

Report



FINAL
Preliminary Site Assessment Report

CTI Metals
Deer Park, New York

NYSDEC Site ID #152115
Work Assignment #D002925-09

November 1995

Prepared for:

New York State
Department Of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Michael Zagata
Commissioner

Division Of Hazardous Waste Remediation

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Executive Summary

Under contract with the New York State Department of Environmental Conservation (NYSDEC), Camp Dresser & McKee (CDM) completed a Preliminary Site Assessment (PSA) of the CTI Metals Site located in Deer Park, Suffolk County, New York. The CTI Metals Site is a small multi-tenant building which was used by an electro-plating business from 1979 to 1987. During this period, the business was found to discharge plating wastes to onsite storm drains and septic systems. The objective of this PSA was to determine if groundwater contamination exists within the site as the result of the documented and suspected waste discharges.

This PSA included the collection of groundwater samples from small diameter temporary boreholes using the Geoprobe™ System and the collection of sediment samples from onsite dry wells. The collected samples were analyzed for volatile organic compounds, semivolatile organic compounds, metals, pesticides and PCB's. CDM completed a review of available NYSDEC, local health department and historical records and files concerning the CTI Metals Site. Information on local and regional hydrogeology was also reviewed.

The CTI Metals site was used for metal anodizing and plating from 1979 to 1987. Manufacturing processes involved the use of various plating solutions, including: caustic soda, nitric acid, sulfuric acid, cadmium, nickel, zinc, cyanide and chromium.

The CTI Metals Site is underlain by glacial outwash deposits consisting of highly permeable sands and gravels. Groundwater is between 17 and 19 feet below grade and flows in a south to southeasterly direction. Groundwater velocities within the glacial aquifer underlying the site range between one and four feet per day. Groundwater is the exclusive source of public drinking water within the site area. Up to 39 public supply wells are located within a three mile radius of the site. Six supply wells are located downgradient of the site, the closest being approximately one-half mile southeast of the site.

Analysis of groundwater samples identified a number of volatile organic compounds (VOC) at trace concentrations downgradient of dry wells suspected of receiving waste discharges from CTI Metals, including: toluene, total xylene and tetrachloroethene. Inorganic analysis identified chromium and cadmium in groundwater samples collected downgradient of the septic system which received plating wastes at concentrations greatly exceeding NYSDEC Class GA groundwater standards. Chromium was detected at 1,170 ug/l in GP-10 and 248 ug/l in GP-9, the GA groundwater standard for chromium is 50 ug/l. Cadmium was detected at 139 ug/l in GP-10 and 114 ug/l in GP-9, the groundwater standard is 10 ug/l. Other discharge exceedances included lead and mercury in GP-10 and iron and manganese in both GP-9 and GP-10 groundwater samples.

Analysis of sediment samples collected from two onsite dry wells which received plating waste discharges from CTI Metals indicated the presence of tetrachloroethene in drywell sample DW-1 at 45 ug/kg and 2-butanone in drywell sample DW-2 at 5 ug/kg. A number of semivolatile compounds and pesticide compounds were detected in both drywell samples. One PCB compound Aroclor-1254 was detected at 8,000 ug/kg in DW-2. Cadmium and chromium were detected in both samples at elevated concentrations. All contaminants detected in the drywell samples were below NYSDEC recommended cleanup levels for soil with the exception of one pesticide compound, Endrin, detected at 270 ug/kg. The soil cleanup standard for Endrin is 100 ug/kg.

Based on the data generated from this PSA, CDM has concluded that significant groundwater contamination by cadmium and chromium is present within groundwater downgradient of the CTI Metals septic system. Given the fact that GP-10, the location of greatest contamination, is on the eastern border of the site, the metal contamination likely extends offsite in a southeasterly direction. Therefore, the extent of this groundwater contamination remains undefined.

(c)/execsumm)

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(cvi/toc)

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(cti/lot)

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(cti/lot)

Section 1

Introduction

1.1 Project Objective

As part of New York State's program to investigate potential hazardous waste sites, the New York State Department of Environmental Conservation (NYSDEC) has entered into a contract with Camp Dresser & McKee (CDM) to undertake a Preliminary Site Assessment (PSA) of the CTI Metals site located in Deer Park in Suffolk County, New York.

The objective of this PSA was to determine if groundwater contamination exists within the site as the result of documented and suspected waste discharges to onsite storm drains and septic systems which occurred, or allegedly occurred, during a period from 1979 to 1987.

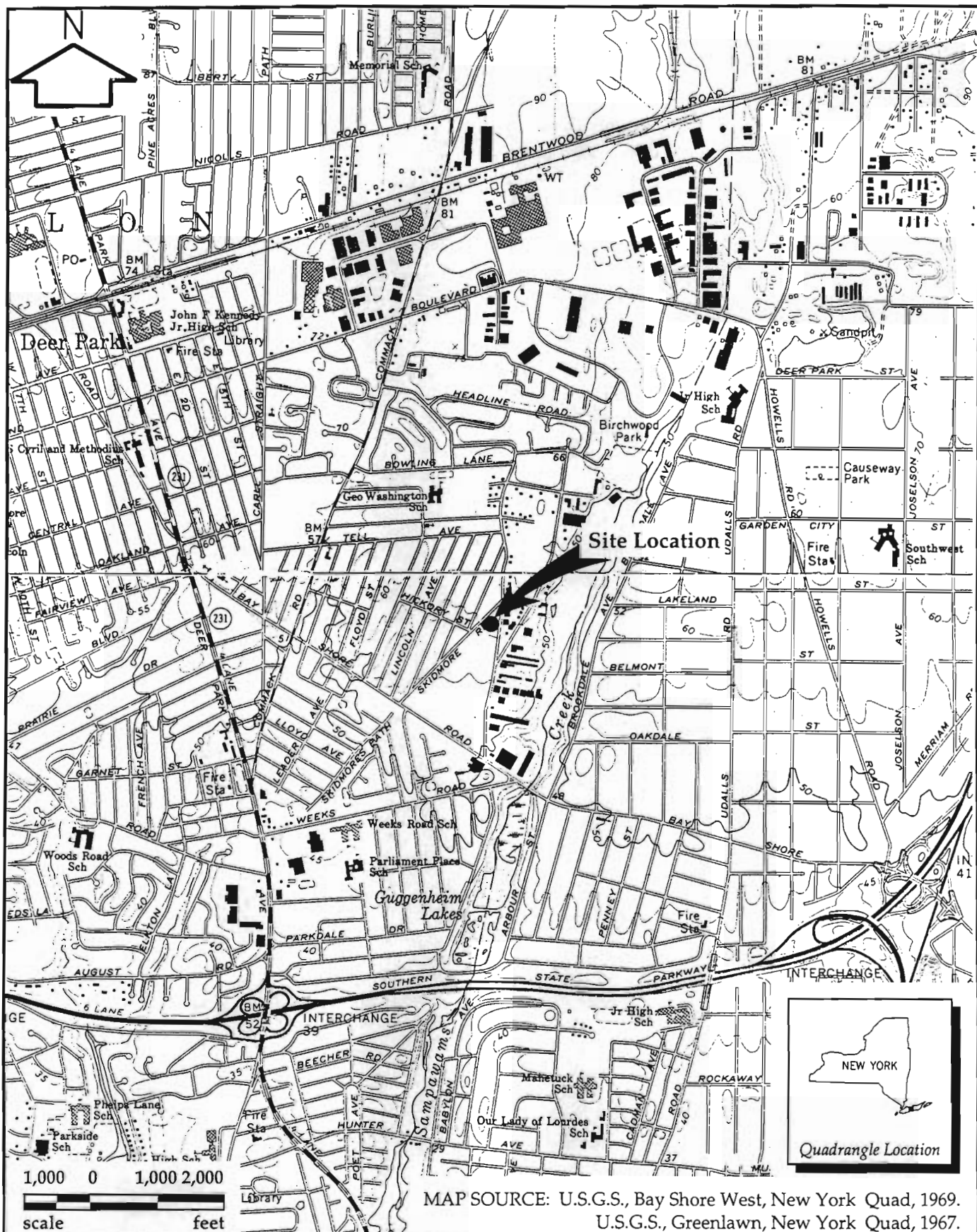
1.2 Site Location and Description

The CTI Metals site is located at 333 Skidmore Road within an area of Deer Park that is a mixture of light industrial/commercial property, in addition to one family residential homes, as shown in Figure 1-1. The site consists of one concrete block building approximately 5,800 square feet, divided into three tenant spaces. CTI Metals, a small electro-plating operation used the central tenant space from 1979 to 1987, see Figure 1-2. Site property surrounding the building is almost entirely paved. Stormwater is discharged to several onsite storm drains. Sanitary wastes are discharged to an onsite septic system. Currently this tenant space is vacant. The only business currently using the site at this time is Arno Manufacturing which specializes in the distribution of metal fasteners such as nuts and bolts.

1.3 Site History

According to the Phase II Investigation Work Plan prepared by R. D. Galli, PE., PC. for the site owner, Mr. Norman Budofsky, Mr. Budofsky purchased the CTI Metal site in 1979. The site owner leased part of the site building to T&S Metal Finishing, Inc. sometime in 1979. In 1982, T&S Metal Finishing became Circle Technology, Inc. (CTI Metals). Both businesses were engaged in metal finishing operations.

According to reviewed records, metal finishing operations conducted by T&S Metal Finishing and CTI Metals involved the anodizing and plating of aluminum and steel products. The metal finishing processes generally consists of the dipping of metal parts in holding tanks containing various chemicals. According to Suffolk County Department of Health Services (SCDHS) inspection reports of T&S Metal and CTI Metals, the operation included holding tanks containing solutions of caustic soda, nitric acid, sulfuric acid,

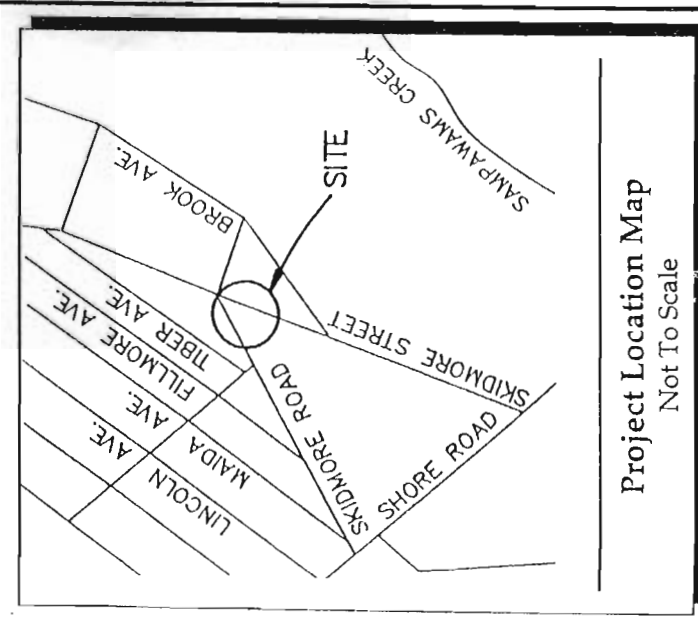
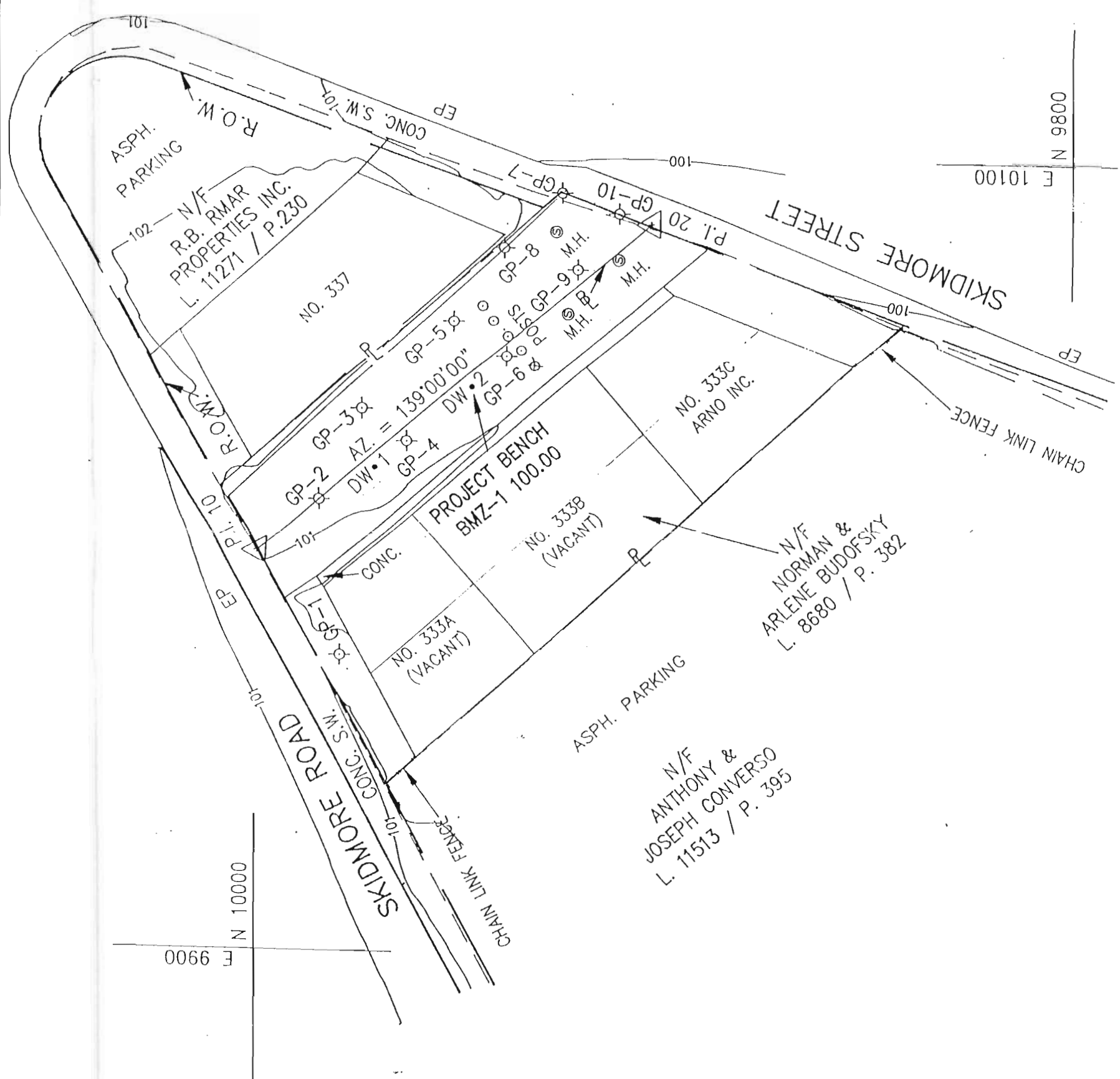
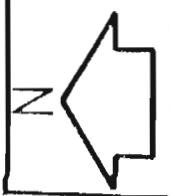


CDM

environmental engineers, scientists,
planners & management consultants

Preliminary Site Assessment Report
CTI Metals, Deer Park, New York
NYSDEC Site ID #152115
Site Location Map

Figure 1-1



SURVEY NOTES

- 1.) ALL LOCATIONS ON THIS MAP ARE BASED ON AN ASSUMED COORDINATE SYSTEM WITH MAGNETIC ORIENTATION.
- 2.) ALL ELEVATIONS SHOWN ON THIS MAP ARE REFERENCED TO THE PROJECT BENCH WITH AN ASSUMED ELEVATION OF 100.00.
- 3.) ALL LOCATIONS SHOWN WERE INFERRED FROM SURFACE EVIDENCE ONLY. NO SUBSURFACE UTILITIES WERE LOCATED.
- 4.) ALL PROPERTY LINE AND RIGHT OF WAY WERE DETERMINED FROM SUFFOLK COUNTY TAX MAPS.

LEGEND:

- Survey Control Point
- Iron Pipe
- GP-3
- Geo Probe Location
- DW-1 - Dry Well Sample Location



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planners & management consultants

SOURCE: O.M.P. Popli, P.E., L.S., P.C.

Preliminary Site Assessment Report
CTI Metals, Deer Park, New York
New York State Department Of Environmental Conservation
Site Survey

hydrochloric acid, cadmium, nickel, zinc, cyanide and chromium dyes. A schematic representation of the CTI Metal facility recorded by SCDHS appears on Figure 1-3.

In 1983, the SCDHS sampled several dry wells including storm drains and cesspools located on the CTI Metals site. Analysis of samples revealed metals and cyanide concentrations exceeding NYSDEC groundwater discharge standards. In response to SCDHS directions, CTI pumped the contents of the sampled drywells into 35, 55-gallon, drums which were staged onsite. Additional sampling performed by SCDHS and NYSDEC of the onsite dry wells indicated the continued presence of contamination by metals above groundwater discharge standards.

In 1987, CTI Metals apparently abandoned the plating operations at the site. As a result, the site owner had to pump out the cesspools a second time and remove hazardous materials from the site left behind by CTI Metals. In 1988, the owners of CTI Metals were required by a New York State court to provide payment for costs associated with the remediation of the site.

1.4 NYSDEC Records Review

CDM completed a review of all available NYSDEC and SCDHS records on February 23, 1995 concerning the CTI Metals site. Table 1-1 summarizes all significant records and files reviewed by CDM. Between 1979 and 1987, the SCDHS collected liquid/sludge samples from onsite dry wells including storm drains and cesspools on seven separate occasions. Contaminants identified over this sampling period were observed at the following concentrations:

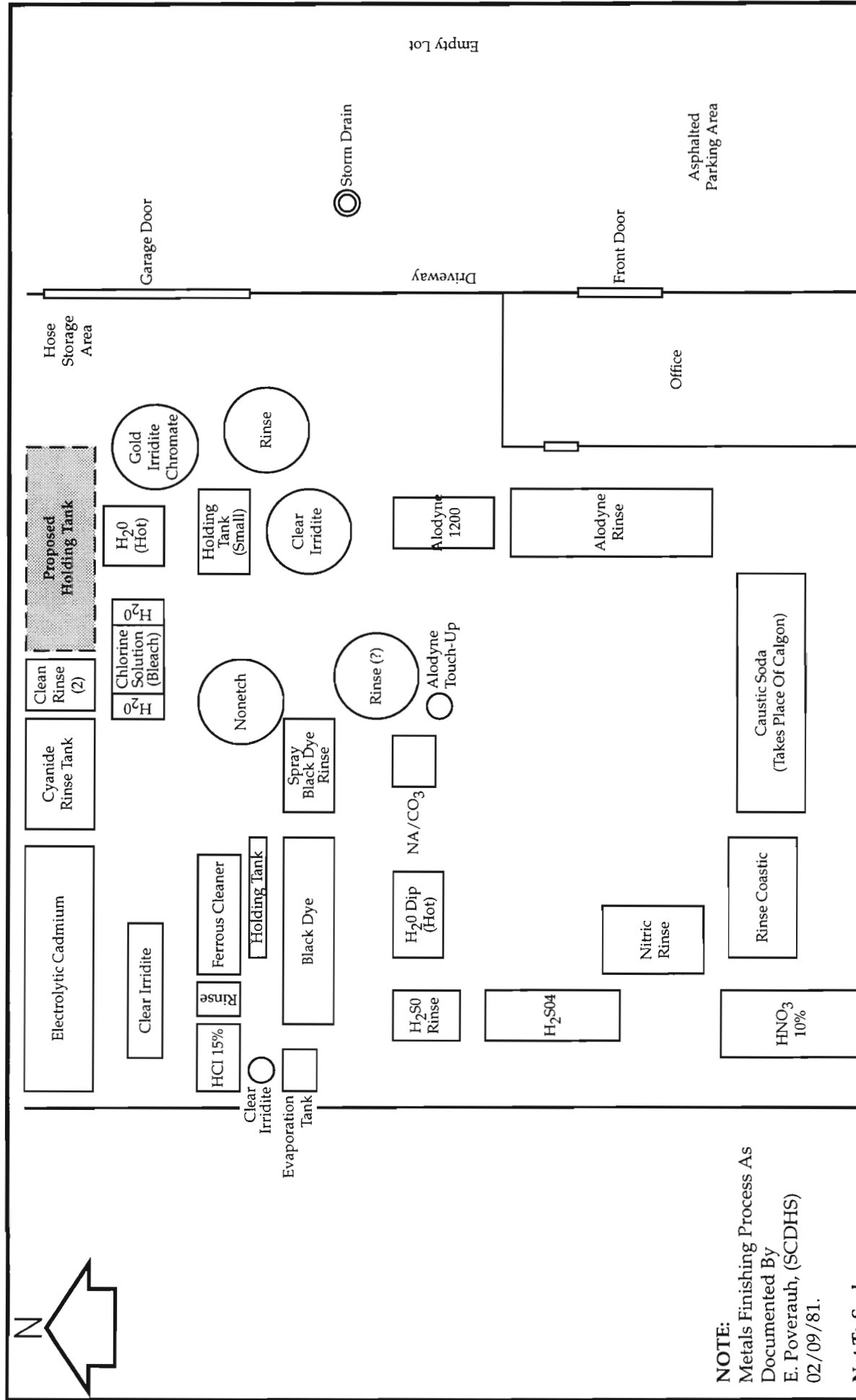
Storm Drains:

Copper	19 mg/l
Iron	16 to 22 mg/l
Lead	1.2 to 14 mg/l
Cadmium	0.27 to 28 mg/l
Zinc	7 mg/l
Total Dissolved Solids	12,400 mg/l
pH	13 pH units

Cesspools:

Copper	3.4 to 6 mg/l
Iron	2.6 to 80 mg/l
Lead	0.3 to 4.5 mg/l
Cadmium	1.8 to 50 mg/l
Zinc	9 mg/l
Cyanide	300 mg/l
Chromium	9 to 52 mg/l

According to reviewed files, the sampled storm drains and septic system were pumped out at least twice under order of SCDHS. In August 1983, T&S Metals contracted Chemical Pollution Control Inc. to pump out both the storm



NOTE:
Metals Finishing Process As
Documented By
E. Poverauh, (SCDHS)
02/09/81.

Not To Scale

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environmental engineers, scientists,
planners & management consultants

Preliminary Site Assessment Report
CTI Metals, Deer Park, New York
NYSDEC Site ID #152115
Metal Plating Process - T&S Metals (1981)

Table 1
Summary Of Selected Public Records Files
CTI Metals - NYSDEC Site ID #152115
Deer Park, New York (Suffolk County)
Grant Hardware Work Assignment
New York State Standby Contract D-002925-9

Date	Document	From	Of	To	Of	Contents (1)
12/20/79	Correspondence	S.A. Costa	SCDHS	T & S Metals	T & S Metals	Informing owner that industrial waste samples collected 12/11/79 were unsatisfactory and corrective measures must be implemented.
02/09/81	Industrial Waste & Hazardous Material Control Report	E. Poverauh	SCDHS	File	NA	Sketch of T & S Metals operations illustrating industrial process. Metal finishing process includes such chemicals as: caustic soda, 10% HNO ₃ , nitric acid, H ₂ SO ₄ , dyes, gold irradiate chromate, chlorine bleach, ferrous cleaner, 15% HCl, cyanide rinse, electrolytic cadmium etc.
05/26/81	Notice of Violation	P.A. Perrella	SCDHS	T & S Metals	T & S Metals	Notice of violation that samples collected from sanitary pool on 04/24/81 had contaminant levels which exceeded SPDES permit limits. Violations subject owner to legal action and violations must cease immediately.
12/04/81	Notice of Violation	J.H. Finkenberg	SCDHS	T & S Metals	T & S Metals	Notice of violation in samples collected from sanitary pool 11/10/81.
03/16/83	Industrial Waste & Hazardous Material Control Report	J. Johnson	SCDHS	File	NA	Documentation of active sulfuric acid discharge to storm sewer from inside building via garden hose. Violation of SCDHS Article 12. (Photos included).
03/22/83	Industrial Waste & Hazardous Material Control Report	J. Johnson	SCDHS	File	NA	Documents the disposal of process rinse water to storm sewer and elimination of chemical nitrate through industrial evaporator.
07/07/83	Notice of Violation	J.H. Finkenberg	SCDHS	T & S Metals	T & S Metals	Notice of violation that samples collected from sanitary pool on 06/22/83 had contaminant levels exceeding SPDES permit.

