Huntingdon
Consulting Engineers Environmental Scientists

Empire Soils Investigations, Inc., Division
5 Knabner Road
Box 2199
Ballston Spa, New York 12020
(518)899-7491
Fax: (518)899-7496

SOIL CHARACTERIZATION STUDY
PROPOSED CHIP HANDLING FACILITY
WATERVLIET ARSENAL
WATERVLIET, NEW YORK
CONTRACT NO.: DAAA22-93-C-0012
MODIFICATION NO.: P00004

PREPARED FOR:

DEPARTMENT OF THE ARMY
WATERVLIET ARSENAL
WATERVLIET, NEW YORK

PREPARED BY:

EMPIRE SOILS INVESTIGATIONS, INC.
BALLSTON SPA, NEW YORK

PROJECT NO.: ATA-92-206-04
MARCH 1994

TABLE OF CONTENTS

SOIL CHARACTERIZATION STUDY
PROPOSED CHIP HANDLING FACILITY
WATERVLIET ARSENAL
WATERVLIET, NEW YORK

1.0 INTRODUCTION

1.1 Authorization

At the request and authorization of the Watervliet Arsenal (WVA), Empire Soils Investigations, Inc. (Empire) has completed a soil characterization study at the location of the proposed Chip Handling Facility. Work performed by Empire has been completed under the terms of Contract No. DAAA22-93-C-0012 Modification No. P00004 dated October 7, 1993. Authorization to proceed was given on February 23, 1994.

1.2 Project Objectives

The work performed by Empire as requested by the Watervliet Arsenal was to determine if contaminated soils are present in the subsurface soils planned for excavation at the proposed Chip Handling Facility for building construction and to determine how the soils may be disposed of. The following tasks were to be performed by Empire to evaluate the subsurface soils in the area of the proposed building:

1) Advancement of a total of five (5) test borings (B-1 through B-5) to a depth of four (4) to six (6) feet below existing grades with continuous split-spoon sampling within the proposed building footprint and securing soil samples for laboratory analysis. The test borings were completed at each of the proposed building corners and one in the center of the proposed structure.

2) Prepare one composite soil sample from all of the recovered split-spoon soil samples at each test boring location and submit for laboratory analysis for leachable concentrations of the Toxicity Characteristic (TC) Rule Volatiles, Semi-Volatiles and Metals by the Toxicity Characteristic Leaching

Procedure (TCLP). Additionally, each composite soil sample was analyzed for total concentrations of PCB's and TC Rule Metals.

3) One of the composite soil samples was analyzed for leachable concentrations of the TC Rule Herbicides and Pesticides by TCLP.

4) Comparison of the analytical results to regulatory limits for determining whether the soils would be defined as "Non-Hazardous" or "Hazardous" material for the appropriate disposal procedures of the excavated material.

5) Preparation of a report outlining the method of investigation, a summary of the data collected and our findings and conclusions.

2.0 SITE DESCRIPTION

The project site is located within the northwestern portion of the Watervliet Arsenal Reservation referred to as "Siberia". The proposed location of the Chip Handling Facility Building is immediately south of the existing Building No. 150. Refer to the "Site Plan" (Drwg. No. 1) presented in Appendix A for the approximate location of the proposed building, and the surrounding physical features.

3.0 METHOD OF INVESTIGATION

3.1 Subsurface Investigation

On February 24 and 25, 1994, Empire equipment and personnel were on-site to perform the subsurface investigation. A total of five (5) borings were completed for this investigation and designated B-1 through B-5. Refer to the "Site Plan" for the locations of each of the borings. Soil sampling at borings B-3 through B-5 was completed with a Failing F-10 drill rig utilizing 2-inch diameter split-spoon sample barrels. Prior to performing the soil sampling operations at boring locatoins B-3, B-4 and B-5,

the concrete pavement at these locations was cored utilizing a 3-inch diameter diamond impregnated core barrel and a portable drill stand. Upon completion of coring, soil samples were collected continuously from immediately beneath the pavement to the boring's termination depths (maximum of 6 feet below ground surface) in general conformance with ASTM Designation D-1534. At borings B-1 and B-2 soil sampling was completed utilizing a 20 lb. sledgehammer to advance the 2-inch sample barrels. This procedure was utilized at borings B-1 and B-2 due to the inaccessibility with the drill rig by snow cover.

Once all of the samples had ben recovered from each boring, the individual split-spoons were opened at the same time and portions of each were selected for laboratory analysis. As a composite of the first five (5) feet of recovered soil was required for analysis, near equal portion of each recovered sample were placed into two (2) laboratory grade 125 ml clear glass containers with septum lids to create the composite sample.

Upon completion of each boring, the borehole was backfilled with soil remaining within the split-spoon samplers and topped off with clean silica sand. The concrete pavement cores at borings B-3, B-4 and B-5 were replaced within the respective coreholes.

The recovered soil samples were visually classified by the on-site hydrogeologist, and are described on the individual Subsurface Logs in Appendix B. A sheet entitled, "Key to Subsurface Logs" is included which defines the terms and symbols used in its preparation.

3.2 Decontamination

Prior to the commencement of the drilling activity, all drill tools which would come in contact with the soils during the subsurface investigation were scrubbed with an alconox soap wash followed by a potable water rinse. Additionally, each split-spoon sampler was washed in the same manner between use to preclude cross contamination between sample intervals and boring locations. Wash and rinse water was contained within a plastic container and disposed of within the interim remedial system (Granular activated

Carbon Units) currently operating at the WVA Motor Pool (Bldg. No. 15) prior to exiting the site.

3.3 Analytical Testing Program

The composite soil samples from each boring location were shipped overnight delivery to Huntingdon Analytical Services (HAS) at Middleport, New York for analysis. HAS is a New York State Department of Health approved environmental laboratory (ELAP No. 10833) and a certified NYS Dept. of Environmental Conservation Analytical Service Protocol (ASP) laboratory.

Each composite sample was analyzed for total concentrations of Toxicity Characteristic (TC) Rule Metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver) by EPA Methods 6000 and 7000 series, and PCB's by EPA Method 8080. Additionally, each sample was analyzed for leachable concentrations of TC Rule Volatiles and Semi-Volatile Organic Compounds and Metals utilizing the Toxicity Characteristic Leaching Procedure (TCLP). Each sample was first prepared by generating an extract via TCLP (EPA Method 1311) and analyzing the extract by the following methodology for the respective parameters:

TC Volatile Organics	EPA Method 8240
TC Semi-Volatile Organics	EPA Method 8270
TC Metals	EPA Methods 6010 and 7470

In addition, the TCLP extract generated from the composite sample collected from boring B-3 was analyzed for Toxicity Characteristic Rule Herbicides and Pesticides by EPA Methods SM 509B and 8080 respectively.

A copy of the analytical results is presented in Appendix C and is discussed in Section 4.0.

4.0 FINDINGS OF INVESTIGATION

4.1 Subsurface Conditions

The subsurface conditions encountered, within the depths explored were relatively uniform beneath the area under study. Within the eastern portion of the proposed building, investigated by borings B-3, B-4 and B-5, the site surface was mantled by

concrete pavement approximately one foot thick. The soil encountered beneath the concrete pavement consisted of granular soils comprised of graded sands and gravels with varying percentages of silt and minor amounts of clay, and ranging in thickness from approximately 1.5 to 3.0 feet. The soils underlying the granular material consisted of cohesive soils comprised primarily of silt with minor percentages of clay and embedded shale fragments. In addition, at boring location B-4 a minor amount of organics was noted within the cohesive soils from approximately the 5.5 feet to the termination depth (6.0 feet) of the boring. At boring location B-2 the ground surface was mantled with approximately a one-foot thick veneer of crushed stone. The soils encountered beneath the crushed stone at boring location B-2 and exposed at the ground surface at boring location B-1 consisted of granular soils similar to the soils encountered beneath the concrete pavement at borings B-3 through B-5. The granular soils encountered at borings B-1 and B-2 ranged in thickness from 3 to 4 feet, and was underlain by similar cohesive soils encountered at the remaining borings. During the soil sampling operations, the soil samples collected from boring locations B-1 and B-3 through B-5 exhibited a petroleum odor and were noticeably discolored. The type of petroleum odor noted within the soil samples was similar to a machining or cutting oils. Refer to the individual Subsurface Logs presented in Appendix B for the details of the subsurface conditions at each of the boring locations.

