

Appendix B

Standard Operating Procedures

(SOPs)

CHAIN OF CUSTODY

STANDARD OPERATING PROCEDURE

1.0 Purpose

This Standard Operating Procedure (SOP) establishes the method and responsibilities associated with the maintenance and custody of samples which are to be used to provide data which form a basis for making project related decisions. It outlines the general procedures for maintaining and documenting sample chain of custody from the time of sample collection through sample disposition.

2.0 References

2.1 IT Contractor Quality Control Program Plan

2.2 IT SQP 4.2 Records Management

3.0 Definitions

3.1 Chain of Custody

The Chain of Custody (COC) document is the written record that traces the sample possession from the time each sample is collected until its final disposition, sometimes called the "cradle to grave" record. Chain of Custody is maintained by compliance with one of the following criteria:

- The sample is in the individual's physical possession
- The sample is maintained in the individual's physical view after being in his/her possession
- The sample is transferred to a designated secure area restricted to authorized personnel
- The sample is sealed and maintained under lock and key to prevent tampering, after having been in physical possession.

3.2 Waybill

A document that contains a list of the goods and shipping instructions relative to a shipment.

3.3 Common Carrier

For the purpose of this procedure, the common carrier is any commercial carrier utilized for the transportation of the sample(s) from the field to the laboratory.

4.0 Procedure

4.1 Responsibilities

4.1.1 The Project Manager is responsible for assuring proper COC is initiated at the time the sample(s) are collected and maintained throughout the handling and subsequent transportation of the sample(s) to the designated laboratory. Additionally, he/she is the project authority for determining the disposition and fate of sample(s) which have identified deficiencies (e.g., missed holding times, elevated temperature at receipt, etc.).

4.1.2 The sample team member(s) are responsible for properly documenting and maintaining the COC from the time of sample collection until the sample is delivered to the lab.

4.1.3 Laboratory personnel are responsible for receipt and entry of samples into the laboratory which have been submitted under a COC document. Additionally, samples received will be entered into the laboratory COC procedures by properly documenting and maintaining COC from the moment that they take custody of the sample at the laboratory until the sample is disposed of or returned to the client.

4.2 General

4.2.1 An overriding consideration for data resulting from laboratory analyses is the ability to demonstrate that the samples were obtained from the locations stated and that they reached the laboratory without alteration. Evidence of collection, shipment, laboratory receipt, and laboratory custody until disposal must be documented to accomplish this. Documentation will be accomplished through a COC Record that lists each sample and the individuals performing the sample collection, shipment, and receipt.

4.2.2 The COC document is a preprinted form with a unique six-digit control number in the upper right-hand corner. The white copy will accompany the samples while the yellow field copy will be retained in the project file.

4.3 Field Sample Custody

4.3.1 Sampling personnel, upon collection of samples for analysis, will properly complete a COC Record form (Attachment 6.1). The COC document will be the controlling document to assure that sample maintenance and custody are maintained thereby assuring the sample(s) are representative of the environment from which they were collected. At a minimum, the following information will be recorded on the COC document:

- The unique identification number assigned to each sample.
- A brief description of the sampling location and a physical description of the sample type.
- The date and time of the sample collection.
- Container type (e.g., glass, poly, brass sleeve, etc.).
- Sample volume and number of containers (e.g., 2 x 40 ml, 3 x 1 liter).
- Sample preservation (e.g., HNO_3, H_2SO_4, 4°C).
- Requested analyses.
- Special instructions to the laboratory including handling requirements, quality assurance/quality control, health and safety, and sample disposition.
- The project name and number.
- The date the analytical report is due.
- The names of all sampling personnel.
- The name and phone number of the project contact.
- The name and phone number of the laboratory contact.

- The name of the courier and the waybill number (if applicable).
- A unique document reference number.

4.3.2 The COC document will be initiated in the field by the person collecting the sample and signed by each individual who has the samples in their possession. Each time that sample custody is transferred, the former custodian must sign over the COC as Relinquished By, and the new custodian must sign on to the COC as Received By. Each signature must be accompanied by the date, time, and the name of their project or company affiliation.

4.3.3 Transferring of COC from sampling personnel to the analytical laboratory will be performed in accordance with the requirements stated below.

4.3.3.1 If the sampling personnel deliver the samples to the laboratory, transfer of COC occurs as follows:

- The sample collector delivers the samples to the laboratory and relinquishes the sample directly to a laboratory representative.
- The collector signs the COC listing his/her name, affiliation, the date, and time. Any person involved in the collection of the sample may act as the sample custodian.
- The laboratory representative must receive the samples by signing his/her name, affiliation, the date, and time on the COC. The laboratory representative may decline to take receipt of the samples if the COC is not properly completed or if the samples are not properly packaged. All designated laboratory personnel may act as the sample custodian.
- One copy of the COC is given to the sample collector to be returned to the project files and one copy is maintained with the samples at the laboratory.

4.3.3.2 If the sampling personnel transfer sample(s) to the laboratory utilizing a common carrier, sampling personnel will retain COC responsibility and the common carrier is not responsible for maintaining sample custody. The sample collectors are responsible for packaging the samples in a manner that meets the COC definition criteria, that is, the samples

are sealed to prevent tampering. When transferring samples to the courier for transport, COC procedures are maintained as follows:

- The sample collector lists the courier affiliation and waybill number on the COC.
- The sample collector relinquishes custody by signing his name, affiliation, date, and time. The collector keeps a copy of the relinquished COC for the project file.
- The relinquished original COC is sealed in a watertight plastic bag and taped to the inside of the lid of the container used for transportation.
- The transportation container is sealed to prevent tampering and given to the courier for delivery to the laboratory.
- The sample collector obtains a copy of the waybill from the courier for the project file.
- The laboratory representative must receive the samples by signing his/her name, affiliation, the date, and time on the COC. This copy is maintained with the samples at the laboratory.
- The laboratory representative obtains a copy of the waybill from the courier for the project file.

4.4 Analytical Laboratory Custody

4.4.1 Upon receipt at the analytical laboratory, the field generated COC document will be signed, dated, time marked, temperature marked, and laboratory identification will be provided in the appropriate spaces.

4.4.2 Laboratory receipt personnel will enter the samples into the laboratory by implementing the sample custody procedures addressed within their IT approved QA Program.

4.4.3 After completion of analytical testing, sample remnants not consumed during testing may be kept for six months beyond the completion of analysis, unless otherwise specified by a notation on the COC that samples are to be returned to the project site for disposal. Once

this time period has elapsed, the samples will be disposed of and the disposal record number will be recorded on the laboratory record copy of the COC.

5.0 Records

5.1 Records generated as a result of implementation of this SOP will be controlled and maintained in the project record files in accordance with SQP 4.2.

6.0 Attachment

6.1 Chain of Custody Record Form

ATTACHMENT 6.1

CHAIN OF CUSTODY RECORD FORM

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 368244
Page 1 of ___

Project Name/No. [1]
Sample Team Members [2]
Profit Center No. [3]
Project Manager [4]
Purchase Order No. [6]
Required Report Date [11]

Samples Shipment Date [7]
Lab Destination [8]
Lab Contact [9]
Project Contact/Phone [12]
Carrier/Waybill No. [13]

Bill to [5]
Report to [10]

White: To accompany samples. Yellow: Field copy. *See back of form for special instructions.

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Pre-servative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]

Special Instructions: [23]

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☐ Archive (mos.)

Turnaround Time Required: [26]
Normal ☐ Rush ☐

QC Level: [27]
I ☐ II ☐ III ☐ Project Specific (specify)

1. Relinquished by [28] (Signature/Affiliation)	Date: Time:	1. Received by [28] (Signature/Affiliation)	Date: Time:
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: [29]

SAMPLE HANDLING, PACKAGING AND SHIPPING

STANDARD OPERATING PROCEDURE

1.0 Purpose

This Standard Operating Procedure (SOP) outlines the methods and responsibilities for field personnel to use in the packaging and shipping of environmental samples for chemical and physical analysis. This SOP only applies to the packaging and shipping of limited quantity, low concentration environmental samples. This procedure does not apply to those samples considered hazardous materials, hazardous waste, mixed waste, radioactive waste, and/or dangerous goods. Those requirements are specified in the Department of Transportation (DOT) 49 CFR 114-327 and the International Air Transport Association (IATA) procedures. The details within this SOP are only applicable to the general requirements for sample packaging and shipping and should only be used as a guide for developing more job-specific work plans.

2.0 References

2.1 EPA, September 1987, Compendium of Superfund Field Operations Methods, EPA 540/P-87/001a, OSWER 9355.0-14.

2.2 EPA, August 1988, EPA Guidelines for Conducting Remedial Investigation and Feasibility Studies under CERCLA, Interim Final OSWER Directive 9355.3-01.

2.3 Code of Federal Regulations, DOT 49 CFR parts 100 to 177, Revised October 1, 1992.

2.4 Dangerous Goods Regulations, IATA, January 1, 1994.

2.5 SQP 4.2 Records Management.

3.0 Definitions

3.1 Environmental Sample

A limited quantity, low concentration sample that does not require DOT or IATA hazardous waste labelling as a hazardous waste or material.

3.2 Hazardous Waste Sample

Medium or high concentration sample requiring either DOT or IATA labelling as a hazardous waste or material.

3.3 Hazardous Waste

Any substance listed in 40 CFR Subpart D (260.30 et seq.) or otherwise characterized as ignitable, corrosive, reactive, or toxic as specified in Subpart C (261.20 et seq.) that would be subject to manifest and packaging requirements specified in 40 CFR 262. Hazardous waste is defined and regulated by the U.S. Environmental Protection Agency (USEPA).

3.4 Hazardous Material

A substance or material in a quantity or form which may pose an unreasonable risk to health, safety, and/or property when transported in commerce. Hazardous material is defined and regulated by DOT (49 CFR 173.2 and 172.101) and IATA (Section 4.2).

3.5 Sample

Physical evidence collected from a facility or the environment which is representative of conditions at the point and time at which the sample is collected.

4.0 Procedure

4.1 Responsibilities

4.1.1 Compliance with this procedure is the responsibility of project management, site management, health and safety, and field personnel.

4.1.2 Project Manager - is responsible for the development and review of site-specific work plans which address the specific sample handling, packaging, and shipping requirements for the project. Review the project specific documentation forms to ensure they are appropriate

for the field activities. The Project Manager is also responsible for seeing that field personnel receive proper training and maintain quality assurance/quality control (QA/QC).

4.1.3 Contractor Quality Control (CQC) - is responsible for the periodic review of documentation generated during sample handling, packaging, and shipping and the periodic review and audit of field personnel as they perform the work.

If problems arise, the CQC is also responsible for swift implementation of corrective action (i.e., retraining personnel, additional review of work plans and SOPs, variances to requirements, issuing nonconformances).

4.2 Sample Handling

4.2.1 Inspect the sampling containers (obtained from the analytical laboratory prior to the sampling event) to ensure that they are appropriate for the samples being collected, correctly preserved, and undamaged.

4.2.2 When collecting a sample always use approved/site specific personal protective equipment (e.g., gloves, etc.) to prevent cross-contamination from sample to sample but also as a health and safety requirement.

4.3 Field Packaging

4.3.1 Collect the samples in accordance with the site-specific work plans and applicable SOPs.

4.3.2 As soon as possible after sample collection, tightly seal the container, and place a piece of custody tape over or around the cap. The custody tape should be placed over the cap so that any attempt to remove the cap will cause the tape to be broken. Do not place custody tape over a volatile organic analysis (VOA) vial septum.

4.3.3 Place all containers in separate, appropriately sized, airtight, seam sealing polyethylene bags (e.g., Ziploc™). Seal the bag, removing any excess air.

4.3.4 Place the bagged container inside an insulating shipping container, "cooler." This cooler should have frozen blue ice inside to assure samples remain cool, "4°," during transit from field to the packaging location.

4.3.5 Because blue ice does not maintain the 4°C standard required for sample shipping, it should only be used while in the field collecting samples.

4.3.6 Maintain the samples under chain of custody (COC) (Attachment 6.1) in accordance with the site-specific work plans and appropriate SOPs.

4.4 Sample Packaging

4.4.1 Inspect the integrity of the shipping container. The container is generally a "cooler" constructed of heavy plastic or metal with appropriate insulating properties so that variations in temperature during shipping are minimized. Also make sure that the drain plug has been sealed with nylon reinforced strapping tape or mailing tape.

4.4.2 Place two to four inches of absorbent packaging material (e.g., Vermiculite™) in the bottom of the shipping container.

4.4.3 Carefully check the COC record against the collected sample labels and containers to ensure that the sample numbers, sample description, date and time of collection, container type and volume, preservative, and the required analytical methods are correct and in agreement.

4.4.4 Place the samples in the shipping container, allowing sufficient room between the samples to place ice and/or packing material.

4.4.5 Double bag and seal crushed or cubed ice in heavy-duty polyethylene bags. Place these bags of ice on top of and between samples. Blue ice should not be used for sample shipping; it does not maintain the 4°C temperature necessary for regulatory compliance. Include a VOA vial of tap water clearly labeled "temperature check" so that the laboratory

can verify the temperature of the samples upon receipt. The remaining space will be filled with packing material.

4.4.6 All samples requiring temperature preservation stated at 4°C will be acceptable "as in" within the range of 4°C 2 °C. The laboratory should record the temperature of receipt upon the COC. For all samples received from 6°C to 10°C, the sample(s) and temperature (in 1°C increments) will be noted on the COC and then analyzed. For samples with temperatures greater than 10°C, the samples will be rejected by the laboratory for analysis and immediately reported to the Project Manager. For VOA samples below 0°C, the samples will be rejected and also reported.

4.5 Sample Shipping

4.5.1 The person in charge of sample custody will time, date, and sign over relinquishment of custody on the COC. When a common carrier is to be used for sample shipment, also record the air/waybill number (tracking number) and the name of the carrier on the COC record. Place the original copy of the COC record in a sealed, clear plastic envelop or bag and tape the COC record envelope to the inside lid of the shipping container. Retain a copy of the COC record for tracking purposes.

4.5.2 Using nylon reinforced strapping tape or mailing tape, seal the shipping container.

4.5.3 Place custody tape over opposite ends of the lid.

4.5.4 Mark the container "THIS END UP," or apply arrow labels that indicate the proper position to be maintained during shipping.

4.5.5 Apply a label stating the name and address of the shipper and the receiving laboratory on the outside of the cooler.

4.5.6 Turn the sample over to the courier or carrier for delivery to the laboratory. All samples should be shipped by the fastest available method to the laboratory as soon as possible after sample collection.

NOTE: The courier or carrier is not responsible for sample custody and is not required to sign the COC.