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<i>Date</i>	<i>Document</i>	<i>From</i>	<i>Of</i>	<i>To</i>	<i>Of</i>	<i>Contents (1)</i>
07/07/83	Notice of Violation	J.H. Finkenberg	SCDHS	T & S Metals	T & S Metals	Notice of violation that samples collected from storm drain 06/22/83 had contaminant levels exceeding SPDES permit.
07/12/83	Correspondence	P. Perrella	SCDHS	T & S Metals	T & S Metals	Scheduling a preliminary hearing regarding the facility's historical Article 12 violations.
08/25/83	Industrial Waste & Hazardous Material Control Report	J. Johnson	SCDHS	File	NA	T & S Metals voluntarily pumping material from on-site sanitary pools.
08/26/83	Industrial Waste & Hazardous Material Control Report	J. Johnson	SCDHS	File	NA	T & S Metals voluntarily cleaning storm drain and septic tank. Material transported off-site by Chemical Pollution Control, Inc.
09/14/83	Correspondence	P. Cappuccilli	T & S Metals	W. Roberts	SCDHS	Correspondence citing change in T & S presidency on 05/03/82 with a proposal to SCDHS not to impose fines related to unlawful discharge of waste.
09/23/83	Correspondence	W. Roberts	SCDHS	P. Cappuccilli	T & S Metals	Rejection of the 09/14/83 proposal to dismiss fines.
10/06/83	Consent Order	SCDHS	SCDHS	T & S Metals	T & S Metals	Order of Consent No. IW-83-56 stipulates terms and conditions regarding site cleanup, requests for information and fines.
06/10/86	Correspondence	R. Seyfarth	SCDHS	P. Cappuccilli	T & S Metals	Notice of violation that post-pumped samples collected from broken storm drain exceeded SPDES permit contaminant levels. Request to pump out drain again.

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09/03/86	Consent Order	NYSDEC	NYSDEC	T & S Metals	T & S Metals	Order of Consent file No. 1392 stipulating schedules for site cleanup and industrial process modifications.
10/03/86	Notice of Formal Hearing	A. Andreoli	SCDHS	N & A Budofsky	Circle Technology	Instructions to appear at formal hearing to discuss Health Code Article 12 violations.
01/27/87	Correspondence	R. Seyfarth	SCDHS	M. Cappuccilli	Circle Technology	Results of SCDHS inspection noting violations of Article 12 storage of toxic and hazardous materials provisions.
08/20/87	Notice of Violation	R. Seyfarth	SCDHS	Circle Technology (CTI)	Circle Technology (CTI)	Notice of violation that samples collected 07/22/87 from storm drain had contaminants exceeding ECL and SC sanitary code limits.
08/87	Report	Roux Associates	Roux Associates	NYSDEC	NYSDEC	Phase I Investigation Report: CTI Metal Finishing Performed HRS Ranking and Recommended Phase II Investigation.
12/10/87	Correspondence	R. Seyfarth	SCDHS	M & P Cappuccilli	T & S Metals	Confirmation of site abandonment and notification of the need to remove all materials from site.
12/17/87	Industrial Waste & Hazardous Material Control Report	SCDHS	SCDHS	CTI Metals	CTI Metals	Results of Article 12 violations found during search warrant inspection.
01/11/88	Correspondence	R. Seyfarth	SCDHS	M & P Cappuccilli	T & S Metals	Notice of violation that samples collected from sanitary system on 12/17/87 had contaminant levels above maximum allowable discharge limits. Addressed directed to pump out system.

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<i>Date</i>	<i>Document</i>	<i>From</i>	<i>Of</i>	<i>To</i>	<i>Of</i>	<i>Contents (1)</i>
02/18/88	Correspondence	R. Seyfarth	SCDHS	N. Budofsky	Owner	Correspondence informs owner that his tenants (M & P Cappuccilli) have not proceeded on the mandated cleanup and that the responsibility now falls to the land owner.
03/11/88	Industrial Waste & Hazardous Material Control Report	SCDHS	SCDHS	File	NA	Indicates that criminal investigation of former owner of CTI Metals is underway. Former owner may agree to pay for site cleanup as part of a plea bargain.
03/23/88	Correspondence	P. Perrella	SCDA	L.J. Iannarone	SCDHS	Correspondence outlines details of the plea bargain with P. Cappuccilli, responsibilities, schedules, fines and cleanup.
04/88	Phase I Investigation Report	Roux Associates	Roux Associates	NYSDEC	NYSDEC	Phase I Report includes site history, site hydrogeology, a preliminary HRS and recommendations for additional work.
04/06/88	Correspondence	J. Merson	Attorney	P. Perrella	Attorney	Advises and requests that the Plea Bargain Agreements be modified slightly to protect the property owners. Illegal abandonment of the site by the tenants resulted in loss of rental income. Continued income loss until site clean up is completed.
10/05/88	Correspondence	J.M. Merson	Counsel	T.V. Mallon	SC Supreme Court	Letter seeks to reimburse landowners of the cleanup efforts they voluntarily made on behalf of their tenants.

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<i>Date</i>	<i>Document</i>	<i>From</i>	<i>Of</i>	<i>To</i>	<i>Of</i>	<i>Contents (1)</i>
10/26/88	Correspondence	J.M. Merson	Attorney	L. Iannanne	Mullen & Iannarone	Document cites legal action against CTI tenants and provides a general scope of services for site cleanup. Costs to the owner for the cleanup are proposed to come from fines assessed against the tenants.
03/02/89	Correspondence	R.J. Owens	NYSDEC	N. Budofsky	CTI	Notifies recipient that under state Superfund Law, DEC is planning a Phase II investigation including the collection of samples. Correspondence offers recipient the opportunity to conduct the investigation themselves.
04/13/90	Correspondence	H. Voigt	NYSDEC	B. McElroy	Attorney	Document contains draft of the Phase II Order of Consent between the State and Budofsky's with instructions on how to expedite the regulation process.
05/21/91	Correspondence	R. Seyfarth	SCDHS	A. Candella	NYSDEC	Letter advises DEC of complaint by present tenant of building that residue from ceiling possibly plating salts was falling from the ceiling and that unknown liquid was seeping through the building's south wall.
06/17/91	Correspondence	Pristine Motors	Pristine Motors	N. Budofsky	N. Budofsky	Informs owner that tenant of 333 Skidmore Road had to evacuate from the premises for reasons known to the owner.
06/92	Phase II Investigation Report	Richard Galli, P.E.	Richard Galli, P.E.	NYSDEC	NYSDEC	Phase II Report includes site description, reconnaissance, results of boring and well installations and laboratory analysis.

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Grant Hardware Work Assignment
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Date	Document	From	Of	To	Of	Contents (1)
07/28/92	Correspondence	E. Barcomb	NYSDEC	N. Budofsky	CTI	Notifies owners of NYSDEC's plan to conduct PSA and requests data on waste generation and practices on the site.
08/04/92	Correspondence	J. Swartout	NYSDEC	N. Budofsky	CTI	Based on the consideration that CTI is planning to undertake a Phase II investigation under a DEC Consent Order, the PSA is being postponed.
05/10/94	Correspondence	J. Olm	NYSDOH	E. Eaton	NYSDEC	Comments to PSA Work Plan.

NOTE:

(1) - This section provides a brief summary of the contents of each selected document. The reader is advised to thoroughly examine the complete document and/or file for complete evaluation, interpretation and intent of said document and/or file.

drains and septic systems. Analysis of samples collected after this remedial action by SCDHS in June of 1986 indicated that contamination was still present and SCDHS ordered a second pump out. In the Spring of 1988, the site owners conducted the second pumpout of storm drains and septic systems given that T&S Metals and CTI Metals had abandoned the site.

Site inspections conducted by SCDHS identified a number of discharges to onsite storm drains/sanitary systems by T&S/CTI Metals in violation of SCDHS Article 12 of Suffolk County's sanitary code. In March of 1983, SCDHS documented a garden hose originating inside the building discharging a sulfuric acid waste to storm drains. In January of 1987, SCDHS conducted an inspection of the site and found numerous Article 12 violations with regard to storage of toxic and hazardous materials. In December of 1987, SCDHS conducted a search warrant inspection of the T&S/CTI Metals facility, which was previously abandoned by the business owners, and found leaking drums and residue around other drums. Also stains on floors and walls within the site building were observed. Available records do not indicate what the residue or staining was actually composed of.

Under subcontract with NYSDEC, Roux Associates completed a Phase I Investigation Report of the CTI Metals site in 1987. Roux Associates recommended that a Phase II Investigation be performed, given that available information indicated hazardous wastes had been released into the environment producing a potential threat to groundwater quality. The Phase II Investigation was to consist of the installation of eight soil boring/monitoring wells and the collection of soil and groundwater samples for analysis. This Phase II Investigation apparently was never undertaken. However, under contract with property owners, R.D. Galli, PE., PC. submitted a draft Work Plan to NYSDEC for review in June 1992. The scope of work in the R.D. Galli P.E., PC was inadequate and approval of the Work Plan was not granted by NYSDEC. The Phase II Investigation was never undertaken by the property owner.

(cti/sect1)

Section 2

Investigation Methods

2.1 Geoprobe Installation and Groundwater Sample Collection

Under subcontract with CDM, Direct Environmental Inc. completed ten geoprobe soil borings at the site, starting on December 20, 1994, and finishing the following day. All geoprobe work was completed under the supervision of a CDM geologist. Figure 1-2 provides the location of each Geoprobe boring. All borings were completed to a total depth of 21 feet below grade. Given a regional direction of groundwater flow of south to southeasterly, geoprobe locations GP-1 and GP-2 would be considered upgradient of the CTI/T&S Metal discharge points. The remaining geoprobes are lateral or downgradient of these past discharge points.

After reaching the depth of 21 feet, Direct Environmental Inc. exposed the Geoprobe screen point sampler in preparation for groundwater collection. After exposing the screen point, approximately one gallon of groundwater was purged from the screen using a foot valve and sample tube to draw groundwater through the screen prior to collecting a sample for chemical analysis. No soil samples were collected during the completion of each probe.

After collection of each groundwater sample, the Geoprobe boring was backfilled and, if placed in the asphalt pavement, an asphalt patch was used to fill the borehole flush with the surrounding asphalt.

Analysis of groundwater samples completed by Energy Environmental Engineering, Inc. (E3I) under subcontract with CDM and included volatile organic compounds (VOC's), semivolatile organic compounds (Semi VOAs), pesticides/PCBs, Target Compound List (TCL) metals and total suspended solids (TSS). A blind duplicate sample was collected from Geoprobe GP-3 and labeled as GP-11. A matrix spike/matrix spike duplicate (MS/MSD) sample was collected from Geoprobe GP-4. One trip blank was provided by E3I along with the sample containers and analyzed for VOC's. Analysis of samples were completed in accordance with NYSDEC Analytical Service Protocol (ASP), December 1991. E3I's data package is provided in Appendix C. Section 4.0 discusses the results of groundwater sample analysis.

All Geoprobe equipment was decontaminated by Direct Environmental, using an Alconox detergent/water solution with a potable rinse before the completion of each Geoprobe boring. All plastic tubing used in the collection of groundwater samples was discarded after one use to avoid cross-contamination.

2.2 Dry Well Sampling

CDM collected sludge samples from the bottom of two onsite dry wells on December 21, 1994. Samples were collected using a decontaminated sludge sampler. The location of each dry well sampled is provided in Figure 1-2.

The cooler containing the dry well samples collected on December 21, 1994, was delivered to the wrong address by the overnight carrier service and opened, resulting in the break of chain of custody procedures. As a result, analysis of these samples would not be valid and therefore resampling was required.

On June 1, 1995, CDM completed the resampling of the same dry wells. Dry well sample DW-1 was collected from the bottom of a dry well located directly in front of the tenant space previously used by CTI/T&S Metals. The dry well had a steel manhole cover and is assumed to be connected to the onsite storm drain system. DW-1 consisted of a dried clay/sludge indicating that the dry well had not recently received any storm water. DW-2 was collected from the bottom of a storm drain dry well with a "grated" manhole cover located approximately 30 feet southeast of DW-1. The storm drain had approximately one foot of standing water within it. Sample DW-2 consisted of a sediment sludge located below the standing water. Samples were analyzed by E3I for VOA's, semi VOA's, Pest/PCB's and metals. Discussion of analytical results is provided in Section 4.0.

Note that the labeling of the two dry well samples were inadvertently reversed in the field. This reversal in the sample label has been corrected in this report, however, the reader should note that the E3I analytical data report for the drywell samples provided in the Supporting Documentation Analytical Data package does not include this correction.

2.3 Site Survey

In March of 1995, OM P. Popli, a New York licensed surveyor of Rochester, New York, completed a site survey of the CTI Metals site. All property line and right-of-ways were based on Suffolk County tax maps. The horizontal location of the Geoprobe boring was also surveyed. All elevations provided by the surveyor are based on using a bench mark with an assumed elevation of 100 feet above mean sea level (MSL). Figure 1-2 is the end product of this surveying task.

2.6 Data Validation

Under contract with CDM, ChemWorld Environmental Inc. completed data validation of E3I's analytical data package. The validation was conducted on all data for the eleven groundwater samples and associated QA/QC samples in accordance with USEPA Region II Organic Data Validation Checklists/Guidelines, January 1992, and NYSDEC ASP, December 1991. ChemWorld

Environmental Inc. provided CDM with a summary report dated May 1995 for the eleven groundwater samples which is presented as Appendix D of this report. ChemWorld Environmental Inc. submitted a second report dated August, 1995 for the two drywell samples collected by CDM in June of 1995. Significant validation findings are discussed in Section 4.0.

(divsect2)

Section 3

Physical Characteristics of the Study Area

3.1 Topography

The site is flat with no apparent slope. Based on Figure 1-1, the site is approximately 55 feet above mean sea level (MSL). Surrounding properties are also flat with no apparent slope. Review of Figure 1-1 indicates that the area surrounding the CTI Metals site gently slopes to the south. Located approximately 1,500 feet east of the site is Sampawams Creek.

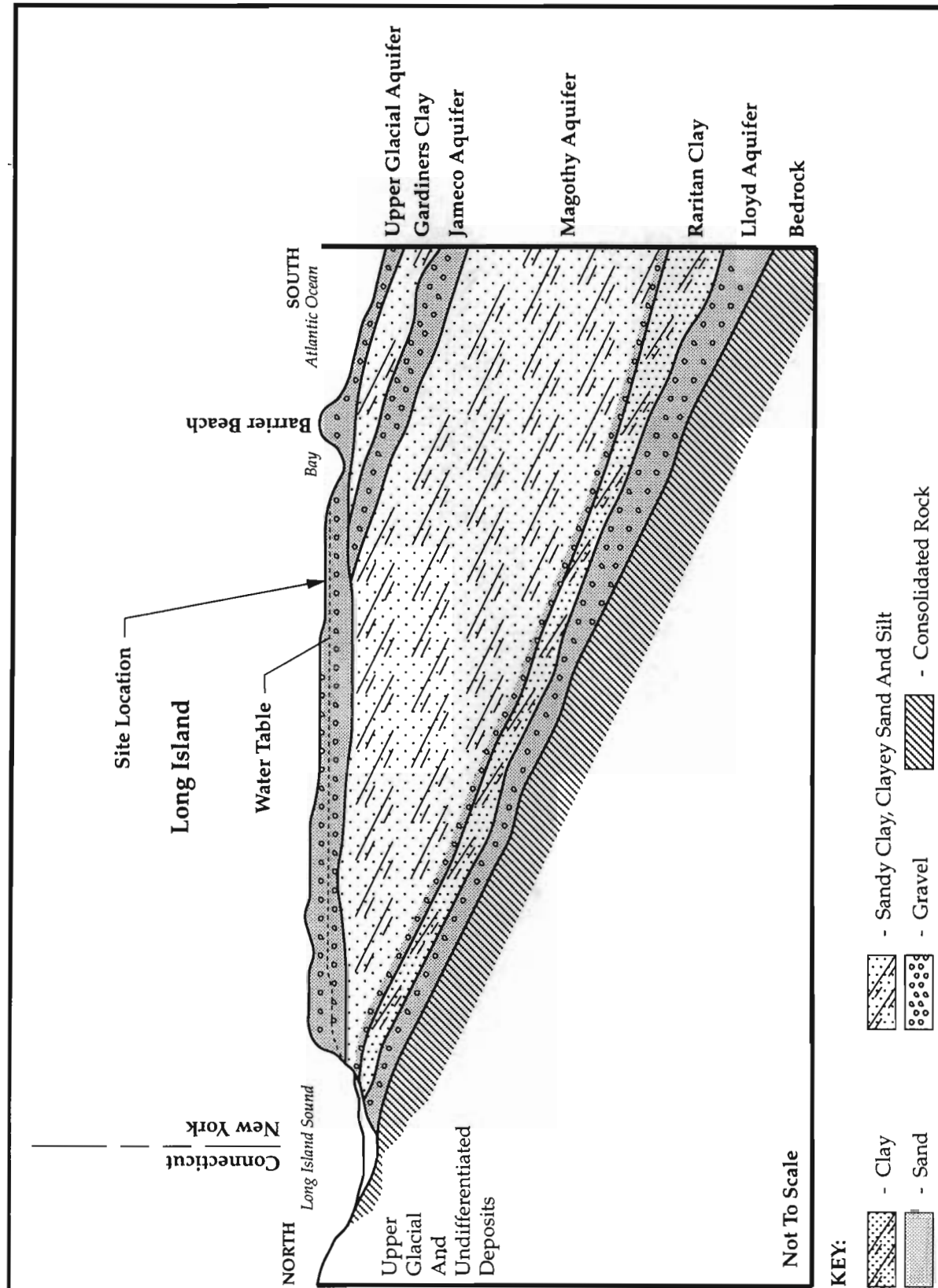
3.2 Regional Hydrogeology

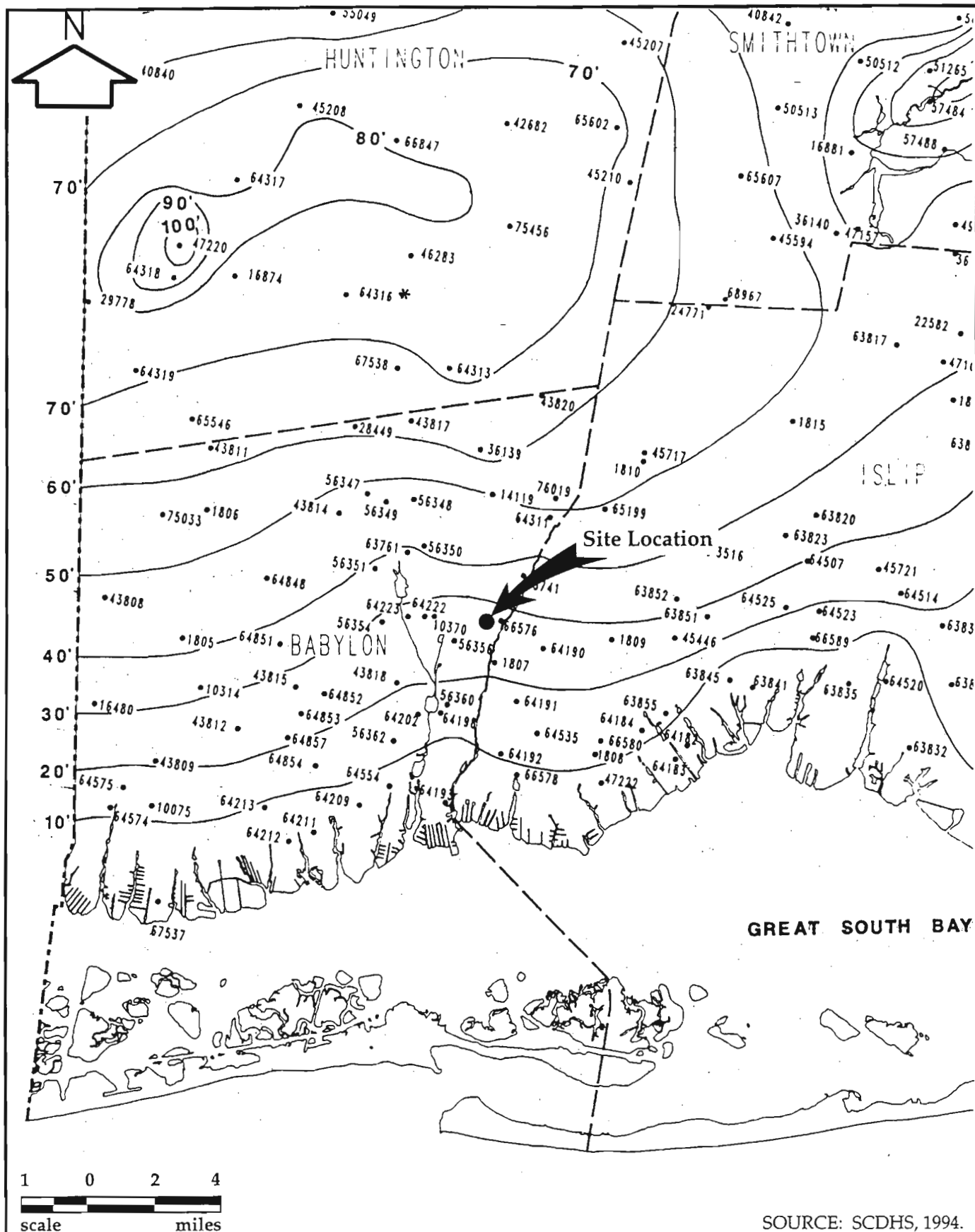
The CTI Metals site is located in an area of Suffolk County, New York, consisting of a relatively flat, gently south sloping, glacial outwash plain. Beneath the site area are unconsolidated sediments of Pleistocene and Cretaceous age, as shown in Figure 3-1.

The area is directly underlain by glacial outwash deposits consisting underlain by glacial outwash deposits consisting of highly permeable fine to coarse quartzitic sands with gravel. These glacial deposits comprise the Upper Glacial aquifer and are approximately 120 feet thick within the site area. Porosity within such deposits can be as high as 30 to 40 percent (Veatch et al, 1906) and average hydraulic conductivities of 1.8×10^5 gpd/ft², and transmissivities of 2.3×10^5 gpd/ft are common (McClymonds & Franke, 1972).

Below the Upper Glacial aquifer lies the Magothy aquifer consisting of Cretaceous aged high to moderately permeable sands, silts, and gravels. The Magothy aquifer is over 800 feet thick within the site area and is the primary source of drinking water for Suffolk County residents. The Magothy aquifer has an estimated horizontal hydraulic conductivity of 50 ft/day (1.7×10^{-10} cm/sec) but individual sandy and gravelly beds may have values four to five times higher (Kimmel & Braids, USGS Prof. Paper 1085).

The Raritan Clay consisting of Cretaceous aged deltaic clay and silty clay beds underlie the Magothy aquifer and acts as an effective aquiclude or confining unit having a hydraulic conductivity of approximately 1.0×10^{-3} ft/day. Below the Raritan Clay is the Lloyd Sand member which lies unconformably on Pre-Cambrian aged bedrock and is of Cretaceous age. It is composed of highly variable sands, gravels, and clays of a deltaic origin and has a moderate hydraulic conductivity of 40 ft/day (1.3×10^{-2} cm/sec) (Kimmel & Braids, USGS Prof. Paper 1085). The Lloyd Sand member, or Lloyd aquifer, is presently a minor source of drinking water within Suffolk County due primarily to its extreme depth.





CDM

environmental engineers, scientists,
planners & management consultants

Preliminary Site Assessment Report
CTI Metals, Deer Park, New York
NYSDEC Site ID #152115
Water Table Contour Map
Suffolk County, New York, 1993

Figure 3-2

According to the groundwater contour map provided as Figure 3-2 obtained from the Suffolk County Department of Health Service (SCDHS), groundwater within the general area of the site flows in a south-southeasterly direction. Groundwater velocities (horizontal) within the Upper Glacial aquifer range between one (1) and four (4) feet/day (McClymonds & Franke, 1972.). Based on completed Geoprobe borings, depth to water is between 17 and 19 feet below grade at the site.