4.2 Analytical Results

The composite soil samples from each boring location were analyzed for total concentrations of the Toxicity Characteristic (TC) Rule Metals and PCB's, and leachable concentrations by TCLP for TC Rule Metals, Volatile and Semi-Volatile Organic Compounds. Additionally, the composite soil collected from boring B-3 was analyzed for leachable concentrations of the TC Rule Herbicides and Pesticides. A summary of the analytical results is presented below and copy of the laboratory report is presented in Appendix C.

1. TC Rule Volatile Organics

The analysis of the TCLP extract prepared from each of the composite soil samples did not detect any of the ten (10) volatile organic compounds (VOC's) included in this methodology above the limit of laboratory detection. The laboratory analysis for VOC's was limited to those compounds specified within the U.S. EPA and NYSDEC Toxicity Characteristic (TC) List.

2. TC Rule Semi-Volatile Organics

The analytical results for the Semi-Volatile compounds within the TCLP extracts indicate that none of the 11 chemical compounds included in the analysis were detected above the limit of laboratory detection. The laboratory analysis for the semi-volatile organic compounds was limited to those compounds included within the U.S. EPA and NYSDEC Toxicity Characteristic List.

3. TC Rule Herbicides and Pesticides

Analysis of the TCLP extract prepared from the composite soil sample collected from boring locations B-3 did not reveal the presence of any of the pesticides or herbicides included in the methodologies above the limit of laboratory detection. The laboratory analysis was limited to the herbicides and pesticides specified within the U.S. EPA and NYSDEC TC List.

4. PCB's

The results of the laboratory analysis for each composite soil sample for concentrations of the seven (7) PCB isomers included in the methodology did not detect the presence of such compounds above the limit of laboratory detection within the B-1 through B-4 samples. The soil sample collected from boring B-5 did detect one of the PCB isomers (PCB-1254) at a concentration of 2.3 micrograms per gram (ug/g) or parts per million (ppm). The NYSDEC regulatory limit for hazardous waste classification for soils containing PCB's is 50 ppm, as per 6NYCRR Part 371 "Identification and Listing of

Hazardous Wastes" dated January 31, 1992. As such the material is defined as "Non-Hazardous".

5. TC Rule Metals

Of the eight (8) metal analytes included within the U.S. EPA and NYSDEC Toxicity Characteristic List (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver) and analyzed for within the TCLP extract, leachable concentrations of lead were detected within the soil samples collected from boring B-3 and B-4; chromium in the soil sample collected from boring B-5; and barium within all of the samples.

The results of the analyses for the eight (8) metal analytes within the soil samples and their respective regulatory limit are tabulated below (Table I).

TABLE I
ANALYTICAL SUMMARY
FOR TCLP CONCENTRATIONS
OF THE TC RULE METALS

Analyte	BORING LOCATION					TC Rule MCL
	B-1	B-2	B-3	B-4	B-5	
Arsenic	<0.5	<0.5	<0.5	<0.5	<0.5	5.0
Barium	1.96	1.0	1.76	2.01	1.43	100
Cadmium	<0.05	<0.05	<0.05	<0.05	<0.05	1.0
Chromium	<0.10	<0.10	<0.10	<0.10	0.11	5.0
Lead	<0.40	<0.40	0.46	0.76	<0.40	5.0
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.2
Selenium	<1.0	<1.0	<1.0	<1.0	<1.0	1.0
Silver	<0.10	<0.10	<0.10	<0.10	<0.10	5.0

Note: All concentrations are reported in milligrams per liter (mg/l) or parts per million (ppm).

Based upon the analytical results, the detected concentrations of barium, lead and chromium are below the mandated NYSDEC and U.S. EPA regulatory levels for hazardous waste classification.

Each of the soil samples were also analyzed for total concentrations of the eight (8) metal analytes. A summary of the results are presented in Table II.

TABLE II
ANALYTICAL SUMMARY FOR
TOTAL CONCENTRATIONS OF
THE TC RULE METALS

Analyte	BORING LOCATION				
	B-1	B-2	B-3	B-4	B-5
Arsenic	9.04	<44.9	7.13	10.7	3.55
Barium	135.0	101.0	148.0	162.0	77.1
Cadmium	3.68	3.85	4.9	4.66	3.1
Chromium	22.0	32.6	25.4	23.0	25.1
Lead	56.5	80.2	19.3	149.0	13.7
Mercury	<0.0933	0.228	<0.112	<0.114	<0.10
Selenium	<2.77	<2.81	<0.585	<0.563	<0.566
Silver	3.99	3.76	4.51	1.49	2.91

Note: All concentrations are reported in milligrams per kilogram (mg/kg) or parts per million (ppm).

As shown within the tabulation, concentrations of barium, cadmium, chromium, lead and silver were detected in each of the soil samples above the limit of laboratory detection. Arsenic was detected above the limit of laboratory detection within each of the soil samples, with the exception of the soil sample collected from boring B-2. Mercury was detected only within the soil sample collected from boring B-2, and selenium was not detected within any of the soil samples. Currently, there are no soil guidance values established by the NYSDEC for total concentrations of each of the

Comparing the naturally occurring concentrations of the eight (8) metal analytes as cited within Table III to the concentrations detected within each of the soil samples collected for this investigation as indicated within Table II, the following observations have been noted:

- The total concentrations of barium and chromium detected within each of the soil samples were within the observed ranges and average concentrations for these two (2) metal analytes naturally occurring in soils.

- The total concentrations of arsenic and silver detected in each of the soil samples were within observed range of the naturally occurring concentrations of the two (2) metal analytes. The total concentrations of arsenic detected in soil samples B-1 and B-4 were greater than average concentrations cited within each of the publications. The concentrations of silver within each of the soil samples ranged from 1.49 to 4.51 ppm, which is greater than the average concentration of 0.05 ppm that naturally occurs in soils.

- The total concentration of cadmium within each of the soil samples exceeded both the average concentration and observed range for cadmium naturally occurring in soils.

- The total concentrations of lead in each of the soil samples were within the observed range and average concentration of lead naturally occurring within soils, with the exception of the soil sample collected from B-4. The concentration of lead present in sample B-4 (149.0 ppm) was within the observed ranges cited (<10-300 ppm and 2-200 ppm), however, the concentration exceeded both of the average concentrations (10 and 17 ppm) cited in the publications.

- Concentrations of mercury were detected above the limit of laboratory detection only within soil sample B-2. However, the concentrations detected were within the observed ranges and the average concentrations of mercury that naturally occurs within soils.

5.0 CONCLUSIONS

- The area investigated by the test borings revealed that the eastern portion of the proposed building (boring B-3 through B-5) was mantled by concrete pavement. The soils beneath the pavement and mantling the surface within the western portion

of the proposed building (boring B-1 and B-2) consisted of granular soils comprised of graded sands and gravels with varying amounts of silt and minor percentages of clay. The granular soils at each of the boring locations were underlain by cohesive soils comprised primarily of silt with minor amounts of clay and embedded shale fragments. Based upon organoleptic observations, the soils encountered at each of the boring locations, with the exception of boring location B-2, appear to be impacted by machining or cutting oils.

- Analytical results for the composite soil samples collected from each of the boring locations for the volatile and semi-volatile organic compounds included in the Toxicity Characteristic List, did not detect leachable concentrations of such compounds within the soils via the Toxicity Characteristic Leaching Procedure (TCLP). Thus the soils are defined as "Non-Hazardous" material in regard to volatile and semi-volatile organic compounds content.

- The composite soil sample collected from boring B-3 was the only soil sample analyzed for leachable concentrations of the Toxicity Characteristic Pesticides and Herbicides. None of these compounds were detected above the limit of laboratory detection. As such the soils are defined as "Non-Hazardous" with regard to pesticides and herbicides content.

- The analytical results of the composite soil samples collected from each of the borings for total concentrations of PCB's, did detect the presence of one of the PCB isomers in the soil sample collected from boring B-5 at a concentration of 2.3 ppm. The concentration detected is below the NYSDEC regulatory limit of 50 ppm. Therefore, the soils are defined as "Non-Hazardous" material with regard to PCB's.

- Analytical results of the composite soil sample collected from each boring location for leachable concentrations of the eight (8) metal analytes included in the Toxicity Characteristic List detected concentrations of three (3) of the metal analytes (barium, chromium and lead) above the limit of laboratory detection. However, the concentrations are below the U.S. EPA and NYSDEC regulatory limits. Thus, the soils are defined as "Non-Hazardous" material in regard to metals.