4.5.7 Contact the appropriate laboratory personnel to advise them of the sample shipment.

4.5.8 Review the COC and sample collection forms for completeness and turn them over to site or project management.

5.0 Records

5.1 Records generated as a result of implementation of this SOP will be controlled and maintained in the project record files and in accordance with SQP 4.2.

6.0 Attachments

6.1 Analysis Request and Chain of Custody Record

ATTACHMENT 6.1

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 368244
Page 1 of ____

Project Name/No. [1]
Sample Team Members [2]
Profit Center No. [3]
Project Manager [4]
Purchase Order No. [6]
Required Report Date [11]

Samples Shipment Date [7]
Lab Destination [8]
Lab Contact [9]
Project Contact/Phone [12]
Carrier/Waybill No. [13]

Bill to: [5]

Report to: [10]

White: To accompany samples
Yellow: Field copy
*See back of form for special instructions

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Pre-servative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]

Special Instructions: [23]

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☐ Archive (mos.)

Turnaround Time Required: [26]
Normal ☐ Rush ☐

QC Level: [27]
I ☐ II. ☐ III. ☐ Project Specific (specify)

1. Relinquished by [28] (Signature/Affiliation)	Date: Time:	1. Received by [28] (Signature/Affiliation)	Date: Time:
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: [29]

SURFACE AND SHALLOW SUBSURFACE SOIL SAMPLING

STANDARD OPERATING PROCEDURE

1.0 Purpose

This Standard Operating Procedure (SOP) establishes guidelines and procedures for use by field personnel in the collection and documentation of surface (0 to 6-inch depth) and shallow subsurface (6 inch to 6 feet in depth) soil samples for physical and chemical analysis. Proper collection procedures are necessary to assure the quality and integrity of all surface and shallow subsurface soil samples. Additional specific procedures and requirements will be provided in the project work plans.

2.0 References

2.1 EPA, September 1987, Compendium of Superfund Field Operations Methods, EPA 540/P-87/001a, OSWER 9355.0-14.

2.2 EPA, August 1988, EPA Guidelines for Conducting Remedial Investigation and Feasibility Studies under CERCLA, Interim Final OSWER Directive 9355.3-01.

2.3 SOP 1.1 - Chain of Custody

2.4 SOP 2.1 - Sample Handling, Packaging and Shipping

2.5 SOP 6.1 - Sampling Equipment and Well Material Decontamination

2.6 SOP 17.1 - Sample Labeling

2.7 SOP 17.2 - Sample Numbering

2.8 SOP 20.1 - Sample Collection, Preservation, and Holding Times

2.9 SQP 4.2 - Records Management

3.0 Definitions

3.1 Surface Soil Sample

Soil collected from the surface to a depth of no more than 6 inches.

3.2 Shallow Subsurface Soil Sample

Soil collected from a depth of 6 inches to 6 feet.

3.3 Subsurface Soil Sample

Soil collected at any depth interval greater than 6 inches.

3.4 Disturbed Soil Sample

A soil sample whose in situ physical structure and fabric has been disturbed as the direct result of sample collection.

3.5 Undisturbed Soil Sample

A soil sample where in situ physical structure and fabric has not been disturbed as the result of sample collection.

3.6 Grab Samples

Representative disturbed soil sample that is collected by using such devices as a shovel, stainless steel spoon, etc.

4.0 Procedure

This section contains both the responsibilities and procedures involved with surface and shallow subsurface soil sampling. Proper surface and shallow soil sampling procedures are necessary to insure the quality and integrity of the samples. The details within this SOP should be used in conjunction with project work plans. The project work plans will generally provide the following information:

- Sample collection objectives

- Locations and depths of soil samples to be collected
- Numbers and volumes of soil samples to be collected
- Types of analyses to be conducted for the samples
- Specific quality control (QC) procedures and sampling required
- Any additional surface or shallow subsurface soil sampling requirements or procedures beyond those covered in this SOP, as necessary.

At a minimum, the procedures outlined below for surface and shallow subsurface soil sampling will be followed.

4.1 Responsibilities

4.1.1 The Delivery Order Manager is responsible for ensuring that all sample collection activities are conducted in accordance with this SOP and any other appropriate procedures. This will be accomplished through staff training and by maintaining quality assurance/quality control (QA/QC).

4.1.2 The Contractor Quality Control Manager (CQCM) is responsible for periodic review of field generated documentation associated with this SOP. The CQCM is also responsible for implementation of corrective action (i.e., retraining personnel, additional review of work plans and SOPs, variances to QC sampling requirements, issuing nonconformances, etc.) if problems occur.

4.1.3 Field personnel assigned to surface and shallow subsurface soil sampling activities are responsible for completing their tasks according to specifications outlined in this SOP and other appropriate procedures. All staff are responsible for reporting deviations from procedures to the Site Superintendent, Delivery Order Manager, or the CQCM.

4.2 Surface Soil Sampling Equipment

A number of devices are available for the collection of surface soil samples. These include, but are not limited to: core samplers, hand augers, spoons, scoops, trowels, shovels, triers,

etc. These devices are constructed of a number of materials including, but not limited to, stainless steel, brass, glass, teflon, etc.

The sampling and analytical requirements, as well as site characteristics, must be taken into account when determining the proper surface soil sampling equipment to use.

At present, the method commonly used for the collection of surface samples and shallow subsurface samples, both disturbed and undisturbed, is with a core sampler. The core sampler is usually a hollow, stainless steel cylinder, tapered at the leading end. A sample sleeve (brass, stainless steel, lexan, etc.) is inserted into the trailing end. The trailing end is then connected to a piston-type drive hammer. The core is driven into the soil by the hammer so that a relatively undisturbed sample is collected in the sleeve. The sample is then handled and shipped in the sample sleeve.

When a core sample is not feasible or planned, a sample can be collected by using such devices as a shovel, hand auger, trowel, or stainless steel spoon, etc. The soil is transferred from the collection device into decontaminated sample containers (commonly glass jars). The project work plans will specify the type of sampling equipment to be used. The sample containers to be used will comply with requirements of SOP 20.1 and will be specified in the project work plans.

4.3 Surface Soil Sample Collection

4.3.1 Prior to sampling and between sampling locations, decontaminate the sample equipment according to SOP 6.1 and procedures outlined in the project work plans.

4.3.2 Ensure that all surface and shallow subsurface soil sampling locations have been appropriately cleared of all underground utilities and buried objects per the project work plans. Review all forms and diagrams documenting the location of the cleared sampling locations, as well as that of any underground utilities or lines, or other buried objects.

4.3.3 As required, calibrate any health and safety monitoring equipment according to the instrument manufacturer's specifications. Calibration results will be recorded on the

appropriate form(s), as specified in the project work plans. Instruments that cannot be calibrated according to the manufacturer's specifications will be removed from service and tagged.

4.3.4 Don appropriate personal protection equipment as specified in the project work plans.

4.3.5 Clear the area to be sampled of surface debris and vegetation using equipment that will not be used for sample collection.

4.3.6 If using the coring device, place the sleeve into the device and drive the assembly into the soil using the drive hammer. Drive the device into the soil until the trailing end of the sleeve is at the soil surface.

4.3.7 Retrieve the device; check to see that soil recovery is adequate in the sample sleeve. If there is sufficient recovery, mark or note the leading end of the sample sleeve.

4.3.8 If using a different sample collection device (other than the coring device), use the other device to scoop or collect soil and directly transfer the soil into the sample container (e.g., glass jar, brass sample sleeve, etc.). Fill the sample container such that little to no head-space exists.

4.3.9 If using sample sleeves, place teflon tape over each end of the sleeve and seal each end with plastic end caps. With a permanent marker, write a "T" for top on the trailing end and a "B" for bottom on the leading end. Place custody tape over each end cap so that any attempt to remove the cap will cause the tape to be broken.

If using glass jars, cap or seal the jars appropriately and place custody tape over the cap so that any attempt to remove the cap will cause the tape to be broken.

4.3.10 Appropriately label and number the sample containers per SOPs 17.1 and 17.2, respectively, and the project work plans. The label will be filled out with waterproof ink and will contain, at a minimum, the following information:

- Project number
- Sample number
- Sample location
- Sample depth
- Sample type
- Date and time of collection
- Parameters for analysis
- Sampler's initials.

4.3.11 Document the sampling event on the Sample Collection Log (Attachment 6.1) or an equivalent form as specified in the project work plans. Note any pertinent field observations, conditions or problems on the Field Activity Daily Log (Attachment 6.2). Any encountered problems or unusual conditions should also be immediately brought to the attention of the Site Superintendent.

4.3.12 Appropriately preserve, handle, package, and ship the samples per SOPs 20.1 and 2.1, respectively, and the project work plans. The samples shall also be maintained under custody per SOP 1.1.

4.3.13 Fill and abandon the sample hole as required by the project work plans.

4.4 Shallow Subsurface Soil Sampling

4.4.1 The common method to collect shallow subsurface soil samples is to use a hand auger to bore to the desired sampling depth and then retrieve the sample with a core sampler. The hand auger might also be used to recover the sample for direct transfer into glass jars. The exact methodology to be used will be specified in the project work plans.

For subsurface soil samples of less than 18 inches in depth, successive drives of the core sampler may potentially be used to recover shallow subsurface soil samples. In all methods cited above, borehole stability should be maintained to prevent the recovery of slough in the samples. If sloughing cannot be controlled, then another sampling methodology may have to be considered.

4.4.2 As with surface soil samples, shallow subsurface soil sampling follows the same sample collection procedures specified in Sections 4.3.1 through 4.3.13.

5.0 Records

5.1 Records generated as a result of this SOP will be controlled and maintained in the project record files in accordance with SQP 4.2.

6.0 Attachments

6.1 Sample Collection Log

6.2 Field Activity Daily Log

ATTACHMENT 6.1

SAMPLE COLLECTION LOG

SAMPLE COLLECTION LOG

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	
TIME	
PAGE	OF
PAGE	
PROJECT NO.	

PROJECT NAME _____

SAMPLE NO. _____

SAMPLE LOCATION _____

SAMPLE TYPE _____

COMPOSITE _____ YES _____ NO

COMPOSITE TYPE _____

DEPTH OF SAMPLE _____

WEATHER _____

CONTAINERS USED	AMOUNT COLLECTED

COMMENTS:

PREPARED BY: _____

ATTACHMENT 6.2

FIELD ACTIVITY DAILY LOG

TECHNOLOGY CORPORATION

DAILY LOG	DATE		
	NO.		
	SHEET	OF	

FIELD ACTIVITY DAILY LOG

PROJECT NAME	PROJECT NO.
FIELD ACTIVITY SUBJECT:	
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:	
VISITORS ON SITE:	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS:
IT PERSONNEL ON SITE:	
SIGNATURE	DATE

327A-7-86

SAMPLING EQUIPMENT AND WELL MATERIAL DECONTAMINATION

STANDARD OPERATING PROCEDURE

1.0 Purpose

This Standard Operating Procedure (SOP) establishes guidelines and procedures for use by field personnel in the decontamination of sampling equipment and well construction materials. Proper equipment decontamination is essential in ensuring the quality and integrity of samples collected during a given sampling event. Additional specific sampling equipment and well material decontamination procedures and requirements will be provided in the project work plans.

2.0 References

2.1 EPA, September 1987, EPA Compendium of Superfund Field Operations Methods, EPA 540/P-87/001a, OSWER 9355.0-14.

2.2 EPA, August 1988, EPA Guidelines for Conducting Remedial Investigation and Feasibility Studies under CERCLA, Interim Final OSWER Directive 9355.3-01.

2.3 SOP 6.2 - Drilling and Heavy Equipment Decontamination

2.4 SQP 4.2 - Records Management

3.0 Definitions

3.1 Deionized Analyte-Free Water

Ion-free, analyte-free water produced on site or purchased from a supplier with a deionization chamber equipped with a carbon filter.

3.2 Potable Water

Treated municipal water.

3.3 Laboratory Grade Detergent

A standard brand of laboratory-grade detergent, such as "Alconox" or "Liquinox."

3.4 Methanol

Laboratory-grade methanol alcohol, CAS #67-56-1.

3.5 Hexane

Laboratory-grade hexane, CAS #110-54-3.

3.6 HPLC Water

High purity laboratory-grade water.

4.0 Procedure

This section contains responsibilities, requirements, and procedures for sampling equipment and well material decontamination. The decontamination is required to maintain proper quality and integrity of collected samples.

The details within this SOP should be used in conjunction with the project work plans. The project work plans will provide the following information:

- Types of equipment requiring decontamination under this SOP;
- Specific materials to be used for the decontamination; and
- Additional decontamination requirements and procedures beyond those covered in this SOP, as necessary.

All field personnel associated with decontamination of sampling equipment or well materials must read both this SOP and the project work plans prior to implementation of related decontamination activities. Information and requirements for the decontamination of any and all drilling and heavy equipment is provided in SOP No. 6.2.

4.1 Responsibilities

4.1.1 The Delivery Order Manager is responsible for ensuring that all sampling equipment and well material decontamination activities are conducted and documented in accordance with this SOP and any other appropriate procedures. This will be accomplished through staff training and by maintaining quality assurance/quality control (QA/QC).

4.1.2 The Contractor Quality Control Manager (CQCM) is responsible for periodic review of field generated documentation associated with this SOP. The CQCM is also responsible for the implementation of corrective action (i.e., retaining personnel, additional review of work plans and SOPs, variances to decontamination requirements, issuing nonconformances, etc.) if problems occur.

4.1.3 Field personnel assigned to sampling equipment and well material decontamination activities are responsible for completing their tasks according to specifications outlined in this SOP and other appropriate procedures. All staff are responsible for reporting deviations from the procedures to the Site Superintendent, Delivery Order Manager, or the CQCM.

4.2 Decontamination Facility

If possible, sampling equipment decontamination will take place in an area designed exclusively for decontamination. This area will ideally be located within the contamination reduction zone on the project site. Well materials may be decontaminated at the facility set up for decontamination of drilling and heavy equipment (see SOP No. 6.2).

Each decontamination facility will be constructed so that the equipment, as well as all wastes generated during decontamination (e.g.: soil, rinsate, liquid spray, debris, etc.), are fully contained. In addition, chemical products used in the decontamination process must be properly containerized and labelled.

4.3 Decontamination of Nondedicated Sampling Equipment

Each piece of reusable, nondedicated sampling equipment will be decontaminated before mobilization to each site and before each sampling event. The standard procedure will be performed as described below.

4.3.1 Suitable personal protective equipment (specified by the project work plans) must be worn by all personnel involved with the task to reduce personal exposure.