Groundwater is the exclusive source of public drinking water within Suffolk County. According to Roux Associate's Phase I Investigation report, located within a 3-mile radius of the site are approximately 100 public-supply and observation wells (39 public-supply and 60 observation wells). Four public supply-wells are screened in the Upper Glacial aquifer and 35 wells pump from the Magothy aquifer. A public-supply well S-30714 is located approximately 1200 feet northeast (upgradient) of the site. Six pumping wells are located downgradient of the site within a 3-mile radius. The closest well S-22389, which pumps from the Magothy aquifer, is about 1/2 mile southeast of the site (USGS, 1987). Each pumping well in the study area supplies an estimated 3,500 people with drinking water (SCWA, 1986).

(dt/sect3)

Section 4

Nature and Extent of Contamination

Table 4-1 provides a summary of analysis for collected groundwater samples. Table 4-2 provides a summary of analysis for collected dry well samples.

The analytical summary tables include all compounds detected in a given sample set. Positive detections that are below the contract required quantitation limit (CRQL), designated as an estimated concentration "J", as well as detections above the CRQL have been highlighted for all organic analysis.

Also included in the summary tables are compounds that were not detected but the analytical quantitation limits are reported as estimated quantities and qualified as "UJ" due to variances in quality control limits. Footnotes for other data qualifiers are provided in the tables. Finally, all groundwater sample results are compared to NYSDEC Class GA groundwater discharge standards/guidance values currently in place for each detected compound or non-detected compound qualified as "UJ".

Analysis of collected samples included:

- Volatile Organic Compounds
- Semi Volatile Organic Compounds
- Pesticides and PCB's
- TCL Metals

Analysis of samples was completed by Energy & Environmental Engineering Inc. (E3I) in accordance with NYSDEC ASP protocols, December 1991.

4.1 Groundwater Quality

Volatile organic compound (VOC) analysis of collected groundwater samples detected a number of VOC's at estimated concentrations. The groundwater sample collected from Geoprobe boring GP-4 located immediately downgradient of a site storm drain suspected of receiving wastes from CTI Metals contained tetrachloroethene at an estimated concentration of 0.7 ug/l and toluene at 0.8 ug/l. Geoprobe GP-6 groundwater sample contained benzene at a concentration of 0.6 ug/l, toluene at 2 ug/l and total xylene at 0.9 ug/l, all at estimated concentrations. GP-6 is located immediately downgradient of a second storm drain suspected of receiving wastes. No VOCs were detected in either upgradient geoprobes GP-1 or GP-2. The trip

TABLE 4-1
GROUNDWATER ANALYTICAL SUMMARY TABLE
CTI METALS

Volatiles Parameters		(All values reported In ug/l)																								Trip Blank
		GA Standard	Q	GP-1	Q	GP-2	Q	GP-11 (GP-3 Dup.)	Q	GP-3	Q	GP-4	Q	GP-5	Q	GP-6	Q	GP-7	Q	GP-8	Q	GP-9	Q	GP-10	Q	
Chloromethane		NONE		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10
Vinyl Chloride		2 S		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10
Chloroethane		5 S		10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	UJ	10	U	10
Methylene Chloride		5 S		10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10
Acetone		5 S		10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	UJ	10	U	10
Carbon Disulfide		5 S		10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	UJ	10	U	7
Benzene		0.7 S		10	U	10	U	10	U	10	U	10	U	10	U	0.6 J	10	U	10	U	10	U	10	U	10	U
Tetrachloroethene		5 S		10	U	10	U	10	U	10	U	0.7 J	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Toluene		5 S		10	U	10	U	10	U	10	U	0.8 J	10	U	2 J	10	U	10	U	10	U	10	U	10	U	10
Total Xylenes		5 S		10	U	10	U	10	U	10	U	10	U	10	U	0.9 J	10	U	10	U	10	U	10	U	10	U

SemiVolatiles Parameters	(All values reported in ug/l)																							
	GA Standard	Q	GP-1	Q	GP-2	Q	GP-11 (GP-3 Dup.)	Q	GP-3	Q	GP-4	Q	GP-5	Q	GP-6	Q	GP-7	Q	GP-8	Q	GP-9	Q	GP-10	Q
bis (2-chloroethyl) ether	1 G		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
2-Methylphenol	NONE		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
bis(2-Chloroisopropyl)ether	5 S		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
4-methylphenol	NONE		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
4-chloro-3-methylphenol	NONE		10	UJ	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
3-Nitroaniline	5 S		25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ
2,4-Dinitrophenol	NONE		25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	U	25	UJ
4-Nitrophenol	NONE		25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ
Diethylphthalate	50 G		10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
4-Nitroaniline	5 S		25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ
4,6-Dinitro-2-methylphenol	NONE		25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	UJ	25	U	25	U	25	U
Carbazole	NONE		10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Di-n-butylphthalate	50 S		10	U	10	U	10	U	10	U	10	U	10	U	10	U	22	U	21	U	10	U	10	U
3,3'-Dichlorobenzidine	5 S		10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	UJ	10	UJ	10	UJ
bis(2-ethylhexyl)phthalate	50 S		10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Di-n-octyl phthalate	50 G		10	UJ	10	U	10	UJ	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U

NOTES:

* GA Standard = Groundwater Discharge Standards, 6NYCRR Parts 700-705

S = Standard

G = Guidance Value

NONE = No Standard or Guidance Value

ND = GA Standard is below detection limit

Organic Data Qualifiers:

J = The associated numerical value is an estimated quantity.

U = The compound was analyzed for but not detected at or above the Contract Required Quantitation Limit (CRQL), or the compound is not detected due to qualification through the method or field blank.

UJ = The compound was analyzed for, but not detected. The sample quantitation limit is an estimated quantity due to variance in quality control limits.

TABLE 4-1 (continued)
GROUNDWATER ANALYTICAL SUMMARY TABLE
CTI METALS

Pesticides/PCBs Parameters	(All values reported in ug/l)																							
	GA Standard	Q	GP-1	Q	GP-2	Q	GP-11 (GP-3 Dup.)	Q	GP-3	Q	GP-4	Q	GP-5	Q	GP-6	Q	GP-7	Q	GP-8	Q	GP-9	Q	GP-10	Q
alpha-BHC	ND		0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ
beta-BHC	ND		0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ
delta-BHC	ND		0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ
gamma-BHC(Lindane)	ND		0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ
Heptachlor	ND		0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ
Aldrin	NONE		0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ
Heptachlor Epoxide	ND		0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ
Endosulfan I	NONE		0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ
Dieldrin	ND		0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ
4,4'-DDE	ND		0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ
Endrin	ND		0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.027	JN	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ
Endosulfan II	NONE		0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ
4,4'-DDD	ND		0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ
Endosulfan Sulfate	NONE		0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ
4,4'-DDT	ND		0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ
Methoxychlor		35 S	0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ	0.21	J	0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ
Endrin Ketone	NONE		0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.070	JN	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ
Endrin Aldehyde		5 S	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ	0.10	UJ
alpha-chlordane	NONE		0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ	0.0093	J	0.018	J	0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ
gamma-chlordane	NONE		0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ	0.50	UJ
Toxaphene	NONE		5.00	UJ	5.00	UJ	5.00	UJ	5.00	UJ	5.00	UJ	5.00	UJ	5.00	UJ	5.00	UJ	5.00	UJ	5.00	UJ	5.00	UJ
Aroclor-1016		0.1 S	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ
Aroclor-1221		0.1 S	2.00	UJ	2.00	UJ	2.00	UJ	2.00	UJ	2.00	UJ	2.00	UJ	2.00	UJ	2.00	UJ	2.00	UJ	2.00	UJ	2.00	UJ
Aroclor-1232		0.1 S	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ
Aroclor-1242		0.1 S	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ
Aroclor-1248		0.1 S	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ
Aroclor-1254		0.1 S	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ
Aroclor-1260		0.1 S	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ	1.00	UJ

NOTES:

- * GA Standard = Groundwater Discharge Standards, 6NYCRR Parts 700-705
- S = Standard
- G = Guidance Value
- NONE = No Standard or Guidance Value
- ND = GA Standard is below detection limit

Organic Data Qualifiers: J = The associated numerical value is an estimated quantity.
U = The compound was analyzed for but not detected at or above the Contract Required Quantitation Limit (CRQL), or the compound is not detected due to qualification through the method or field blank.
UJ = The compound was analyzed for, but not detected. The sample quantitation limit is an estimated quantity due to variance in quality control limits.
JN = Tentatively identified with approximated concentrations.

TABLE 4-1 (continued)
GROUNDWATER ANALYTICAL SUMMARY TABLE
CTI METALS

Inorganics		(All values reported in ug/l)																							
Parameters	IGA Standard	Q	GP-1	Q	GP-2	Q	GP-11 (GP-3 Dup.)	Q	GP-3	Q	GP-4	Q	GP-5	Q	GP-6	Q	GP-7	Q	GP-8	Q	GP-9	Q	GP-10	Q	
Aluminum	100	S	1060.00		1190.00			277.00		384.00		3090.00		103.00	B	1910.00		1770.00		994.00		4290.00		18000.00	
Antimony	3	G	58.00	U	58.00	U	58.00	U	58.00	U	58.00	U	58.00	U	60.50	U	58.00	U	58.00	U	58.00	U	58.00	U	
Arsenic	25	S	1.70	U	1.70	U	1.70	U	1.70	U	1.80	J	1.70	U	1.70	U	1.70	U	1.70	U	1.90	J	9.00	J	
Barium	1000	S	23.00	B	6.00	B	10.00	B	11.00	B	19.00	B	16.00	B	17.00	B	27.00	B	31.00	B	32.00	B	63.00	B	
Beryllium	3	G	1.10	U	1.10	U	1.10	U	1.10	U	1.10	U	1.10	U	1.10	U	1.10	U	1.10	U	1.10	U	1.30	B	
Cadmium	10	S	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	114.00		139.00		
Calcium	NONE		14800.00		13200.00		9750.00		12600.00		13800.00		11200.00		11000.00		15700.00		14200.00		16200.00		13500.00		
Chromium	50	S	9.10	B	7.50	B	6.70	U	6.70	U	17.70	U	6.70	U	64.00	U	36.30		58.10		248.00		1170.00		
Cobalt	NONE		9.30	U	9.30	U	9.30	U	9.30	U	9.30	U	9.30	U	12.40	B	11.90	B	9.30	U	9.30	U	9.30	U	
Copper	200	S	8.70	B	10.60	B	7.80	U	7.80	U	11.70	B	7.80	U	22.70	B	7.80	U	10.80	B	24.00	B	175.00	U	
Iron	300	S	3790.00		1530.00		2010.00		2020.00		7320.00		1270.00		6250.00		4800.00		10400.00		15300.00		45200.00		
Lead	25	S	1.10	U	1.10	U	1.10	U	1.10	U	1.10	U	1.10	U	9.70	J	2.20	J	1.70	J	3.60	J	53.90	J	
Magnesium	35000	G	2870.00	B	1970.00	B	2280.00	B	2620.00	B	2580.00	B	2410.00	B	2630.00	B	2770.00	B	3070.00	B	2900.00	B	3620.00	B	
Manganese	300	S	205.00		321.00		103.00		111.00		563.00		57.00		298.00		481.00		222.00		609.00		702.00		
Mercury	2	S	0.45	J	0.33	J	0.37	J	0.41	J	1.80	J	0.54	J	1.50	J	0.42	J	0.53	J	0.73	J	3.20	J	
Nickel	NONE		9.40	U	9.40	U	9.40	U	9.40	U	9.40	U	9.40	U	15.10	B	9.40	U	17.30	B	65.40		83.00		
Potassium	NONE		3850.00	B	2400.00	B	2340.00	B	2090.00	B	3420.00	B	1990.00	B	1660.00	B	3320.00	B	3750.00	B	2990.00	B	3770.00	B	
Sodium	20000	S	19900.00		10700.00		8020.00		8600.00		11700.00		14800.00		9580.00		10300.00		14300.00		11400.00		11600.00		
Thallium	4	G	1.80	UJ	18.00	UJ	1.80	UJ	18.00	UJ	18.00	UJ	1.80	UJ	1.80	UJ	1.80	UJ	1.80	UJ	1.80	UJ	1.80	UJ	
Vanadium	NONE		13.70	U	13.70	U	13.70	U	13.70	U	13.70	U	13.70	U	13.70	U	13.70	U	13.70	U	14.10	B	28.10	B	
Zinc	300	S	28.90		29.60		5.50	B	5.90	B	16.20	B	4.90	U	8.00	B	36.40		191.00		45.00		322.00		

Total Suspended Solids		(All values reported in mg/l)																							
Parameters	GA Standard*	Q	GP-1	Q	GP-2	Q	GP-11 (GP-3 Dup.)	Q	GP-3	Q	GP-4	Q	GP-5	Q	GP-6	Q	GP-7	Q	GP-8	Q	GP-9	Q	GP-10	Q	
TSS	NONE		5	U	5	U	77		46		896		59		487		626		25		164		25		

NOTES:

* GA Standard = Groundwater Discharge Standards, 6NYCRR Parts 700-705

S = Standard
G = Guidance Value
NONE = No Standard or Guidance Value
ND = GA Standard is below detection limit

Inorganic Data Qualifiers:

J = The reported value is estimated due to variance from quality control limits.
U = Analyte was not detected at or below the Contract Required Detection Limit (CRDL), or the compound is not detected due to qualification through the method or field blank.
UJ = The element was analyzed for, but not detected. The sample quantitation limit is an estimate due to variance in quality control limits.
B = Indicates analyte result is between Instrument Detection Limit (IDL) and CRDL.

blank contained carbondisulfide at 7 ug/l. Tetrachloroethene is an organic solvent with a wide range of uses, including metal degreasing and drycleaning solvent. Toluene, benzene and total xylene are typically associated with petroleum contamination.

No semivolatile organic compounds were detected in collected groundwater samples, with the exception of upgradient GP-1, exhibiting diethylphthalate at an estimated concentration of 1 ug/l. Phthalate compounds are typically associated with plastic manufacturing and processing. Several pesticide compounds were detected at estimated concentrations including Aldrin at 0.0082 ug/l, methoxychlor 0.21 ug/l, endrin ketone 0.07 ug/l, alpha-chlordane 0.012 ug/l in GP-6. PCB's were not detected in any collected groundwater samples.

Inorganic analysis indicates significant concentrations of a number of heavy metals within groundwater samples collected from GP-10 and to a lesser degree GP-9. Both Geoprobe borings are located immediately downgradient of the onsite septic system which is suspected of receiving waste discharges from CTI/T&S Metals. Chromium was detected in GP-10 at 1,170 ug/l and in GP-9 at 248 ug/l. The NYSDEC Class GA groundwater standard for chromium is 50 ug/l. Cadmium was detected in GP-10 and GP-9 at 139 ug/l and 114 ug/l, respectively. The GA standard for cadmium is 10 ug/l. Other exceedances of GA standards included lead, mercury in GP-10 and iron and manganese in both GP-9 and GP-10 groundwater samples.

Total suspended solids (TSS) analysis of collected groundwater samples indicate significantly higher TSS levels in onsite groundwater than upgradient groundwater. The highest observed TSS levels were observed in GP-4 (896 mg/l), GP-6 (487 mg/l) and GP-7 at 626 mg/l. GP-4 and 6 are both located immediately downgradient of onsite stormdrains and GP-7 is located immediately downgradient of the onsite septic system. Upgradient TSS was less than 5 mg/l.

4.1.1 Chromium Speciation in Groundwater

Chromium has two stable oxidation states, hexavalent chromium (Cr^{+6}) and trivalent chromium (Cr^{+3}). Chromium speciation within groundwater will be dependant on the oxidation-reduction potential (Eh) and pH of the groundwater (T. Henderson, Groundwater, 1994). The more mobile Cr^{+6} predominates in oxidizing environments, while the less toxic and relatively immobile Cr^{+3} is restricted to reducing environments. (A. Davis & R.L. Olsen, Groundwater, 1995). However, lab studies have demonstrated that Cr^{+6} species can be readily reduced in the presence of naturally occurring organic matter, ferrous (Fe^{+2}) iron and sulfate (T. Henderson, Groundwater 1994). Groundwater within the Upper Glacial aquifer is typically acidic with a pH of 5.5 to 6.5 but is highly oxidizing with dissolved oxygen levels averaging 10.5 mg/l (SCDHS, 1986), therefore it is likely the predominant chromium species

observed within groundwater samples GP-9 and GP-10 is Cr^{+6} . However, reducing conditions and the presence of organic matter associated with the nearby septic system may result in the reduction of Cr^{+6} to Cr^{+3} . Reduction of Cr^{+6} to Cr^{+3} results in the precipitation from solution of solid chromium hydroxide (T. Henderson, Groundwater, 1994). Therefore, if reducing conditions are present, the concentration of chromium within groundwater would be expected to decrease over time due to the precipitation process.

4.2 Dry Well Sampling

Note that the labeling of the two drywell samples were inadvertently reversed in the field. This reversal in sample labels was corrected in this report including Table 4-2. However, the E3I analytical data package does not include this correction.

VOC analysis of the dry well samples identified 2-butanone at a concentration of 5 ug/kg in dry well sample DW-1 and tetrachloroethene at an estimated concentration of 45 ug/kg in DW-2. Methylene chloride was detected in both samples and acetone was detected in DW-2, however, the presence of these compounds is attributed to laboratory contamination given they were also detected in laboratory blanks. As discussed previously, tetrachloroethene is an organic solvent with a wide range of uses. The VOC, 2-butanone is also an organic solvent with a wide range of uses, including an organic solvent and paint stripper.

Semi-volatile organic analysis identified a number of polynuclear aromatic hydrocarbons (PAHs) in both dry well samples, such as acenaphthene, fluorene, phenanthrene, fluoranthene, pyrene, chrysene, etc., up to a maximum concentration of 48,000 ug/kg (48 ppm) for fluoranthene detected in DW-1. PAH contamination is typically associated with fuel oil and other "heavy" petroleum products such as motor oils.

Pesticide analysis of the dry well samples identified 15 pesticide compounds at estimated concentrations in DW-2 and nine pesticide compounds at estimated concentrations in DW-1. The pesticide Endrin was detected in DW-1 at a concentration of 270 ug/kg which is greater than recommended clean up level of 100 ug/kg given in the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) entitled Determination of Soil Cleanup Objectives and Cleanup Levels, November 16, 1992. Data validation has determined results for delta-BHC in DW-2 and results for 4,4'-DDT unusable due to unacceptable differences between QA duplicate analysis performed on the dry well samples.

PCB analysis identified one PCB compound Aroclor-1254 at 8,000 ug/kg in DW-1. The NYSDEC cleanup level for PCBs for the protection of groundwater quality is 10,000 ug/kg or 10 ppm.

TABLE 4-2
 DRY WELL ANALYTICAL SUMMARY TABLE
 CTI METALS

Volatiles (All values reported in ug/kg)				
Parameters	DW-1	Q	DW-2	Q
Chloromethane	15	UJ	62	UJ
Bromomethane	15	UJ	62	UJ
Vinyl Chloride	15	UJ	62	UJ
Chloroethane	15	U	62	U
Methylene Chloride	15	U	62	U
Acetone	26	U	62	UJ
1,1-Dichloroethene	15	U	62	U
1,1-Dichloroethane	15	U	62	U
1,2-Dichloroethene (total)	15	U	62	U
Chloroform	15	U	62	U
1,2-Dichloroethane	15	U	62	U
2-Butanone	5	J	62	UJ
1,1,1-Trichloroethane	15	U	62	U
Carbon Tetrachloride	15	U	62	U
Bromodichloromethane	15	U	62	U
1,2-Dichloropropane	16	U	63	U
cis-1,3-Dichloropropene	17	U	64	U
Trichloroethene	18	U	65	U
Dibromochloromethane	19	U	66	U
1,1,2-Trichloroethane	15	U	62	U
Benzene	15	U	62	U
trans-1,3-Dichloropropane	15	U	62	U
Bromoform	15	U	62	U
4-Methyl-2-Pentanone	15	UJ	62	UJ
2-Hexanone	15	UJ	62	UJ
Tetrachloroethene	15	U	45	J
1,1,2,2-Tetrachloroethane	15	U	62	U
Toluene	15	U	62	U
Chlorobenzene	15	U	62	U
Ethylbenzene	15	U	62	U
Styrene	15	U	62	U
Total Xylenes	15	U	62	U

NOTES:

J = The associated numerical value is an estimated quantity

U = Analyzed for but not detected at or above the Contract Required Detection Limit (CRDL), or the compound was not detected due to qualification through the method or field blank.

UJ = The compound was analyzed for but no detected. The sample quantitation limit is an estimate due to variance in quality control limits.

TABLE 4-2
 DRY WELL ANALYTICAL SUMMARY TABLE
 CTI METALS

SemiVolatiles		(All values reported in ug/kg)		
Parameters	DW-1	Q	DW-2	Q
Phenol	10000	U	4200	U
bis (2-chloroethyl) ether	10000	U	4200	UJ
2-Chlorophenol	10000	U	4200	U
1,3-Dichlorobenzene	10000	U	4200	U
1,4-Dichlorobenzene	10000	U	4200	U
1,2-Dichlorobenzene	10000	U	4200	U
2-methylphenol	10000	U	4200	U
bis(2-Chloroisopropyl)ether	10000	U	4200	U
4-Methylphenol	10000	U	4200	U
N-Nitroso-Di-n-propylamine	10000	U	4200	U
Hexachloroethane	10000	U	4200	U
Nitrobenzene	10000	U	4200	U
Isophorone	10000	U	4200	U
2-Nitrophenol	10000	U	4200	U
2,4-Dimethylphenol	10000	U	4200	U
bis(-2-Chloroethoxy) Metha	10000	U	4200	U
2,4-Dichlorophenol	10000	U	4200	U
1,2,4-Trichlorobenzene	10000	U	4200	U
Napthalene	10000	U	4200	U
4-Chloroaniline	10000	U	4200	U
Hexachlorobutadiene	10000	U	4200	U
4-Chloro-3-methylphenol	10000	U	4200	U
2-Methylnapthalene	10000	U	4200	U
Hexachlorocyclopentadiene	10000	U	4200	U
2,4,6-Trichlorophenol	10000	U	4200	U
2,4,5-Trichlorophenol	25000	U	10000	U
2-Chloronapthalene	10000	U	4200	U
2-Nitroaniline	25000	U	10000	U
Dimethyl Phthalate	10000	U	4200	U
Acenaphthylene	10000	U	4200	U
2,6-Dinitrotoluene	10000	U	4200	U
3-Nitroaniline	25000	UJ	10000	UJ
Acenaphthene	780	J	420	U

NOTES:

J = The associated numerical value is an estimated quantity

U = Analyzed for but not detected at or above the Contract Required Detection Limit (CRDL), or the compound was not detected due to qualification through the method or field blank.

UJ = The compound was analyzed for but no detected. The sample quantitation limit is an estimate due to variance in quality control limits.

TABLE 4-2
 DRY WELL ANALYTICAL SUMMARY TABLE
 CTI METALS

SemiVolatiles (con't...) (All values reported in ug/kg)				
Parameters	DW-1	Q	DW-2	Q
2,4-Dinitrophenol	25000	U	10000	U
4-Nitrophenol	25000	U	10000	U
Dibenzofuran	10000	U	4200	U
2,4-Dinitrotoluene	10000	U	4200	U
Diethylphthalate	10000	U	4200	U
4-Chlorophenyl-phenylether	10000	U	4200	U
Fluorene	1500	J	4200	U
4-Nitroaniline	25000	UJ	10000	U
4,6-Dinitro-2-methylphenol	25000	U	10000	U
N-Nitrosodiphenylamine	10000	UJ	4200	U
4-Bromophenyl-phenylether	10000	U	4200	U
Hexachlorobenzene	10000	U	4200	U
Pentachlorophenol	25000	U	10000	U
Phenanthrene	21000		5400	
Anthracene	2100	J	660	J
Carbazole	11000	J	4500	
Di-n-butylphthalate	6300	J	13000	B
Fuoranthene	48000		8900	
Pyrene	37000		7800	
Butylbenzylphthalate	5200	J	840	J
3,3'-Dichlorobenzidine	10000	U	4200	U
Benzo(a)anthracene	23000		4700	
Chrysene	25000		5700	
Bis (2-ethylhexyl) Phthalate	30000		1500	J
Di-n-octyl Phthalate	1000	J	4200	U
Benzo(b)fluoranthene	31000		7000	
Benzo(k)fluoranthene	19000		4800	
Bezo(a)pyrene	19000		5100	
Indeno(1,2,3-cd) Pyrene	18000		2800	J
Dibenzo(a,h) Anthracene	5700	J	930	J
Benzo (g,h,i) Perylene	18000		1800	J

NOTES:

- J = The associated numerical value is an estimated quantity
- U = Analyzed for but not detected at or above the Contract Required Detection Limit (CRDL), or the compound was not detected due to qualification through the method or field blank.
- UJ = The compound was analyzed for but no detected. The sample quantitation limit is an estimate due to variance in quality control limits.
- B = Compound was also detected in the laboratory blank.