- The analytical results of the composite soil samples collected from each boring for total concentrations of the eight (8) metal analytes included in the Toxicity Characteristic List detected concentrations of five (5) of the metal analytes (barium, chromium, cadmium, lead and silver) within each of the soil samples. Total concentrations of arsenic were detected in each of the soil samples with the exception of boring B-2, and concentrations of mercury were only detected in the soil sample collected from boring B-2. Currently,

there are no soil guidance values established by the NYSDEC for total concentrations of each of the metal analytes.

6.0 CLOSURE

This report presents the findings and conclusions of a subsurface investigation performed in the area of the proposed Chip Handling Building located immediately south of Building No. 150 at the Watervliet Arsenal, Watervliet, New York. The services provided by Empire Soils Investigations, Inc. to the Watervliet Arsenal were completed in accordance with the terms of Contract No. DAAA22-93-C-0012, Modification No. P00004.

The information presented herein is based upon the investigation completed by Empire. The opinion of the environmental conditions existing within the project site represents the conditions believed to exist at the time of our investigation. No other warranties, expressed or implied are made.

If there are any questions or comments, please contact this office at your convenience.

Yours truly,

EMPIRE SOILS INVESTIGATIONS, INC.

James Vincent

James Vincent
Sr. Hydrogeologist

Kirk Moline

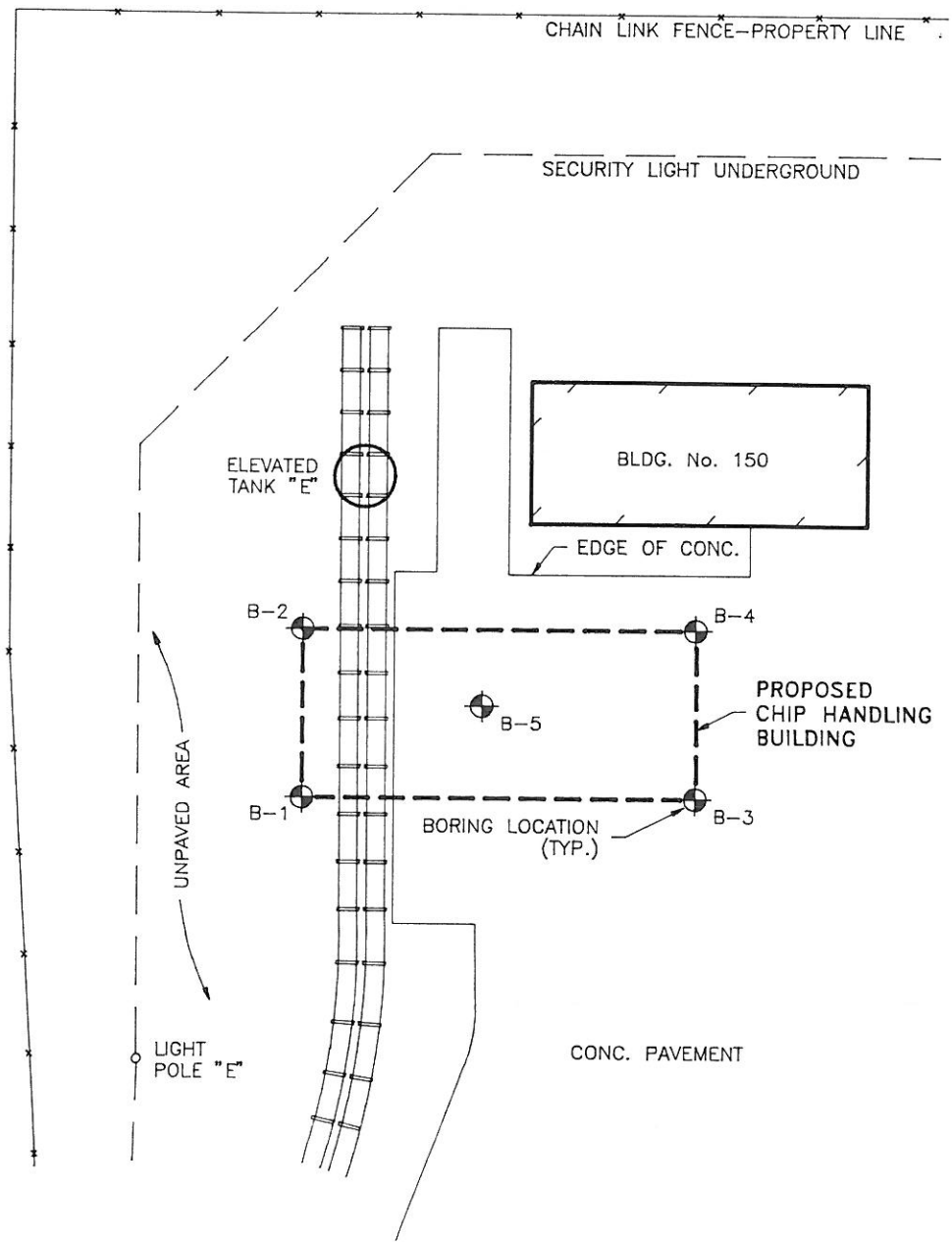
Kirk Moline
Regional Environmental Manager

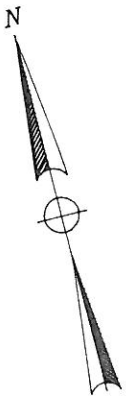
JV/KM:lsl

S:\LINDA\wp51\JIM\ATA92206.-04

APPENDIX A

DRAWINGS





Huntingdon
Consulting Engineers Environmental Scientists
Empire Soils Investigations, Inc., Division

SITE PLAN

SOIL CHARACTERIZATION STUDY
PROPOSED CHIP HANDLING FACILITY
WATERVLIET ARSENAL, WATERVLIET, NEW YORK

SCALE:	1" = 30'
DATE:	3/94
DRAWN BY:	JSH
REV'D BY:	
DWG. FILE:	ARSNL4
PROJ. No.:	ATA–92–206–4
DRAWING No.:	1

APPENDIX B

SUBSURFACE LOGS

DATE

STARTED 2/24/94

FINISHED 2/24/94

SHEET 1 OF 1

EMPIRE
SOILS INVESTIGATIONS

SUBSURFACE LOG

HOLE NO. B-1

SURF. ELEV –

G.W. DEPTH

PROJECT Proposed Chip Handling Facility
South of Bldg. 150

LOCATION Wartervliet Arsenal
Watervliet, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID PPM	SOIL OR ROCK CLASSIFICATION	NOTES
	1						Gray SILT and fine to coarse SAND and GRAVEL, little clay; strong oil odor noted	
	2							
5	3						–becomes Brown–Gray with Some fine to coarse Sand, little fine gravel +/– 4.0'	
							Brown–Gray SILT, little clay and shale fragments	
							BORING TERMINATED @ 6.0'	
10								
15								
20								
25								
30								
35								
40								

N = NO. BLOWS TO DRIVE 2" SPOON 12" WITH A 140 LB. PIN WT. FALLING 30" PER BLOW CLASSIFICATION: Visual By Geologist

DRILLER: Tom Farrell DRILL RIG TYPE :

METHOD OF INVESTIGATION 20lb. sledgehammer utilized to drive 2" split spoon sampler

DATE

STARTED 2/24/94

FINISHED 2/24/94

SHEET 1 OF 1

EMPIRE
SOILS INVESTIGATIONS

SUBSURFACE LOG

HOLE NO. B-2

SURF. ELEV –

G.W. DEPTH –

PROJECT Proposed Chip Handling Facility
South of Bldg. 150

LOCATION Wartervliet Arsenal
Watervliet, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID PPM	SOIL OR ROCK CLASSIFICATION	NOTES
	1						Gray Crushed Stone +/-1.0'	Note #1: Borehole was terminated @ 4.0' due to coarse gravel.
	2						Brown-Gray SILT, little clay with Some fine to coarse Sand	
							-Similar with Some fine to coarse Gravel noted	
5							BORING TERMINATED @ 4.0'	
10								
15								
20								
25								
30								
35								
40								

N = NO. BLOWS TO DRIVE 2" SPOON 12" WITH A 140 LB. PIN WT. FALLING 30" PER BLOW

CLASSIFICATION: Visual By Geologist

DRILLER: Tom Farrell

DRILL RIG TYPE :

METHOD OF INVESTIGATION 20lb. sledgehammer utilized to drive 2" split spoon sampler