4.3.2 Heavily caked soil and/or other material will be scraped or brushed from equipment. The scrapings will be placed into an appropriate container for disposal. Steam cleaning of equipment may be required to remove material from samplers.

4.3.3 Equipment that will not be damaged by water should be placed into a wash tub containing a laboratory-grade detergent solution and scrubbed with a brush or clean cloth. Rinsing will then be conducted with fresh, potable water, followed by deionized water.

4.3.4 Methanol, hexane, and HPLC water rinses may then follow for some sampler components when specified by the project work plans.

4.3.5 Any equipment that may be damaged by submersion into water will be wiped clean using a sponge and detergent solution. Cleaning will be followed by wiping the equipment with deionized water.

4.3.6 Air dry the rinsed equipment. Soil organic vapor (SOV) sampling equipment should be flushed dry with bottled air of known quality and/or as per the project work plans.

4.3.7 Place decontaminated equipment on clean plastic sheeting to prevent contact with contaminated soil. If equipment is not used immediately, cover or wrap the equipment in clean plastic sheeting to minimize airborne contamination.

4.3.8 Decontamination activities shall be documented on the Field Activity Daily Log (FADL) (Attachment 6.1) or other appropriate form(s), as specified by the project work plans.

4.4 Decontamination of Dedicated Sampling Equipment

Dedicated sampling equipment, such as submersible pumps, will be decontaminated prior to installation inside monitoring wells. At a minimum, the procedure outlined below must be performed. If factory-cleaned, hermetically sealed materials are used, no decontamination will be necessary, provided that laboratory certification of decontamination is submitted with the equipment.

4.4.1 Suitable personal protective equipment will be worn by all personnel involved in the task, in accordance with the project work plans.

4.4.2 Foot vale and pumping lines will be washed with a laboratory-grade detergent solution.

4.4.3 The equipment will then be rinsed twice with tap water, followed by a rinse with deionized water.

4.4.4 Air dry.

4.4.5 Place decontaminated equipment on clean plastic sheeting to prevent contact with contaminated soil. If equipment is not used immediately, cover or wrap the equipment in clean plastic sheeting to minimize airborne contamination.

4.4.6 Decontamination activities will be documented on the FADL or the appropriate form(s), as specified by the project work plans.

4.5 Decontamination of Well Materials

Well materials including well casing, well screens, centralizers, and end caps will be decontaminated prior to use in constructing monitoring wells. (If factory-cleaned, hermetically sealed material are used, no decontamination will be necessary provided that laboratory decontamination certification is submitted with the equipment.) The standard procedure outlined below must be performed when decontaminating well materials.

4.5.1 Appropriate personal protective equipment will be worn by all personnel involved in the task, in accordance with the project work plans.

4.5.2 Materials will be thoroughly sprayed and washed with water using a high pressure steam cleaner.

4.5.3 Air dry.

4.5.4 Decontaminated materials will be placed on clean metal racks or clean plastic sheeting. If equipment is not used immediately, cover or wrap the equipment in clean plastic sheeting to minimize airborne contamination.

4.5.5 Decontamination activities will be documented on the FADL or other appropriate form(s), as specified by the project work plans.

5.0 Records

Records generated as a result of this SOP will be maintained in the Project Records file in accordance with SQP No. 4.2.

6.0 Attachments

6.1 Field Activity Daily Log

ATTACHMENT 6.1

FIELD ACTIVITY DAILY LOG

INTERNATIONAL TECHNOLOGY CORPORATION

DAILY LOG		
	DATE:	
	NO.	
	SHEET	OF

FIELD ACTIVITY DAILY LOG

PROJECT NAME	PROJECT NO.
FIELD ACTIVITY SUBJECT:	
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:	
VISITORS ON SITE:	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS:
IT PERSONNEL ON SITE:	
SIGNATURE	DATE:

SAMPLE LABELING

STANDARD OPERATING PROCEDURE

1.0 Purpose

This Standard Operating Procedure (SOP) establishes guidelines and procedures for sample labeling. Sample labeling is required to identify, track and trace samples from the time of collection until the time of disposal. Additional specific procedures and requirements will be provided in the project work plans.

2.0 References

2.1 EPA, September 1987, Compendium of Superfund Field Operations Methods, EPA 540/P-87/001a, OSWER 9355.0-14.

2.2 EPA, August 1988, EPA Guidance for Conducting Remedial Investigation and Feasibility Studies Under CERCLA, Interim Final OSWER Directive 9355.3-01.

2.3 SQP 4.2 - Records Management

3.0 Definitions

3.1 Sample Label

Sample labels include all forms of sample identification (labels or tags) that are physically attached to samples collected and provide, at a minimum, the information required by this SOP and project work plans. An example sample label is shown as Attachment 6.1

4.0 Procedure

This section contains both the responsibilities and procedures involved with sample labeling. Sample labeling is required to identify, track and trace samples from the time of collection until the time of disposal. The details within this SOP should be used in conjunction with the

project work plans. The project work plans will commonly provide the following information:

- Sample collection objectives
- Numbers, types and locations of samples to be collected
- Any additional sample labeling requirements or procedures beyond those covered in this SOP, as necessary.

4.1 Responsibilities

4.1.1 The Delivery Order Manager is responsible for ensuring that all sample collection and labeling activities are conducted and documented in accordance with this SOP and any other appropriate procedures. This will be accomplished through staff training and by maintaining quality assurance/quality control (QA/QC).

4.1.2 The Contractor Quality Control Manager (CQCM) is responsible for periodic review of field generated documentation associated with this sample labeling SOP. The CQCM is also responsible for the implementation of corrective action (i.e., retraining personnel, additional review of work plans and SOPs, variances to sample labeling requirements, issuing nonconformances, etc.) if problems occur.

4.1.3 Field personnel assigned to sampling and sample labeling activities are responsible for completing their tasks according to specifications outlined in this SOP and other appropriate procedures. All staff are responsible for reporting deviations from the procedures to the Site Superintendent, Delivery Order Manager, or the CQCM.

4.2 Sample Labeling

4.2.1 Document all the information necessary on the sample label and ensure that the label is physically attached to each respective sample. Each sample label must contain at a minimum the following information:

- Project name
- Project number
- Date and time of collection
- Sample location
- Sample identification number

- Collector's name
- Preservative used (if any).

Additional information may also be required per the project work plans and must accordingly be included on all sample labels.

4.2.2 Indelible ink should be used in filling out all sample labels.

4.2.3 Ensure that each sample collected has a sample label.

4.2.4 Ensure that the information documented on the sample label corresponds with the information documented on the Sample Collection Log (Attachment 6.2), Sampling Information Form for groundwater samples (Attachment 6.3) and Chain-of-Custody Record (Attachment 6.4).

5.0 Records

5.1 Records generated as a result of implementation of this SOP will be controlled and maintained in the project record file in accordance with SQP 4.2.

6.0 Attachments

6.1 Example Sample Label
6.2 Sample Collection Log
6.3 Sampling Information Form
6.4 Chain-of-Custody Record

ATTACHMENT 6.1

EXAMPLE SAMPLE LABEL

INTERNATIONAL
TECHNOLOGY
CORPORATION

F
H R

Project Name _____

Project No. _____

Sample No. _____

Collection Date/Time _____

Collector's Name _____

Sample Location _____

Sample Type/Depth/Description _____

Analyze For _____ Preservative _____

Bottle _____ of _____ _____ Filtered _____ Nonfiltered

23-8-85

ATTACHMENT 6.2

SAMPLE COLLECTION LOG

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	
TIME	
PAGE ____ OF ____	
PAGE	
PROJECT NO.	

SAMPLE COLLECTION LOG

PROJECT NAME _____

SAMPLE NO. _____

SAMPLE LOCATION _____

SAMPLE TYPE _____

COMPOSITE ____ YES ____ NO

COMPOSITE TYPE _____

DEPTH OF SAMPLE _____

WEATHER _____

CONTAINERS USED	AMOUNT COLLECTED

COMMENTS:

PREPARED BY: _____

ATTACHMENT 6.2

SAMPLE COLLECTION LOG (CONTINUED)

COMMENTS: (Continued)	DATE
	TIME
	PAGE ____ OF ____
	PAGE
	PROJECT NO.

PREPARED BY: _____

LEGEND

1. A SAMPLE COLLECTION LOG IS TO BE COMPLETED FOR EACH SAMPLE.
2. ALWAYS COMPLETE BOTH SIDES. IF SECOND SIDE IS NOT USED, DRAW A LINE THROUGH IT AND MARK N/A. FILL IN CONTROL BLOCK AND PREPARED BY
3. ALL ENTRIES ON LOG ARE TO BE COMPLETED. IF NOT APPLICABLE MARK N/A
4. DATE: USE MONTH/DAY/YEAR: I.E., 10/30/85
5. TIME: USE 24-HOUR CLOCK: I.E., 1835 FOR 6:35 P.M.
6. PAGE: EACH SAMPLE TEAM SHOULD NUMBER PAGE _____ OF _____ FOR THE DAY'S ACTIVITIES FOR ALL SHEETS PREPARED ON A SINGLE DAY. I.E., IF THERE ARE A TOTAL OF 24 PAGES (INCLUDING FRONT AND BACK) NUMBER 1 OF 24, 2 OF 24, ETC.
7. SAMPLE LOCATION: USE BORING OR MONITORING WELL NUMBER, GRID LOCATION (TRANSECT), SAMPLING STATION I.D., OR COORDINATE TO PHYSICAL FEATURES WITH DISTANCES. INCLUDE SKETCH IN COMMENT SECTION IF NECESSARY
8. SAMPLE TYPE: USE THE FOLLOWING - SOIL, WATER (SURFACE OR GROUND); AIR (FILTERS, TUBES, AMBIENT, PERSONNEL); SLUDGE, DRUM CONTENTS, OIL, VEGETATION; WIPE, SEDIMENT
9. COMPOSITE TYPE: I.E., 24-HOUR, LIST SAMPLE NUMBERS IN COMPOSITE, SPATIAL COMPOSITE.
10. DEPTH OF SAMPLE: GIVE UNITS, WRITE OUT UNITS SUCH AS INCHES, FEET. DON'T USE ' OR "
11. WEATHER: APPROXIMATE TEMPERATURE, SUN AND MOISTURE CONDITIONS
12. CONTAINERS USED: LIST EACH CONTAINER TYPE AS NUMBER, VOLUME, MATERIAL (E.G., 2 - 1L GLASS, 4 - 40 ML GLASS VIAL, 1 - 400 ML PLASTIC, 1 - 3 INCH STEEL TUBE, 1 - 8 OZ. GLASS JAR)
13. AMOUNT COLLECTED: VOLUME IN CONTAINERS (E.G. 1/2 FULL)

ATTACHMENT 6.3

SAMPLING INFORMATION FORM

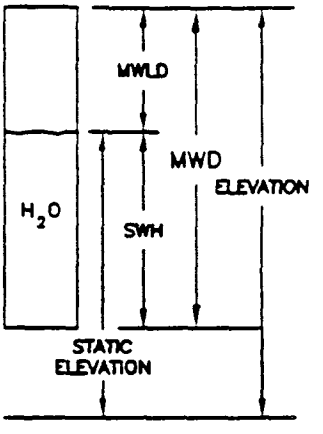
JOB NAME: _____ JOB NUMBER: _____ SAMPLE ID#: _____ WELL NUMBER: _____

SAMPLE TYPE:

☐ ORIGINAL ☐ DUPLICATE ☐ MATRIX SPIKE ☐ MATRIX SPIKE DUPLICATE

☐ FIELD BLANK ☐ TRIP BLANK ☐ OTHER: _____ ☐ EQUIPMENT RINSE

CALCULATIONS		DATE	TIME	INITIALS
SWH = STATIC WATER HEIGHT	( ) ft.			
MWD = MEASURED WELL DEPTH	( ) ft.			
MWLD = MEASURED WATER LEVEL DEPTH	( ) ft.			
WWV = WELL WATER VOLUME	( ) ft.			
D = CASING DIAMETER	( ) ft.			
WATER HEIGHT: SWH = MWD − MWLD ( ) = ( ) − ( )				



EVACUATION		DATE	TIME	INITIALS
VOLUME: WWV = SWH X 0.163 X $(D/2)^2$ ( ) = ( ) X 0.163 X $(/2)^2$				
PURGE VOLUME: MIN. PURGE VOL. = 3 X WWV ( ) = 3 X ( )				
ACT PURGE VOLUME = ( ) gal. ( ) = ( ) − ( )				
☐ PURGED DRY	START			
	STOP			

☐ PUMP ID#: _____

☐ BLADDER ☐ SUMP ☐ SUBMERSIBLE

☐ BAILER:

☐ PVC ☐ TEFLON ☐ STAINLESS

WEATHER

TEMPERATURE:

GENERAL CONDITION:

☐ SUNNY ☐ RAINY ☐ WINDY

☐ CLOUDY ☐ DRIZZLING

COLOR:

☐ BLACK ☐ GREEN ☐ TAN

☐ GREY ☐ YELLOW ☐ WATER CLEAR

☐ CLOUDY ☐ OTHER

ODOR:

☐ SULFUR ☐ DIESEL ☐ METALLIC

☐ NONE ☐ OTHER _____

ATTACHMENT 6.3

SAMPLING INFORMATION FORM (CONTINUED)

JOB NAME: _____ JOB NUMBER: _____ SAMPLE ID#: _____ WELL NUMBER: _____

SAMPLING		DATE	TIME	INITIALS
☐ PUMP ID#: _____ ☐ BAILER: ☐ BLADDER ☐ SUMP ☐ PVC ☐ TEFLON ☐ STAINLESS				
MWLD (IMMEDIATELY PRIOR TO SAMPLING) = ( ) ft.				
MWLD (IMMEDIATELY AFTER SAMPLING) = ( ) ft.				

CALIBRATIONS (MEASURED IN WELL/SURFACE)					
METER TYPE	BRAND	ID #	DATE	TIME	INITIALS
pH					
THERMOMETER					
CONDUCTIVITY					
TURBIDITY					
REDOX POTENTIAL					
DISSOLVED OXYGEN					

	MEASUREMENTS													
	TEMP (C°)	pH. SU	CONDUCTIVITY (umhos/cm)			TURBIDITY (ntu)			Eh. (mV)	D.O. (ppm)	DATE	TIME	INITIALS
			DISPLAY	RANGE	ACTUAL	DISPLAY	RANGE	ACTUAL					
1)													
2)													
3)													
4)													

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity – Reported to the nearest 10% mhos/cm of instrument set range
- Water temperature – Reported to nearest 0.1°C

COMMENTS:

_____ PRINT NAME

_____ PRINT NAME

ATTACHMENT 6.4

CHAIN-OF-CUSTODY RECORD

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 499900
Page 1 of ____

Project Name/No. 1 _____
Sample Team Members 2 _____
Profit Center No. 3 _____
Project Manager 4 _____
Purchase Order No. 6 _____
Required Report Date 11 _____

Samples Shipment Date 7 _____
Lab Destination 8 _____
Lab Contact 9 _____
Project Contact/Phone 12 _____
Carrier/Waybill No. 13 _____

Bill to: 5 _____
Report to: 10 _____

White To accompany samples

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Pre-servative 19	Requested Testing Program 20	Condition on Receipt 21	Disposal Record No. 22
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	

Yellow Field copy

Special Instructions: 23

Possible Hazard Identification: 24
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: 25
Return to Client ☐ Disposal by Lab ☐ Archive _____ (mos.)