TABLE 4-2
DRY WELL ANALYTICAL SUMMARY TABLE
CTI METALS

Pesticides/PCBs		(All values reported in ug/kg)		
Parameters	DW-1	Q	DW-2	Q
alpha-BHC	7.9	JN	10	UJ
beta-BHC	2.5	UJ	10	UJ
delta-BHC	5.7	R	14	JN
gamma-BHC (Lindane)	2.5	UJ	10	UJ
Heptachlor	13	J	10	UJ
Aldrin	63	E	12	JN
Heptachlor Epoxide	2.5	UJ	16	J
Endosulfan I	2.5	UJ	10	UJ
Dieldrin	5.1	UJ	67	JN
4,4'-DDE	5.1	UJ	20	JN
Endrin	270	E	32	JN
Endosulfan II	5.1	UJ	23	JN
4,4'-DDD	120	E	36	JN
Endosulfan Sulfate	55	JN	21	UJ
4,4'-DDT	5.1	R	21	R
Methoxychlor	25	UJ	52	JN
Endrin Ketone	5.1	UJ	21	UJ
Endrin Aldehyde	5.1	UJ	21	UJ
alpha-chlordane	2.5	UJ	34	JN
gamma-chlordane	81	E	28	JN
Toxaphene	250	UJ	1000	UJ
Aroclor-1016	51	UJ	210	UJ
Aroclor-1221	100	UJ	420	UJ
Aroclor-1232	51	UJ	210	UJ
Aroclor-1242	51	UJ	210	UJ
Aroclor-1248	51	UJ	210	UJ
Aroclor-1254	8000	E	210	UJ
Aroclor-1260	51	UJ	210	UJ

NOTES:

J = The associated numerical value is an estimated quantity

U = Analyzed for but not detected at or above the Contract Required Detection Limit (CRDL), or the compound was not detected due to qualification through the method or field blank.

UJ = The compound was analyzed for but not detected. The sample quantitation limit is an estimate due to variance in quality control limits.

JN = Tentatively identified with approximate concentrations (Volatile and Semi-Volatile Organics)

R = Reported value is unusable and rejected due to variance from quality control limits.

E = Reported value is estimated due to quantitation above the calibration range.

TABLE 4-2
 DRY WELL ANALYTICAL SUMMARY TABLE
 CTI METALS

Inorganics		(All values reported in ug/kg)		
Parameters	DW-1	Q	DW-2	Q
Aluminum	6800.00		171000.00	
Antimony	2.70	B	16.00	B
Arsenic	1.30	UJ	17.90	J
Barium	35.80	B	45.20	B
Beryllium	0.27	B	0.45	U
Cadmium	111.00		158.00	
Calcium	2530.00		768.00	B
Chromium	333.00		2230.00	
Cobalt	4.30	B	7.70	B
Copper	324.00		1270.00	
Iron	12700.00	J	14700.00	J
Lead	136.00		764.00	
Magnesium	2100.00		1390.00	B
Manganese	65.00		115.00	
Mercury	0.16	U	8.60	J
Nickel	29.30		27.10	B
Potassium	236.00	B	371.00	B
Selenium	0.86	R	15.50	J
Silver	0.89	B	4.80	B
Sodium	48.30	B	155.00	B
Thallium	1.70	U	5.20	U
Vanadium	21.20		34.10	B
Zinc	552.00	J	624.00	J

NOTES:

J = Reported value is estimated due to variance from quality control limits.

U = Analyzed for but not detected at or above the Contract Required Detection Limit (CRDL), or the compound was not detected due to qualification through the method or field blank.

UJ = The element was analyzed for but no detected. The sample quantitation limit is an estimate due to variance in quality control limits.

B = Analyte result is between Instrument Detection Limit (IDL) and CRDL.

R = Reported value is unusable and rejected due to variance from quality control limits.

Inorganic analysis identified a number of metals at elevated concentrations in both dry well samples. Cadmium was identified in DW-1 at 111 ug/kg and 158 ug/kg at DW-2, chromium was detected at 333 ug/kg in DW-1 and 2,230 ug/kg in DW-2. However, the observed concentrations are well below the NYSDEC cleanup levels of 10,000 ug/kg for chromium and 1,000 ug/kg for cadmium. The remaining inorganic parameters were below detection levels or within typical background concentrations for Long Island soils.

(di/sect4)

Section 5 Conclusions

The CTI Metals site is underlain by glacial outwash deposits consisting of highly permeable sands and gravels. Groundwater is between 17 and 19 feet below grade at the site and flows in a south to southeasterly direction. Groundwater velocities within the glacial aquifer underlying the site range between one and four feet per day. Groundwater is the exclusive source of public drinking water within the site area. Up to 39 public supply wells are located within a three mile radius of the site. Six supply wells are located downgradient of the site, the closest being approximately one-half mile southeast of the site.

The CTI Metals site was used for metal anodizing and plating from 1979 to 1987. Manufacturing processes involved the use of various plating solutions, including: caustic soda, nitric acid, sulfuric acid, cadmium, nickel, zinc, cyanide and chromium.

Analysis of groundwater samples identified a number of volatile organic compounds (VOC) at trace concentrations downgradient of dry wells suspected of receiving waste discharges from CTI Metals, including: toluene, total xylene and tetrachloroethene. Inorganic analysis identified chromium and cadmium in groundwater samples collected downgradient of the septic system which received wastes at concentrations greatly exceeding NYSDEC GA class groundwater standards. Chromium was detected at 1,170 ug/l in GP-10 and 248 ug/l in GP-9, the groundwater standard for chromium is 50 ug/l. Cadmium was detected at 139 ug/l in GP-10 and 114 ug/l in GP-9, the groundwater standard is 10 ug/l. Other discharge exceedances included lead and mercury in GP-10 and iron and manganese in both GP-9 and GP-10 groundwater samples.

Analysis of sediment samples collected from two onsite dry wells which received plating waste discharges from CTI Metals indicated the presence of tetrachloroethene in drywell sample DW-1 at 45 ug/kg and 2-butanone in drywell sample DW-2 at 5 ug/kg. A number of semivolatile compounds and pesticide compounds were detected in both drywell samples. One PCB compound Aroclor-1254 was detected at 8,000 ug/kg in DW-2. Cadmium and chromium were detected in both samples at elevated concentrations. All contaminants detected in the drywell samples were below NYSDEC recommended cleanup levels with the exception of one pesticide compound Endrin detected at 270 ug/kg, the cleanup standard for Endrin is 100 ug/kg.

Based on the data generated from this PSA, CDM has concluded that significant groundwater contamination by cadmium and chromium is present within groundwater downgradient of the CTI Metals site septic system. Given the fact that GP-10, the location of greatest contamination, is on the eastern

border of the site, the metal contamination likely extends offsite in a southeasterly direction. Therefore, the extent of this groundwater contamination remains undefined.

(div/sect5)

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(civ/appendix)

DATA VALIDATION REPORT

ORGANIC AND INORGANIC ANALYSES

CTI Metals Project

Sample Delivery Group No. GP1001

Sampling Dates of December 19-20, 1994

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CTI Metals Project
Data Validation Report: Organic and Inorganic Analyses

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CTI Metals Project
Data Validation Report: Organic and Inorganic Analyses

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DATA VALIDATION SUMMARY: ORGANIC and INORGANIC ANALYSES

CTI Metals Project
Sample Delivery Group No. GP1001
Sampling Dates of December 19-20, 1994

INTRODUCTION

This Data Validation Summary report for organic and inorganic analyses was generated for 12 water samples and the associated quality control samples for Sample Delivery Group (SDG) No. GP1001. Sampling activities were conducted in support of the field investigation for the CTI Metals Project. The analytical laboratory work was performed by Energy & Environmental Engineering, Inc.

In addition to the water samples, two soil samples were collected for the project. However, these samples were lost by Federal Express and delivered to the laboratory three days late. The cooler reportedly had been opened by Federal Express personnel prior to delivery at the laboratory to determine the contents. Upon opening the cooler, Federal Express personnel indicated that there were two soil samples and one bag of water (melted ice). The analytical results from the two soil samples were not validated and are considered unusable, due to the break in the Chain-of-Custody and the length of travel time to the laboratory.

Analytical testing consisted of Contract Laboratory Program (CLP) analyses, including Volatile Organic analyses by Gas Chromatography/Mass Spectroscopy (GC/MS); Base/Neutral and Acid Extractable Organics by GC/MS; and Pesticides and Polychlorinated Biphenyls (PCBs) by GC. Inorganics were analyzed by Atomic Absorption (AA) and Inductively Coupled Plasma (ICP), with Mercury by Cold Vapor. The analytical work was performed utilizing New York State Department of Environmental Conservation (NYSDEC) Analytical Service Protocols (ASP), December 1991.

This report provides a summary of data acceptability and deviations in accordance with the United States Environmental Protection Agency (USEPA) Region II Organic and Inorganic Data Validation Checklists/ Guidelines (January 1992); and, the CLP portion of the NYSDEC ASP (December 1991), where applicable and relevant. The validation report pertains to the following samples:

SDG No. GP1001

CTI-GW:

GP10 (-001)
GP1001
GP11001 (Duplicate of GP3001)
GP2001
GP3001
GP4
GP5001
GP6001
GP7001
GP8001

GP9001
TB (Trip Blank 12/19/94)

The analytical data summary tables attached as Appendices A through D include all parameters that were analyzed for the samples noted. The tables include concentrations of the compounds that were detected in the samples. A blank space is included in the table for those compounds analyzed but not detected in the samples.

1.0 VOLATILE ORGANICS BY GC/MS

The following items/criteria were reviewed:

- * Holding Times
- * System Monitoring Compound (Surrogate) Recovery
- * Matrix Spikes (MS) and Matrix Spike Duplicates (MSD)
- * Initial and Continuing Calibration
- * Blanks (Method and Field)
- * GC/MS Instrument Performance Check
- * Tentatively Identified Compounds (TICs)
- * Internal Standards
- * Field Duplicates
- * Target Compound List (TCL) Compound Identification
- * Compound Quantitation and Reported Detection Limits
- * System Performance

All items above were generated within acceptable Quality Control (QC) specifications, with deviations detailed as follows. All data is considered to be valid and usable with the appropriate qualifiers, as noted on the data summary tables in Appendix A and within the following text.

1.1 Holding Times

All holding times were met within the acceptable time frame of 7 days from Verified Time of Sample Receipt (VTSR) at the laboratory for the water samples.

1.2 System Monitoring (Surrogate) Compound Recovery

All system monitoring compound recovery (%R) was found to be generated within acceptable limits for the three surrogate compounds.

1.3 Matrix Spike/Matrix Spike Duplicates (MS/MSD)

One MS/MSD sample set and one Matrix Spike Blank (MSB) were analyzed for the SDG. Acceptable accuracy (percent recovery) and precision (relative percent difference) were generated.

1.4 Calibration

All initial and continuing calibration was performed within acceptable limits for average Relative Response Factors (RRF), Percent Relative Standard Deviation (% RSD), Relative Response Factors (RRF), and percent Difference (% D), with the following exceptions.

1.4.1 Continuing Calibration

Date, Time

12/23/94, 10:27	Chloromethane	31.4% D	(Limit 25%)
	Vinyl Chloride	27.9%	
12/27/94, 10:38	Chloromethane	52.9%	
	Vinyl Chloride	39.3%	
12/28/94, 10:25	Chloromethane	85.3%	
	Chloroethane	84.1%	
	Carbon Disulfide	56.3%	
	Acetone	63.5%	

The samples associated with the continuing calibrations above were qualified as 'J', estimated, for the positive results, and 'UJ', estimated, for the non-detectable results, for the compounds noted.

1.5 Blanks

1.5.1 Field Blanks

One trip blank was analyzed for the SDG. Carbon disulfide was detected at 7 ug/L for the trip blank. Carbon disulfide was not detected in the samples, therefore, qualification was not required in relation to the trip blank.

1.5.2 Method Blanks

Three water method blanks were analyzed for the SDG. Volatile Organics were detected as follows.

Sample ID

VBLKW231	Methylene Chloride	1 ug/L, estimated
	Acetone	9 ug/L, estimated
VBLKW271	Methylene Chloride	3 ug/L, estimated
	Acetone	6 ug/L, estimated
VBLKW281	Acetone	13 ug/L

Limits of ten times the highest methylene chloride and acetone method blank results above were used for review and qualification of the associated water samples. All associated sample results for methylene chloride and acetone were found to be less than the Contract Required Quantitation Limit (CRQL) and less than the respective method blank limit. The results for the two compounds were qualified as 'U', not detected, at the CRQL.

1.6 GC/MS Instrument Performance Check

Instrument performance was generated within acceptable limits and frequency for Bromofluorobenzene (BFB).

1.7 Tentatively Identified Compounds (TICs)

TICs were generated in accordance with protocol. Copies of the Form I's are included in Appendix E.

1.8 Internal Standards

All internal standards were generated within acceptable specifications for area counts and retention time variation.

1.9 Field Duplicates

Samples GP3001 and GP11001 were collected as the field duplicate samples and analyzed for Volatile Organics. Positive results were not detected for either sample, therefore, acceptable precision was generated.

1.10 TCL Identification

GC/MS qualitative analyses are considered to be acceptable for the data set. Retention times and mass spectra were generated within appropriate quality control specifications.

1.11 Compound Quantitation and Reported Detection Limits

GC/MS quantitative analyses are considered to be acceptable. Sample dilutions, internal standards and response factors were found to be within acceptable limits.

1.12 System Performance

Acceptable system performance was maintained throughout the analyses of the water samples. This was exhibited through good resolution and consistent chromatographic performance.

2.0 SEMI-VOLATILE ORGANICS BY GC/MS (Base/Neutral and Acid Extractable Organics)

The following items/criteria were reviewed:

- * Holding Times
- * Surrogate Recovery
- * MS/MSD
- * Initial and Continuing Calibration
- * Blanks (Method and Field)
- * GC/MS Instrument Performance Check
- * TICs
- * Internal Standards
- * Field Duplicates
- * TCL Compound Identification
- * Compound Quantitation and Reported Detection Limits
- * System Performance

All items above were generated within acceptable QC specifications, with deviations detailed as follows. Various TIC results were qualified as 'R', unusable, due to their presence at less than five times the corresponding method blank value. The remaining data is considered to be valid and usable with the appropriate qualifiers, as noted on the data summary tables in Appendix B and within the following text.

2.1 Holding Times

All holding times were met for extraction and analysis of the water samples. The NYSDEC holding time is 5 days from VTSR at the laboratory for extraction, and 40 days from extraction to analysis.

2.2 Surrogate Recovery

All surrogate recovery was found to be generated within acceptable limits for the eight surrogate compounds, with the following exceptions.

Sample ID

GP1001	2-Chlorophenol-d4	23% R (Limit 33-110)
GP3001	2-Chlorophenol-d4	27%

The samples above do not require qualification due to the fact that only one surrogate per fraction is out of specification (two are required for qualification).

2.3 MS/MSD

One MS/MSD sample set and one MSB were analyzed for the SDG. Acceptable accuracy and precision were generated.

2.4 Calibration

All initial and continuing calibrations were performed within acceptable limits for \overline{RRF} , % RSD, RRF, and % D, with the exception of the following.

2.4.1 Continuing Calibration

Date, Time

1/30/95, 10:56	bis(2-Chloroethyl)ether	32.6% D	(Limit 25%)
	2-methylphenol	31.2%	
	bis(2-Chloroisopropyl)ether	70.0%	
	4-methylphenol	29.9%	
	4-Chloro-3-methylphenol	30.1%	
	3-Nitroaniline	46.9%	
	4-Nitroaniline	48.1%	
	Carbazole	185%	
	Di-n-butylphthalate	31.6%	
1/31/95, 16:44	Di-n-octylphthalate	38.5%	
	2-methylphenol	26.0%	
	bis(2-Chloroisopropyl)ether	63.5%	
	4-methylphenol	31.0%	
	3-Nitroaniline	28.8%	
	4-Nitrophenol	26.4%	
	4-Nitroaniline	75.7%	
	4,6-Dinitro-2-methylphenol	27.4%	
	Carbazole	96.4%	
2/01/95, 12:21	bis(2-Chloroethyl)ether	26.1%	
	bis(2-Chloroisopropyl)ether	63.2%	
	2,4-Dinitrophenol	28.0%	
	4-Nitrophenol	29.7%	
	4-Nitroaniline	39.5%	
	Carbazole	37.2%	
	3,3'-Dichlorobenzidine	32.3%	
2/02/95, 11:53	Phenol	30.0%	
	bis(2-Chloroisopropyl)ether	78.0%	
	4-methylphenol	30.0%	
	3-Nitroaniline	30.7%	
	4-Nitroaniline	82.7%	
	Carbazole	99%	
	3,3'-Dichlorobenzidine	32.6%	
	Benzo(k)fluoranthene	27.4%	

The samples associated with the continuing calibrations above were qualified as 'J', estimated, for the positive results, and 'UJ', estimated, for the non-detectable results, for the compounds noted.

2.5 Blanks

2.5.1 Field Blanks

Field blanks were not collected for Semi-Volatile Organic analyses.

2.5.2 Method Blanks

Two water method blanks were analyzed for the SDG. Semi-Volatile Organics were detected as follows.

Sample ID

SBLKW232	Di-n-butylphthalate	4 ug/L, estimated
SBLKW262	Di-n-butylphthalate	61 ug/L
	Butylbenzylphthalate	5 ug/L, estimated
	bis(2-ethylhexyl)phthalate	12 ug/L

Limits of ten times the bis(2-ethylhexyl)phthalate value and five times the highest di-n-butylphthalate and butylbenzylphthalate values above were used for review and qualification of the associated samples. Sample results that were reported at less than the CRQL and less than the respective method blank limit were qualified as 'U', not detected, at the CRQL. Sample results reported over the CRQL and less than the respective method blank limit were qualified as 'U', not detected. Butylbenzylphthalate was not detected in the samples, therefore, qualification was not required for this compound.

2.6 GC/MS Instrument Performance Check

Instrument performance was generated within acceptable limits and frequency for Decafluorotriphenylphosphine (DFTPP).

2.7 TICs

TICs were generated in accordance with protocol. The Form I's, including the appropriate qualifiers, are included in Appendix E. TICs were detected as follows:

Sample ID

SBLKW232	2-methyl-1-propanoic acid	2 ug/L, estimated
SBLKW262	1,2-Propanediol	4 ug/L, estimated

All TIC sample results for the compounds above that were reported at less than five times the method blank value were qualified as 'R', unusable.

2.8 Internal Standards

All internal standards were generated within acceptable specifications for area counts and retention time variation.

2.9 Field Duplicates

Samples GP3001 and GP11001 were collected as the field duplicate samples and analyzed for Semi-Volatile Organics. Positive results were not detected for either sample, therefore, acceptable precision was generated.

2.10 TCL Compound Identification

GC/MS qualitative analyses are considered to be acceptable for the data set. Retention times and mass spectra were generated within appropriate quality control specifications.

2.11 Compound Quantitation and Reported Detection Limits

GC/MS quantitative analyses are considered to be acceptable for the data set. Sample dilutions, internal standards and response factors were found to be within acceptable limits.

2.12 System Performance

Acceptable system performance was maintained throughout the analyses of the water samples. This was exhibited through good resolution and consistent chromatographic performance.

3.0 PESTICIDES AND PCBs BY GC

The following items/criteria were reviewed:

- * Holding Times
- * Surrogate Recovery
- * MS/MSD
- * Blanks (Method and Field)
- * Instrument (GC) Performance
- * Calibration
- * Field Duplicates
- * Compound Identification
- * Compound Quantitation and Reported Detection Limits

All items above were generated within acceptable QC specifications, with deviations detailed as follows. The method blank re-analysis for PBLK1223 was qualified as 'R', unusable, for the non-detectable results, due to the fact that the rerun took place 22 days beyond the acceptable holding time. The remaining data is considered to be valid and usable with the appropriate qualifiers, as noted on the data summary tables in Appendix C and within the following text.

3.1 Holding Times

All holding times were met within acceptable time frames for extraction and analysis of the water samples, with the following exceptions. The NYSDEC holding time is 5 days from VTSR at the laboratory for extraction and 40 days from extraction to analysis.

<u>Sample ID</u>	<u>No. of Days Exceeding Holding Time</u>
GP5001-RE	10 (Analysis)
GP6001-RE	10 (Analysis)
GP-7001	1 (Analysis)

GP-8001	1 (Analysis)
GP-9001	1 (Analysis)
GP-10	1 (Analysis)
GP-11001-RE	10 (Analysis)
PBLK1222	2 (Analysis)
PBLK1223-RE	22 (Analysis)
W1223MSB	1 (Analysis)
GP4-MS-RE	9 (Analysis)
GP4-MSD-RE	9 (Analysis)

The samples above were qualified as 'J', estimated, for the positive results, and 'UJ', estimated, for the non-detectable results. However, PBLK1223-RE was qualified as 'R', unusable, for the non-detectable results, due to analysis 22 days beyond the acceptable holding time.

3.2 Surrogate Recovery

Surrogate recovery was generated within acceptable limits for both surrogate compounds, with the following exceptions.

Sample ID

GP8001	TCX1	51%	(Advisory Limit 60-150)
	TCX2	54%	
	DCB1	55%	
	DCB2	50%	
W1223MSB	TCX1	59%	
	TCX2	57%	
GP4MS	TCX1	58%	
GP5001	TCX1	55%	
GP4MS RE	TCX2	55%	
GP5001 RE	DCB1	156%	

Sample GP8001 was qualified through *Section 3.1, Holding Times*. Additional qualification is not required. The remaining samples above did not require qualification due to the fact that only one of the two surrogates is out of specification.

3.3 MS/MSD

One MS/MSD sample set and one MSB were analyzed for the SDG. Acceptable accuracy and precision were generated.

3.4 Blanks

3.4.1 Field Blanks

Field blanks were not collected for Pesticide/PCB analyses.

3.4.2 Method Blanks

Two water method blanks were analyzed for the SDG. Pesticides and PCBs were not detected.

3.5 Instrument (GC) Performance

Adequate chromatographic resolution and instrument sensitivity were achieved through the generation of data within acceptable limits for the Resolution Check Mixture and Performance Evaluation Mixtures, with the following exceptions. The review included resolution between adjacent peaks, retention time windows, Relative Percent Difference (RPD), and percent breakdown for DDT/Endrin.

Combined DDT/Endrin Breakdown:

Date, Time

2/02/95, 16:49	38.23%	(Limit 30%)
2/22/95, 22:42	72.24%	
1/13/95, 07:29	34.92%	
1/17/95, 14:19	53.01%	
1/31/95, 14:51	47.35%	
2/01/95, 13:48	43.21%	
2/02/95, 18:58	59.70%	
2/14/95, 08:31	30.95%	
2/22/95, 22:01	46.76%	

Endrin Breakdown:

Date, Time

2/01/95, 15:15	22.71%	(Limit 20%)
2/02/95, 16:49	34.61%	

2/09/95, 08:01	24.88%
2/09/95, 19:39	24.05%
2/12/95, 02:58	20.70%
2/22/95, 22:42	48.82%
1/13/95, 07:29	24.57%
1/17/95, 14:19	43.15%
1/31/95, 14:51	40.56%
2/01/95, 13:48	39.14%
2/02/95, 18:58	53.45%
2/09/95, 20:20	22.70%
2/22/95, 22:01	30.31%

4,4'-DDT Breakdown:

Date, Time

2/22/95, 22:42	23.41%	(Limit 20%)
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The associated positive sample results for 4,4'-DDT and endrin were qualified as 'J', estimated. The associated positive sample results for 4,4'-DDD, endrin ketone, and endrin aldehyde were qualified as 'JN', presumptively present at an approximated quantity. The compound 4,4'-DDE was not detected, therefore, qualification was not required for this compound.