DATE

STARTED 2/24/94

FINISHED 2/24/94

SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS

SUBSURFACE LOG

HOLE NO. B-3

SURF. ELEV –

G.W. DEPTH –

PROJECT Proposed Chip Handling Facility
South of Bldg. 150

LOCATION Wartervliet Arsenal
Watervliet, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID PPM	SOIL OR ROCK CLASSIFICATION	NOTES
							CONCRETE +/-1.0'	Note #1:
	1	18	23		41		Dark Brown fine to coarse SAND and fine GRAVEL, little silt +/-3.0'	All three (3) samples exhibited strong oil odors.
	2	24	21		32			
			11	14			Brown-Gray to Black SILT, little clay w/numerous shale fragments	
5	3	8	7		13			
			6	4				
							BORING TERMINATED @ 6.0'	
10								
15								
20								
25								
30								
35								
40								

N = NO. BLOWS TO DRIVE 2" SPOON 12" WITH A 140 LB. PIN WT. FALLING 30" PER BLOW

CLASSIFICATION: Visual By Geologist

DRILLER: Tom Farrell

DRILL RIG TYPE : Failing F-10

METHOD OF INVESTIGATION

DATE

STARTED 2/25/94

FINISHED 2/25/94

SHEET 1 OF 1

EMPIRE
SOILS INVESTIGATIONS

SUBSURFACE LOG

HOLE NO. B-4

SURF. ELEV –

G.W. DEPTH –

PROJECT Proposed Chip Handling Facility
South of Bldg. 150

LOCATION Wartervliet Arsenal
Watervliet, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID PPM	SOIL OR ROCK CLASSIFICATION	NOTES
							CONCRETE +/–1.0'	Note #1:
	1	20	32		–		Dark Brown fine to coarse SAND and GRAVEL, little silt	All three (3) samples exhibited a strong oil odor.
	2	28	25		46		+/– 4.0'	
			21	19				
5	3	18	14		22		Brown–Gray SIIT, little clay w/shale fragments	
			8	8			BORING TERMINATED @ 6.0'	
10								
15								
20								
25								
30								
35								
40								

N = NO. BLOWS TO DRIVE 2" SPOON 12" WITH A 140 LB. PIN WT. FALLING 30" PER BLOW

CLASSIFICATION: Visual By Geologist

DRILLER: Tom Farrell

DRILL RIG TYPE : Failing F–10

METHOD OF INVESTIGATION

DATE

STARTED 2/25/94

FINISHED 2/25/94

SHEET 1 OF 1

EMPIRE
SOILS INVESTIGATIONS

SUBSURFACE LOG

HOLE NO. B-4

SURF. ELEV –

G.W. DEPTH –

PROJECT Proposed Chip Handling Facility
South of Bldg. 150

LOCATION Wartervliet Arsenal
Watervliet, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID PPM	SOIL OR ROCK CLASSIFICATION	NOTES
							CONCRETE +/-1.0'	Note #1:
	1	20	32		–		Dark Brown fine to coarse SAND, little fine gravel and	All three (3) samples
	2	28	25		46		silt +/- 2.5'	exhibited a strong
			21	19				oil odor.
5	3	18	14		22		Brown-Gray SILT, little clay w/shale fragments	
			8	8			-organics noted @ +/-5.5-6.0'	
							BORING TERMINATED @ 6.0'	
10								
15								
20								
25								
30								
35								
40								

N = NO. BLOWS TO DRIVE 2" SPOON 12" WITH A 140 LB. PIN WT. FALLING 30" PER BLOW

CLASSIFICATION: Visual By Geologist

DRILLER: Tom Farrell

DRILL RIG TYPE : Failing F-10

METHOD OF INVESTIGATION

DATE

STARTED 2/25/94

FINISHED 2/25/94

SHEET 1 OF 1

EMPIRE
SOILS INVESTIGATIONS

SUBSURFACE LOG

HOLE NO. B-5

SURF. ELEV –

G.W. DEPTH –

PROJECT Proposed Chip Handling Facility
South of Bldg. 150

LOCATION Wartervliet Arsenal
Watervliet, NY

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID PPM	SOIL OR ROCK CLASSIFICATION	NOTES
							CONCRETE +/-1.0'	
	1	58	44		–		Dark Brown fine to coarse SAND and GRAVEL, little	
	2	60	35		64		silt; low recovery (0.2') strong oil odor noted	
			29	24			– Similar; low recovery (0.2')	
5	3	28	50/.1		–		–No Recovery	
							BORING TERMINATED @ 4.6'	
10								
15								
20								
25								
30								
35								
40								

N = NO. BLOWS TO DRIVE 2" SPOON 12" WITH A 140 LB. PIN WT. FALLING 30" PER BLOW

CLASSIFICATION: Visual By Geologist

DRILLER: Tom Farrell

DRILL RIG TYPE : Failing F-10

METHOD OF INVESTIGATION

DATE
STARTED 5-1-86
FINISHED 5-1-86
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC

SUBSURFACE LOG

HOLE NO. B-175
SURF. ELEV. 325.6
G. W. DEPTH See Note #1

Project
LOCATION

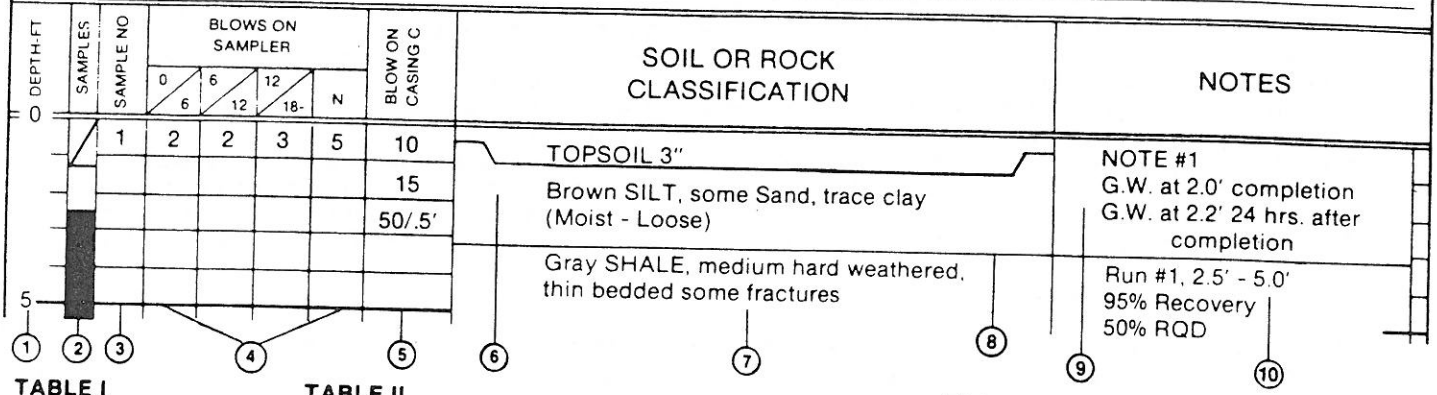


TABLE I

- Split Spoon Sample
- Shelby Tube Sample
- Auger or Test Pit Sample
- Rock Core

TABLE II

Identification of soil type is made on basis of an estimate of particle sizes, and in the case of fine grained soils also on basis of plasticity.

Soil Type	Soil Particle Size	
Boulder	> 12"	Coarse Grained (Granular)
Cobble	3" - 12"	
Gravel - Coarse	3" - ¾"	
- Fine	¾" - #4	
Sand - Coarse	#4 - #10	
- Medium	#10 - #40	
- Fine	#40 - #200	
Silt-Non Plastic (Granular) Clay-Plastic (Cohesive)	<#200	Fine Grained

TABLE III

The following terms are used in classifying soils consisting of mixtures of two or more soil types. The estimate is based on weight of total sample.

Term	Percent of Total Sample
"and"	35 - 50
"some"	20 - 35
"little"	10 - 20
"trace"	less than 10

(When sampling gravelly soils with a standard split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter.)

TABLE IV

The relative compactness or consistency is described in accord with the following terms.

Granular Soils		Cohesive Soils	
Term	Blows per Foot, N	Term	Blows per Foot, N
Loose	< 11	Very Soft	< 3
Firm	11 - 30	Soft	3 - 5
Compact	31 - 50	Medium	6 - 15
Very Compact	> 51	Stiff	16 - 25
		Hard	> 26

(Large particles in the soils will often significantly influence the blows per foot recorded during the Penetration Test.)