Turnaround Time Required: 26
Normal ☐ Rush ☐

QC Level: 27
I. ☐ II. ☐ III. ☐ Project Specific (specify): _____

1. Relinquished by 28 (Signature/Affiliation)	Date: Time:	1. Received by 28 (Signature/Affiliation)	Date: Time:
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: 29

*See back of form for special instructions

MCA 3/1/91

SAMPLE NUMBERING

STANDARD OPERATING PROCEDURE

1.0 Purpose

This Standard Operating Procedure (SOP) establishes guidelines and procedures for sample numbering. Sample numbering is required to identify, track and trace samples from the time of collection until the time of disposal. Additional specific procedures and requirements will be provided in the project work plans.

2.0 References

2.1 EPA, September 1987, Compendium of Superfund Field Operations Methods, EPA 540/P-87/001a,OSWER 9355.0-14.

2.2 EPA, August 1988, EPA Guidance for Conducting Remedial Investigation and Feasibility Studies Under CERCLA, Interim Final OSWER Directive 9355.3-01.

2.3 SOP 17.1 - Sample Labeling

2.4 SQP 4.2 - Records Management

3.0 Definitions

3.1 Sample Number

A sample number is a unique alphanumeric identification assigned to each and all physical samples collected as part of any given project.

4.0 Procedure

This section contains both the responsibilities and procedures involved with sample numbering. Sample numbering is required to provide a means by which samples can be identified, tracked and traced from the time of collection until the time of disposal. The

details within this SOP should be used in conjunction with project work plans. The project work plans will generally provide the following information:

- Sample collection objectives
- Numbers, types, and locations of samples to be collected
- Project-specific character string to be used for the sample numbering
- Person responsible for issuing sample numbers to field personnel conducting sampling activities
- Any additional sample numbering requirements or procedures beyond those covered in this SOP, as necessary.

4.1 Responsibilities

4.1.1 The Delivery Order Manager is responsible for ensuring that all sample collection and numbering activities are conducted and documented in accordance with this SOP and any other appropriate procedures. This will be accomplished through staff training and by maintaining quality assurance/quality control (QA/QC).

4.1.2 The Contractor Quality Control Manager (CQCM) is responsible for periodic review of field generated documentation associated with this SOP. The CQCM is also responsible for implementation of corrective action (i.e., retraining personnel, additional review of work plans and SOPs, variances to sample numbering requirements, issuing nonconformances, etc.) if problems occur.

4.1.3 Field personnel assigned to sampling and sample numbering activities are responsible for completing their tasks according to specifications outlined in this SOP and other appropriate procedures. All staff are responsible for reporting deviations from the procedures to the Site Superintendent, Delivery Order Manager, or the CQCM.

4.2 Sample Numbering

4.2.1 The alphanumeric character string (AANNNN vs. AAANNNNN) will be determined on a project-specific basis and stated in the project work plans. The sample numbers should be

as simple and preferably as short as possible; however, they should also be compatible with the laboratory analytical tracking system and the data management system to be used for the project sample data.

4.2.2 A unique sample number will be assigned in the field to each sample to be submitted for analysis.

4.2.3 The sample numbers will be assigned sequentially (e.g. SB-1000, SB-1001) as the samples are collected. Both environmental (soil, sediment, groundwater, air, etc.) and QC samples will be assigned sequential sample numbers with the same prefix so that the laboratory will be unable to distinguish between the QC and non-QC samples.

4.2.4 The sample number will be recorded, using indelible ink, directly on the sample label attached to each sample per SOP 17.1. Prenumbered tape may also be used and affixed to each sample; however, their use is not mandatory for this SOP. When used, the sample number on the preprinted tape must also be recorded on the sample label.

4.2.5 The sample number must also be recorded on the Sample Collection Log (Attachment 6.1), Sampling Information Form for groundwater samples (Attachment 6.2), and Chain-of-Custody Record (Attachment 6.3).

4.2.6 It is recommended that one person (either the Site Superintendent or other designee) be responsible for issuing sample numbers to field sampling personnel and ensuring that the sample sequence numbers are applied to samples in the sequence in which they are collected.

4.2.7 It is also recommended the field supervisor or designee be responsible for keeping a master sample log listing the sample numbers and a brief description of the samples collected.

5.0 Records

Records generated as a result of implementation of this SOP will be controlled and maintained in the project record files in accordance with SQP 4.2.

6.0 Attachments

6.1 Sample Collection Log

6.2 Sampling Information Form

6.3 Chain of Custody Record

ATTACHMENT 6.1
SAMPLE COLLECTION LOG

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	
TIME	
PAGE ____ OF ____	
PAGE	
PROJECT NO	

SAMPLE COLLECTION LOG

PROJECT NAME _____

SAMPLE NO. _____

SAMPLE LOCATION _____

SAMPLE TYPE _____

COMPOSITE ____ YES ____ NO

COMPOSITE TYPE _____

DEPTH OF SAMPLE _____

WEATHER _____

CONTAINERS USED	AMOUNT COLLECTED

COMMENTS:

PREPARED BY: _____

ATTACHMENT 6.1
SAMPLE COLLECTION LOG
(CONTINUED)

COMMENTS: (Continued)	DATE
	TIME
	PAGE ____ OF ____
	PAGE
	PROJECT NO.

PREPARED BY: _____

LEGEND

1. A SAMPLE COLLECTION LOG IS TO BE COMPLETED FOR EACH SAMPLE.
2. ALWAYS COMPLETE BOTH SIDES. IF SECOND SIDE IS NOT USED, DRAW A LINE THROUGH IT AND MARK N/A. FILL IN CONTROL BLOCK AND PREPARED BY.
3. ALL ENTRIES ON LOG ARE TO BE COMPLETED. IF NOT APPLICABLE MARK N/A.
4. DATE: USE MONTH/DAY/YEAR: I.E., 10/30/85.
5. TIME: USE 24-HOUR CLOCK: I.E., 1835 FOR 6:35 P.M.
6. PAGE. EACH SAMPLE TEAM SHOULD NUMBER PAGE _____ OF _____ FOR THE DAY'S ACTIVITIES FOR ALL SHEETS PREPARED ON A SINGLE DAY. I.E., IF THERE ARE A TOTAL OF 24 PAGES (INCLUDING FRONT AND BACK) NUMBER 1 OF 24, 2 OF 24, ETC.
7. SAMPLE LOCATION: USE BORING OR MONITORING WELL NUMBER, GRID LOCATION (TRANSECT), SAMPLING STATION I.D., OR COORDINATE TO PHYSICAL FEATURES WITH DISTANCES. INCLUDE SKETCH IN COMMENT SECTION IF NECESSARY.
8. SAMPLE TYPE: USE THE FOLLOWING - SOIL, WATER (SURFACE OR GROUND); AIR (FILTERS, TUBES, AMBIENT, PERSONNEL); SLUDGE; DRUM CONTENTS, OIL, VEGETATION; WIPE, SEDIMENT.
9. COMPOSITE TYPE: I.E., 24-HOUR, LIST SAMPLE NUMBERS IN COMPOSITE, SPATIAL COMPOSITE.
10. DEPTH OF SAMPLE. GIVE UNITS. WRITE OUT UNITS SUCH AS INCHES, FEET. DON'T USE ' OR ".
11. WEATHER: APPROXIMATE TEMPERATURE, SUN AND MOISTURE CONDITIONS.
12. CONTAINERS USED. LIST EACH CONTAINER TYPE AS NUMBER, VOLUME, MATERIAL (E.G., 2 - 1L GLASS; 4 - 40 ML GLASS VIAL; 1 - 400 ML PLASTIC; 1 - 3 INCH STEEL TUBE; 1 - 8 OZ. GLASS JAR).
13. AMOUNT COLLECTED. VOLUME IN CONTAINERS (E.G. 1/2 FULL).

125-10-85

ATTACHMENT 6.2
SAMPLING INFORMATION FORM

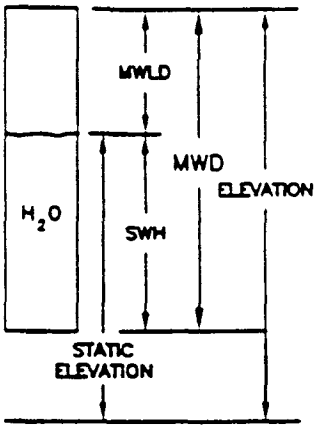
JOB NAME: _____ JOB NUMBER: _____ SAMPLE ID#: _____ WELL NUMBER: _____

SAMPLE TYPE:

☐ ORIGINAL ☐ DUPLICATE ☐ MATRIX SPIKE ☐ MATRIX SPIKE DUPLICATE

☐ FIELD BLANK ☐ TRIP BLANK ☐ OTHER: _____ ☐ EQUIPMENT RINSE

CALCULATIONS		DATE	TIME	INITIALS
SWH = STATIC WATER HEIGHT	( ) ft.			
MWD = MEASURED WELL DEPTH	( ) ft.			
MWLD = MEASURED WATER LEVEL DEPTH	( ) ft.			
WWV = WELL WATER VOLUME	( ) ft.			
D = CASING DIAMETER	( ) ft.			
WATER HEIGHT: SWH = MWD − MWLD ( ) = ( ) − ( )				



EVACUATION		DATE	TIME	INITIALS
VOLUME: WWV = SWH X 0.163 X $(D/2)^2$ ( ) = ( ) X 0.163 X $(/2)^2$				
PURGE VOLUME: MIN. PURGE VOL. = 3 X WWV ( ) = 3 X ( )				
ACT PURGE VOLUME = ( ) gal. ( ) = ( ) − ( )				
☐ PURGED DRY	START			
	STOP			

☐ PUMP ID#: _____

☐ BLADDER ☐ SUMP ☐ SUBMERSIBLE

☐ BAILER:

☐ PVC ☐ TEFLON ☐ STAINLESS

WEATHER

TEMPERATURE:

GENERAL CONDITION:

☐ SUNNY ☐ RAINY ☐ WINDY

☐ CLOUDY ☐ DRIZZLING

COLOR:

☐ BLACK ☐ GREEN ☐ TAN

☐ GREY ☐ YELLOW ☐ WATER CLEAR

☐ CLOUDY ☐ OTHER

ODOR:

☐ SULFUR ☐ DIESEL ☐ METALLIC

☐ NONE ☐ OTHER _____

ATTACHMENT 6.2
SAMPLING INFORMATION FORM
(CONTINUED)

JOB NAME: _____ JOB NUMBER: _____ SAMPLE ID#: _____ WELL NUMBER: _____

SAMPLING		DATE	TIME	INITIALS
☐ PUMP ID#: _____ ☐ BAILER: ☐ BLADDER ☐ SUMP ☐ PVC ☐ TEFLON ☐ STAINLESS				
MWLD (IMMEDIATELY PRIOR TO SAMPLING) = ( ) ft.				
MWLD (IMMEDIATELY AFTER SAMPLING) = ( ) ft.				

CALIBRATIONS (MEASURED IN WELL/SURFACE)					
METER TYPE	BRAND	ID #	DATE	TIME	INITIALS
pH					
THERMOMETER					
CONDUCTIVITY					
TURBIDITY					
REDOX POTENTIAL					
DISSOLVED OXYGEN					

MEASUREMENTS														
	TEMP (C°)	pH. SU	CONDUCTIVITY (umhos/cm)			TURBIDITY (ntu)			Eh. (mV)	D.O. (ppm)	DATE	TIME	INITIALS
			DISPLAY	RANGE	ACTUAL	DISPLAY	RANGE	ACTUAL					
1)													
2)													
3)													
4)													

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity – Reported to the nearest 10% mhos/cm of instrument set range
- Water temperature – Reported to nearest 0.1°C

COMMENTS:

_____ PRINT NAME

_____ PRINT NAME

ATTACHMENT 6.3
CHAIN OF CUSTODY RECORD

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 499900
Page 1 of ____

Project Name/No. 1 _____
Sample Team Members 2 _____
Profit Center No. 3 _____
Project Manager 4 _____
Purchase Order No. 6 _____
Required Report Date 11 _____

Samples Shipment Date 7 _____
Lab Destination 8 _____
Lab Contact 9 _____
Project Contact/Phone 12 _____
Carrier/Waybill No. 13 _____

Bill to: 5 _____
Report to: 10 _____

White: To accompany samples
Yellow: Field copy

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Preservative 19	Requested Testing Program 20	Condition on Receipt 21	Disposal Record No. 22

FOR LAB USE ONLY

FOR LAB USE ONLY

Special Instructions: 23

Possible Hazard Identification: 24
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: 25
Return to Client ☐ Disposal by Lab ☐ Archive _____ (mos.)

Turnaround Time Required: 26
Normal ☐ Rush ☐

QC Level: 27
I. ☐ II. ☐ III. ☐ Project Specific (specify): _____

1. Relinquished by 28 (Signature/Affiliation)	Date: Time:	1. Received by 28 (Signature/Affiliation)	Date: Time:
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: 29

*See back of form for special instructions

MCA 9/16/91

FIELD QC SAMPLING

STANDARD OPERATING PROCEDURE

1.0 Purpose

This Standard Operating Procedure (SOP) establishes guidelines and procedures for conducting field quality control (QC) sampling. Field QC sampling is required to assist in verifying the quality and integrity of samples collected during a given sampling event. Additional specific field QC sampling procedures and requirements will be provided in the project work plans.

2.0 References

2.1 EPA, September 1987, Compendium of Superfund Field Operations Methods, EPA 540/P-87/001a, OSWER 9355.0-14.

2.2 EPA, August 1988, EPA Guidance for Conducting Remedial Investigation and Feasibility Studies Under CERCLA, Interim Final OSWER Directive 9355.3-01.

