Interim Measures Report

Lake Shore Foundry
653 S. Market Street
Waukegan, Lake County, Illinois 60085

August 31, 2007

Submitted to:

US EPA Region V
Land and Chemicals Division
Remediation and Reuse Branch
Corrective Action Section
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Prepared by:

Deigan & Associates, LLC
Environmental Consultants
100 S. Genesee St.
Waukegan, IL. 60085

www.deiganassociates.com

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1.0 Background & Objectives

1.1 Site Location & Current Conditions

The Lake Shore Foundry site is at 653 Market Street in Waukegan, Lake County, Illinois. The dimensions of the property are approximately 270 feet north-south and 135 feet east-west. The 0.77 acre LSF property contains a single corrugated metal building. The Facility is located on the western shoreline of Lake Michigan. The Elgin, Joliet, and Eastern railroad borders the facility on the west and north sides. Lake Michigan borders the facility on the east side. A City ROW is south of the facility. The ground surface is relatively flat with fill soil covering much of the ground throughout the facility property. The LSF property and adjoining properties have a 100+ year history of heavy industrial uses, including Moen, US Steel, Fansteel/VR Wesson, Waukegan Paint & Lacquer, Diamond Scrap Yard and numerous other factories and warehouses.

Figure 1 shows the location of this property imposed on a 2002 aerial photo.

1.2 Objectives of Interim Measures Investigation

The foundry was established in 1900 and produces prototype, short run and high production non-ferrous alloys. Products presently produced by Lake Shore Foundry include brass, bronze & aluminum sand & permanent mold castings. The facility previously manufactured red brass and tin bronze, products which may have contained lead. Previous sampling conducted by the United States Environmental Protection Agency (USEPA) in February 2003 and in September 2004 found total lead and Toxicity Characteristic Leaching Procedure (TCLP) lead at concentrations exceeding regulatory limits. The USEPA's sampling and analysis, however, was not sufficient to design a removal plan or adequately quantify the vertical or horizontal extent of soils having elevated TCLP and total lead levels.

The objective of the interim measures investigation was to obtain the environmental data needed to determine the nature and extent of unacceptable levels of heavy metals (primarily lead) in soils at the Facility. These measures included:

- Testing of soil on the facility to determine the extent lead-contaminated soil above the TCLP regulatory limit of 5 mg/L set forth in 40 CFR 261.24;

- Evaluation of the levels of total lead measured in soil by comparing the average surface (0–6 inch) soil lead concentration to the USEPA Region 9 preliminary remediation goal of 800 mg/kg for a commercial/industrial exposure scenario; and

- Development of an appropriate interim measures removal or treatment plan for the facility to address characteristically hazardous sources of lead contamination.

The following subsections present the results of the Interim Measures investigation as well as the proposed Interim Measures soil removal activities.

2.0 Scope of Investigation

In determining environmental conditions on the project site, a sampling and analysis program was conducted on the property. All field investigative activities were conducted by Deigan and Associates, LLC in accordance with a USEPA-approved Interim Measures Work Plan (IMWP). Severn Trent Laboratories, Inc. (STL) of University Park, Illinois performed all laboratory analyses.

2.1 Work Plan Approval

On behalf of Lake Shore Foundry, Deigan and Associates, LLC submitted an Interim Measures Work Plan to the USEPA on 16 January 2007. On 22 February 2007, the USEPA returned comments regarding the work plan. After making the appropriate revisions, Deigan and Associates submitted the revised work plan on 27 April 2007. The revised Interim Measures Work Plan was approved by the USEPA on 15 May 2007.

2.2 Sampling & Analysis Plan

2.2.1 Summary of Field Sampling Completed

Figure 2 presents an overview of the sampling and analysis schematic for the study area. Sample locations (x,y,z coordinates) were documented using field survey techniques. A site-wide grid pattern of surface and subsurface borings for soil (see **Figure 2**) was established using a base grid that utilized a north-south grid interval of 50 feet and east-west grid interval of 50 feet. The grid was simply utilized as a field reference to locate the 20 initial plus 6 off-set sample locations shown on **Figure 2**. The grid was also utilized to return to various field locations and perform off-set sampling at 6 locations, for further delineation and as a point of reference for removal work. The grid was not used as a means for selection of the sample locations.

On 12 and 13 July 2007, discrete soil samples were collected at every sample location in the 0- to 6-inch interval and at every two feet in depth, beginning at 6 inches below ground surface (bgs) and continuing to the above the interface of the groundwater/vadose zone. No soil samples were obtained at or below the water table. Geoprobe direct push sampling techniques were utilized using a truck-mounted rig. **Appendix B** includes all of the soil probe logs from the initial testing round.

All surface (0-6” bgs) and subsurface (>6” bgs) samples were analyzed for total metals and TCLP Lead. Total metals were analyzed using SW846-Method 6010; TCLP lead was analyzed using SW-846 Methods 1310/6010. Total metals analysis was conducted per USEPA’s Work Plan approval letter, which requested at least 10% of the samples be analyzed for total metals.

Following the initial sampling, a supplemental round of sampling was performed on 10 August 2007, with an additional 6 sample locations added. The purpose of this “step-out sampling” was to further delineate the area of TCLP lead contamination. Procedures

identical to those followed in the initial sampling were performed in collecting the soil samples, which where then tested by STL for TCLP lead. **Figure 2** shows the location of all sampling, including the six supplemental locations.

During the soil delineation, a composite sample of the material that may be subject to excavation and disposal was collected for analysis of parameters required for waste profiling at the disposal facility. The analytical parameters were determined by the disposal facility's waste analysis plan and permits.