TABLE V

Varved	- Horizontal uniform layers or seams of soil(s).
Layer	- Soil deposit more than 6" thick.
Seam	- Soil deposit less than 6" thick.
Parting	- Soil deposit less than ⅛" thick.
Laminated	- Irregular, horizontal and angled seams and partings of soil(s).

TABLE VI

Rock Classification Terms Term		Meaning	
Hardness	Soft	Scratched by fingernail	
	Medium Hard	Scratched easily by penknife	
	Hard	Scratched with difficulty by penknife	
	Very Hard	Cannot be scratched by penknife	
Weathering	Very Weathered	Judged from the relative amounts of disintegration iron staining, core recovery, clay seams, etc.	
	Weathered		
	Sound		
Bedding	Laminated	Natural breaks in Rock Layers	(<1")
	Thin bedded		(1" - 4")
	Bedded		(4" - 12")
	Thick bedded		(12" - 36")
	Massive		(>36")

(Fracturing refers to natural breaks in the rock oriented at some angle to the rock layers.)

APPENDIX C

ANALYTICAL REPORTS

ENVIRONMENTAL ANALYTICAL REPORT

REPORT NUMBER: 94-0284

PREPARED FOR:

EMPIRE SOILS INVESTIGATIONS, INC.
P.O. BOX 2199
BALLSTON SPA, NEW YORK 12020

RE: WVA - CHIP HANDLING (ATA-92-206)

PREPARED BY:

HUNTINGDON ANALYTICAL SERVICES
DIVISION OF EMPIRE SOILS INVESTIGATIONS, INC.
P.O. BOX 250
MIDDLEPORT, NEW YORK 14105
TELEPHONE: 716/735-3400; FAX: 716/735-3653

MARCH 15, 1994

Huntingdon

HUNTINGDON ANALYTICAL SERVICES
ELAP #10833
ENVIRONMENTAL REPORT

REPORT NUMBER: 94-0284

STATEMENT OF WORK PERFORMED

I HEREBY DECLARE THAT THE WORK WAS PERFORMED UNDER MY SUPERVISION ACCORDING TO THE PROCEDURES OUTLINED BY THE FOLLOWING REFERENCES AND THAT THIS REPORT PROVIDES A CORRECT AND FAITHFUL RECORD OF THE RESULTS OBTAINED.

- 40 CFR PART 136, "GUIDELINES ESTABLISHING TEST PROCEDURES FOR THE ANALYSIS OF POLLUTANTS UNDER THE CLEAN WATER ACT", OCTOBER 26, 1984 (FEDERAL REGISTER) U. S. ENVIRONMENTAL PROTECTION AGENCY.

- U.S. ENVIRONMENTAL PROTECTION AGENCY, "TEST METHODS OF EVALUATING SOLID WASTE - PHYSICAL/CHEMICAL METHODS", OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE, SW-846, 2ND EDITION AND 3RD EDITION.

THIS REPORT CONTAINS ANALYTICAL DATA BASED ON OUR EXAMINATION OF THE SAMPLE(S) PRESENTED TO US. THIS REPORT CONTAINS (EXCEPT WHERE EXPLICITLY STATED) A COMPLETE ACCOUNT OF THE ANALYSES REQUESTED TO BE PERFORMED ON THE SAMPLE(S). INFORMATION WHICH WAS NOT REQUESTED TO BE REPORTED IS NOT INCLUDED.

Douglas F. Gillard 3-15-94

DOUGLAS F. GILLARD, PH.D.
MANAGER, ENVIRONMENTAL SERVICES

REPORT CODE LEGEND:

<DL	= LESS THAN DETECTION LIMIT
ND	= NOT DETECTED
NA	= NOT APPLICABLE
INP	= INFORMATION NOT PROVIDED
MB	= METHOD BLANK

Huntingdon

HUNTINGDON ANALYTICAL SERVICES

METALS ANALYSIS-TCLP DATA SHEET

Sample ID: B-1
HAS Sample: #94-0284-01
Date Sampled: 2/24/94

ANALYTE	EPA METHOD	EPA LIMITS	DATE ANALYZED	DET.LIMIT mg/L	RESULT mg/L
ARSENIC	6010	5.0 mg/L	3/02/94	0.50	<0.50
BARIUM	6010	100 mg/L	3/02/94	1.00	1.96
CADMIUM	6010	1.0 mg/L	3/02/94	0.05	<0.05
CHROMIUM	6010	5.0 mg/L	3/02/94	0.10	<0.10
LEAD	6010	5.0 mg/L	3/02/94	0.40	<0.40
MERCURY	7470	.2 mg/L	3/01/94	0.0002	<0.0002
SELENIUM	6010	1.0 mg/L	3/02/94	1.00	<1.00
SILVER	6010	5.0 mg/L	3/02/94	0.10	<0.10

HUNTINGDON ANALYTICAL SERVICES

METALS ANALYSIS-TCLP DATA SHEET

Sample ID: B-2
HAS Sample: #94-0284-02
Date Sampled: 2/24/94

ANALYTE	EPA METHOD	EPA LIMITS	DATE ANALYZED	DET.LIMIT mg/L	RESULT mg/L
ARSENIC	6010	5.0 mg/L	3/02/94	0.50	<0.50
BARIUM	6010	100 mg/L	3/02/94	1.00	1.00
CADMIUM	6010	1.0 mg/L	3/02/94	0.05	<0.05
CHROMIUM	6010	5.0 mg/L	3/02/94	0.10	<0.10
LEAD	6010	5.0 mg/L	3/02/94	0.40	<0.40
MERCURY	7470	.2 mg/L	3/01/94	0.0002	<0.0002
SELENIUM	6010	1.0 mg/L	3/02/94	1.00	<1.00
SILVER	6010	5.0 mg/L	3/02/94	0.10	<0.10

HUNTINGDON ANALYTICAL SERVICES

METALS ANALYSIS-TCLP DATA SHEET

Sample ID: B-3
HAS Sample: #94-0284-03
Date Sampled: 2/24/94

ANALYTE	EPA METHOD	EPA LIMITS	DATE ANALYZED	DET.LIMIT mg/L	RESULT mg/L
ARSENIC	6010	5.0 mg/L	3/02/94	0.50	<0.50
BARIUM	6010	100 mg/L	3/02/94	1.00	1.76
CADMIUM	6010	1.0 mg/L	3/02/94	0.05	<0.05
CHROMIUM	6010	5.0 mg/L	3/02/94	0.10	<0.10
LEAD	6010	5.0 mg/L	3/02/94	0.40	0.46
MERCURY	7470	.2 mg/L	3/01/94	0.0002	<0.0002
SELENIUM	6010	1.0 mg/L	3/02/94	1.00	<1.00
SILVER	6010	5.0 mg/L	3/02/94	0.10	<0.10

HUNTINGDON ANALYTICAL SERVICES

METALS ANALYSIS-TCLP DATA SHEET

Sample ID: METHOD BLANK
HAS Sample: #94-0284-MB
Date Sampled: NA

ANALYTE	EPA METHOD	EPA LIMITS	DATE ANALYZED	DET.LIMIT mg/L	RESULT mg/L
ARSENIC	6010	5.0 mg/L	3/02/94	0.50	<0.50
BARIUM	6010	100 mg/L	3/02/94	1.00	<1.00
CADMIUM	6010	1.0 mg/L	3/02/94	0.05	<0.05
CHROMIUM	6010	5.0 mg/L	3/02/94	0.10	<0.10
LEAD	6010	5.0 mg/L	3/02/94	0.40	<0.40
MERCURY	7470	.2 mg/L	3/01/94	0.0002	<0.0002
SELENIUM	6010	1.0 mg/L	3/02/94	1.00	<1.00
SILVER	6010	5.0 mg/L	3/02/94	0.10	<0.10

HUNTINGDON ANALYTICAL SERVICES

Sample ID: B-1
HAS Sample #94-0284-01
Date Sampled: 2/24/94
Date Prepared: 2/28/94

ANALYTE	EPA METHOD	DATE ANALYZED	DET.LIMIT (ug/kg)	RESULT ug/kg
ARSENIC	7060	3/07/94	1,110	9,040
BARIUM	6010	3/02/94	1,110	135,000
CADMIUM	6010	3/02/94	554	3,680
CHROMIUM	6010	3/02/94	1,110	22,000
LEAD	7421	3/09/94	6,650	56,500
MERCURY	7471	3/01/94	93.3	<93.3
SELENIUM	7740	3/11/94	2,770	<2770
SILVER	6010	3/02/94	1,110	3,990