2.3 SOP 1.1 - Chain-of-Custody

2.4 SOP 2.1 - Sample Handling, Packaging and Shipping

2.5 SOP 9.1 - Groundwater Sampling

2.6 SOP 17.1 - Sample Labeling

2.7 SOP 17.2 - Sample Numbering

2.8 SOP 19.1 - On-Site Sample Storage

2.9 SOP 20.1 - Sample Collection, Preservation, and Holding Times

2.10 SQP 4.2 - Records Management

3.0 Definitions

3.1 Field QC Sample

A field QC sample is a physical sample collected during or for a specific sampling event. The purpose of this sample is to evaluate the quality and integrity of original samples collected during the specific sampling event.

4.0 Procedure

This section contains both responsibilities and requirements for field QC sampling. Field QC sampling is required to provide data to verify the quality and integrity of environmental samples collected during a given sampling event.

The details within this SOP should be used in conjunction with project plans. These plans will generally provide the following information:

- Sample collection objectives
- Numbers, types and locations of environmental (non-QC) samples to be collected
- Numbers and types of supportive QC samples to be collected
- Any additional QC sampling requirements or procedures beyond those covered in this SOP, as necessary.

4.1 Responsibilities

4.1.1 The Delivery Order Project Manager is responsible for ensuring that all sample collection activities are conducted in accordance with this SOP and any other appropriate procedures. This will be accomplished through staff training and by maintaining quality assurance/quality control (QA/QC).

4.1.2 The Contractor Quality Control Manager (CQCM) is responsible for periodic review of field generated documentation associated with this SOP. The CQCM is also responsible for implementation of corrective action (i.e., retraining personnel, additional review of work plans

and SOPs, variances to QC sampling requirements, issuing nonconformances, etc.) if problems occur.

4.1.3 Field personnel assigned to environmental and QC sampling activities are responsible for completing their tasks according to specifications outlined in this SOP and other appropriate procedures. All staff are responsible for reporting deviations from procedures to the Site Superintendent, Delivery Order Manager, or the CQCM.

4.2 Quality Control Sampling Requirements

4.2.1 Field QC samples may consist of different media. Typical QC samples are as follows:

- Trip blank (TB)
- Equipment rinsate (ER)
- Field blank (FB)
- Field duplicate (FD)

4.2.1.1 Trip blanks are analyte-free water, shipped from and returned unopened to the laboratory in the same shipping containers for volatile organic, and at times gasoline hydrocarbons. The blanks are prepared at the laboratory using ASTM Type II DI Water, sent to the project location, carried with the sampling team(s) during sampling, and shipped to the laboratory for analysis with the environmental samples.

Trip blank samples are commonly collected and analyzed at a rate of one per sample cooler containing samples for volatile organic analyses or the gasoline fraction of petroleum hydrocarbons. The number or rate of trip blanks to be collected and the specific analyses to be conducted for the trip blanks will be provided in the project work plans.

4.2.1.2 Equipment rinsate samples are collected from the final rinse water during decontamination of groundwater, soil, or waste sampling equipment. This type of equipment includes bailers, splitspoon samplers, soil sample sleeves, hand augering equipment, surface soil sampling equipment, purge and sample pumps, etc.

Rinsate samples are generally collected at a rate of one per day per sampling team during the sampling event. Equipment rinsates are usually collected from dedicated sampling equipment

only upon installation. The number or rate of equipment rinsate samples to be collected for a particular project will be specifically developed and documented in the project work plans. The specific chemical analyses to be conducted for the rinsate samples will also be developed and documented in the project work plans.

4.2.1.3 Field blanks are prepared from the water which is used for decontamination. One sample from each sampling event and each water source or lot number is generally collected and analyzed for all parameters of interest for the project. Upon collection, a description of the water source for the field blank sample should be documented in the Sample Collection Log (Attachment 6.1)

The number or rate of field blank samples to be collected for a particular project will be specifically developed and documented in the project work plans. The specific chemical analyses to be conducted for the field blank samples will also be developed and documented in the project work plans.

4.2.1.4 For soils, field duplicate samples are generally collected by co-located sampling (e.g., using successive sample tubes from the same split spoon sampling run) or by splitting samples. Field duplicate water samples are commonly collected by retaining consecutive samples from the sampling device (e.g., bailer or sample pump discharge line). Field duplicate water samples may also be generated by splitting a collected volume; however, this practice may lead to a loss in volatile organic compounds and is not common practice for volatile analyses.

Field duplicate samples are commonly collected at a rate of 10 percent per media sampled. However, the number or rate of field duplicate samples to be collected for a particular project will be specifically developed and documented in the project work plans. The specific chemical analyses to be conducted for the field duplicates will also be developed and documented in the project work plans.

4.2.2 The type and number of QC samples collected for a particular project is based on specifications provided in project specific documents, i.e., the project work plans. Field QC samples are to be collected at appropriate times during a sampling event.

4.2.3 All field QC samples will be collected in proper containers with appropriate preservation per SOP 20.1 and the project work plans.

4.2.4 The collection of field QC samples consisting of various media (e.g., soil, groundwater, etc.) will follow procedures in sample collection SOPs for the respective media and any other applicable procedures in the project work plans. For example, the collection of a groundwater field duplicate QC sample will follow procedures specified in the groundwater sampling SOP (SOP 9.1). Equipment rinsate samples are collected directly while rinsing the sampling equipment following appropriate procedures in SOP 9.1 and the project work plans. Field blank samples are collected by pouring decontamination water directly into sample containers following appropriate protocol in SOP 9.1 and the project work plans.

4.2.5 Field QC samples will be labeled and numbered as described in SOPs 17.1 and 17.2 respectively and the project work plans.

4.2.6 The field QC samples will also be maintained under custody per SOP 1.1, and be appropriately stored, handled and shipped per SOPs 19.1 and 2.1, respectively.

5.0 Records

Records generated as a result of implementation of this SOP will be controlled and maintained in the project record files in accordance with SQP 4.2.

6.0 Attachments

6.1 Sample Collection Log

ATTACHMENT 6.1

SAMPLE COLLECTION LOG

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	
TIME	
PAGE ____ OF ____	
PAGE	
PROJECT NO.	

SAMPLE COLLECTION LOG

PROJECT NAME _____

SAMPLE NO. _____

SAMPLE LOCATION _____

SAMPLE TYPE _____

COMPOSITE ____ YES ____ NO

COMPOSITE TYPE _____

DEPTH OF SAMPLE _____

WEATHER _____

CONTAINERS USED	AMOUNT COLLECTED

COMMENTS:

PREPARED BY: _____

Appendix C

Analytical Laboratory Reports
and
Chain-of-Custody Records

CHROMALAB, INC.

Environmental Services (SDB)

November 5, 1997 Submission #: 9710393

Attn: Dan Baden

RE: Analysis for project 773497, number 773497.

REPORTING INFORMATION

Samples were received cold and in good condition on October 24, 1997. They were refrigerated upon receipt and analyzed as described in the attached report. ChromaLab followed EPA or equivalent methods for all testing reported.

Deviation from standard conditions was found in the following:

- Low MS/MSD recoveries due to matrix interference, which was confirmed by redigestion and reanalysis. The BS/BSD verified the batch precision and accuracy.

Client Sample ID	Matrix	Date collected	Sample #
WT001	SOIL	October 24, 1997	154243
WT002	SOIL	October 24, 1997	154244
WT002D	SOIL	October 24, 1997	154245
WT003	SOIL	October 24, 1997	154246
WT004	SOIL	October 24, 1997	154247
WT005	SOIL	October 24, 1997	154248
WT006	SOIL	October 24, 1997	154249

Dennis Mayugba
QA/QC Director

Eric Tam
Laboratory Director

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

October 27, 1997 *Submission #:* 9710393

Atten: Dan Baden

Project: 773497 *Project#:* 773497
Received: October 24, 1997

re: One sample for Lead analysis.
Method: *EPA 3010A/3050A/6010A Nov 1990*

Client Sample ID: **WT001**
Spl#: 154243 *Matrix:* SOIL *Extracted:* October 26, 1997
Sampled: October 24, 1997 *Run#:* 9341 *Analyzed:* October 27, 1997

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
LEAD	120	1.0	N.D.	98.6	1

Christopher Arndt
Chemist

John S. Labash
Inorganics Supervisor

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(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

October 27, 1997 *Submission #:* 9710393

Atten: Dan Baden

Project: 773497 *Project#:* 773497
Received: October 24, 1997

re: One sample for Lead analysis.
Method: *EPA 3010A/3050A/6010A Nov 1990*

Client Sample ID: **WT002**
Spl#: 154244 *Matrix:* SOIL *Extracted:* October 26, 1997
Sampled: October 24, 1997 *Run#:* 9341 *Analyzed:* October 27, 1997

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
LEAD	380	1.0	N.D.	98.6	1

Christopher Arndt
Chemist

John S. Labash
Inorganics Supervisor

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(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

October 27, 1997 *Submission #:* 9710393

Atten: Dan Baden

Project: 773497 *Project#:* 773497
Received: October 24, 1997

re: One sample for Lead analysis.
Method: *EPA 3010A/3050A/6010A Nov 1990*

Client Sample ID: **WT002D**
Spl#: 154245 *Matrix:* SOIL *Extracted:* October 26, 1997
Sampled: October 24, 1997 *Run#:* 9341 *Analyzed:* October 27, 1997

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
LEAD	360	1.0	N.D.	98.6	1

Christopher Arndt
Chemist

John S. Labash
Inorganics Supervisor

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CHROMALAB, INC.

Environmental Services (SDB)

October 27, 1997 *Submission #:* 9710393

Atten: Dan Baden

Project: 773497 *Project#:* 773497
Received: October 24, 1997

re: One sample for Lead analysis.
Method: *EPA 3010A/3050A/6010A Nov 1990*

Client Sample ID: **WT003**
Spl#: 154246 *Matrix:* SOIL *Extracted:* October 26, 1997
Sampled: October 24, 1997 *Run#:* 9341 *Analyzed:* October 27, 1997

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
LEAD	340	1.0	N.D.	98.6	1

Christopher Arndt
Chemist

John S. Labash
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CHROMALAB, INC.

Environmental Services (SDB)

October 27, 1997 *Submission #:* 9710393

Atten: Dan Baden

Project: 773497 *Project#:* 773497
Received: October 24, 1997

re: One sample for Lead analysis.
Method: *EPA 3010A/3050A/6010A Nov 1990*

Client Sample ID: **WT004**
Spl#: 154247 *Matrix:* SOIL *Extracted:* October 26, 1997
Sampled: October 24, 1997 *Run#:* 9341 *Analyzed:* October 27, 1997

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
LEAD	76	1.0	N.D.	98.6	1

~~Christopher Arndt~~
Chemist

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CHROMALAB, INC.

Environmental Services (SDB)

October 27, 1997 *Submission #:* 9710393

Atten: Dan Baden

Project: 773497 *Project#:* 773497
Received: October 24, 1997

re: One sample for Lead analysis.
Method: *EPA 3010A/3050A/6010A Nov 1990*

Client Sample ID: **WT005**
Spl#: 154248 *Matrix:* SOIL *Extracted:* October 26, 1997
Sampled: October 24, 1997 *Run#:* 9341 *Analyzed:* October 27, 1997

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
LEAD	440	1.0	N.D.	98.6	1

Christopher Arndt
Chemist

John S. Labash
Inorganics Supervisor

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CHROMALAB, INC.

Environmental Services (SDB)

October 27, 1997 *Submission #:* 9710393

Atten: Dan Baden

Project: 773497 *Project#:* 773497
Received: October 24, 1997

re: One sample for Lead analysis.
Method: *EPA 3010A/3050A/6010A Nov 1990*

Client Sample ID: **WT006**
Spl#: 154249 *Matrix:* SOIL *Extracted:* October 26, 1997
Sampled: October 24, 1997 *Run#:* 9341 *Analyzed:* October 27, 1997

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
LEAD	390	1.0	N.D.	98.6	1

Christopher Arndt
Chemist

John S. Labash
Inorganics Supervisor

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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

November 5, 1997 *Submission #:* 9710393

Atten: Dan Baden

Project: 773497 *Project#:* 773497
Received: October 24, 1997

re: **Blank spike and duplicate** report for Lead analysis.

Method: EPA 3010A/3050A/6010A Nov 1990

Matrix: SOIL
Lab Run#: 9341 *Analyzed:* October 27, 1997

Analyte	Spike Amount BSP (mg/Kg)	Spike Amount Dup (mg/Kg)	Spike Found BSP (mg/Kg)	Spike Found Dup (mg/Kg)	Spike Recov BSP (%)	Spike Recov Dup (%)	Control Limits %	% RPD	% RPD Lim
LEAD	100	100	98.6	98.4	98.6	98.4	80-120	0.20	35

BS Smpl #: 154289
BSD Smpl #: 154290

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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

October 27, 1997 *Submission #:* 9710393

IT- HUNTERS POINT

Atten: Dan Baden

Project: 773497 *Project#:* 773497
Received: October 24, 1997

re: **Matrix spike** report for Lead analysis.

Method: EPA 3010A/3050A/6010A Nov 1990

Matrix: SOIL *Extracted:* October 26, 1997
Lab Run#: 9341 *Instrument:* *Analyzed:* October 27, 1997

Analyte	Spiked Sample Amount (mg/Kg)	Spike Amt MS (mg/Kg)	Spike Amt MSD (mg/Kg)	Amt Found MS (mg/Kg)	Amt Found MSD (mg/Kg)	Spike Recov MS (%)	Spike Recov MSD (%)	Control Limits	% RPD	% RPD Lir
LEAD	120	100	100	191	186	74.0*	69.0*	75-125	6.99	3

Sample Spiked: 154243
Submission #: 9710393
Client Sample ID: WT001

* Low spike recoveries due to matrix interference, which was confirmed by redigestion and reanalysis. The BS/BSD met all QC criteria.

MS Smpl #: 154292
MSD Smpl #: 154293

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Federal ID #68-0140157

QCMSPK1229 JOHN 27-Oct-97 15:

CHROMALAB, INC.

Environmental Service (SDB)

Sample Receipt Checklist

Client Name: **IT-MARTINEZ** Date/Time Received: **10/24/97** | 1905

Reference/Submis: **36316** | **9710393** Received by: ET

Checklist completed by: _____ (Signature) | 10/27/97 (Date) Reviewed by: _____ (Initials | Date)

Matrix: SOIL Carrier name: Client - C/L

Shipping container/cooler in good condition?	Yes ✓	No ___	Not Present ___
Custody seals intact on shipping container/cooler?	Yes ___	No ✓ (M)	Not Present ✓
Custody seals intact on sample bottles?	Yes ___	No ___	Not Present ✓
Chain of custody present?	Yes ✓	No ___	
Chain of custody signed when relinquished and received?	Yes ✓	No ___	
Chain of custody agrees with sample labels?	Yes ✓	No ___	
Samples in proper container/bottle?	Yes ✓	No ___	
Sample containers intact?	Yes ✓	No ___	
Sufficient sample volume for indicated test?	Yes ✓	No ___	
All samples received within holding time?	Yes ✓	No ___	
Container/Temp Blank temperature in compliance?	Temp: 5.5 °C Yes ✓	No ___	
Water - VOA vials have zero headspace?	No VOA vials submitted ✓	Yes ___	No ___
Water - pH acceptable upon receipt? ___	Adjusted? ___	Checked by ___ (chemist for VOAs)	

Any No and/or NA (not applicable) response must be detailed in the comments section below.