Performance Evaluation Mixures:

Date, Time

1/31/95, 14:10	4,4'-DDT	35.0%	(Limit 25%)
	Methoxychlor	30.4%	
2/02/95, 16:49	4,4'-DDT	27.0%	
2/14/95, 07:50	alpha-BHC	30.0%	
	beta-BHC	30.0%	
	gamma-BHC	30.0%	
	Endrin	28.0%	
2/22/95, 22:42	Methoxychlor	57.6%	
1/12/95, 21:14	Endrin	26.0%	

1/13/95, 07:29	4,4'-DDT	27.0%
1/17/95, 14:19	Endrin	26.0%
1/31/95, 14:51	Endrin	26.0%
2/02/95, 18:58	beta-BHC	30.0%
	Endrin	58.0%
2/09/95, 20:20	4,4'-DDT	26.0%
2/14/95, 08:31	4,4'-DDT	31.0%
2/22/95, 22:01	alpha-BHC	30.0%
	gamma-BHC	30.0%

The associated samples were qualified as 'J', estimated, for the positive results, and 'UJ', estimated, for the non-detectable results, for the compounds noted above.

3.6 Calibration

All initial and continuing calibration was performed within acceptable limits for the individual standard mixtures, with the following exceptions. Review items included resolution, retention time windows, calibration factors (CF), percent RSD for linearity, RPD and %R.

Linearity:

<u>Date</u>			
1/13/95	alpha-BHC	24.0% RSD	(Limit 20%)
1/29/95	alpha-BHC	22.7% / 24.1%	
	delta-BHC	26.4%	
2/08/95	beta-BHC	22.1%	
	Heptachlor Epoxide	21.2%	
	Endosulfan II	21.1%	
	Endosulfan Sulfate	22.2%	
	Endrin Aldehyde	24.7%	
2/13/95	4,4'-DDT	30.1%	

The associated samples were qualified as 'J', estimated, for the positive results, and 'UJ', estimated, for the non-detectable results, for the compounds noted. Retention time shifts were noted for various samples. The samples exhibiting retention time shifts were qualified as 'J', estimated, for the positive results detected for the associated sample.

Individual Standard Mixtures:

Date, Time

2/23/95, 10:19	Heptachlor	30.0%	(Limit 25%)
	4,4'-DDD	72.5%	
	Methoxychlor	64.0%	
2/23/95, 11:00	Endosulfan II	32.5%	
	Endosulfan Sulfate	40.0%	
	Endrin Ketone	65.0%	
2/02/95, 04:50	Endrin	55.0%	
2/11/95, 14:42	Endrin	30.0%	
2/23/95, 11:00	alpha-BHC	35.0%	
	gamma-BHC	35.0%	

The associated samples were qualified as 'J', estimated, for the positive results, and 'UJ', estimated, for the non-detectable results, for the compounds noted above.

3.7 Field Duplicates

Samples GP3001 and GP11001 were collected as the field duplicate samples and analyzed for Pesticides and PCBs. Acceptable precision was generated for the duplicate pair.

3.8 Compound Identification

GC qualitative analyses are considered to be acceptable. In accordance with protocol, the lower of the two values from the GC columns is reported. However, the following percent differences (%D) between the two GC columns exceeded the 25% limit.

<u>Sample ID</u>	<u>Compound</u>	<u>% D</u>
GP5001	Endrin	111.1
	Endrin Ketone	171.4
	alpha-Chlordane	29.0
GP6001-RE	Aldrin	1240
	alpha-Chlordane	40.0
GP11001	alpha-Chlordane	36.4
W1223MSB	Endrin	60.0
	4,4'-DDT	32.1
	Endrin Ketone	171.2
	Endrin Aldehyde	81.8
GP4MS	Endrin Ketone	222.6
GP4MS-RE	4,4'-DDT	29.0

GP4MSD	Endrin Ketone	242.9
	Endrin Aldehyde	300.0

The samples above were qualified as 'J', estimated, for the compound noted where the %D was reported at up to 50%. The samples were qualified as 'JN', presumptively present at an approximated quantity, where the percent difference exceeds 50%.

3.9 Compound Quantitation and Reported Detection Limits

GC quantitative analyses are considered to be acceptable for the water samples. Supporting data was generated within the appropriate quality control specifications.

4.0 INORGANIC ANALYSES BY AA AND ICP (Mercury by Cold Vapor)

The following items/criteria were reviewed:

- * Holding Times
- * Initial and Continuing Calibration
- * CRDL Standards for AA and ICP
- * Blanks (Initial, Continuing Calibration, and Preparation)
- * Field Blanks
- * ICP Interference Check Sample
- * Matrix Spike Sample Recovery
- * Laboratory Duplicates
- * Field Duplicates
- * Laboratory Control Sample (LCS)
- * ICP Serial Dilution
- * Furnace (AA) Quality Control
- * Sample Result Verification

All items above were generated within acceptable QC specifications, with deviations detailed as follows. All data is considered to be valid and usable with the appropriate qualifiers, as noted on the data summary tables in Appendix D and within the following text.

4.1 Holding Times

All holding times were met within the acceptable time frame from VTSR at the laboratory for metals (180 days) and mercury (26 days).

4.2 Calibration

All initial and continuing calibration was performed within acceptable limits for percent recovery.

4.3 Contract Required Detection Limit (CRDL) Standards for AA and ICP

Percent recovery was found to be within the 80-120% limit, with the following exceptions.

AA

Selenium 67.8% / 77.2%

ICP

Cadmium - / 68.0%

Cadmium results did not fall within the affected range, therefore, qualification was not required. Selenium was not detected in the water samples, therefore, qualification was not required.

4.4 Blanks

4.4.1 Laboratory (Method) Blanks

All initial calibration, continuing calibration, and preparation blanks were generated in accordance with acceptable limits.

4.4.2 Field Blanks

Field blanks were not collected for Inorganic analyses.

4.5 ICP Interference Check

The recoveries for the ICP Interference Check samples were found to be within the acceptable 80-120% limit.

4.6 Spiked Sample Recovery

All percent recoveries for the matrix spike sample were found to be within the 75-125% limit, with the following exceptions.

GP4 (ug/L)

Arsenic	131.3%
Mercury	-32.0%
Thallium	11.2%

Positive results, only, for arsenic were qualified as 'J', estimated, due to high spike recovery. Mercury results were qualified as 'J', estimated, due to low spike recovery. The thallium non-detectable results were qualified as 'UJ', estimated, also due to low spike recovery.

4.7 Laboratory Duplicates

Precision (relative percent difference) for the samples was found to be acceptable, with the following exceptions.

GP4 (ug/L)

Lead	200% RPD
Mercury	127.3%

The positive results for lead and mercury for the water samples were qualified as 'J', estimated.

4.8 Field Duplicates

Samples GP3001 and GP11001 were collected as the field duplicate samples and analyzed for Inorganics. Acceptable precision was generated for the water samples. However, elevated relative percent difference was generated for aluminum. Table 1 includes calculated precision for the duplicate pair.

4.9 Laboratory Control Sample (LCS)

The aqueous laboratory control sample was generated within the acceptable 80-120% limit.

4.10 ICP Serial Dilution

ICP Serial Dilution was found to be within the acceptable 10% limit for percent difference (%D).

4.11 Furnace (AA) Quality Control

Quality control for furnace atomic absorption was found to be acceptable.

4.12 Sample Result Verification

Quantitative analyses are considered to be acceptable for the data set. Analyte quantitation was generated in accordance with protocols.

TABLE 1
FIELD DUPLICATE SAMPLE ANALYSIS
PRECISION FOR INORGANICS

CTI Metals Project

Results in ug/L (ppb)

Parameter	GP3001	GP11001	RPD*
Aluminum	384	277	32%
Antimony	ND	ND	++
Arsenic	ND	ND	++
Barium	11	10	10%
Beryllium	ND	ND	++
Cadmium	ND	ND	++
Calcium	12600	9750	26%
Chromium	ND	ND	++
Cobalt	ND	ND	++
Copper	ND	ND	++
Iron	2020	2010	1%
Lead	ND	ND	++
Magnesium	2620	2280	14%
Manganese	111	103	7%
Mercury	0.41	0.37	10%
Nickel	ND	ND	++
Potassium	2090	2340	11%
Selenium	ND	ND	++
Silver	ND	ND	++
Sodium	8600	8020	7%
Thallium	ND	ND	++
Vanadium	ND	ND	++
Zinc	5.9	5.5	7%

* Relative Percent Difference (Calculated Precision)

ND Not Detected

++ Unable to be calculated due to non-detected results

APPENDIX A

DATA SUMMARY TABLES

VOLATILE ORGANICS

CTI METALS PROJECT

CASE NO. 0897
SDG NO. GP1001

SDG NO. GP1001

All results reported in ug/L

[illegible]

CTI METALS PROJECT VOLATILES/WATER - DATA SUMMARY (cont.)

CASE NO. 0897
SDG NO. GP1001

All results reported in ug/L

Parameters - Volatiles	GP7001	GP8001	GP9001	TB	VBLKW231	VBLKW271	VBLKW281	Q
Chloromethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Bromomethane								
Vinyl Chloride	UJ			UJ	UJ	UJ		
Chloroethane		UJ	UJ				UJ	
Methylene Chloride					1 J	3 J		
Acetone		UJ	10 U		9 J	6 J	13 J	J
Carbon Disulfide		UJ	UJ	7 J				UJ
1,1-Dichloroethylene								
1,1-Dichloroethane								
Total 1,2-Dichloroethylene								
Chloroform								
1,2-Dichloroethane								
2-Butanone								
1,1,1-Trichloroethane								
Carbon Tetrachloride								
Bromodichloromethane								
1,2-Dichloropropane								
cis-1,3-Dichloropropene								
Trichloroethene								
Dibromochloromethane								
1,1,2-Trichloroethane								
Benzene								
trans-1,3-Dichloropropene								
Bromoform								
4-Methyl-2-pentanone								
2-Hexanone								
Tetrachloroethene								
1,1,2,2-Tetrachloroethane								
Toluene								
Chlorobenzene								
Ethylbenzene								
Styrene								
Total Xylenes								

CTI METALS PROJECT

VOLATILES/WATER - DATA SUMMARY (cont.)

CASE NO. 0897

SDG NO. GP1001

All results reported in ug/L

Parameters - Volatiles	VSPKW231	Q	GP4 MS	Q	GP4 MSD	Q
Chloromethane		UJ		UJ		UJ
Bromomethane						
Vinyl Chloride		UJ		UJ		UJ
Chloroethane						
Methylene Chloride	10 U					
Acetone						
Carbon Disulfide						
1,1-Dichloroethylene	49		46		45	
1,1-Dichloroethane						
Total 1,2-Dichloroethylene						
Chloroform						
1,2-Dichloroethane						
2-Butanone						
1,1,1-Trichloroethane						
Carbon Tetrachloride						
Bromodichloromethane						
1,2-Dichloropropane						
cis-1,3-Dichloropropene						
Trichloroethene	45		47		48	
Dibromochloromethane						
1,1,2-Trichloroethane						
Benzene	47		49		50	
trans-1,3-Dichloropropene						
Bromoform						
4-Methyl-2-pentanone						
2-Hexanone						
Tetrachloroethene						
1,1,2,2-Tetrachloroethane						
Toluene	47		50		51	
Chlorobenzene	47		49		51	
Ethylbenzene						
Styrene						
Total Xylenes			0.9 J		1 J	

APPENDIX B

DATA SUMMARY TABLES

SEMI-VOLATILE ORGANICS

SEMI-VOLATILES/WATER - DATA SUMMARY

All results reported in ug/L

[illegible]

SEMI-VOLATILES/WATER - DATA SUMMARY (cont.)

SDG NO. GP1001

All results reported in ug/L

[illegible]

CTI METALS PROJECT

SEMI-VOLATILES/WATER - DATA SUMMARY (cont.)

CASE NO. 0897
SDG NO. GP1001

All results reported in ug/L

Parameters - SemiVolatiles	GP7001	Q	GP8001	Q	GP9001	Q	SBLKW232	Q	SBLKW262	Q	WS1223SB2	Q	GP4 MS	Q	GP4 MSD	Q
Phenol											47		30		34	
bis (2-chloroethyl) ether		UJ		UJ		UJ		UJ				UJ				
2-Chlorophenol											44		32		38	
1,3-Dichlorobenzene																
1,4-Dichlorobenzene											35		27		28	
1,2-Dichlorobenzene																
2-Methylphenol						UJ		UJ				UJ		UJ		UJ
bis(2-Chloroisopropyl) ether		UJ		UJ		UJ		UJ				UJ		UJ		UJ
4-methylphenol																
N-Nitroso-di-n-propylamine											36		32		32	
Hexachloroethane																
Nitrobenzene																
Isophorone																
2-Nitrophenol																
2,4-Dimethylphenol																
bis(2-chloroethoxy)methane																
2,4-Dichlorophenol																
1,2,4-Trichlorobenzene											38		30		30	
Naphthalene																
4-chloroaniline																
Hexachlorobutadiene																
4-chloro-3-methylphenol						UJ		UJ			54		46		47	
2-methylnaphthalene																
Hexachlorocyclopentadiene																
2,4,6-Trichlorophenol																
2,4,5-Trichlorophenol																
2-Chloronaphthalene																
2-Nitroaniline																
Dimethylphthalate																
Acenaphthylene																
2,6-Dinitrotoluene													2 J		4 J	
3-Nitroaniline						UJ		UJ		UJ		UJ		UJ		UJ

LOG NO. GP1001

6

[illegible]

PESTICIDES and PCBs/WATER - DATA SUMMARY

All results reported in ug/L

[illegible]

CTI METALS PROJECT

PESTICIDES and PCBs/WATER - DATA SUMMARY (cont.)

CASE NO. 0897
SDG NO. GP1001

All results reported in ug/L

Parameters-Pesticides/PCBs	GP7001	GP8001	GP9001	GP10	GP11001	GP11001 RE	PBLK1222	Q
alpha-BHC	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
beta-BHC	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
delta-BHC	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
gamma-BHC(Lindane)	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Heptachlor	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Aldrin	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Heptachlor Epoxide	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Endosulfan I	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Dieldrin	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
4,4'-DDE	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Endrin	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Endosulfan II	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
4,4'-DDD	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Endosulfan Sulfate	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
4,4'-DDT	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Methoxychlor	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Endrin Ketone	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Endrin Aldehyde	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
alpha-chlordane	UJ	UJ	UJ	UJ	0.011 J	UJ	UJ	UJ
gamma-chlordane	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Toxaphene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Aroclor-1016	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Aroclor-1221	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Aroclor-1232	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Aroclor-1242	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Aroclor-1248	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Aroclor-1254	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
Aroclor-1260	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ

CTI METALS PROJECT

PESTICIDES and PCBs/WATER - DATA SUMMARY (cont.)

CASE NO. 0897
SDG NO. GP1001

All results reported in ug/L

Parameters-Pesticides/PCBs	PBLK1223	Q	PBLK1223 RE	Q	W1223MSB	Q	GP4 MS	Q	GP4 MS RE	Q	GP4 MSD	Q	GP4 MSD RE	Q
alpha-BHC		UJ		R		UJ				UJ		UJ		UJ
beta-BHC				R		UJ				UJ				UJ
delta-BHC		UJ		R		UJ				UJ				UJ
gamma-BHC(Lindane)				R		0.33 J	0.39 J	J	0.29 J	J	0.45 J	J	0.36 J	J
Heptachlor				R		0.25 J	0.35 J	J	0.28 J	J	0.40 J	J	0.35 J	J
Aldrin				R		0.24 J	0.33 J	J	0.25 J	J	0.38 J	J	0.30 J	J
Heptachlor Epoxide				R		UJ				UJ				UJ
Endosulfan I				R		UJ				UJ				UJ
Dieldrin				R		0.73 J	0.94 J	J	0.69 J	J	1.0 J	J	0.83 J	J
4,4'-DDE				R		UJ				UJ				UJ
Endrin		UJ		R		0.50 JN	0.96 J	J	0.79 J	J	1.1 J	J	0.94 J	J
Endosulfan II				R		UJ				UJ				UJ
4,4'-DDD				R		UJ	0.030 JN	JN		UJ	0.052 JN	JN		UJ
Endosulfan Sulfate				R		UJ				UJ				UJ
4,4'-DDT		UJ		R		0.56 J	0.92 J	J	0.62 J	J	1.1 J	J	0.76 J	J
Methoxychlor		UJ		R		UJ				UJ				UJ
Endrin Ketone				R		0.059 JN	0.031 JN	JN		UJ	0.035 JN	JN		UJ
Endrin Aldehyde				R		0.055 JN				UJ	0.017 JN	JN		UJ
alpha-chlordane				R		UJ				UJ				UJ
gamma-chlordane				R		UJ				UJ				UJ
Toxaphene				R		UJ				UJ				UJ
Aroclor-1016				R		UJ				UJ				UJ
Aroclor-1221				R		UJ				UJ				UJ
Aroclor-1232				R		UJ				UJ				UJ
Aroclor-1242				R		UJ				UJ				UJ
Aroclor-1248				R		UJ				UJ				UJ
Aroclor-1254				R		UJ				UJ				UJ
Aroclor-1260				R		UJ				UJ				UJ

APPENDIX D

DATA SUMMARY TABLES

INORGANICS

CTI METALS PROJECT

INORGANICS/WATER - DATA SUMMARY

SDG NO. GP1001

All results reported in ug/L

Parameters - Inorganics	GP10001	Q	GP1001	Q	GP11001	Q	GP2001	Q	GP3001	Q	GP4	Q	GP5001	Q	GP6001	Q
Aluminum	18000		1060		277		1190		384		3090		103 B		1910	
Antimony															60.5	
Arsenic	9 J										1.8 J					
Barium	63 B		23 B		10 B		6 B		11 B		19 B		16 B		17 B	
Beryllium	1.3 B															
Cadmium	139															
Calcium	13500		14800		9750		13200		12600		13800		11200		11000	
Chromium	1170		9.1 B				7.5 B				17.7				64	
Cobalt															12.4 B	
Copper	175		8.7 B				10.6 B				11.7 B				22.7 B	
Iron	45200		3790		2010		1530		2020		7320		1270		6250	
Lead	53.9 J														9.7 J	
Magnesium	3620 B		2870 B		2280 B		1970 B		2620 B		2580 B		2410 B		2630 B	
Manganese	702		205		103		321		111		563		57		298	
Mercury	3.2 J		0.45 J		0.37 J		0.33 J		0.41 J		1.8 J		0.54 J		1.5 J	
Nickel	83														15.1 B	
Potassium	3770 B		3850 B		2340 B		2400 B		2090 B		3420 B		1990 B		1660 B	
Selenium																
Silver																
Sodium	11600		19900		8020		10700		8600		11700		14800		9580	
Thallium																
Vanadium	28.1 B															
Zinc	322		28.9		5.5 B		29.6		5.9 B		16.2 B				8 B	

10 1 11 2 3 4 5 6

CTI METALS PROJECT

INORGANICS/WATER - DATA SUMMARY (cont.)

SDG NO. GP1001

All results reported in ug/L

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Parameters - Inorganics	GP7001	Q	GP8001	Q	GP9001	Q
Aluminum	1770		994		4290	
Antimony						
Arsenic					1.9 J	
Barium	27 B		31 B		32 B	
Beryllium						
Cadmium					114	
Calcium	15700		14200		16200	
Chromium	36.3		58.1		248	
Cobalt	11.9 B					
Copper			10.8 B		24 B	
Iron	4800		10400		15300	
Lead	2.2 J		1.7 J		3.6 J	
Magnesium	2770 B		3070 B		2900 B	
Manganese	481		222		609	
Mercury	0.42 J		0.53 J		0.73 J	
Nickel			17.3 B		65.4	
Potassium	3320 B		3750 B		2990 B	
Selenium						
Silver						
Sodium	10300		14300		11400	
Thallium		UJ		UJ		UJ
Vanadium					14.1 B	
Zinc	36.4		191		45	

APPENDIX E

DATA SUMMARY FORMS TENTATIVELY IDENTIFIED COMPOUNDS

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP10

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950569-4

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

Lab File ID: L4008

Level: (low/med) LOW

Date Received: 12/21/94

% Moisture: not dec. _____

Date Analyzed: 12/27/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	24.94	7.	JN
2.				
3.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP1001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-1

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

Lab File ID: L3982

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: not dec. _____

Date Analyzed: 12/23/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP11001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-7

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

Lab File ID: L3987

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: not dec. _____

Date Analyzed: 12/23/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	23.16	6.	JN
2.				
3.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP2001

Lab Name: ENVIROSOFT DEMO COPY

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-2

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

Lab File ID: L3983

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: not dec. _____

Date Analyzed: 12/23/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP3001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-3

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

Lab File ID: L3984

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: not dec. _____

Date Analyzed: 12/23/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP4

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-4

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

Lab File ID: L3979

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: not dec. _____

Date Analyzed: 12/23/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

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

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	24.90	6.	JN
2.				
3.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP5001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-5

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

Lab File ID: L3985

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: not dec. _____

Date Analyzed: 12/23/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP6001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-6

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

Lab File ID: L3986

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: not dec. _____

Date Analyzed: 12/23/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
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6.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP7001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950569-1

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

Lab File ID: L4005

Level: (low/med) LOW

Date Received: 12/21/94

% Moisture: not dec. _____

Date Analyzed: 12/27/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	24.89	6.	JN
2.				
3.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP8001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950569-2

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

Lab File ID: L4024

Level: (low/med) LOW

Date Received: 12/21/94

% Moisture: not dec. _____

Date Analyzed: 12/28/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP9001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950569-3

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

Lab File ID: L4025

Level: (low/med) LOW

Date Received: 12/21/94

% Moisture: not dec. _____

Date Analyzed: 12/28/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB

Lab Name: **E3I**

Contract:

Lab Code: E3I

Case No.: 0897

CAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-8

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

Lab File ID: L3978

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: not dec. _____

Date Analyzed: 12/23/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

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

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	24.84	7.	JN
2.				
3.				
4.				
5.				
6.				
7.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKW231

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: WV1223BK1

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

Lab File ID: L3975

Level: (low/med) LOW

Date Received: 00/00/00

% Moisture: not dec. _____

Date Analyzed: 12/23/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

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

Number TICs found: 1

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	24.92	7.	JN
2.				
3.				
4.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLKW271

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: WV1227BK1

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

Lab File ID: L3999

Level: (low/med) LOW

Date Received: 00/00/00

% Moisture: not dec. _____

Date Analyzed: 12/27/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	24.93	10.	JN
2.				
3.				
4.				
5.				
6.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBKWK281

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: WV1228BK1

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

Lab File ID: L4021

Level: (low/med) LOW

Date Received: 00/00/00

% Moisture: not dec. _____

Date Analyzed: 12/28/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VSPKW231

Lab Name: **E3I**

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: WV1223SB1

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

Lab File ID: L3976

Level: (low/med) LOW

Date Received: 00/00/00

% Moisture: not dec. _____

Date Analyzed: 12/23/94

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP10

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950569-4

Sample wt/vol: 1000.0 (g/mL) ML

Lab File ID: K2052

Level: (low/med) LOW

Date Received: 12/21/94

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 12/26/94

Concentrated Extract Volume: 1000.0 (uL)

Date Analyzed: 02/01/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP1001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-1

Sample wt/vol: 1000.0 (g/mL) ML

Lab File ID: K2021

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 12/23/94

Concentrated Extract Volume: 1000.0 (uL)

Date Analyzed: 01/30/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 5.0

Number TICs found: 6

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	2.57	4	J N
2. 541-05-9	Cyclotrisiloxane, hexamethyl	3.36	26 30.	J N
3. - -	UNKNOWN	7.25	2 2.4	J N
4. 541-02-6	Cyclopentasiloxane, decameth	8.56	14 10.2	J N
5. - -	UNKNOWN	10.31	7 7.	J N
6. - -	UNKNOWN	11.13	3 3.	J N
7. _____	_____	_____	_____	_____
8. _____	_____	_____	_____	_____
9. _____	_____	_____	_____	_____
10. _____	_____	_____	_____	_____
11. _____	_____	_____	_____	_____
12. _____	_____	_____	_____	_____
13. _____	_____	_____	_____	_____
14. _____	_____	_____	_____	_____
15. _____	_____	_____	_____	_____
16. _____	_____	_____	_____	_____
17. _____	_____	_____	_____	_____
18. _____	_____	_____	_____	_____
19. _____	_____	_____	_____	_____
20. _____	_____	_____	_____	_____
21. _____	_____	_____	_____	_____
22. _____	_____	_____	_____	_____
23. _____	_____	_____	_____	_____
24. _____	_____	_____	_____	_____
25. _____	_____	_____	_____	_____
26. _____	_____	_____	_____	_____
27. _____	_____	_____	_____	_____
28. _____	_____	_____	_____	_____
29. _____	_____	_____	_____	_____
30. _____	_____	_____	_____	_____