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: B-2
HAS Sample #94-0284-02
Date Sampled: 2/24/94
Date Prepared: 2/28/94

ANALYTE	EPA METHOD	DATE ANALYZED	DET.LIMIT (ug/kg)	RESULT ug/kg
ARSENIC	7060	3/10/94	44,900	<44900
BARIUM	6010	3/02/94	1,110	101,000
CADMIUM	6010	3/02/94	556	3,850
CHROMIUM	6010	3/02/94	1,110	32,600
LEAD	7421	3/09/94	16,800	80,200
MERCURY	7471	3/01/94	113.0	228
SELENIUM	7740	3/11/94	2,810	<2810
SILVER	6010	3/02/94	1,110	3,760

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: B-3
HAS Sample #94-0284-03
Date Sampled: 2/24/94
Date Prepared: 2/28/94

ANALYTE	EPA METHOD	DATE ANALYZED	DET.LIMIT (ug/kg)	RESULT ug/kg
ARSENIC	7060	3/07/94	1,170	7,130
BARIUM	6010	3/02/94	1,160	148,000
CADMIUM	6010	3/02/94	580	4,900
CHROMIUM	6010	3/02/94	1,160	25,400
LEAD	7421	3/09/94	3,510	19,300
MERCURY	7471	3/01/94	112.0	<112
SELENIUM	7740	3/11/94	585	<585
SILVER	6010	3/02/94	1,160	4,510

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: METHOD BLANK
HAS Sample #94-0284-MB
Date Sampled: NA
Date Prepared: 2/28/94

ANALYTE	EPA METHOD	DATE ANALYZED	DET.LIMIT (ug/kg)	RESULT ug/kg
ARSENIC	7060	3/07/94	1,000	<1000
BARIUM	6010	3/02/94	1,000	<1000
CADMIUM	6010	3/02/94	500	<500
CHROMIUM	6010	3/02/94	1,000	<1000
LEAD	7421	3/10/94	300	<300
MERCURY	7471	3/01/94	100	<100
SELENIUM	7740	3/11/94	500	<500
SILVER	6010	3/02/94	1,000	<1000

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT.

HUNTINGDON ANALYTICAL SERVICES

EPA METHOD 8080
POLYCHLORINATED BIPHENYLS

SAMPLE IDENTIFICATION	B-1	B-2	B-3	METHOD BLANK	
HAS SAMPLE #940284	01	02	03	-----	
ANALYTE	RESULT ug/g	RESULT ug/g	RESULT ug/g	RESULT ug/g	DL ug/g
PCB-1016 ----------	<0.20	<0.20	<0.20	<0.20	0.20
PCB-1221 ----------	<0.20	<0.20	<0.20	<0.20	0.20
PCB-1232 ----------	<0.20	<0.20	<0.20	<0.20	0.20
PCB-1242 ----------	<0.20	<0.20	<0.20	<0.20	0.20
PCB-1248 ----------	<0.20	<0.20	<0.20	<0.20	0.20
PCB-1254 ----------	<0.20	<0.20	<0.20	<0.20	0.20
PCB-1260 ----------	<0.20	<0.20	<0.20	<0.20	0.20
DATE EXTRACTED:	3-3-94	3-3-94	3-3-94	3-3-94	
DATE ANALYZED:	3-9-94	3-9-94	3-9-94	3-9-94	

HUNTINGDON ANALYTICAL SERVICES

METHOD SM 509B
TCLP HERBICIDES

SAMPLE IDENTIFICATION	B-3	METHOD BLANK		
HAS SAMPLE #940284	03	--		
ANALYTE	RESULT mg/L	RESULT mg/L	DL mg/L	REGULATORY LIMIT mg/L
2,4-D ----------	<0.005	<0.005	0.005	10
SILVEX (2,4,5-TP) ----------	<0.005	<0.005	0.005	1.0
TCLP DATE:	2-28-94	2-28-94		
DATE EXTRACTED:	3-8-94	3-8-94		
DATE ANALYZED:	3-11-94	3-11-94		

HUNTINGDON ANALYTICAL SERVICES

EPA METHOD 8080
TCLP PESTICIDES

SAMPLE IDENTIFICATION	B-3	METHOD BLANK		
HAS SAMPLE #940284	03	--		
ANALYTE	RESULT mg/L	RESULT mg/L	DL mg/L	REGULATORY LIMIT mg/L
G-BHC(LINDANE) ----------	<0.00025	<0.00025	0.00025	0.400
CHLORDANE ----------	<0.00250	<0.00250	0.00250	0.030
ENDRIN ----------	<0.00050	<0.00050	0.00050	0.020
HEPTACHLOR ----------	<0.00025	<0.00025	0.00025	0.008
HEPTACHLOR EPOXIDE ---	<0.00025	<0.00025	0.00025	0.008
TOXAPHENE ----------	<0.00500	<0.00500	0.00500	0.500
METHOXYCHLOR----------	<0.00250	<0.00250	0.00250	10.0
TCLP DATE:	2-28-94	2-28-94		
DATE EXTRACTED:	3-3-94	3-3-94		
DATE ANALYZED:	3-7-94	3-7-94		

HUNTINGDON ANALYTICAL SERVICES

EPA METHOD 8240
TCLP VOLATILE ORGANICS

SAMPLE IDENTIFICATION :	B-1	B-2	B-3	METHOD BLANK		
HAS SAMPLE #940284	01	02	03	--		
COMPOUND	RESULT mg/L	RESULT mg/L	RESULT mg/L	RESULT mg/L	DL mg/L	REGULATORY LIMIT mg/L
VINYL CHLORIDE	<0.050	<0.050	<0.050	<0.050	0.050	0.20
1,1-DICHLOROETHENE	<0.050	<0.050	<0.050	<0.050	0.050	0.70
CHLOROFORM	<0.050	<0.050	<0.050	<0.050	0.050	6.00
1,2-DICHLOROETHANE	<0.050	<0.050	<0.050	<0.050	0.050	0.50
?-BUTANONE (MEK)	<0.050	<0.050	<0.050	<0.050	0.050	200
CARBON TETRACHLORIDE	<0.050	<0.050	<0.050	<0.050	0.050	0.50
TRICHLOROETHENE	<0.050	<0.050	<0.050	<0.050	0.050	0.50
BENZENE	<0.050	<0.050	<0.050	<0.050	0.050	0.50
TETRACHLOROETHENE	<0.050	<0.050	<0.050	<0.050	0.050	0.70
CHLOROBENZENE	<0.050	<0.050	<0.050	<0.050	0.050	100
TCLP DATE:	3-4-94	3-4-94	3-4-94	3-4-94		
DATE ANALYZED:	3-7-94	3-7-94	3-7-94	3-7-94		

HUNTINGDON ANALYTICAL SERVICES

METHOD 8270
TCLP SEMI-VOLATILE ORGANICS

SAMPLE IDENTIFICATION :	B-1	B-2	B-3	TCLP METHOD BLANK		
HAS SAMPLE #940284	01	02	03	----		
COMPOUND	RESULT mg/L	RESULT mg/L	RESULT mg/L	RESULT mg/L	MDL mg/L	REGULATORY LIMIT mg/L
CRESOL (TOTAL) ----------	<0.050	<0.050	<0.050	<0.050	0.050	200
1,4-DICHLOROBENZENE ----------	<0.050	<0.050	<0.050	<0.050	0.050	7.5
2,4-DINITROTOLUENE ----------	<0.050	<0.050	<0.050	<0.050	0.050	0.13
HEXACHLOROBENZENE ----------	<0.050	<0.050	<0.050	<0.050	0.050	0.13
HEXACHLOROBUTADIENE ----------	<0.050	<0.050	<0.050	<0.050	0.050	0.50
HEXACHLOROETHANE ----------	<0.050	<0.050	<0.050	<0.050	0.050	3.0
NITROBENZENE ----------	<0.050	<0.050	<0.050	<0.050	0.050	2.0
PENTACHLOROPHENOL ----------	<0.250	<0.250	<0.250	<0.250	0.250	100
2,4,5-TRICHLOROPHENOL ----------	<0.250	<0.250	<0.250	<0.250	0.250	400
2,4,6-TRICHLOROPHENOL ----------	<0.050	<0.050	<0.050	<0.050	0.050	2.0
PYRIDINE ----------	<0.050	<0.050	<0.050	<0.050	0.050	5.0
TCLP DATE:	2-28-94	2-28-94	2-28-94	2-28-94		
DATE EXTRACTED:	3-4-94	3-4-94	3-4-94	3-4-94		
DATE ANALYZED:	3-8-94	3-8-94	3-8-94	3-8-94		