==========

Client contacted: _____ **Date contacted:** _____ **Person contacted:** _____

Contacted by: _____ **Regarding:** _____

Comments: _____

Corrective Action: _____

INTERNATIONAL TECHNOLOGY CORPORATION

393/154243 -154219

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

36316

Reference Document No. [illegible]

Page 1 of 1

Project Name/No. [1] 773-497

Sample Team Members [2] DAN BADEN

Profit Center No. [3] 55/5001

Project Manager [4] DAN BADEN

Purchase Order No. [6]

Required Report Date [11] 10-27-97

Samples Shipment Date [7] 10-21-97

Lab Destination [8]

Lab Contact [9]

Project Contact/Phone [12] 510-372-5216

Carrier/Waybill No. [13]

Bill to: [5] IT Corp / NAVY RAC

Report to: [10] DAN BADEN 510 372 5216

White: To accompany samples

Yellow: Field copy

ONE CONTAINER PER LINE

Sample Number [14]	Sample Description/Type [15]	Date/Time Collected [16]	Container Type [17]	Sample Volume [18]	Pre-servative [19]	Requested Testing Program [20]	Condition on Receipt [21]	Disposal Record No. [22]
WT001	Surface/Soil	10-24-97 1:55 pm	Lexan Tube	600 cm		Lead only		
WT002	" "	10-24-97 2:00 pm	"	"		" "		
WT002D	" "	10-24-97 2:10 pm	"	"		" "		
WT003	" "	10-24-97 2:15 pm	"	"		" "		
WT004	" "	10-24-97 2:20 pm	"	"		" "		
WT005	" "	10-24-97 2:25 pm	"	"		" "		
WT006	" "	10-24-97 2:30 pm	"	"		" "		
						" "		

SUBN #: 0710595 BTS: IM
CLIENT: IT CON-MARTI
DUE: 10/27/97
REF #: 36316

Special Instructions: [23] 24 HR TURNAROUND FAX TO 510 372 5220 ATTN DAN BADEN

Possible Hazard Identification: [24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: [25]
Return to Client ☐ Disposal by Lab ☑ Archive Standard (mos.)

Turnaround Time Required: [26]
Normal ☐ Rush ☑

QC Level: [27]
I. ☐ II. ☐ III. ☐ Project Specific (specify): SEE PAM

1. Relinquished by [28] (Signature/Affiliation) Ken Sloan IT	Date: 10-24-97 Time: 1520	1. Received by [28] (Signature/Affiliation) [illegible]	Date: 10-24-97 Time: 1525
2. Relinquished by (Signature/Affiliation) [illegible]	Date: 10-24-97 Time: 1700	2. Received by (Signature/Affiliation) Rick Van Buren	Date: 10-24-97 Time: 1700
3. Relinquished by (Signature/Affiliation) Rick Van Buren	Date: ~~1205~~ 10-24-97 Time: 1705	3. Received by (Signature/Affiliation) [illegible]	Date: 10-24-97 Time: 1705

Comments: [29]
4. Relin. by [illegible] 10/24/97 18:05
4. Rec'd by: Mike Naranjo 10/24/97 1805

*See back of form for special instructions.

MCA 3/15/91

CHROMALAB, INC.

Environmental Services (SDB)

November 5, 1997 Submission #: 9710394

Attn: Dan Baden

RE: Analysis for project DO111 HUNTERS POINT, number 773497.

REPORTING INFORMATION

Samples were received cold and in good condition on October 24, 1997. They were refrigerated upon receipt and analyzed as described in the attached report. ChromaLab followed EPA or equivalent methods for all testing reported.

Deviation from standard conditions was found in the following:

- Low MS/MSD recoveries due to matrix interference, which was confirmed by redigestion and reanalysis. The BS/BSD verified the batch precision and accuracy.

Client Sample ID	Matrix	Date collected	Sample #
DO111-R-105-H	SOIL	October 24, 1997	154251
DO111-R-105-RS	SOIL	October 24, 1997	154250

Dennis Mayugba
QA/QC Director

Eric Tam
Laboratory Director

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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

October 27, 1997 *Submission #:* 9710394

Atten: Dan Baden

Project: DO111 HUNTERS POINT *Project#:* 773497
Received: October 24, 1997

re: One sample for Lead analysis.
Method: *EPA 3010A/3050A/6010A Nov 1990*

Client Sample ID: **DO111-R-105-RS**
Spl#: 154250 *Matrix:* SOIL *Extracted:* October 26, 1997
Sampled: October 24, 1997 *Run#:* 9341 *Analyzed:* October 27, 1997

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
LEAD	240	1.0	N.D.	98.6	1

Christopher Arndt
Chemist

John S. Labash
Inorganics Supervisor

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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

October 27, 1997 *Submission #:* 9710394

Atten: Dan Baden

Project: DO111 HUNTERS POINT *Project#:* 773497
Received: October 24, 1997

re: One sample for Lead analysis.
Method: *EPA 3010A/3050A/6010A Nov 1990*

Client Sample ID: **DO111-R-105-H**
Spl#: 154251 *Matrix:* SOIL *Extracted:* October 26, 1997
Sampled: October 24, 1997 *Run#:* 9341 *Analyzed:* October 27, 1997

ANALYTE	RESULT (mg/Kg)	REPORTING LIMIT (mg/Kg)	BLANK RESULT (mg/Kg)	BLANK SPIKE (%)	DILUTION FACTOR
LEAD	180	1.0	N.D.	98.6	1

Christopher Arndt
Chemist

John S. Labash
Inorganics Supervisor

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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

October 29, 1997 *Submission #:* 9710394

Atten: Dan Baden

Project: DO111 HUNTERS POINT *Project#:* 773497
Received: October 24, 1997

re: **Blank spike and duplicate** report for Lead analysis.

Method: EPA 3010A/3050A/6010A Nov 1990

Matrix: SOIL
Lab Run#: 9341 *Analyzed:* October 27, 1997

Analyte	Spike Amount BSP (mg/Kg)	Spike Amount Dup (mg/Kg)	Found BSP (mg/Kg)	Found Dup (mg/Kg)	Spike Recov BSP (%)	Spike Recov Dup (%)	Control Limits %	% RPD	% RPD Lim
LEAD	100	100	98.6	98.4	98.6	98.4	80-120	0.20	35

BS Smpl #: 154289
BSD Smpl #: 154290

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(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

October 27, 1997 *Submission #:* 9710394

Atten: Dan Baden

Project: DO111 HUNTERS POINT *Project#:* 773497
Received: October 24, 1997

re: **Matrix spike** report for Lead analysis.

Method: EPA 3010A/3050A/6010A Nov 1990

Matrix: SOIL *Extracted:* October 26, 1997
Lab Run#: 9341 *Instrument:* *Analyzed:* October 27, 1997

Analyte	Spiked Sample Amount (mg/Kg)	Spike Amt MS (mg/Kg)	Spike Amt MSD (mg/Kg)	Amt Found MS (mg/Kg)	Amt Found MSD (mg/Kg)	Spike Recov MS (%)	Spike Recov MSD (%)	Control Limits	% RPD	% RP Li
LEAD	120	100	100	191	186	74.0*	69.0*	75-125	6.99	3

Sample Spiked: 154243
Submission #: 9710393
Client Sample ID: WT001

* Low spike recoveries due to matrix interference, which was confirmed by redigestion and reanalysis. The BS/BSD met all QC criteria.

MS Smpl #: 154292
MSD Smpl #: 154293

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

QCMSPK1229 JOHN 27-Oct-97 15

CHROMALAB, INC.

Environmental Service (SDB)

Sample Receipt Checklist

Client Name: **IT-MARTINEZ** Date/Time Received: **10/24/97** | 1705

Reference/Submis: **36317** | **9710394** Received by: ET

Checklist completed by: _____ (Signature) | 10/27/97 (Date) Reviewed by: _____ (Initials | Date)

Matrix: Soil Carrier name: Client - C/L

Shipping container/cooler in good condition?	Yes ✓	No ___	Not Present ___
Custody seals intact on shipping container/cooler?	Yes ___	No ___	Not Present ✓
Custody seals intact on sample bottles?	Yes ___	No ___	Not Present ✓
Chain of custody present?	Yes ✓	No ___	
Chain of custody signed when relinquished and received?	Yes ✓	No ___	
Chain of custody agrees with sample labels?	Yes ✓	No ___	
Samples in proper container/bottle?	Yes ✓	No ___	
Sample containers intact?	Yes ✓	No ___	
fficient sample volume for indicated test?	Yes ✓	No ___	
All samples received within holding time?	Yes ✓	No ___	
Container/Temp Blank temperature in compliance?	Temp: 5.5 °C Yes ✓	No ___	
Water - VOA vials have zero headspace?	No VOA vials submitted ✓	Yes ___	No ___

Water - pH acceptable upon receipt? ___ Adjusted? ___ Checked by _____ (chemist for VOAs)

Any No and/or NA (not applicable) response must be detailed in the comments section below.

==========

Client contacted: _____ **Date contacted:** _____ **Person contacted:** _____

Contacted by: _____ **Regarding:** _____

Comments: _____

Corrective Action: _____

INTERNATIONAL TECHNOLOGY CORPORATION

394 / 154250-15425

Do 111 Hunters Pt

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

36317

Reference Document No. [illegible]

Page 1 of 1

Project Name/No. 1 773497

Samples Shipment Date 7 10-24-97

Bill to: 5 IT Corp / NAVY RAC

Sample Team Members 2 Kevin Stoulstreet / Dan Baden

Lab Destination 8

Profit Center No. 3 5515001

Lab Contact 9

Project Manager 4 Dan Baden

Project Contact/Phone 12 510-372-5216

Report to: 10 Dan Baden 510-372-5216

Purchase Order No. 6

Carrier/Waybill No. 13

Required Report Date 11 10-27-97

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Pre-servative 19	Requested Testing Program 20	Condition on Receipt 21	Disposal Record No. 22
Do111-R-105-RS	Surface / Soil	10-24-97 1450	Lexan Tube	600 GM		Lead only		
Do111-R-105-H	"	" 1455	"	"		" "		

SUBM #: 9710394 REP: PM
CLIENT: IT COM-MARTI
DUE: 10/27/97
REF #:36317

RUSH

Special Instructions: 23 24 HR TURNAROUND FAX TO 510-372-5220 ATTN DAN BADEN

Possible Hazard Identification: 24
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: 25
Return to Client ☐ Disposal by Lab ☐ Archive (mos.)

Turnaround Time Required: 26
Normal ☐ Rush ☑

QC Level: 27
I. ☐ II. ☐ III. ☐ Project Specific (specify): SEC DAM

1. Relinquished by 28 (Signature/Affiliation) [signature] IT	Date: 10-24-97 Time: 1520	1. Received by 28 (Signature/Affiliation) [signature]	Date: 10-24-97 Time: 1528
2. Relinquished by (Signature/Affiliation) [signature]	Date: 10-24-97 Time: 1700	2. Received by (Signature/Affiliation) Rick Van Buren	Date: 10-24-97 Time: 1700
3. Relinquished by (Signature/Affiliation) Rick Van Buren	Date: ~~1705~~ 10-24-97 Time: 1708	3. Received by (Signature/Affiliation) [signature]	Date: 10-24-97 Time: 1700

Comments: 29
4. Relinq by [signature] 10/24/97 18:05
4. Rec'd by [signature] Mike Naranjo 10/24/97 1805

White: To accompany samples
Yellow: Field copy
*See back of form for special instructions.

MCA 3/15/91

Appendix D

Sample Collection Logs

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	102497
TIME	1450
PAGE	1 OF 1
PAGE	
PROJECT NO.	773497

SAMPLE COLLECTION LOG

PROJECT NAME Huntsing Pt Do#111

SAMPLE NO. Do 111-R-105 RS & Do111-R-105-H

SAMPLE LOCATION

SAMPLE TYPE Surface Soil

COMPOSITE ___ YES ✓ NO

COMPOSITE TYPE —

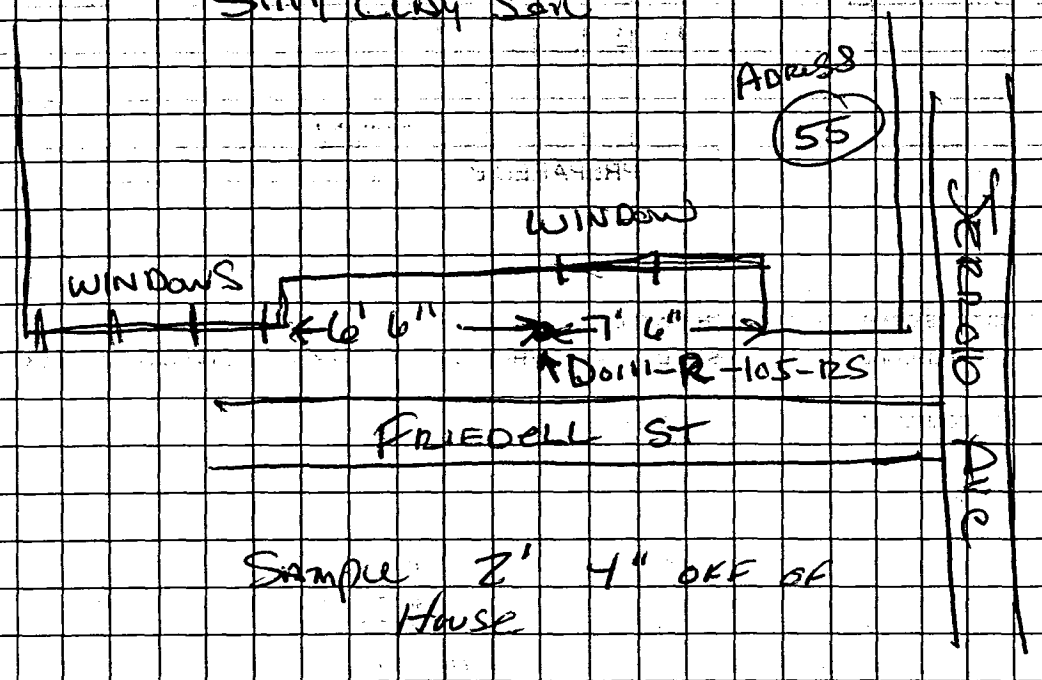
DEPTH OF SAMPLE 1"-2" Below Grade

WEATHER 75°

CONTAINERS USED	AMOUNT COLLECTED
Lexan Tube	600 Gm
Rinced with	HCLP water

COMMENTS:

Silty Clay Soil



PREPARED BY: K. Stonestreet

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	102497
TIME	1:55 pm
PAGE 1 OF 1	
PAGE	
PROJECT NO. ~~Pending~~ 773497	

SAMPLE COLLECTION LOG

PROJECT NAME Do # 111 Hunters Pt

SAMPLE NO. WT001

SAMPLE LOCATION West Side of Tank 18" off Asphalt

SAMPLE TYPE Surface Soil

COMPOSITE ____ YES ✓ NO

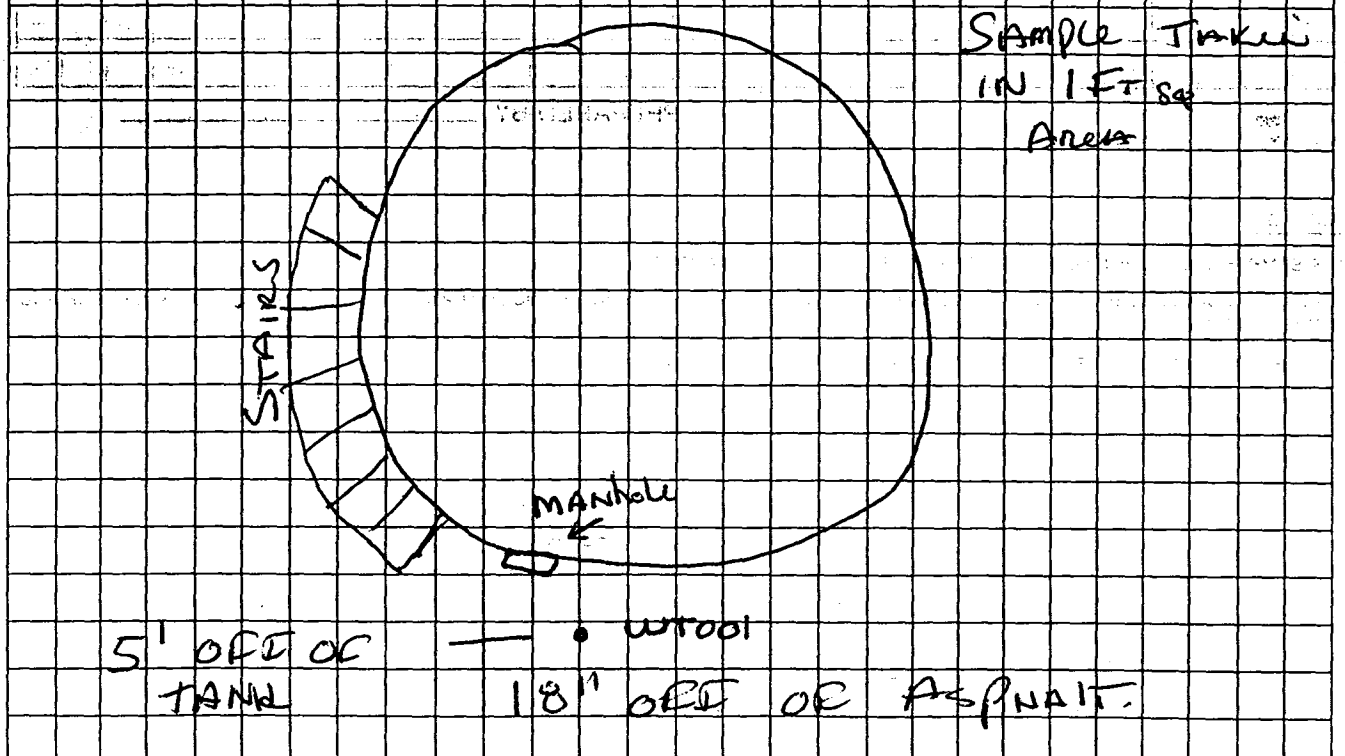
COMPOSITE TYPE ~~C~~

DEPTH OF SAMPLE 1"-2" Below Grade

WEATHER 75°

CONTAINERS USED	AMOUNT COLLECTED
Lexan Tube	~600 Grams
Rinsed w/ HPLC water	

COMMENTS: Picture #19 Collected by DWBaden 1:55 pm
Soil Type Silty



PREPARED BY: Kevin Stonestreet

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	102497
TIME	1400
PAGE	2 OF 1
PAGE	
PROJECT NO.	773497

SAMPLE COLLECTION LOG

PROJECT NAME DO# 111 HUNTERS PT

SAMPLE NO. WT002 & WT002D

SAMPLE LOCATION SOUTH WEST SIDE OF TANK

SAMPLE TYPE Soil

COMPOSITE ____ YES ✓ NO

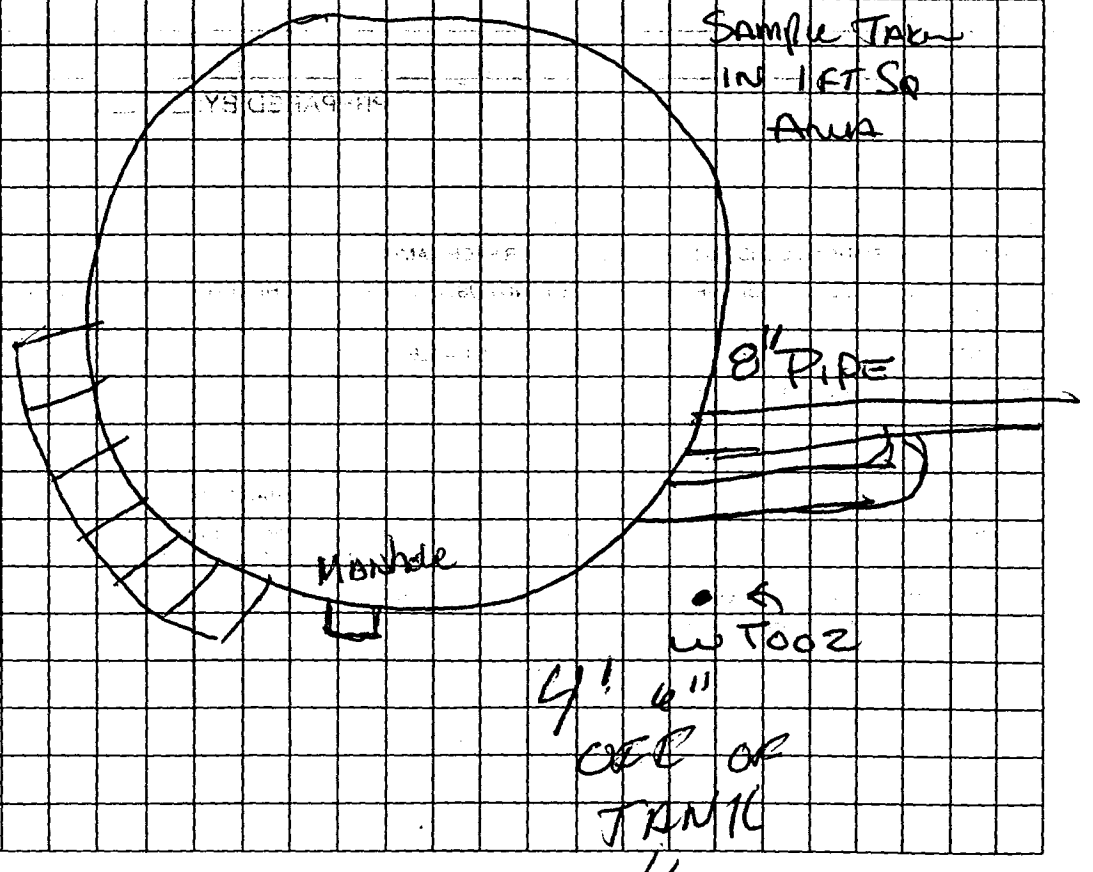
COMPOSITE TYPE

DEPTH OF SAMPLE 1"-2" Below GRADE

WEATHER 75°

CONTAINERS USED	AMOUNT COLLECTED
LEXAN TUBE	600 GM
Rinsed/with HPLC WATER	

COMMENTS: Picture # 20 Collected By D. Baden 1400
Soil type SANDY



PREPARED BY: K. Stonestreet

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	102497
TIME	1410
PAGE	31 OF 1
PAGE	
PROJECT NO.	773497

SAMPLE COLLECTION LOG

PROJECT NAME DO#111 HUNTERS PT.

SAMPLE NO. WT003

SAMPLE LOCATION SOUTH EAST SIDE OF TANK

SAMPLE TYPE SOIL / SURFACE

COMPOSITE ___ YES ✓ NO

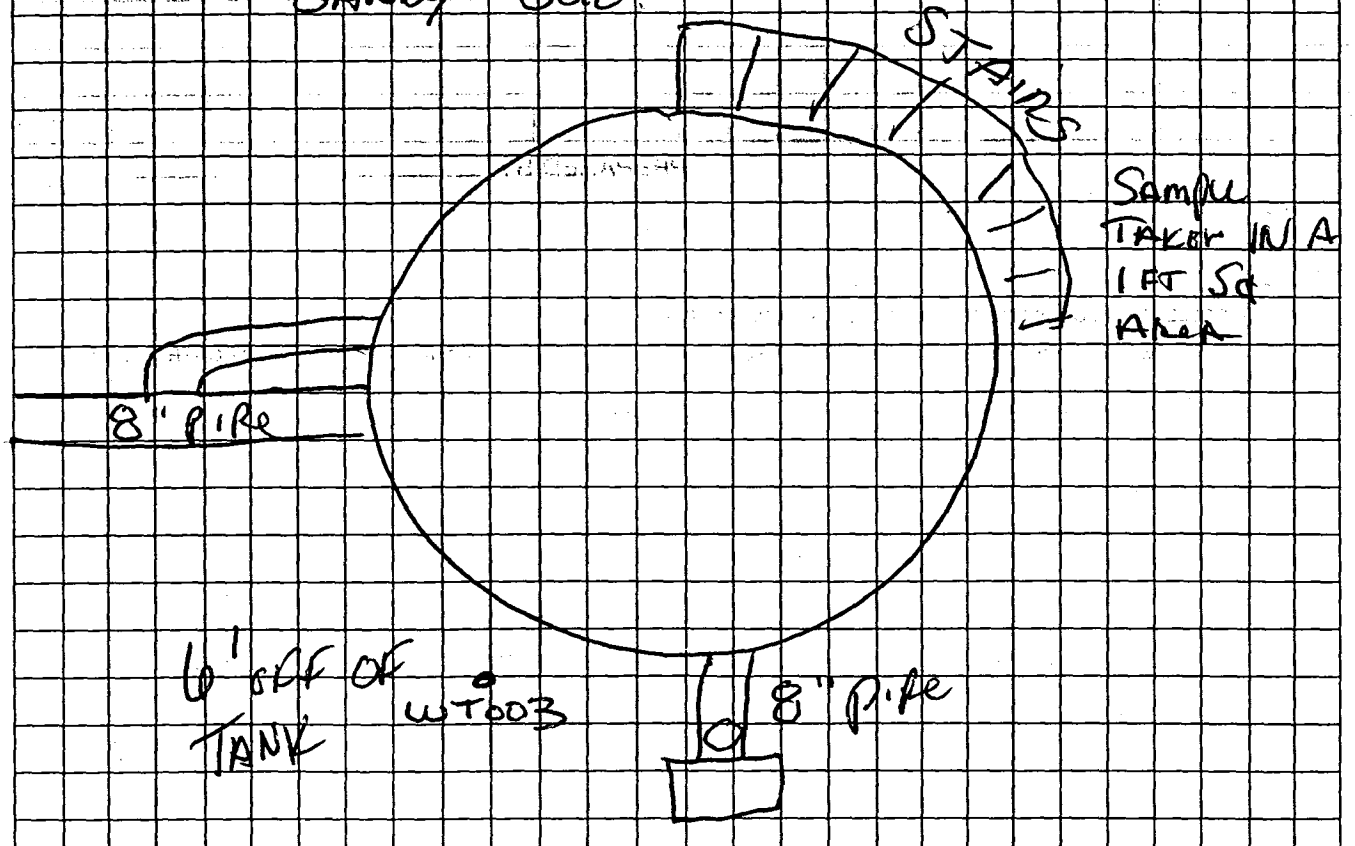
~~COMPOSITE TYPE~~ 1" - 2" Below Grade

DEPTH OF SAMPLE

WEATHER 75°

CONTAINERS USED	AMOUNT COLLECTED
LEXAN TUBE	600 GM
RINSED WITH	HPLC WATER

COMMENTS: PICTURE #21 SANDY SOIL COLLECTED BY D. BADEN



PREPARED BY: K. STONESTREET

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	102497
TIME	1415
PAGE	1 OF 1
PAGE	
PROJECT NO.	773497