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP11001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-7

Sample wt/vol: 1000.0 (g/mL) ML

Lab File ID: K2033

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 12/23/94

Concentrated Extract Volume: 1000.0 (uL)

Date Analyzed: 01/31/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 5.0

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

Number TICs found: 2

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 57-55-6	1,2-Propanediol	2.58	5	JN
2. -	UNKNOWN	10.32	2	JN
3.				
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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP2001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-2

Sample wt/vol: 1000.0 (g/mL) ML

Lab File ID: K2026

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 12/23/94

Concentrated Extract Volume: 1000.0 (uL)

Date Analyzed: 01/31/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 5.0

Number TICs found: 4

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	2.60	8	JN
2. - -	UNKNOWN	10.32	3	JN
3. 74381-40-1	Propanoic acid, 2-methyl-, 1	14.87	3	JN
4. - -	UNKNOWN KETONE	22.02	5	JN
5.				
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP3001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-3

Sample wt/vol: 1000.0 (g/mL) ML

Lab File ID: K2027

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 12/23/94

Concentrated Extract Volume: 1000.0 (uL)

Date Analyzed: 01/31/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 5.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 541-05-9	Cyclotrisiloxane, hexamethyl	3.39	29 30 10	J N
2. - -	UNKNOWN	8.58	10 10.2 10.4	J N
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP4

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-4

Sample wt/vol: 1000.0 (g/mL) ML

Lab File ID: K2028

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 12/23/94

Concentrated Extract Volume: 1000.0 (uL)

Date Analyzed: 01/31/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 5.0

Number TICs found: 5

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 57-55-6	1,2-Propanediol	2.60	4	J N
2. 541-05-9	Cyclotrisiloxane, hexamethyl	3.39	13 10.4	J N
3. - -	UNKNOWN	8.61	3 3.2	J N
4. - -	UNKNOWN	10.36	2 2.2	J N
5. - -	UNKNOWN	14.89	2 2.	J N
6.				
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP5001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-5

Sample wt/vol: 1000.0 (g/mL) ML

Lab File ID: K2031

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 12/23/94

Concentrated Extract Volume: 1000.0 (uL)

Date Analyzed: 01/31/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 5.0

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

Number TICs found: 2

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 57-55-6	1,2-Propanediol	2.61	4	J N
2. 541-05-9	Cyclotrisiloxane, hexamethyl	3.41	2	J N
3.				
4.				
5.				
6.				
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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP6001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950564-6

Sample wt/vol: 1000.0 (g/mL) ML

Lab File ID: K2032

Level: (low/med) LOW

Date Received: 12/20/94

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 12/23/94

Concentrated Extract Volume: 1000.0 (uL)

Date Analyzed: 01/31/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 5.0

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

Number TICs found: 2

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 547-64-8	Propanoic acid, 2-hydroxy-,	2.53	6	J N
2. 541-02-6	Cyclopentasiloxane, decameth	8.58	5	J N
3.				
4.				
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP7001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950569-1

Sample wt/vol: 1000.0 (g/mL) ML

Lab File ID: K2049

Level: (low/med) LOW

Date Received: 12/21/94

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 12/26/94

Concentrated Extract Volume: 1000.0 (uL)

Date Analyzed: 02/01/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 6.0

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

Number TICs found: 3

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	2.57	6	JN
2. - -	UNKNOWN	10.27	3	JN
3. - -	UNKNOWN	14.82	3	JN
4.				
5.				
6.				
7.				
8.				
9.				
10.				
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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP8001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950569-2

Sample wt/vol: 1000.0 (g/mL) ML

Lab File ID: K2050

Level: (low/med) LOW

Date Received: 12/21/94

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 12/26/94

Concentrated Extract Volume: 1000.0 (uL)

Date Analyzed: 02/01/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 6.0

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

Number TICs found: 2

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	2.58	13 10.0	JN
2. 74381-40-1	Propanoic acid, 2-methyl-, 1	14.83	3 1.2105	JN R
3.				
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

GP9001

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: 950569-3

Sample wt/vol: 1000.0 (g/mL) ML

Lab File ID: K2051

Level: (low/med) LOW

Date Received: 12/21/94

% Moisture: _____ decanted: (Y/N)___

Date Extracted: 12/26/94

Concentrated Extract Volume: 1000.0 (uL)

Date Analyzed: 02/01/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 6.0

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

Number TICs found: 2

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	2.55	3	JN
2. - -	UNKNOWN AMIDE	26.01	5	JN
3.				
4.				
5.				
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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLKW232

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: WS1223BK2

Sample wt/vol: 1000.0 (g/mL) ML

Lab File ID: K2018

Level: (low/med) LOW

Date Received: 00/00/00

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 12/23/94

Concentrated Extract Volume: 1000.0 (uL)

Date Analyzed: 01/30/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 5.0

Number TICs found: 3

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	2.56	3 B.	JN
2. - -	UNKNOWN	8.87	2 2.	JN
3. 74381-40-1	Propanoic acid, 2-methyl-, 1	14.86	2 2.	J N
4.				
5.				
6.				
7.				
8.				
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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLKW262

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

Matrix: (soil/water) WATER

Lab Sample ID: WS1226BK2

Sample wt/vol: 1000.0 (g/mL) ML

Lab File ID: K2061

Level: (low/med) LOW

Date Received: 00/00/00

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 12/26/94

Concentrated Extract Volume: 1000.0 (uL)

Date Analyzed: 02/02/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 5.0

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

Number TICs found: 4

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 57-55-6	1,2-Propanediol	2.49	4	J N
2. - -	UNKNOWN	18.98	2	J N
3. - -	UNKNOWN	20.23	3	J N
4. - -	UNKNOWN ALKANE	22.78	3	J N
5.				
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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

WS1223SB2

Lab Name: EM

Contract:

Lab Code: E3I

Case No.: 0897

SAS No.:

SDG No.: GP1001

410/42

Matrix: (soil/water) WATER

Lab Sample ID: WS1223SB2

Sample wt/vol: 1000.0 (g/mL) ML

Lab File ID: K2020

Level: (low/med) LOW

Date Received: 00/00/00

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 12/23/94

Concentrated Extract Volume: 1000.0 (uL)

Date Analyzed: 01/30/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 5.0

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

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
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APPENDIX F

DATA QUALIFIERS

ORGANIC DATA QUALIFIERS

- U - Indicates that the compound was analyzed for but not detected at or above the Contract Required Quantitation Limit (CRQL), or the compound is not detected due to qualification through the method or field blank.
- J - The associated numerical value is an estimated quantity.
- JN - Tentatively identified with approximated concentrations (Volatile and Semi-Volatile Organics).

Presumptively present at an approximated quantity (Pesticides/PCBs).
- UJ - The compound was analyzed for, but not detected. The sample quantitation limit is an estimated quantity due to variance in quality control limits.
- C - Applies to pesticide results where the identification has been confirmed by GC/MS.
- X - The mass spectrum does not meet USEPA CLP criteria for confirmation, however, compound presence is strongly suspected.
- E - Reported value is estimated due to quantitation above the calibration range.
- D - Reported result taken from diluted sample analysis.
- A - Aldol condensation product.
- R - Reported value is unusable and rejected due to variance from quality control limits.
- NA - Not Analyzed.

INORGANIC DATA QUALIFIERS

- U - Indicates analyte was not detected at or above the Contract Required Detection Limit (CRDL), or the compound is not detected due to qualification through the method or field blank.
- B - Indicates analyte result is between Instrument Detection Limit (IDL) and CRDL.
- J - Reported value is estimated due to variance from quality control limits.
- UJ - The element was analyzed for, but not detected. The sample quantitation limit is an estimate due to variance in quality control limits.
- E - Reported value is estimated because of the presence of interference.
- R - Reported value is unusable and rejected due to variance from quality control limits.
- N.A. Not Analyzed.

APPENDIX G

NYSDEC ASP SUMMARY SHEETS

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SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

[illegible]

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
VOLATILE (VOA)
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed
950564-1	Water	12-19-94	12-20-94	N A	12-23-94
-2					12-23-94
-3					12-23-94
-4					12-23-94
-5					12-23-94
-6					12-23-94
-7					12-23-94
-8					12-23-94
950569-1	-	12-20-94	12-21-94		12-27-94
-2					12-28-94
-3					12-28-94
-4					12-27-94
950586-1	Soil	12-19-94	12-23-94		12-27-94
-2	Soil	12-19-94	12-23-94		12-27-94

12-28-94

To be included with all lab data and with each workplan

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

[illegible]

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
SEMIVOLATILE (BNA)
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed
950564-1	Water	12-19-94	12-20-94	12-23-94	1-30-95
-2					1-31-95
-3					1-31-95
-4					1-31-95
-5					1-31-95
-6					1-31-95
-7					1-31-95
950569-1		12-20-94	12-21-94	12-26-94	2-1-95
-2					2-1-95
-3					2-1-95
-4					2-1-95
950586-1	Soil	12-19-94	12-23-94	12-23-94	2-1-95
-2	"	"	"	"	2-4-95

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
SEMIVOLATILE (BNA)
ANALYSES

Laboratory Sample ID	Matrix	Analytical Protocol	Extraction Method	Auxiliary Cleanup	Dil/Conc Factor
950564-1	water	91-2	lig-11g	none	1
-2			1	7	1
-3					1
-4					1
-5					1
-6					1
-7					1
950565-1					1
-2					1
-3					1
-4					1
950586-1	Soil	91-2	sonication	GPC	1
-2		"	"	"	30

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY

PESTICIDE/PCB
ANALYSES

Laboratory Sample ID	Matrix	Analytical Protocol	Extraction Method	Auxiliary Cleanup	Dil/Conc Factor
950564-1	water	91-3	sep funnel	Hg, F107	1
-2	1	1			1
-3					1
-4					1
-5					1
-6					1
-7					1
950569-8					1
-2	--				1
-3					1
-4	↓	↓	↓	↓	1
950586-1	Soil	91-3	Sonication	GPC Hg, F107	1
-2	"	"	"	"	2

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
PESTICIDE/PCB
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed
950564-1	Water	12-19-94	12-20-94	12-23-94	2-1-95
-2				12-23-94	2-1-95
-3				12-23-94	2-1-95
-4				12-23-94	2-1-95
-5				12-23-94	1-15-95
-6				12-23-94	1-15-95
-7				12-23-94	1-15-95
950569-1		12-20-94	12-21-94	12-22-94	2-1-95
-2				12-22-94	2-1-95
-3				12-22-94	2-1-95
-4				12-22-94	2-1-95
950586-1	Soil	12-19-94	12-23-94	12-23-94	2-2-95
-2	Soil	"	"	12-23-94	2-2-95

2-11-95
2-11-95

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

[illegible]

INORGANIC ANALYSES

[illegible]

INORGANIC ANALYSES

3

INORGANIC ANALYSES

[illegible]

INORGANIC ANALYSES

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INORGANIC ANALYSES

2.

INORGANIC ANALYSES

10

INORGANIC ANALYSES

14

INORGANIC ANALYSES

16

INORGANIC ANALYSES

[illegible]

INORGANIC ANALYSES

20

INORGANIC ANALYSES

91

INORGANIC ANALYSES

24

APPENDIX H

CASE NARRATIVES

CASE NARRATIVE

LAB NAME: Energy & Environmental Engineering, Inc. (E3I)

E3I PROJECT: 950564, 950569, 950586

CASE NO.: 0897 (CTI Metals)

SDG: GP1001

SAMPLE NO.: DW1001, DW1002, GP10, GP1001, GP11001, GP2001,
GP3001, GP4, GP5001, GP6001, GP7001, GP8001,
GP9001, TB.

VOLATILE ORGANICS: The results of two analyses are reported for sample DW1002 to demonstrate a matrix effect on internal standard areas.

The method blank VBLKW231 contains one nontarget compound.

The method blank VBLKW271 contains one nontarget compound.

The method blank VBLKS27B contains one nontarget compound.

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature."


Charline Driscoll
Project Manager

January 27, 1995

CASE NARRATIVE

LAB NAME: Energy & Environmental Engineering, Inc. (E3I)

E3I PROJECT: 950564, 950569, 950586

CASE NO.: 0897 (CTI Metals)

SDG: GP1001

SAMPLE NO.: DW1001, DW1002, GP10, GP1001, GP11001, GP2001,
GP3001, GP4, GP5001, GP6001, GP7001, GP8001,
GP9001, TB.

SEMIVOLATILE ORGANICS: It is acknowledged that the method blank SBLKW232 contains three nontarget compounds.

It is acknowledged that the method blank SBLKW262 contains four nontarget compounds as well as a concentration of Di-N-Butylphthalate greater than five times the CRQL.

It is acknowledged that the analytical holding time was exceeded for the method blank SBLKS231. This blank contains the aldol condensation product and ten additional nontarget compounds.

The results of two analyses are reported for sample DW1001 to demonstrate a matrix effect on internal standard areas.

Sample DW1002 was analyzed at a 1:30 dilution due to a high concentration of target compounds.

It is acknowledged that the continuing calibration on 1/30/95 had %D >100 for carbazol.

PESTICIDES/PCBs: There was a retention time shift in the analysis of the following samples on the DB608 column: GP1001, GP2001, GP3001, GP4, GP7001, GP8001, GP9001 and GP10. Please note that no target compounds were found in the RTX1701 column analysis of these samples, therefore confirmation was not necessary. These samples were analyzed on the last day of holding time; reanalysis would not have given any more useful information.

There was a retention time shift in the analysis of the following samples on the DB608 column: GP5001, GP6001, GP11001, GP4MS, GP4MSD, PBLK1223. These samples were reanalyzed after holding time because there were potential target compounds present. The reanalyses are designated "RE".

PESTICIDES/PCBs, continued: For sample GP5001, both the initial analysis and reanalysis of an archived portion of extract indicated laboratory induced contamination. The sample has been reextracted and is currently being analyzed.

The initial analysis of the method blank PBLK1223 had nontarget some carryover from a previous analysis. The carryover was not present in the reanalysis.

For the sequence beginning 1/12/95 on the DB608 column:

- The standard analyzed 1/15/95, 05:01 should have been INDBM, but an INDAM standard was analyzed. There were no other problems with this set of standards.
- The standard analyzed 1/15/95, 19:46 misinjected. The next set of continuing calibration standards are included.
- The following samples were analyzed outside of 12 hours of the PIBLK: GP5001, GP6001, GP11001, GP4MS, GP4MSD. These samples were reanalyzed in a valid sequence.

For the sequence beginning 1/29/95 on the DB608 column:

- PEMN4: Methoxychlor and DDT have %D >25; endrin breakdown is >20%.
- PEMN6: Endrin breakdown is >20%.
- PEMN8: DDT has %D >25; endrin breakdown is >20%; combined breakdown is >30%.
- There was a retention time shift in the analysis of the following: PIBLKN5, INDAMN5, INDBMN5, PIBLKN8, PEMN8.

For the sequence beginning 2/8/95 on the DB608 column:

- Linearity: Beta-BHC, heptachlor epoxide, endosulfan II, endosulfan sulfate, methoxychlor, endrin aldehyde have >20 %RSD.
- PEME1: Endrin breakdown is >20%.
- PEME3: Endrin breakdown is >20%.
- PEME7: Endrin breakdown is >20%.
- INDAME4: TCX has %D >25.
- INDBME4: TCX has %D >25.
- INDAME6: TCX and DCB have %D >25.
- INDBME6: TCX and DCB have %D >25.

For the sequence beginning 2/13/95 on the DB608 column:

- PEMU1: Alpha-BHC, beta-BHC, gamma-BH and endrin have %D>25.
- PEMU16: Methoxychlor has %D >25.
- INDAMU17: Heptachlor, DDD, Methoxychlor and DCB have %D >25.
- INDBMU17: Endosulfan II, endosulfan sulfate, endrin ketone and DCB have %D >25.

PESTICIDES/PCBs, continued: For the sequence beginning 1/12/95 on the RTX1701 column:

- The standard analyzed 1/15/95, 05:01 should have been INDBM, but an INDAM standard was analyzed. There were no other problems with this set of standards.
- The standard analyzed 1/15/95, 19:46 misinjected. The next set of continuing calibration standards are included.
- The following samples were analyzed outside of 12 hours of the PIBLK: GP5001, GP6001, GP11001, GP4MS, GP4MSD. These samples were analyzed in a valid sequence.
- PEMG: Endrin has >25 %D.
- PEMG1: DDT has %D >25; endrin breakdown is >20%; combined breakdown is >30%.
- PEMG7: Endrin has >25 %D; endrin breakdown is >20%; combined breakdown is >30%.

For the sequence beginning 1/30/95 on the RTX1701 column:

- PEMS4: Endrin has >25 %D; endrin breakdown is >20%; combined breakdown is >30%.
- PEMS6: Endrin breakdown is >20%; combined breakdown is >30%.
- PEMS8: Beta-BHC and endrin have %D >25; endrin breakdown is >20%; combined breakdown is >30%.
- INDAMS7: Endrin has %D >25.

For the sequence beginning 2/8/95 on the RTX1701 column:

- PEMJ3: 4,4'-DDT has >25 %D; endrin breakdown is >20 %.
- INDAMJ6: Endrin has %D >25.
- INDBMJ6: TCX and DCB have %D >25.

For the sequence beginning 2/13/95 on the RTX1701 column:

- Linearity: 4,4'-DDT has %RSD >30.
- PEMV1: 4,4'-DDT has >25 %D; combined breakdown is >30%.
- PEMV6: Alpha-BHC and gamma-BHC have %D >25; endrin breakdown is >20%; combined breakdown is >30%.
- INDAM17: Alpha-BHC and gamma-BHC have %D >25.

Recovery of endrin is below the QC limit in W1223MSB. Also, this MSB was analyzed beyond 12 hours of the PIBLK on both columns.

PESTICIDES/PCBs, continued: Recovery of the surrogate TCX was outside the advisory limit for the following samples on the DB608 column: GP8001, W1223MSB, GP4MS, GP5001, DW1001, DW1002.

Recovery of the surrogate TCX was outside the advisory limit for the following samples on the RTX1701 column: GP8001, W1223MSB, GP4MSRE, DW1001, DW1002.

Recovery of the surrogate DCB was outside the advisory limit for the following samples on the DB608 column: GP8001, GP5001RE, DW1002.

Recovery of the surrogate DCB was outside the advisory limit for the following samples on the RTX1701 column: DW1002, GP8001.

For sample DW1002, the percent recovery of DCB on both columns could not be determined due to coelution with a nontarget compound.

Florisil check, Lot 953062: 2,4,5-T has >5% recovery.

GPC check, 12/28/94: All compounds are above the QC limits.

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature."


Charline Driscoll
Project Manager

February 27, 1995

NARRATIVE

Description of Instrumentation:

1. ICP:

Perkin-Elmer 6500XR

Meinhard Model TR-30-C2 Nebulizer

No other significant modifications.

Operating conditions:

RF Power: 1200W

Coolant gas: 16lpm

Auxiliary gas: 0.4lpm

Nebulizer gas: 1.0lpm (indicated)

Observation height: 17mm

Wavelengths used:

Al 237.3nm	Pb 220.3
Sb 206.8	Fe 240.5
Ba 233.5	Mg 279.1
Be 313.0	Mn 294.9
Cd 214.4	Ni 231.6
Ca 317.9	K 766.4
Cr 267.7	Ag 328.1
Co 228.6	Na 589.0
Cu 324.7	V 292.4
	Zn 231.6

Explanation of error messages for ICP raw data:

Peak offset: The system did not find a peak at the analytical wavelength. When the concentration is below the detection limit this is not an error, since it merely states that the element was not found. At higher concentrations it indicates that the peak wavelength has drifted unacceptably (this did not happen during the gathering of this data), or that the concentration is too high for the system to measure. In this case the sample was diluted appropriately to bring those elements into range.

Over calibration: The concentration determined was more than 10% above the highest standard. This is not an error condition, until the reading approaches the limit of the system's measuring capabilities. In this case the sample was diluted, as above.

2. Graphite Furnace AA:

Perkin-Elmer 5100 Zeeman AA with an AS-60 Autosampler. No significant modifications or changes.

Operating conditions:

In accordance with CLP procedures and following manufacturer's recommendations. The instrument was used for the analysis of As, Pb, Se, and Tl. The integration time used for all elements was 5.0 seconds.

3. Cold Vapor Mercury:

Buck Scientific Model 400 Mercury Analyzer with Hewlett-Packard 3392A Integrator.

Calibration Standards:

Mixed (for ICP) and single element calibration standards were made up as described in our Standards Logs from 1000ppm stock solutions. Specific sources are given in tables at the end of this narrative.

Initial and continuing calibration verification standards used were produced in-house from stock standards other than those used to prepare the standardization solutions.

Laboratory Control Samples:

The above ICV standards were used as Laboratory Control Samples for all aqueous samples. The soil Laboratory Control Sample was from ERA.

Interference Check Sample:

The Interference Check Samples A and AB were made up by us and tested in accordance with SOW ILM02.0.

Comments to the Data Package:

Serial Dilutions: ICP serial dilutions were made by diluting 10ml of sample into a total volume of 50ml.

Statement of Work: These results are in accordance with EPA-CLP SOW ILM02.0 and NYSDEC ASP 12/91.

AA Analysis Times: Form 14 uses times which are stored by the AA computer, which are the time when the analysis starts. The time printed out on the raw data, however, is when the analysis of each replicate is completed, which is about 2½ minutes later for the first replicate. Thus the time on the raw data for the first replicate will always be two or three minutes after the time specified for that sample on Form 14.

Exceptions to ASP Methods: None.

ICP Interelement Corrections: The ICP instrument used, a Perkin-Elmer 6500XR, cannot perform interelement corrections. Therefore they must be done off-line after the raw data is generated. For this reason the raw data will not agree with the forms where interelement corrections have been applied. The data may be checked by applying the correction factor on Form 11 to the raw data. This is done by multiplying an experimentally determined factor (the value on Form 11) times the interferant concentration and then subtracting this product from the analyte concentration. This is done before any conversions to mg/kg for soil samples. This formula can be expressed as:

$$CA_{\text{corr}} = CA_{\text{raw}} - (CI * F),$$

where CA_{corr} is the concentration of the analyte corrected for the interference; CA_{raw} is the analyte concentration as it appears in the raw data (i. e., before correction); CI is the interferant concentration in that sample (from the raw data); and F is the factor for that interference, from Form 11. For the interference of Fe on Zn, for example, Fe is the interferant and Zn is the analyte. Multiple IEC's (e.g., Fe and Al on Cd) are assumed to be simply additive. Once the decision to do a particular IEC is made, a computer routine is used which performs the above calculation on all samples where the correction (the product of the IEC factor and the interferant concentration) is both larger than the analyte IDL and larger than 0.5% of the analyte concentration.

The corrections applied and the samples involved are:

Correction	Samples Correction Applied To:
Fe on Mn	DW1002, GP10001, GP9001; LCSS; ICS stds.
Fe on Cd	DW1001; ICS stds.
Fe on Sb	ICS stds.
Fe on Zn	as above
Al on Pb	DW1001; ICS stds.
Al on Cd	as above

ICP STANDARDS

Element	Source	Concentration
Standard 1:		Prepared: 25 Jan. 1994
Ba	Baker lot F22626	9.98
Be	Leeman lot 817931	1.00
Cd	VWR lot I2-11	1.00
Co	VWR lot L2-28	2.00
Cr	Baker lot G23620	1.996
Cu	Leeman lot 817931	2.00
Mn	PlasmaChem lot D3J25N1P71	5.00
Ni	VWR lot I2-11	2.00
Pb	VWR lot D3-09	10.00
Sb	Baker lot G12610	2.00
V	Baker lot F13651	2.002
Zn	VWR lot L2-09	5.00
Ag	Plasma Chem lot J4J47N1P209	2.00
Standard 2:		Prepared: 25 Jan. 1994
Al	VWR lot A3-14	100.0 mg/L
Ca	VWR lot D3-28	100.0
Fe	Baker lot G05633	100.0
Mg	VWR lot C3-30	100.0
Standard 0:		Prepared: 25 Jan. 1994
Blank		
NAK Standard 1:		Prepared: 27 Jan. 1994
Na	Baker lot G09632	100.7 mg/L
K	PlasmaChem lot D3J1901P176	100.0

All standards were made up in 1% nitric acid and 5% hydrochloric acid

AA STANDARDS

Element	Source	Concentrations	Date(s)
As	Env. Express lot 390602	10, 30, 60 ug/L	1/18, 1/20
Pb	VWR lot D3-09	3, 25, 50 ug/L	1/13, 1/14, 1/18
Se	Fisher 931473-18	5, 25, 45	1/17, 1/22
Tl	Env. Express lot 390303	10, 30, 60	1/11, 1/13, 1/18

Integration time 5.0 secs. for all elements.