EMPIRE SOILS INVESTIGATIONS, INC.
HUNTINGDON ANALYTICAL SERVICES
CHAIN OF CUSTODY AND ANALYTICAL REQUEST FORM

Page 1 of 1 SK 31-94

Client Name: Empire Soils
Address: 5 Knabner Road, Ballston Spa, NY 12020
Contact: Jim Vincent
Phone: 518-899-7491

Project No.: ATA 92 206
Project Site/Name: WMA - Chip Handling
Sampler's Signature: [signature]

HAS Quote #
P.O. #
HAS Ref. No.: 94- 0284

Sample I.D.	Date	Time	Comp or Grab	Sample Location	HAS Seq. #	Matrix	No. of Cont.	Container Size & Type: 125 ml VOA						Analysis Requested/Remarks
B-1	2/24/94	1015	Comp	0-6'	01	Soil	1	X						Totals 8240, 8270, PCB's, RCRA metals
B-1	↓	1015	Comp	0-6'	01	↓	1	↓						TCLP organics & metals
B-2	↓	1050	Comp	0-4'	02	↓	1	↓						Totals 8240, 8270, PCB's, RCRA metals
B-2	↓	1050	Comp.	0-4'	02	↓	1	↓						TCLP organics & metals
B-3	↓	1215	Comp.	1-6'	03	↓	1	↓						Totals 8240, 8270, PCB's, RCRA metals
B-3	↓	1215	Comp.	1-6'	03	↓	1	↓						TCLP organics & metals
END														

Relinquished by: [signature]	Date/Time: 2-24-93 1330	Received by: [signature]	Relinquished by: [signature]	Date/Time: 2-24-94 1440	Received by:
Relinquished by:	Date/Time:	Received by:	Relinquished by:	Date/Time:	Received by:
Relinquished by:	Date/Time:	Received for Lab by: P. BERNARD	Date/Time: 2/25/94 1200	Remarks: TCLP - TC Rule Parameters	

ENVIRONMENTAL ANALYTICAL REPORT

REPORT NUMBER: 94-0314

PREPARED FOR:

EMPIRE SOILS INVESTIGATIONS, INC.
P.O. BOX 2199
BALLSTON SPA, NEW YORK 12020

RE: WVA - CHIP HANDLING FACILITY (ATA-92-206-4)

PREPARED BY:

HUNTINGDON ANALYTICAL SERVICES
DIVISION OF EMPIRE SOILS INVESTIGATIONS, INC.
P.O. BOX 250
MIDDLEPORT, NEW YORK 14105
TELEPHONE: 716/735-3400; FAX: 716/735-3653

MARCH 19, 1994

Huntingdon

HUNTINGDON ANALYTICAL SERVICES
ELAP #10833
ENVIRONMENTAL REPORT

REPORT NUMBER: 94-0314

STATEMENT OF WORK PERFORMED

I HEREBY DECLARE THAT THE WORK WAS PERFORMED UNDER MY SUPERVISION ACCORDING TO THE PROCEDURES OUTLINED BY THE FOLLOWING REFERENCES AND THAT THIS REPORT PROVIDES A CORRECT AND FAITHFUL RECORD OF THE RESULTS OBTAINED.

- 40 CFR PART 136, "GUIDELINES ESTABLISHING TEST PROCEDURES FOR THE ANALYSIS OF POLLUTANTS UNDER THE CLEAN WATER ACT", OCTOBER 26, 1984 (FEDERAL REGISTER) U. S. ENVIRONMENTAL PROTECTION AGENCY.

- U.S. ENVIRONMENTAL PROTECTION AGENCY, "TEST METHODS OF EVALUATING SOLID WASTE - PHYSICAL/CHEMICAL METHODS", OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE, SW-846, 2ND EDITION AND 3RD EDITION.

THIS REPORT CONTAINS ANALYTICAL DATA BASED ON OUR EXAMINATION OF THE SAMPLE(S) PRESENTED TO US. THIS REPORT CONTAINS (EXCEPT WHERE EXPLICITLY STATED) A COMPLETE ACCOUNT OF THE ANALYSES REQUESTED TO BE PERFORMED ON THE SAMPLE(S). INFORMATION WHICH WAS NOT REQUESTED TO BE REPORTED IS NOT INCLUDED.

Douglas F. Gillard 3-22-94

DOUGLAS F. GILLARD, PH.D.
MANAGER, ENVIRONMENTAL SERVICES

REPORT CODE LEGEND:

<DL	= LESS THAN DETECTION LIMIT
ND	= NOT DETECTED
NA	= NOT APPLICABLE
INP	= INFORMATION NOT PROVIDED
MB	= METHOD BLANK

Huntingdon

HUNTINGDON ANALYTICAL SERVICES

Sample ID: B-4
HAS Sample #94-0314-01
Date Sampled: 2/25/94
Date Prepared: 3/08/94 and 3/14/94

ANALYTE	EPA METHOD	DATE ANALYZED	DET.LIMIT (ug/kg)	RESULT ug/kg
ARSENIC	7060	3/15/94	4,510	10,700
BARIUM	6010	3/09/94	1,130	162,000
CADMIUM	6010	3/09/94	563	4,660
CHROMIUM	6010	3/09/94	1,130	23,000
LEAD	7421	3/14/94	3,380	149,000
MERCURY	7471	3/08/94	114	<114
SELENIUM	7740	3/16/94	563	<563
SILVER	6010	3/09/94	1,130	1,490

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: METHOD BLANK 2
HAS Sample #94-0314-MB2
Date Sampled: NA
Date Prepared: 3/08/94 and 3/14/94

ANALYTE	EPA METHOD	DATE ANALYZED	DET.LIMIT (ug/kg)	RESULT ug/kg
ARSENIC	7060	3/15/94	1,000	<1000
BARIUM	6010	3/09/94	1,000	<1000
CADMIUM	6010	3/09/94	500	<500
CHROMIUM	6010	3/09/94	1,000	<1000
LEAD	7421	3/14/94	300	<300
MERCURY	7471	3/08/94	20	<20
SELENIUM	7740	3/16/94	500	<500
SILVER	6010	3/09/94	1,000	<1000

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: B-5
HAS Sample #94-0314-02
Date Sampled: 2/25/94
Date Prepared: 3/03/94

ANALYTE	EPA METHOD	DATE ANALYZED	DET.LIMIT (ug/kg)	RESULT ug/kg
ARSENIC	7060	3/07/94	1,130	3,550
BARIUM	6010	3/04/94	1,110	77,100
CADMIUM	6010	3/04/94	555	3,000
CHROMIUM	6010	3/04/94	1,110	25,100
LEAD	7421	3/09/94	1,700	13,700
MERCURY	7471	3/08/94	100	<100
SELENIUM	7740	3/11/94	566	<566
SILVER	6010	3/04/94	1,110	2,910

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: METHOD BLANK
HAS Sample #94-0314-MB
Date Sampled: NA
Date Prepared: 3/03/94

ANALYTE	EPA METHOD	DATE ANALYZED	DET.LIMIT (ug/kg)	RESULT ug/kg
ARSENIC	7060	3/07/94	1,000	<1000
BARIUM	6010	3/04/94	1,000	<1000
CADMIUM	6010	3/04/94	500	<500
CHROMIUM	6010	3/04/94	1,000	<1000
LEAD	7421	3/10/94	300	<300
MERCURY	7471	3/08/94	20	<20
SELENIUM	7740	3/11/94	500	<500
SILVER	6010	3/04/94	1,000	<1000

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT.