SAMPLE COLLECTION LOG

PROJECT NAME Do #111 Hunters Pt

SAMPLE NO. WT004

SAMPLE LOCATION EAST SIDE

SAMPLE TYPE Surface Soil

COMPOSITE ____ YES ✓ NO

COMPOSITE TYPE ⊖

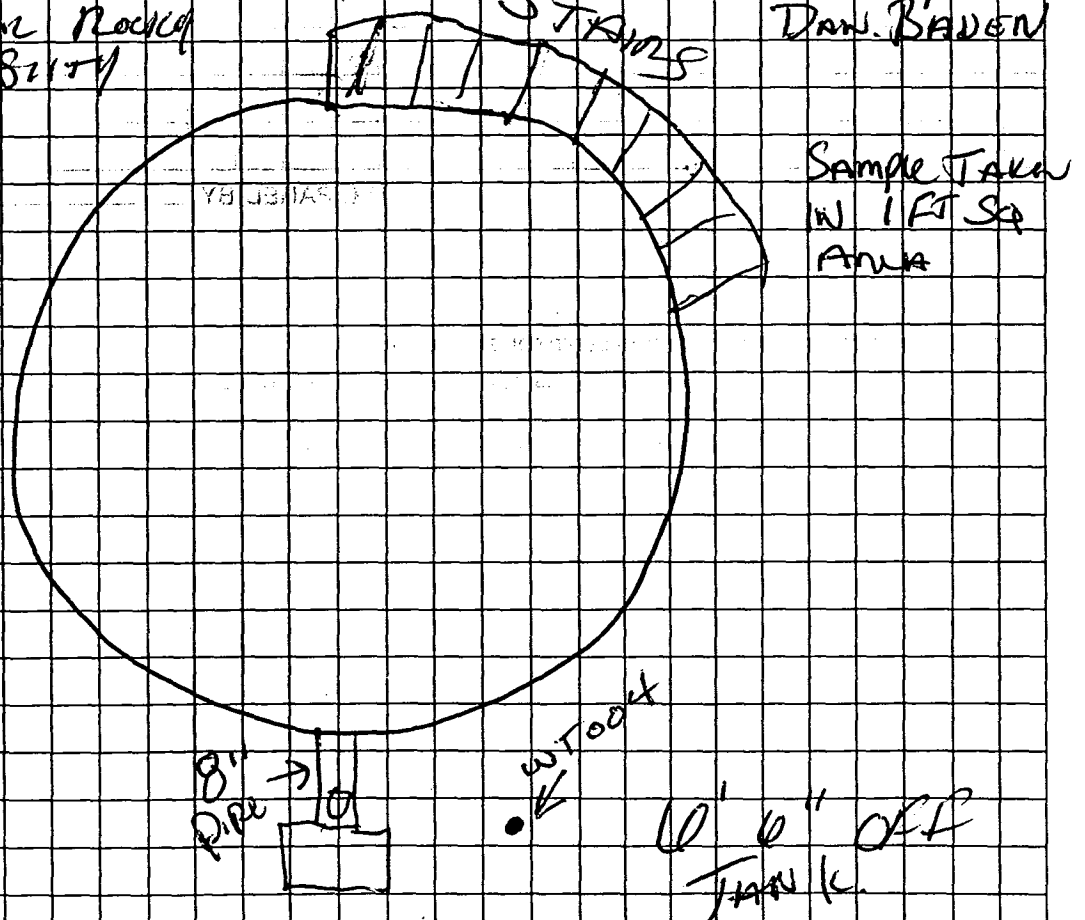
DEPTH OF SAMPLE 1"-2" Below Grade

WEATHER 75°

CONTAINERS USED	AMOUNT COLLECTED
Lexan Tube	600 GM
Rinsed with	HPLC Water

COMMENTS: Picture #22 Soil Rocky Silty

Corected By Dan. Baden



PREPARED BY: [signature] Stonestreet

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	102497
TIME	1420
PAGE	~~3~~ 1 OF 1
PAGE	
PROJECT NO.	773497

SAMPLE COLLECTION LOG

PROJECT NAME: DO# 111 HUNTERS PT.

SAMPLE NO.: WT005

SAMPLE LOCATION: NORTH ~~WEST~~

SAMPLE TYPE: SOIL SURFACE

COMPOSITE: ____ YES ✓ NO

COMPOSITE TYPE: ~~G~~

DEPTH OF SAMPLE: 1"-2" Below Grade

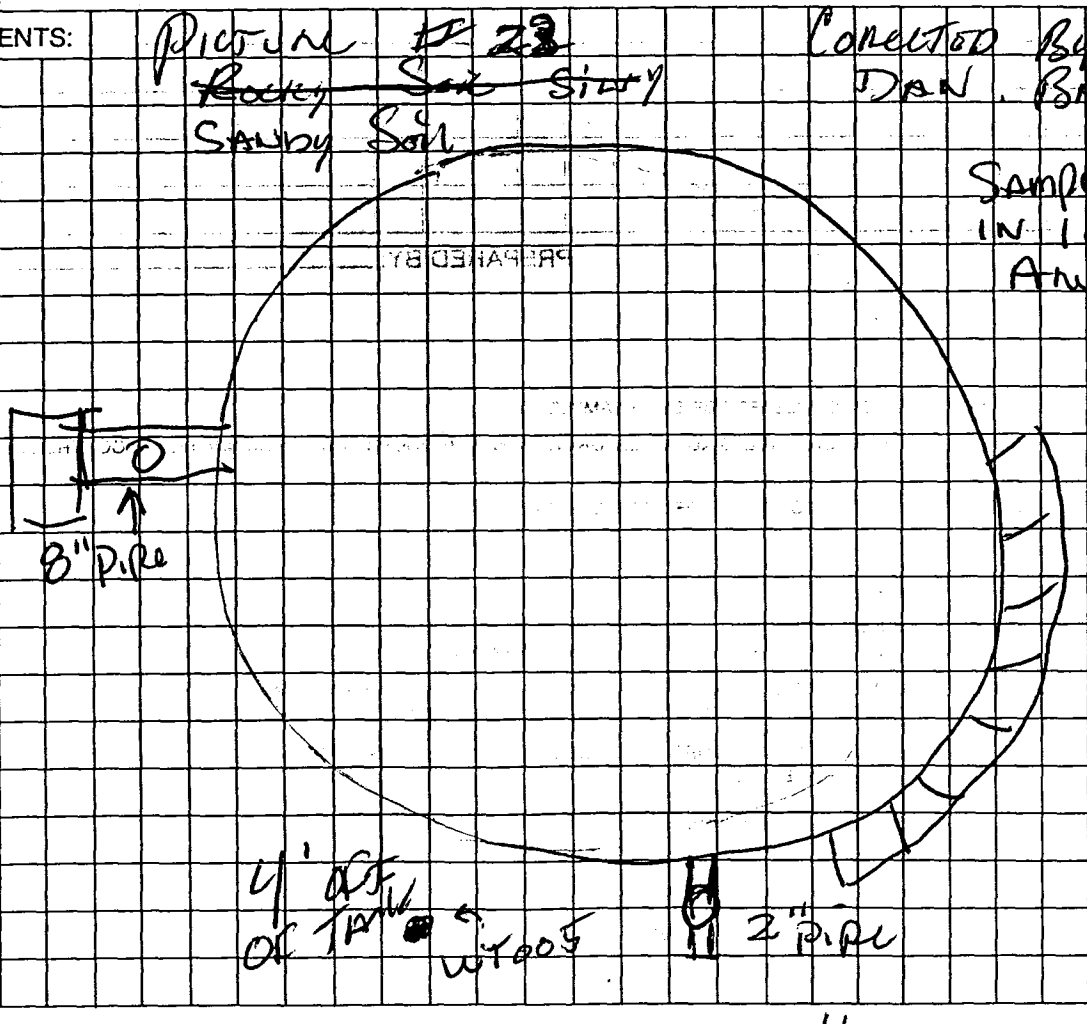
WEATHER: 75°

CONTAINERS USED	AMOUNT COLLECTED
LEXAN TUBE	600 GM
RINSED WITH	HPLC WATER

COMMENTS: PICTURE ~~#23~~ ~~Rocky Soil~~ SILTY SANDY SOIL

COLLECTED BY DAN. BADGER

SAMPLE TAKEN IN 1 FT SQ AREA.



PREPARED BY: K. STONESTREET

INTERNATIONAL TECHNOLOGY CORPORATION

DATE	102497
TIME	1425
PAGE	1 OF 1
PAGE	
PROJECT NO.	773497

SAMPLE COLLECTION LOG

PROJECT NAME: Do 111 Hunters Pt

SAMPLE NO.: WT006

SAMPLE LOCATION: North West Side of Tank

SAMPLE TYPE: Surface Soil

COMPOSITE: ___ YES ✓ NO

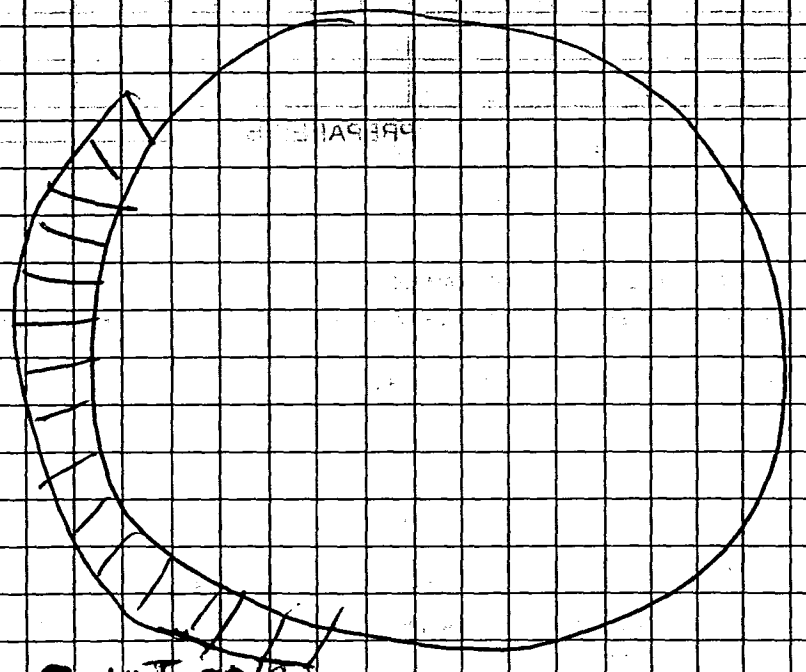
COMPOSITE TYPE: —

DEPTH OF SAMPLE: 1"-2" Below Grade

WEATHER: 75°

CONTAINERS USED	AMOUNT COLLECTED
Lexan Tube	600 Gm
Rinced with	HPLC Water

COMMENTS: Picture # 24 Sandy Soil Collected By Dan. Baden



PREPARED BY: K. Stonestreet

Appendix E

Response To USEPA Comments

Parcel A
Supplemental Soil Lead Sampling
Hunters Point Shipyard
San Francisco, California

Response To USEPA Comments

USEPA Comment

1) Page 1, first paragraph, last sentence. Please clarify and elaborate upon this statement. For example: The initial sampling of Parcel A soils for lead based paint releases conducted in 1993 indicated that there were elevated lead levels in soils around the water tank. Since the sample analyzed was elevated and a composite and since no detail on the 1993 sampling effort in the vicinity of the tank was available, it was not clear whether there was elevated lead in soil around the water tank or not. In addition, during the 1993 sampling effort one Parcel A housing unit, while showing no lead in soil problems based on the field XRF measurements did show elevated concentrations in the lab confirmation sampling. Therefore, it was unclear whether there was a lead problem in the soils around this housing unit or not. As a result of discussions with USEPA, the Navy agreed to resample this two area and clarify whether lead was elevated in the soils of these two areas or not. The remainder of the 1993 sampling effort was not disputed.

Response

The intent of this comment has been fully incorporated. Section 1.0 of the report has been expanded and rewritten to more accurately summarize the sequence of events that lead to this supplemental sampling effort.

USEPA Comment

2) Page 2, Section 1.2. Please rewrite this section. It does not clearly describe the site investigations. More background on the 1993 sampling effort is required. Wording per my comment 1 above could be used. Also, last sentence of section 1.2 - it was not just the residence R-105 that needed resampling but also the water tank. Please add a sentence to the effect: "Further, the Navy resampled the soil around the Parcel A water tank to determine whether or not there was a significant lead in soil problem requiring remediation in the are of the water tank. USEPA had informed the Navy that until these discrepancies of lead in soil concentrations at residence R-105 and the water tank were

resolved, we should not be able to concur at the time of transfer of Parcel A that, per the CERCLA covenant, all remedial action had been taken at Parcel A.

Response

The intent of this comment has been fully incorporated. Section 1.2 of the report has been rewritten to reflect more details of the previous sampling effort, and some of the reasoning behind the supplemental sampling effort.

USEPA Comment

3) Page 3, Section 2.0. What sampling and analysis plan was used, if any, to guide the Tetra Tech and subsequent IT sampling efforts? Please add this information to the text.

Response

It appears that the 1993 Tetra Tech sampling was performed under applicable HUD Guidelines rather than a site specific SAP. The 1997 IT sampling was also performed under current HUD Guidelines rather than a site specific SAP. Section 2.0 has been revised to reflect this information. Section 1.2 has also been revised to reflect Tetra Tech's reference to the HUD Guidelines.

USEPA Comment

4) Page 3, Section 2.1, second sentence. Add "During the 1993 sampling effort," and move "at the water tank location" to the end of the sentence.

Response

The format and content of Section 2 has been significantly revised, this comment was incorporated as requested.

USEPA Comment

5) Page 4, first sentence. Regarding SOPs. See comment 3 above. Please elaborate on SOPs. Could they be placed in an appendix?

Response

The appendices have been reordered to follow the text more closely. The applicable SOPs are presented as Appendix B.

USEPA Comment

6) Page 5, last paragraph. The report should note that the results of the 1997 IT sampling effort at residence R-105 were very similar to the XRF measurements obtained in 1993. As result, the Navy has concluded that the 1993 lab confirmation sample for this area that showed elevated lead concentrations was anomalous and was likely due to the 1993 lab sample containing a paint chip.

Response

The intent of this comment has been fully incorporated. Section 2.3 of the report has been revised to reflect a notation of the similarities between like sample results. The concluding portion of the comment was addressed in the revised and expanded portion of Section 3.0.

USEPA Comment

7) Page 6, Section 3.0. The conclusion needs some elaboration. The Navy needs to more effectively argue that the results of the 1997 versus 1993 are more representative of Parcel A soils. Also, please elaborate on the clearing away of the surface organic matter. At what depth below the surface was the soil sampled? What about the fact that any recently flaked-off lead based paint would likely be present on the surface not below it? Is the Navy convinced that the soils around the water tank have been accurately characterized with respect to lead?

Response

The intent of this comment has been fully incorporated. The conclusions have been expanded and portions of Section 3.0 have been rewritten. The references to sampling depth, clearing of surface organic debris, and paint chips are addressed in the second paragraph of Section 2.2. The Navy is convinced that the soil surrounding the water tank has been adequately characterized, as presented in the third paragraph of Section 3.0.

USEPA Comment

8) Comments on the Report by USEPA's Dr. Daniel Stralka:

The document barely presents the facts and is lacking in any explanation of the differences between the results of the earlier sampling performed by Tetra Tech and the current IT results. Additional discussion needs to be incorporated as to why the sampling methods are different (section 2.2) and with these differences, how can the reader compare the results (section 3)? The differences in the methods will be hard to explain since this effort was to confirm the previous effort and should have supplied a higher density of samples in the areas of interest but with no change in procedure so the results would be directly comparable.

So what can be concluded with both sets of data? Based on the different vertical sampling locations, it appears that lead contamination, if any, is localized in the top layers of soil, as would be expected from the site conceptual model of how the lead was released. The density of samples suggests that there is not a significant areal increase of soil lead that would be above the risk range.

The report should incorporate a clear discussion of all the data, the discrepancies between the two data sets and the conclusions that can be supported so that the project team can use this report to support a final decision.

Response

Comment noted. The Navy believes that the soil surrounding the structures on Parcel A has been adequately characterized.