APPENDIX I

CHAIN - OF - CUSTODY FORMS



CTI notes

P.O. Box 215
E. Cambridge, MA 02141

35 Medford St.
Somerville, MA 02143

Energy & Environmental Engineering, Inc.
Phone: (617) 666-5500 FAX: (617) 666-5802

CHAIN OF CUSTODY RECORD

Client Name: CDM/Grant Hardware Project #: 0897 Project Name: CTI P.O. # _____
Client Address: 40 Cambridge Park West Woburn MA 01797 Telephone #: (516) 496-8800
Report to: _____ Date Results Required: _____ Invoice to: _____

Sample Identification	Date / Time Sampled	Sample Type	Analyses						Total # of Cont.	Comments
			Vol	Refr	RF	RF	RF	RF		
CTI-GW-GP1-001	1/14/83	Water	2	3	1	1	1	1	7	
CTI-GW-GP2-001	1025		2	3	1	1	1	1	7	
CTI-GW-GP3-001	1140		2	3	1	1	1	1	7	
CTI-GW-GP4-001	1350		6	9	3	3	1	1	21	MS + MSD
CTI-GW-GP5-001	1630		2	3	1	1	1	1	7	
CTI-GW-GP6-001	1800	↓	2	3	1	1	1	1	7	
CTI-WS-DW1-001	0900	Soil	1	1	1	1	1	1	3	Dry well
CTI-WS-DW2-001	0945	Soil	1	1	1	1	1	1	3	Dry well
CTI-GW-GP11-001	↓ 0700	Water	2	3	1	1	1	1	7	
Field Blank		Water	2						2	Field Blank
Soil samples received on 12/23/94 11:10 AM										
Cooler temp 10°C pH OK										

Relinquished by (Signature) Joe Di Maria Date / Time 12/15/94 1900 Received by (Signature) _____ Date / Time _____
Relinquished by (Signature) _____ Date / Time 12/15/94 10:00 AM Received by (Signature) _____ Date / Time _____
Remarks: CTI-WS-DW1-001 No samples received. WHT 12/20/94
CTI-WS-DW2-001
Field Blank on C.O.C. but received. Trish Blank. M.M.D.S.



P.O. Box 215
E. Cambridge, MA 02141

Page 1 of 1

Client Name: CDN/Grant Project #: 0897 Project Name: CTI P.O. # _____
Client Address: 100 Crossways Park West Waltham, NY 11797 Telephone # (516) 496-8400
Report to: Dave Keil Date Results Required: _____ Invoice to: _____

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DATA VALIDATION REPORT #2

ORGANIC AND INORGANIC ANALYSES

CTI Metals Project

Sample Delivery Group No. DW1002

Sampling Date of June 1, 1995

PREPARED FOR:

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August 1995

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CTI Metals Project
Data Validation Report #2: Organic and Inorganic Analyses

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CTI Metals Project
Data Validation Report #2: Organic and Inorganic Analyses

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DATA VALIDATION SUMMARY: ORGANIC and INORGANIC ANALYSES

CTI Metals Project
Sample Delivery Group No. DW1002
Sampling Date of June 1, 1995

INTRODUCTION

This Data Validation Summary report for organic and inorganic analyses was generated for 2 soil samples and the associated quality control samples for Sample Delivery Group (SDG) No. DW1002. Sampling activities were conducted in support of the field investigation for the CTI Metals Project. The analytical laboratory work was performed by Energy & Environmental Engineering, Inc.

Analytical testing consisted of Contract Laboratory Program (CLP) analyses, including Volatile Organic analyses by Gas Chromatography/Mass Spectroscopy (GC/MS); Base/Neutral and Acid Extractable Organics by GC/MS; and Pesticides and Polychlorinated Biphenyls (PCBs) by GC. Inorganics were analyzed by Inductively Coupled Plasma (ICP), with Mercury by Cold Vapor. The analytical work was performed utilizing New York State Department of Environmental Conservation (NYSDEC) Analytical Service Protocols (ASP), December 1991.

This report provides a summary of data acceptability and deviations in accordance with the United States Environmental Protection Agency (USEPA) Region II Organic and Inorganic Data Validation Checklists/ Guidelines (January 1992); and, the CLP portion of the NYSDEC ASP (December 1991), where applicable and relevant. The validation report pertains to the following samples:

SDG No. DW1002

DW1002
DW2002

The analytical data summary tables attached as Appendices A through D include all parameters that were analyzed for the samples noted. The tables include concentrations of the compounds that were detected in the samples. A blank space is included in the table for those compounds analyzed but not detected in the samples.

ChemWorld Environmental, Inc. was notified by Camp Dresser and McKee that the sample identifications as presented in the analytical data packages were in fact the opposite of what was collected in the field. The analytical data for sample DW1002 was actually DW2002, and sample DW2002 was in fact DW1002. These modifications are reflected in the tables located in Appendices A through D as well as the following report.

1.0 VOLATILE ORGANICS BY GC/MS

The following items/criteria were reviewed:

- * Holding Times
- * System Monitoring Compound (Surrogate) Recovery
- * Matrix Spikes (MS) and Matrix Spike Duplicates (MSD)
- * Initial and Continuing Calibration
- * Blanks (Method and Field)
- * GC/MS Instrument Performance Check
- * Tentatively Identified Compounds (TICs)
- * Internal Standards
- * Field Duplicates
- * Target Compound List (TCL) Compound Identification
- * Compound Quantitation and Reported Detection Limits
- * System Performance

All items above were generated within acceptable Quality Control (QC) specifications, with deviations detailed as follows. The TIC result for the compound Nonanol for the MSB was qualified as 'R', unusable, due to its presence at less than five times the blank result. The remaining data is considered to be valid and usable with the appropriate qualifiers, as noted on the data summary tables in Appendix A and within the following text.

1.1 Holding Times

All holding times were met within the acceptable time frame of 7 days from Verified Time of Sample Receipt (VTSR) at the laboratory for the soil samples.

1.2 System Monitoring (Surrogate) Compound Recovery

All system monitoring compound recovery (%R) was found to be generated within acceptable limits for the three surrogate compounds.

1.3 Matrix Spike/Matrix Spike Duplicates (MS/MSD)

An MS/MSD sample set was not collected for the two soil samples. However, one matrix spike blank (MSB) was analyzed for Volatile Organics. Acceptable accuracy (percent recovery) was generated.

1.4 Calibration

All initial and continuing calibration was performed within acceptable limits for average Relative Response Factors (\overline{RRF}), Percent Relative Standard Deviation (% RSD), Relative Response Factors (RRF), and percent Difference (% D), with the following exceptions.

1.4.1 Continuing Calibration

Date, Time

6/09/95, 10:44	Chloromethane	65.0% D	(Limit 25%)
	Bromomethane	44.1%	
	Vinyl Chloride	28.0%	
	Acetone	55.6%	
	2-Butanone	56.2%	
	4-methyl-2-pentanone	57.1%	
	2-Hexanone	87.2%	

The samples associated with the continuing calibrations above were qualified as 'J', estimated, for the positive results, and 'UJ', estimated, for the non-detectable results, for the compounds noted.

1.5 Blanks

1.5.1 Field Blanks

Field blanks were not collected for the two soil samples.

1.5.2 Method Blanks

One soil method blank was analyzed for the SDG. Volatile Organics were detected as follows.

Sample ID

VBLKS09A	Methylene Chloride	3 ug/Kg, estimated
	Acetone	8 ug/Kg, estimated

Limits of ten times the methylene chloride and acetone method blank results above were used for review and qualification of the associated soil samples. The associated sample results that were found to be less than the respective blank limit were qualified as 'U', not detected. Sample results that were found to be less than the Contract Required Quantitation Limit (CRQL) and less than the respective method blank limit were qualified as 'U', not detected, at the CRQL.

1.6 GC/MS Instrument Performance Check

Instrument performance was generated within acceptable limits and frequency for Bromofluorobenzene (BFB).

1.7 Tentatively Identified Compounds (TICs)

TICs were generated in accordance with protocol. Copies of the Form I's are included in Appendix E. The TIC compound Nonanal was detected in the method blank at 12 ug/Kg. This compound was also detected in the MSB and was qualified as 'R', unusable, due to its presence at less than five times the method blank value. The TIC Nonanal was not detected in the two soil samples for the project.

1.8 Internal Standards

All internal standards were generated within acceptable specifications for area counts and retention time variation.

1.9 Field Duplicates

Field duplicate samples were not collected for the two soil samples.

1.10 TCL Identification

GC/MS qualitative analyses are considered to be acceptable for the data set. Retention times and mass spectra were generated within appropriate quality control specifications.

1.11 Compound Quantitation and Reported Detection Limits

GC/MS quantitative analyses are considered to be acceptable. Sample dilutions, internal standards and response factors were found to be within acceptable limits.

1.12 System Performance

Acceptable system performance was maintained throughout the analyses of the soil samples. This was exhibited through good resolution and consistent chromatographic performance.

2.0 SEMI-VOLATILE ORGANICS BY GC/MS (Base/Neutral and Acid Extractable Organics)

The following items/criteria were reviewed:

- * Holding Times
- * Surrogate Recovery
- * MS/MSD
- * Initial and Continuing Calibration
- * Blanks (Method and Field)
- * GC/MS Instrument Performance Check
- * TICs
- * Internal Standards
- * Field Duplicates
- * TCL Compound Identification
- * Compound Quantitation and Reported Detection Limits
- * System Performance

All items above were generated within acceptable QC specifications, with deviations detailed as follows. Various TIC results were qualified as 'R', unusable, due to their presence at less than five times the corresponding method blank value. The remaining data is considered to be valid and usable with the appropriate qualifiers, as noted on the data summary tables in Appendix B and within the following text.

2.1 Holding Times

All holding times were met for extraction and analysis of the soil samples. The NYSDEC holding time is 5 days from VTSR at the laboratory for extraction, and 40 days from extraction to analysis.

2.2 Surrogate Recovery

All surrogate recovery was found to be generated within acceptable limits for the eight surrogate compounds.

2.3 MS/MSD

An MS/MSD sample set was not collected for the two soil samples. However, one MSB was analyzed for Semi-Volatile Organics. Acceptable accuracy was generated.

2.4 Calibration

All initial and continuing calibrations were performed within acceptable limits for \overline{RRF} , % RSD, RRF, and % D, with the exception of the following.

2.4.1 Continuing Calibration

Date, Time

6/26/95, 14:00	bis(2-Chloroethyl)ether	54.3% D	(Limit 25%)
	3-Nitroaniline	61.6%	
	4-Nitroaniline	63.6%	
	n-Nitrosodiphenylamine	35.1%	
	Carbazole	71.2%	
6/27/95, 14:10	3-Nitroaniline	40.9%	
	4-Nitroaniline	56.7%	
	n-Nitrosodiphenylamine	27.9%	
	Carbazole	56.8%	

The samples associated with the continuing calibrations above were qualified as 'J', estimated, for the positive results, and 'UJ', estimated, for the non-detectable results, for the compounds noted.

2.5 Blanks

2.5.1 Field Blanks

Field blanks were not collected for the two soil samples.

2.5.2 Method Blanks

One soil method blank was analyzed for the SDG. Semi-Volatile Organics were detected as follows.

Sample ID

SBLKS062

Di-n-butylphthalate

640 ug/Kg

A limits of five times the di-n-butylphthalate value above was used for review and qualification of the soil samples. Sample results that were reported at less than the CRQL and less than the respective method blank limit were qualified as 'U', not detected, at the CRQL. Sample results that exceed the method blank limit do not require qualification.

2.6 GC/MS Instrument Performance Check

Instrument performance was generated within acceptable limits and frequency for Decafluorotriphenylphosphine (DFTPP).

2.7 TICs

TICs were generated in accordance with protocol. The Form I's, including the appropriate qualifiers, are included in Appendix E. TICs were detected as follows:

Sample ID

SBLKS062

1,2-Propanediol

1000 ug/Kg, estimated

4-hydroxy-4-methyl-2-pentanone

2400 ug/Kg, estimated

All TIC sample results for the compounds above that were reported at less than five times the method blank value were qualified as 'R', unusable.

2.8 Internal Standards

All internal standards were generated within acceptable specifications for area counts and retention time variation.

2.9 Field Duplicates

Field duplicate samples were not collected for the two soil samples.

2.10 TCL Compound Identification

GC/MS qualitative analyses are considered to be acceptable for the data set. Retention times and mass spectra were generated within appropriate quality control specifications.

2.11 Compound Quantitation and Reported Detection Limits

GC/MS quantitative analyses are considered to be acceptable for the data set. Sample dilutions, internal standards and response factors were found to be within acceptable limits.

2.12 System Performance

Acceptable system performance was maintained throughout the analyses of the soil samples. This was exhibited through good resolution and consistent chromatographic performance.

3.0 PESTICIDES AND PCBs BY GC

The following items/criteria were reviewed:

- * Holding Times
- * Surrogate Recovery
- * MS/MSD
- * Blanks (Method and Field)
- * Instrument (GC) Performance
- * Calibration
- * Field Duplicates
- * Compound Identification
- * Compound Quantitation and Reported Detection Limits

All items above were generated within acceptable QC specifications, with deviations detailed as follows. Samples DW1002 and DW2002 were qualified as 'R', unusable, for the non-detectable results for 4,4'-DDT, due to DDT breakdown. Sample DW1002 was qualified as 'R', unusable, for delta-BHC due to an extremely high percent difference between the two GC columns. The remaining data is considered to be valid and usable with the appropriate qualifiers, as noted on the data summary tables in Appendix C and within the following text.

3.1 Holding Times

All holding times were met within acceptable time frames for extraction and analysis of the soil samples. The NYSDEC holding time is 5 days from VTSR at the laboratory for extraction and 40 days from extraction to analysis.

3.2 Surrogate Recovery

Surrogate recovery was generated within acceptable limits for both surrogate compounds, with the following exceptions.

Sample ID

DW2002	DCB1	0%	(Advisory Limit 60-150)
DW1002	DCB1	0%	
	DCB2	243%	

Recovery for the surrogate DCB1 on the DB608 column was not possible due to interference and coelution with an unknown compound. The remaining surrogate recoveries were found to be acceptable. Both samples above were qualified as 'J', estimated, for the positive results, and 'UJ', estimated, for the non-detectable results.

3.3 MS/MSD

An MS/MSD sample set was not collected for the two soil samples. However, one MSB was analyzed for Pesticides. Acceptable accuracy was generated.

3.4 Blanks

3.4.1 Field Blanks

Field blanks were not collected for Pesticide/PCB analyses.

3.4.2 Method Blanks

One soil method blank was analyzed for the SDG. Pesticides and PCBs were not detected.

3.5 Instrument (GC) Performance

Adequate chromatographic resolution and instrument sensitivity were achieved through the generation of data within acceptable limits for the Resolution Check Mixture and Performance Evaluation Mixtures, with the following exceptions. The review included resolution between adjacent peaks, retention time windows, Relative Percent Difference (RPD), and percent breakdown for DDT/Endrin.

Combined 4,4'-DDT/Endrin Breakdown:

Date, Time

6/24/95, 15:27	46.30%	(Limit 30%)
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Endrin Breakdown:

6/22/95, 22:17	20.51%	(Limit 20%)
----------------	--------	-------------

6/24/95, 14:46	23.45%
----------------	--------

6/27/95, 20:45	23.00%
----------------	--------

6/28/95, 12:17	23.51%
----------------	--------

6/14/95, 16:57	22.04%
----------------	--------

6/24/95, 15:27	37.95%
----------------	--------

6/28/95, 12:58	20.79%
----------------	--------

Samples DW1002 and DW2002 were qualified as 'R', unusable, for the non-detectable results for 4,4'-DDT, due to DDT breakdown. The associated positive sample results for endrin were qualified as 'J', estimated. The associated positive sample results for 4,4'-DDD, 4,4'-DDE, endrin ketone, and endrin aldehyde were qualified as 'JN', presumptively present at an approximated quantity.

Performance Evaluation Mixtures:

Date, Time

6/15/95, 03:11	4,4'-DDT	27.0% RPD	(Limit 25%)
----------------	----------	-----------	-------------

6/21/95, 20:00	4,4'-DDT	43.0%
----------------	----------	-------

6/22/95, 22:57	4,4'-DDT	41.0%
6/24/95, 15:27	4,4'-DDT	52.0%
6/27/95, 21:26	Endrin	34.0%
	4,4'-DDT	92.0%
	Methoxychlor	35.2%
6/28/95, 12:58	4,4'-DDT	63.0%

The associated samples were qualified as 'J', estimated, for the positive results, and 'UJ', estimated, for the non-detectable results, for the compounds noted above.

3.6 Calibration

All initial and continuing calibration was performed within acceptable limits for the individual standard mixtures, with the following exceptions. Review items included resolution, retention time windows, calibration factors (CF), percent RSD for linearity, RPD and %R.

Linearity:

Date

6/14/95	4,4'-DDT	21.6% RSD	(Limit 20%)
---------	----------	-----------	-------------

The associated samples were qualified as 'J', estimated, for the positive results, and 'UJ', estimated, for the non-detectable results, for 4,4'-DDT.

Individual Standard Mixtures:

Date, Time

6/23/95, 10:51	delta-BHC	30.0% RPD	(Limit 25%)
6/25/95, 03:49	4,4'-DDT	55.0%	
6/25/95, 04:30	delta-BHC	35.0%	
	4,4'-DDE	27.5%	
6/28/95, 02:13	4,4'-DDT	57.5%	
	Methoxychlor	25.5%	
6/28/95, 02:54	delta-BHC	30.0%	
	4,4'-DDE	27.5%	

The associated samples were qualified as 'J', estimated, for the positive results, and 'UJ', estimated, for the non-detectable results, for the compounds noted above.

GPC Calibration:

gamma-BHC	125% / -	(Limit 80-110)
Aldrin	120% / -	
Dieldrin	134% / 129%	
Endrin	138% / 126%	
4,4'-DDT	152% / 182%	

The samples were qualified as 'J', estimated, for the positive results, only, for the compounds noted above.

3.7 Field Duplicates

Field duplicate samples were not collected for the two soil samples.

3.8 Compound Identification

GC qualitative analyses are considered to be acceptable. In accordance with protocol, the lower of the two values from the GC columns is reported. However, the following percent differences (%D) between the two GC columns exceeded the 25% limit.

<u>Sample ID</u>	<u>Compound</u>	<u>% D</u>
DW2002	delta-BHC	1900
	Aldrin	375.0
	Dieldrin	288.1
	4,4'-DDE	175.0
	Endrin	159.4
	Endosulfan II	87.0
	Methoxychlor	246.2
	alpha-Chlordane	61.8
	gamma-Chlordane	117.9
DW1002	alpha-BHC	115.2
	delta-BHC	10430
	Endrin	270.4
	4,4'-DDD	1230
	Endosulfan Sulfate	827.3
	gamma-Chlordane	443.2
	Aroclor-1254	37.5
DW1002 DL	Aldrin	35.3
	4,4'-DDE	94.4
	Endrin	718.2
	Endosulfan II	128.3
	4,4'-DDD	4280
	gamma-Chlordane	723.5
S0606MSB	4,4'-DDD	233.3
	Endrin Ketone	35.7
	Endrin Aldehyde	52.9

The samples above were qualified as 'J', estimated, for the compound noted where the %D was reported at up to 50%. The samples were qualified as 'JN', presumptively present at an approximated quantity, where the percent difference exceeds 50%. However, sample DW1002 was qualified as 'R', unusable, for delta-BHC due to the extremely high percent difference generated for the compound.

3.9 Compound Quantitation and Reported Detection Limits

GC quantitative analyses are considered to be acceptable for the soil samples. Supporting data was generated within the appropriate quality control specifications.

4.0 INORGANIC ANALYSES BY ICP (Mercury by Cold Vapor)

The following items/criteria were reviewed:

- * Holding Times
- * Initial and Continuing Calibration
- * CRDL Standards for ICP
- * Blanks (Initial, Continuing Calibration, and Preparation)
- * Field Blanks
- * ICP Interference Check Sample
- * Matrix Spike Sample Recovery
- * Laboratory Duplicates
- * Field Duplicates
- * Laboratory Control Sample (LCS)
- * ICP Serial Dilution
- * Sample Result Verification

All items above were generated within acceptable QC specifications, with deviations detailed as follows. The selenium non-detectable result for DW1002 was qualified as 'R', unusable, due to 0% recovery for the CRDL standard. The remaining data is considered to be valid and usable with the appropriate qualifiers, as noted on the data summary tables in Appendix D and within the following text.

4.1 Holding Times

All holding times were met within the acceptable time frame from VTSR at the laboratory for metals (180 days) and mercury (26 days), with the following exceptions.

Samples DW1002 and DW2002 were digested within the mercury holding time. However, these samples were analyzed two days beyond the 26-day holding time. The mercury results were qualified as 'J', estimated, for the positive results, and 'UJ', estimated, for the non-detectable results.

4.2 Calibration

All initial and continuing calibration was performed within acceptable limits for percent recovery.

4.3 Contract Required Detection Limit (CRDL) Standards for ICP

Percent recovery was found to be within the 80-120% limit, with the following exceptions.

ICP

Arsenic	59.7% / -
Selenium	0% / 0%
Thallium	161.2% / 154.6%

The arsenic results were qualified as 'J', estimated, for the positive results, and 'UU', estimated, for the non-detectable results. The selenium result for DW2002 was qualified as 'J', estimated. The selenium non-detectable result for DW1002 was qualified as 'R', unusable, due to 0% recovery of the CRDL standard. The non-detectable results for thallium did not require qualification.

4.4 Blanks

4.4.1 Laboratory (Method) Blanks

All initial calibration, continuing calibration, and preparation blanks were generated in accordance with acceptable limits.

4.4.2 Field Blanks

Field blanks were not collected for Inorganic analyses.

4.5 ICP Interference Check

The recoveries for the ICP Interference Check sample were found to be within the acceptable 80-120% limit.

4.6 Spiked Sample Recovery

A matrix spike sample for mercury, only, was performed for the two soil samples. Qualification in regard to the mercury spike sample was not required due to the fact that the sample concentration exceeded the spike concentration by more than four times.

4.7 Laboratory Duplicates

A laboratory duplicate sample for mercury, only, was performed for the two soil samples. Acceptable precision was generated.

4.8 Field Duplicates

Field duplicate samples were not collected for the two soil samples.

4.9 Laboratory Control Sample (LCS)

The solid laboratory control sample was generated within acceptable limits.

4.10 ICP Serial Dilution

ICP Serial Dilution was found to be within the acceptable 10% limit for percent difference (%D), with the following exceptions.

DW1002 (mg/Kg)

Iron	12.4% D
Zinc	28.9%

Sample results for iron and zinc that exceed 50 times the Instrument Detection Limit (IDL) were qualified as 'J', estimated.

4.11 Sample Result Verification

Quantitative analyses are considered to be acceptable for the data set. Analyte quantitation was generated in accordance with protocols.