HUNTINGDON ANALYTICAL SERVICES

METALS ANALYSIS-TCLP DATA SHEET

Sample ID: B-4
HAS Sample: #94-0314-01
Date Sampled: 2/25/94

ANALYTE	EPA METHOD	EPA LIMITS	DATE ANALYZED	DET.LIMIT mg/L	RESULT mg/L
ARSENIC	6010	5.0 mg/L	3/08/94	0.50	<0.50
BARIUM	6010	100 mg/L	3/08/94	1.00	2.01
CADMIUM	6010	1.0 mg/L	3/08/94	0.05	<0.05
CHROMIUM	6010	5.0 mg/L	3/08/94	0.10	<0.10
LEAD	6010	5.0 mg/L	3/08/94	0.40	0.76
MERCURY	7470	.2 mg/L	3/08/94	0.0002	<0.0002
SELENIUM	6010	1.0 mg/L	3/08/94	1.00	<1.00
SILVER	6010	5.0 mg/L	3/08/94	0.10	<0.10

HUNTINGDON ANALYTICAL SERVICES

METALS ANALYSIS-TCLP DATA SHEET

Sample ID: B-5
HAS Sample: #94-0314-02
Date Sampled: 2/25/94

ANALYTE	EPA METHOD	EPA LIMITS	DATE ANALYZED	DET.LIMIT mg/L	RESULT mg/L
ARSENIC	6010	5.0 mg/L	3/07/94	0.50	<0.50
BARIUM	6010	100 mg/L	3/07/94	1.00	1.43
CADMIUM	6010	1.0 mg/L	3/07/94	0.05	<0.05
CHROMIUM	6010	5.0 mg/L	3/07/94	0.10	0.11
LEAD	6010	5.0 mg/L	3/07/94	0.40	<0.40
MERCURY	7470	.2 mg/L	3/08/94	0.0002	<0.0002
SELENIUM	6010	1.0 mg/L	3/07/94	1.00	<1.00
SILVER	6010	5.0 mg/L	3/07/94	0.10	<0.10

HUNTINGDON ANALYTICAL SERVICES

METALS ANALYSIS-TCLP DATA SHEET

Sample ID: METHOD BLANK
HAS Sample: #94-0314-MB
Date Sampled: NA

ANALYTE	EPA METHOD	EPA LIMITS	DATE ANALYZED	DET.LIMIT mg/L	RESULT mg/L
ARSENIC	6010	5.0 mg/L	3/08/94	0.50	<0.50
BARIUM	6010	100 mg/L	3/08/94	1.00	<1.00
CADMIUM	6010	1.0 mg/L	3/08/94	0.05	<0.05
CHROMIUM	6010	5.0 mg/L	3/08/94	0.10	<0.10
LEAD	6010	5.0 mg/L	3/08/94	0.40	<0.40
MERCURY	7470	.2 mg/L	3/08/94	0.0002	<0.0002
SELENIUM	6010	1.0 mg/L	3/08/94	1.00	<1.00
SILVER	6010	5.0 mg/L	3/08/94	0.10	<0.10

HUNTINGDON ANALYTICAL SERVICES

EPA METHOD 8080
POLYCHLORINATED BIPHENYLS

SAMPLE IDENTIFICATION	B-4	B-5	METHOD BLANK	
HAS SAMPLE #940314	01	02	-----	
ANALYTE	RESULT ug/g	RESULT ug/g	RESULT ug/g	DL ug/g
PCB-1016 ----------	<0.20	<0.20	<0.20	0.20
PCB-1221 ----------	<0.20	<0.20	<0.20	0.20
PCB-1232 ----------	<0.20	<0.20	<0.20	0.20
PCB-1242 ----------	<0.20	<0.20	<0.20	0.20
PCB-1248 ----------	<0.20	<0.20	<0.20	0.20
PCB-1254 ----------	<0.20	2.3	<0.20	0.20
PCB-1260 ----------	<0.20	<0.20	<0.20	0.20
DATE EXTRACTED:	3-3-94	3-3-94	3-3-94	
DATE ANALYZED:	3-10-94	3-10-94	3-10-94	

HUNTINGDON ANALYTICAL SERVICES

EPA METHOD 8240
TCLP VOLATILE ORGANICS

SAMPLE IDENTIFICATION :	B-4	B-5	METHOD BLANK	METHOD BLANK		
HAS SAMPLE #940314	01	02	--	--		
COMPOUND	RESULT mg/L	RESULT mg/L	RESULT mg/L	RESULT mg/L	DL mg/L	REGULATORY LIMIT mg/L
VINYL CHLORIDE	<0.050	<0.050	<0.050	<0.050	0.050	0.20
1,1-DICHLOROETHENE	<0.050	<0.050	<0.050	<0.050	0.050	0.70
CHLOROFORM	<0.050	<0.050	<0.050	<0.050	0.050	6.00
1,2-DICHLOROETHANE	<0.050	<0.050	<0.050	<0.050	0.050	0.50
2-BUTANONE (MEK)	<0.050	<0.050	<0.050	<0.050	0.050	200
CARBON TETRACHLORIDE	<0.050	<0.050	<0.050	<0.050	0.050	0.50
TRICHLOROETHENE	<0.050	<0.050	<0.050	<0.050	0.050	0.50
BENZENE	<0.050	<0.050	<0.050	<0.050	0.050	0.50
TETRACHLOROETHENE	<0.050	<0.050	<0.050	<0.050	0.050	0.70
CHLOROBENZENE	<0.050	<0.050	<0.050	<0.050	0.050	100
TCLP DATE:	3-4-94	3-3-94	3-3-94	3-4-94		
DATE ANALYZED:	3-7-94	3-7-94	3-7-94	3-7-94		

HUNTINGDON ANALYTICAL SERVICES

METHOD 8270
TCLP SEMI-VOLATILE ORGANICS

SAMPLE IDENTIFICATION :	B-4	B-5	TCLP METHOD BLANK	TCLP METHOD BLANK		
HAS SAMPLE #940314	01	02	----	----		
COMPOUND	RESULT mg/L	RESULT mg/L	RESULT mg/L	RESULT mg/L	MDL mg/L	REGULATORY LIMIT mg/L
CRESOL (TOTAL) ----------	<0.050	<0.050	<0.050	<0.050	0.050	200
1,4-DICHLOROBENZENE ----------	<0.050	<0.050	<0.050	<0.050	0.050	7.5
2,4-DINITROTOLUENE ----------	<0.050	<0.050	<0.050	<0.050	0.050	0.13
HEXACHLOROBENZENE ----------	<0.050	<0.050	<0.050	<0.050	0.050	0.13
HEXACHLOROBUTADIENE ----------	<0.050	<0.050	<0.050	<0.050	0.050	0.50
HEXACHLOROETHANE ----------	<0.050	<0.050	<0.050	<0.050	0.050	3.0
NITROBENZENE ----------	<0.050	<0.050	<0.050	<0.050	0.050	2.0
PENTACHLOROPHENOL ----------	<0.250	<0.250	<0.250	<0.250	0.250	100
2,4,5-TRICHLOROPHENOL ----------	<0.250	<0.250	<0.250	<0.250	0.250	400
2,4,6-TRICHLOROPHENOL ----------	<0.050	<0.050	<0.050	<0.050	0.050	2.0
PYRIDINE ----------	<0.050	<0.050	<0.050	<0.050	0.050	5.0
TCLP DATE:	3-4-94	3-3-94	3-3-94	3-4-94		
DATE EXTRACTED:	3-7-94	3-7-94	3-7-94	3-7-94		
DATE ANALYZED:	3-8-94	3-8-94	3-8-94	3-8-94		

EMPIRE SOILS INVESTIGATIONS, INC.

HUNTINGDON ANALYTICAL SERVICES

CHAIN OF CUSTODY RECORD AND ANALYTICAL REQUEST FORM

Client Name: Empire Soils
Address: 5 Knabner Rd, Ballston Spa, NY 12020
Contact: Jim Vincent
Phone: (518) 899-7491

Project No.: ~~ATA-92-206-#4~~
Project Site/Name: WVA - Chip Handling Facility
Sampler's Signature: James Vincent

HAS Quote #
P.O. #
HAS Ref. No.: ~~93-~~ 94-0314

Sample I.D.	Date	Time	Comp or Grab	Sample Location	HAS Seq. #	Matrix	No. of Cont.	Container Size & Type: 125ml VOA						Analysis Requested/Remarks
B-4	2/25/94	0830	Comp.	1'-6'	01	Soil	2	✓						~~8240, 8270, PCB's, RCRA Metals, TCLP Organics & Pesticides~~
B-5	2/25/94	0900	Comp.	1'-4.5'	02 KF	Soil	2	✓						TC Rule 11 Volatiles, Semi Volatiles, Metals by TCLP. TC Rule Metals (Total) Total PCB's (8080)

Relinquished by:	Date/Time:	Received by:	Relinquished by:	Date/Time:	Received by:
James Vincent	3/1/94 / 1700 hrs				
Relinquished by:	Date/Time:	Received by:	Relinquished by:	Date/Time:	Received by:
Relinquished by:	Date/Time:	Received for Lab by:	Date/Time: 3/2/94 11:5	Remarks: ~~X TCLP mi For~~ TC Rule Parameters	