APPENDIX A

DATA SUMMARY TABLES

VOLATILE ORGANICS

CTI METALS PROJECT
VOLATILES/SOIL - DATA SUMMARY

SDG NO. DW1002

All results reported in ug/Kg

Parameters - Volatiles	DW2002	Q	DW1002	Q	VBLKS09A	Q	VSPKS09A	Q
Chloromethane		UJ		UJ			2 J	
Bromomethane		UJ		UJ			3 J	
Vinyl Chloride		UJ		UJ				UJ
Chloroethane								
Methylene Chloride	62 U		15 U		3 J		10 U	
Acetone		UJ	26 U		8 J		12 U	
Carbon Disulfide								
1,1-Dichloroethylene							45	
1,1-Dichloroethane								
Total 1,2-Dichloroethylene								
Chloroform								
1,2-Dichloroethane								
2-Butanone		UJ	5 J		UJ			UJ
1,1,1-Trichloroethane								
Carbon Tetrachloride								
Bromodichloromethane								
1,2-Dichloropropane								
cis-1,3-Dichloropropene								
Trichloroethene							40	
Dibromochloromethane								
1,1,2-Trichloroethane								
Benzene							44	
trans-1,3-Dichloropropene								
Bromoform								
4-Methyl-2-pentanone		UJ		UJ	UJ			UJ
2-Hexanone		UJ		UJ	UJ			UJ
Tetrachloroethene	45 J							
1,1,2,2-Tetrachloroethane								
Toluene							43	
Chlorobenzene							44	
Ethylbenzene								
Styrene								
Total Xylenes								

APPENDIX B

DATA SUMMARY TABLES SEMI-VOLATILE ORGANICS

CTI METALS PROJECT

SEMI-VOLATILES/SOIL - DATA SUMMARY

SDG NO. DW1002

All results reported in ug/Kg

Parameters - SemiVolatiles	DW2002	Q	DW1002	Q	SBLKS062	Q	SS0606SB1	Q
Phenol							1600	
bis (2-chloroethyl) ether		UJ			UJ			UJ
2-Chlorophenol							1600	
1,3-Dichlorobenzene								
1,4-Dichlorobenzene							1100	
1,2-Dichlorobenzene								
2-Methylphenol								
bis(2-Chloroisopropyl)ether								
4-methylphenol								
N-Nitroso-di-n-propylamine							1000	
Hexachloroethane								
Nitrobenzene								
Isophorone								
2-Nitrophenol								
2,4-Dimethylphenol								
bis(2-chloroethoxy)methane								
2,4-Dichlorophenol								
1,2,4-Trichlorobenzene							1200	
Naphthalene								
4-chloroaniline								
Hexachlorobutadiene								
4-chloro-3-methylphenol							1700	
2-methylnaphthalene								
Hexachlorocyclopentadiene								
2,4,6-Trichlorophenol								
2,4,5-Trichlorophenol								
2-Chloronaphthalene								
2-Nitroaniline								
Dimethylphthalate								
Acenaphthylene								
2,6-Dinitrotoluene		UJ		UJ		UJ		UJ
3-Nitroaniline								

CTI METALS PROJECT

SEMI-VOLATILES/SOIL - DATA SUMMARY (cont.)

SDG NO. DW1002

All results reported in ug/Kg

Parameters - SemiVolatiles	DW2002	Q	DW1002	Q	SBLKS062	Q	SS0606SB1	Q
Acenaphthene			780 J				1200	
2,4-Dinitrophenol								
4-Nitrophenol							2000	
Dibenzofuran								
2,4-Dinitrotoluene							1200	
Diethylphthalate								
4-chlorophenyl-phenylether								
Fluorene			1500 J					
4-Nitroaniline		UJ		UJ		UJ		UJ
4,6-Dinitro-2-methylphenol								
N-Nitrosodiphenylamine		UJ		UJ		UJ		UJ
4-Bromophenyl-phenylether								
Hexachlorobenzene								
Pentachlorophenol							1800	
Phenanthrene	5400		21000					
Anthracene	660 J		2100 J					
Carbazole	4500 J		11000 J			UJ		UJ
Di-n-butylphthalate	13000		6300 J		640		330 U	
Fluoranthene	8900		48000					
Pyrene	7800		37000				1300	
Butylbenzylphthalate	840 J		5200 J					
3,3'-Dichlorobenzidine								
Benzo(a)anthracene	4700		23000					
Chrysene	5700		25000					
bis(2-ethylhexyl)phthalate	1500 J		30000					
Di-n-octyl phthalate			1000 J					
Benzo(b)flouranthene	7000		31000					
Benzo(k)flouranthene	4800		19000					
Benzo(a)pyrene	5100		19000					
Indeno(1,2,3-cd)pyrene	2800 J		18000					
Dibenz(a,h)anthracene	930 J		5700 J					
Benzo(g,h,i)perylene	1800 J		18000					

APPENDIX C

DATA SUMMARY TABLES

PESTICIDES and PCBs

CTI METALS PROJECT

PESTICIDES and PCBs/SOIL - DATA SUMMARY

SDG NO. DW1002

All results reported in ug/Kg

Parameters-Pesticides/PCBs	DW2002	Q	DW1002	Q	DW1002	DL	Q	PBLK606	Q	S0606MSB	Q
alpha-BHC		UJ	7.9	JN							
beta-BHC		UJ		UJ							
delta-BHC	14	JN	5.7	R						14 J	
gamma-BHC(Lindane)		UJ		UJ						13	
Heptachlor		UJ	13	J						14 J	
Aldrin	12	JN	63	E		170	JD				
Heptachlor Epoxide	16	J		UJ							
Endosulfan I		UJ		UJ							
Dieldrin	67	JN		UJ						33 J	
4,4'-DDE	20	JN		UJ		720	DJN				
Endrin	32	JN	270	E		440	DJN			39 J	
Endosulfan II	23	JN		UJ		920	DJN				
4,4'-DDD	36	JN	120	E		480	DJN			0.60 JN	
Endosulfan Sulfate		UJ	55	JN							
4,4'-DDT		R		R			UJ		UJ	39 J	
Methoxychlor	52	JN		UJ			UJ				
Endrin Ketone		UJ		UJ						1.4 JN	
Endrin Aldehyde		UJ		UJ						1.7 JN	
alpha-chlordane	34	JN		UJ							
gamma-chlordane	28	JN	81	E		170	DJN				
Toxaphene		UJ		UJ							
Aroclor-1016		UJ		UJ							
Aroclor-1221		UJ		UJ							
Aroclor-1232		UJ		UJ							
Aroclor-1242		UJ		UJ							
Aroclor-1248		UJ		UJ							
Aroclor-1254		UJ	8000	E		42000					
Aroclor-1260		UJ		UJ							

APPENDIX D

DATA SUMMARY TABLES

INORGANICS

CTI METALS PROJECT

INORGANICS/SOIL - DATA SUMMARY

SDG NO. DW1002

All results reported in mg/Kg

Parameters - Inorganics	DW2002	Q	DW1002	Q
Aluminum	171000		6800	
Antimony	16 B		2.7 B	
Arsenic	17.9 J			UJ
Barium	45.2 B		35.8 B	
Beryllium			0.27 B	
Cadmium	158		111	
Calcium	768 B		2530	
Chromium	2230		333	
Cobalt	7.7 B		4.3 B	
Copper	1270		324	
Iron	14700 J		12700 J	
Lead	764		136	
Magnesium	1390 B		2100	
Manganese	115		65	
Mercury	8.6 J			UJ
Nickel	27.1 B		29.3	
Potassium	371 B		236 B	
Selenium	15.5 J			R
Silver	4.8 B		0.89 B	
Sodium	155 B		48.3 B	
Thallium				
Vanadium	34.1 B		21.2	
Zinc	624 J		552 J	

APPENDIX E

**DATA SUMMARY FORMS
TENTATIVELY IDENTIFIED COMPOUNDS**

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

Lab Name: E3I

Contract:

~~DW1002~~

DW2002

Lab Code: E3I

Case No.: DTI METASAS No.:

SDG No.: DW1002

APS
8/9/95

Matrix: (soil/water) SOIL

Lab Sample ID: 951242-1

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

Lab File ID: H7600

Level: (low/med) LOW

Date Received: 06/02/95

% Moisture: not dec. 84.

Date Analyzed: 06/09/95

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

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

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

Lab Name: E3I

Contract:

~~DW2002~~

DW1002

Lab Code: E3I

Case No.: CTI METASAS No.:

SDG No.: DW1002

Matrix: (soil/water) SOIL

Lab Sample ID: 951242-2

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

Lab File ID: H7601

Level: (low/med) LOW

Date Received: 06/02/95

% Moisture: not dec. 34.

Date Analyzed: 06/09/95

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

Number TICs found: 10

(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. - -	UNKNOWN	19.85	25 20.	JN
2. - -	UNKNOWN ALKANE	20.38	34 30.	JN
3. - -	UNKNOWN	21.00	11 10.	JN
4. - -	UNKNOWN	21.92	29 30.	JN
5. - -	UNKNOWN ALKANE	22.03	36 40.	JN
6. - -	UNKNOWN	22.24	21 20.	JN
7. - -	UNKNOWN CYCLOHEXANE	22.40	18 20.	JN
8. - -	UNKNOWN	22.66	16 20.	JN
9. - -	UNKNOWN	23.51	12 10.	JN
10. - -	UNKNOWN ALKANE	24.06	14 10.	JN
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APS
8/9/95

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

VBLS09A

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: CTI ME GAS No.:

SDG No.: DW1002

Matrix: (soil/water) SOIL

Lab Sample ID: SV0609BKA

Sample wt/vol: 5.000 (g/mL) 5

Lab File ID: H7597

Level: (low/med) LOW

Date Received: 00/00/00

% Moisture: not dec. 0.

Date Analyzed: 06/09/95

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

Number TICs found: 1

(ug/L or ug/Kg) UG/KG

LAS NUMBER	COMPOUND NAME	RT	EST. CONC.	()
1. 124-19-6	Nonanal	23.36	12 10.000 ^{6/5/95}	JN
2.				
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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

VSPKS09A

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: CTI METASAS No.:

SDG No.: DW1002

Matrix: (soil/water) SOIL

Lab Sample ID: SV0609SBA

Sample wt/vol: 5.000 (g/mL) 6

Lab File ID: H7598

Level: (low/med) LOW

Date Received: 00/00/00

% Moisture: not dec. 0.

Date Analyzed: 06/09/95

GC Column: CAP ID: .53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

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

Number TICs found: 1

GAS NUMBER	COMPOUND NAME	RT	EST. CONC.	()
1. 124-19-6	Nonanal	23.33	19 20.18 + 83 4445	R
2.				
3.				
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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

Lab Name: E3I

Contract:

DW1002
DW2002

Lab Code: E3I

Case No.: CTI METASAS No.:

SDG No.: DW1002

Matrix: (soil/water) SOIL

Lab Sample ID: 951242-1

APS
8/9/95

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: K3914

Level: (low/med) LOW

Date Received: 06/02/95

% Moisture: 84. decanted: (Y/N) N

Date Extracted: 06/06/95

Concentrated Extract Volume: 500.0 (uL)

Date Analyzed: 06/26/95

Injection Volume: 2.0 (uL)

Dilution Factor: 2.0

GPC Cleanup: (Y/N) Y pH: 5.5

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

Number TICs found: 12

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 57-55-6	1,2-Propanediol	3.42	18000 20000.	JN
2. 123-42-2	2-Pentanone, 4-hydroxy-4-met	4.76	19000 20000.	JN NA
3. - -	UNKNOWN	11.67	2200 2000.	JN
4. - -	UNKNOWN ALKENE	11.89	940 800.	JN
5. - -	UNKNOWN	12.32	1600 2000.	JN
6. - -	UNKNOWN ALKANE	12.69	2900 3000.	JN
7. - -	UNKNOWN ALKANE	12.86	2500 3000.	JN
8. - -	UNKNOWN ALKANE	17.43	1100 1000.	JN
9. - -	UNKNOWN ALKANE	19.52	7400 8000.	JN
10. - -	UNKNOWN	31.89	5800 5000.	JN
11. - -	UNKNOWN	33.32	16000 20000.	JN
12. - -	UNKNOWN	36.90	25000 20000.	JN
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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

DW2002
DW1002

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: CTI METASAS No.:

SDG No.: DW1002

Matrix: (soil/water) SOIL

Lab Sample ID: 951242-2

APS
8/9/95

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: K3935

Level: (low/med) LOW

Date Received: 06/02/95

% Moisture: 34. decanted: (Y/N) N

Date Extracted: 06/06/95

Concentrated Extract Volume: 500.0 (uL)

Date Analyzed: 06/27/95

Injection Volume: 2.0 (uL)

Dilution Factor: 20.0

GPC Cleanup: (Y/N) Y pH: 6.0

Number TICs found: 10

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 57-55-6	1,2-Propanediol	3.30	3800 4000.	BS-N-R
2. 123-42-2	2-Pentanone, 4-hydroxy-4-met	4.71	4400 4000.	BS-NA-R
3. -	UNKNOWN ALKANE	11.35	2300 2000.	JN
4. -	UNKNOWN ALKANE	11.66	5000 5000.	JN
5. -	UNKNOWN ALKANE	12.07	13000 10000.	JN
6. -	UNKNOWN	12.78	2100 2000.	JN
7. -	UNKNOWN ALKANE	14.34	3300 3000.	JN
8. -	UNKNOWN ALKANE	17.33	2800 3000.	JN
9. -	UNKNOWN	19.67	7200 7000.	JN
10. -	UNKNOWN PAH	23.11	9500 8000.	JN
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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SBLKS062

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: CTI ME SAS No.:

SDG No.: DW1002

Matrix: (soil/water) SOIL

Lab Sample ID: SS0606BK2

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: K3911

Level: (low/med) LOW

Date Received: 00/00/00

% Moisture: 0. decanted: (Y/N) N

Date Extracted: 06/06/95

Concentrated Extract Volume: 500.0 (uL)

Date Analyzed: 06/26/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: _____

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

Number TICs found: 2

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 57-55-6	1,2-Propanediol	3.39	1000 1000.00	J N
2. 123-42-2	2-Pentanone, 4-hydroxy-4-met	4.77	2400 2000.00	J NA
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1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SS0606SB1

Lab Name: E3I

Contract:

Lab Code: E3I

Case No.: CTI METASAS No.:

SDG No.: DW1002

Matrix: (soil/water) SOIL

Lab Sample ID: SS0606SB1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: K3912

Level: (low/med) LOW

Date Received: 00/00/00

% Moisture: 0. decanted: (Y/N) N

Date Extracted: 06/06/95

Concentrated Extract Volume: 500.0 (uL)

Date Analyzed: 06/26/95

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) Y pH: _____

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 57-55-6	1,2-Propanediol	3.40	310 300.	BJ N R
2. 123-42-2	2-Pentanone, 4-hydroxy-4-met	4.76	900 900.	BJ NA R
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APPENDIX F

DATA QUALIFIERS

ORGANIC DATA QUALIFIERS

- U - Indicates that the compound was analyzed for but not detected at or above the Contract Required Quantitation Limit (CRQL), or the compound is not detected due to qualification through the method or field blank.
- J - The associated numerical value is an estimated quantity.
- JN - Tentatively identified with approximated concentrations (Volatile and Semi-Volatile Organics).

Presumptively present at an approximated quantity (Pesticides/PCBs).
- UJ - The compound was analyzed for, but not detected. The sample quantitation limit is an estimated quantity due to variance in quality control limits.
- C - Applies to pesticide results where the identification has been confirmed by GC/MS.
- X - The mass spectrum does not meet USEPA CLP criteria for confirmation, however, compound presence is strongly suspected.
- E - Reported value is estimated due to quantitation above the calibration range.
- D - Reported result taken from diluted sample analysis.
- A - Aldol condensation product.
- R - Reported value is unusable and rejected due to variance from quality control limits.
- NA - Not Analyzed.

INORGANIC DATA QUALIFIERS

- U - Indicates analyte was not detected at or above the Contract Required Detection Limit (CRDL), or the compound is not detected due to qualification through the method or field blank.
- B - Indicates analyte result is between Instrument Detection Limit (IDL) and CRDL.
- J - Reported value is estimated due to variance from quality control limits.
- UJ - The element was analyzed for, but not detected. The sample quantitation limit is an estimate due to variance in quality control limits.
- E - Reported value is estimated because of the presence of interference.
- R - Reported value is unusable and rejected due to variance from quality control limits.
- N.A. Not Analyzed.

APPENDIX G

NYSDEC ASP SUMMARY SHEETS

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

[illegible]

APG
8/9/95

DW 2002

DW1002

SAMPLE PREPARATION AND ANALYSIS SUMMARY

[illegible]

SAMPLE PREPARATION AND ANALYSIS SUMMARY SEMIVOLATILE (BNA) ANALYSES

[illegible]

1291

SAMPLE PREPARATION AND ANALYSIS SUMMARY SEMIVOLATILE (BNA) ANALYSES

[illegible]

12/91

SAMPLE PREPARATION AND ANALYSIS SUMMARY

[illegible]

007

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

[illegible]

INORGANIC ANALYSES

[illegible]

INORGANIC ANALYSES

[illegible]

INORGANIC ANALYSES

[illegible]

INORGANIC ANALYSES

[illegible]

INORGANIC ANALYSES

[illegible]

INORGANIC ANALYSES

[illegible]

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7/6

INORGANIC ANALYSES

[illegible]

INORGANIC ANALYSES

[illegible]

APPENDIX H

CASE NARRATIVES

To: Andrea Schuessler - ChemWorld Environmental
From: Frank Robinson - CDM
Re: Mixup of Drywell Samples

It has come to my attention that the drywell samples taken at CTI metals on June 1 1995 were inadvertently mixed up in the field. CTI-WS-DW1-002 is actually CTI-WS-DW2-002 and CTI-WS-DW2-002 is actually CTI-WS-DW1-002. This was due to my error in labeling the bottles in the field. I know this is correct because DW1 was dry and DW2 had ~6" of standing water in it. According to the analysis:
DW1 = 84% moisture and 16% solids and
DW2 = 34% moisture and 66% solids.
This is obviously the opposite of what I observed in the field.

Frank Robinson (CDM)

7/27/95

CASE NARRATIVE

LAB NAME: E3I Environmental Laboratory

E3I PROJECT: 951242

CASE : CTI Metals

SDG: DW1002

SAMPLE NO.: DW1002, DW2002

VOLATILE ORGANICS: Bromomethane has %D >40 in the continuing calibration.

The method blank VBLKS09A contains one nontarget compound.

An MS/MSD set was not sent for this SDG. An MSB is reported. The matrix spike blank VSPKS09A contains one nontarget compound.

*AP's
8/9/95*
SEMIVOLATILE ORGANICS: Sample ^{DW2002}~~DW1002~~ was analyzed at a 1:2 dilution due to a high concentration of nontarget compounds.

^{DW1002}
Sample ~~DW2002~~ was analyzed at a 1:20 dilution due to a high concentration of nontarget compounds.

The continuing calibration for 6/26/95 has %D >40 for bis(2-chloroethyl)ether.

The method blank SBLKS062 contains two nontarget compounds.

APs
8/9/95

DW1002

PESTICIDES/PCBs: Sample DW2002 was analyzed at a 1:80 dilution due to a high concentration of AR1254. An undiluted analysis is also reported.

DW2002 DW1002

Recovery of the surrogate DCB was outside the advisory limit for DW1002, DW2002, DW2002DL on the DB608 column due to coelution with an unknown compound.

DW1002DL

DW1002

Recovery of the surrogate DCB was outside the advisory limit for DW2002 on the RTX1701 column.

For the sequence starting on 6/14/95 on DB608:

- There was a misinjection of AR1232. It was injected after AR1254D.
- PEMD17: Endrin breakdown is >20%.
- PEMD20: Endrin breakdown is >20%.
- PEMD27: Endrin breakdown is >20%.
- PEMD29: Endrin breakdown is >20%.

For the sequence starting on 6/14/95 on RTX1701:

- PEM1: Endrin breakdown is >20%.
- PEM11: 4,4'-DDT has >25 %RPD.
- PEM115: 4,4'-DDT has >25 %RPD.
- PEM117: 4,4'-DDT has >25 %RPD.
- PEM120: 4,4'-DDT has >25 %RPD.
Endrin breakdown is >20%; combined breakdown is >30%.
- PEM127: Endrin has >25 %RPD.
4,4'-DDT has >25 %RPD.
- PEM129: 4,4'-DDT has >25 %RPD. Endrin breakdown is >20%.
- INDBM118: Delta-BHC has >25 %RPD.
- INDAM121: Delta-BHC, 4,4'-DDT and 4,4'-DDE have >25 %RPD.
- INDAM128: 4,4'-DDT and Methoxychlor have >25 %RPD.
- INDAM128: 4,4'-DDT and Delta-BHC have >25 %RPD.

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature."



Charline Driscoll
Project Manager

002

July 3, 1995

SDG NARRATIVE

Statement of Work: These results are in accordance with NYSDEC ASP 12/91.

Comments: All holding time and QC requirements were met with the following exceptions:

All mercury samples were analyzed past holding times, as our mercury instrument was inoperable at the time. However, all mercury samples were digested within holding times.

Qualifier Definitions:

- B - Reported value obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).
- U - The value recorded by the instrument was less than the Instrument Detection Limit (IDL).
- E - The reported value is estimated because of the presence of interference.
- N - Spiked sample recovery not within control limits.
- * - Duplicate analysis not within control limits.

Description of Instrumentation:

1. ICP:

Leeman Labs PS-1000AT

No significant modifications.

Operating conditions:

RF Power: 1200W

Coolant gas: 17lpm

Auxiliary gas: 0.6lpm

Nebulizer gas: 59 psi pressure

Wavelengths used:

Al 396.2nm	Pb 220.3
Sb 217.6	Fe 263.1
As 193.7	Mg 279.1
Ba 455.4	Mn 257.6
Be 313.0	Ni 231.6
Cd 214.4	K 766.4
Ca 317.9	Se 196.0
Cr 267.7	Ag 328.1
Co 228.6	Na 589.6
Cu 324.7	V 292.4
Tl 190.8	Zn 206.2

Calibration Standards:

Mixed (for ICP) and single element calibration standards were made up as described in our Standards Logs from 1000ppm stock solutions. Specific sources are given in tables at the end of this narrative.

Initial and continuing calibration verification standards used were produced in-house from stock standards other than those used to prepare the standardization solutions.

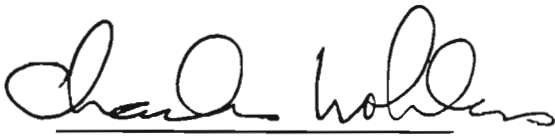
Laboratory Control Samples:

The above ICV standards were used as Laboratory Control Samples for all aqueous samples. The soil Laboratory Control Sample was from ERA.

Interference Check Sample:

The Interference Check Samples A and AB were made up by us and tested in accordance with SOW ILM02.0.

"I certify that this data package is in compliance with the terms and conditions of the Protocol, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."

A handwritten signature in cursive script, appearing to read "Charles W. Holden", written over a horizontal line.

Signature

A handwritten date "7 July 1995" written over a horizontal line.

Date

NYSDEC - ASP

COVER PAGE - INORGANIC ANALYSIS DATA PACKAGE

Lab Name: Energy & Environ. Engr.

Contract:

Lab Code: E3I

Case No.:

SAS No.:

SDG No.: DW1002

Protocol Version: 12/91

NYSDEC Sample No.

DW1002 DW2002
DW1002D DW2002D
DW1002S DW2002S
DW2002 DW1002

Lab Sample ID.

95124201
95124201D
95124201S
95124202

Where ICP interelement corrections applied?

Yes/No YES

Were ICP background corrections applied?

Yes/No YES

If yes-were raw data generated before
application of background corrections?

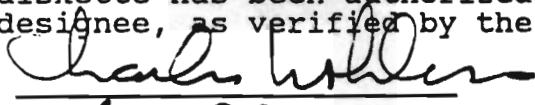
Yes/No NO

Comments:

ICP Interelement corrections were applied AFTER raw data was generated.
See narrative for further information.

I certify that this data package is in compliance with the terms and conditions of the Protocol, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature:



Name: Dr. Charles Wohlers

Date:

6 July 1995

Title: Laboratory Manager

COVER PAGE - IN

0030

APPENDIX I

CHAIN - OF - CUSTODY FORMS

E3I Environmental Laboratory
35 Medford St., Somerville, MA 02143
P.O. Box 410215, E. Cambridge, MA 02141
Tel: (617) 666-5500
Fax: (617) 666-5802

CHAIN OF CUSTODY RECORD



CLIENT: CDM/Grant Hardware
ADDRESS: 100 Crossways Port West
Woodbury NY 11767
PHONE #: (516) 496-8400 FAX #: ()
CLIENT CONTACT: Dave Keil
SITE/DESCRIPTION: CTI Met!

[illegible]**REPORT TO:**

LAB INVOICE TO:

DISTRIBUTION: ORIGINAL ACCOMPANIES SHIPMENT; BOTTOM COPY TO CLIENT

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