2.2.2 Data Quality Objectives

Sampling protocols and laboratory methods followed IEPA and USEPA guidelines. Illinois EPA practical quantitation limits (PQLs) established under the Illinois SRP and TACO regulations were used by the laboratory. PQLs were based on residential land use. STL provided all sample containers for this project, all of which had been cleaned according to USEPA standards.

Collection of duplicate samples to assess the field precision was proposed in the QAPP, but the field team did not collect any duplicates, primarily due to low sample recovery. Based on the number of samples collected from this small facility (40+ samples collected from a 0.77 acre parcel), it is believed that sufficient data of appropriate quality has been generated and lack of duplicate samples will have no effect on the quality of the overall Interim Measures investigation.

3.0 Findings of Interim Measures Site Investigation

Total lead and TCLP lead results are provided in **Table 1.** Total metals positively detected in soil are provided in **Table 2**. The laboratory reports containing all total metals TCLP data are available in **Appendix C** on CD-ROM**.**

3.1 TCLP Lead in Soil

Lead TCLP results were compared to the TCLP regulatory limit of 5 mg/L set forth in 40 CFR 261.24. **Table 1** compares the TCLP concentrations at the initial 20 locations to the regulatory limit. Exceedances were found at 5 locations: LSF-GP-04, 06, 08, 10, and 11. The exceedances were found in the 0-6" bgs interval at LSF-GP-04, 06, 08, and 11, as well as in 1.5 ft. to 2 ft. range at LSF-GP-08 and in the 2 ft. to 2.5 ft. range at LSF-GP-10. The location of these exceedances is mapped in **Figure 3.**

Following the analysis of the initial round of soil testing, an additional 6 soil samples were collected and tested for TCLP Lead in the vicinity of areas that had TCLP Lead exceedances, as a means of further delineation. Again, TCLP Lead results were compared to the TCLP regulatory limit of 5 mg/L set forth in 40 CFR 261.24. None of the step-out locations contained TCLP lead above the regulatory threshold.

3.2 Total Lead in Soil

The arithmetic average concentration of lead in surface soil (0-6" bgs) was compared to the USEPA Region 9 industrial PRG of 800 mg/kg. Total lead levels were analyzed for in the initial 20 sample locations. Of those samples, five (LSF-GP-04,06,08,10,11) were not included in the arithmetic average calculation because the top six inches of soil are proposed to be removed due to TCLP Lead exceedances. Thus, the average was calculated over the remaining 15 sample locations. The arithmetic average of lead concentrations was found to be 372 mg/kg, which is below the USEPA Region 9 industrial PRG. **Table 3** shows the samples and values used to calculate the mean concentration of lead in surface soil.

As IEPA defines surface soil as the upper three feet of soil (0-3' bgs), the arithmetic mean concentration of lead was calculated for the 0-3 ft bgs zone. Samples at varying depths of the same location were treated as discrete samples, and again, any soil that was proposed to be excavated due to a lead TCLP exceedance was not considered in the average. The arithmetic average concentration of lead in surface soil (0 to 3 ft. bgs) was found to be 346 mg/kg, which is below IEPA (35 IAC Part 742) residential soil remediation objective of 400 mg/kg. **Table 4** shows the samples and values used to calculate the mean concentration of surface soil as defined by the IEPA.

3.3 Other Total Metals in Soils

Appendix IX list of metals/inorganics was analyzed at the initial Geoprobe locations and sample depths, as requested in the USEPA's conditional work plan approval. The analysis of these compounds in soil indicates that arsenic, copper, and chromium exceeded IEPA TACO Tier 1 soil remediation objectives at several discrete sample locations. Arsenic exceeded the Tier 1 SRO for the ingestion exposure route at six locations (LSF-GP-01, -02, 06, -09, and 17); copper exceeded the Tier 1 SRO for the ingestion exposure route at LSF-GP-08; and chromium exceeded the Tier 1 migration to groundwater SRO at LSF-GP-07.

Under IEPA TACO (35 IAC Part 742.225), averaging of chemical concentrations within an exposure area can be performed to demonstrate compliance with SROs for the ingestion and inhalation exposure routes. The average concentration of arsenic in surface soil (0-3 ft bgs) is 7.2 mg/kg, which is less than the Tier 1 residential SRO of 13 mg/kg. The average concentration of copper (positive detections only) in surface soil is 1623 mg/kg, which is less than the Tier 1 residential SRO of 2900 mg/kg. While the total chromium concentration at LSF-GP-07 (29 mg/kg) slightly exceeded the migration to groundwater SRO (21 mg/kg), this SRO is based on hexavalent chromium. Though the chromium species has not been determined at this Facility, most chromium is present in the trivalent form in the environment. The hexavalent chromium concentration present at the Facility can be estimated from the total concentration by applying a 1:6 ratio of hexavalent Cr trivalent chromium, as presented in USEPA' s Integrated Risk Information System (IRIS) database. The estimated hexavalent chromium concentration at LSF-GP-

07 is 4.8 mg/kg, which is below the Tier 1 SRO for migration to groundwater of 21 mg/kg

Thus, based on this demonstration, no other metals except lead (Pb) are of concern at the Facility.

3.4 Waste Profile Analysis

A composite sample of material subject to removal was collected as a "disposal sample" and was tested for appropriate waste profile parameters. The lab results can be found in **Appendix C.** This analysis will be used to obtain disposal approval at an off-site licensed landfill. The Veolia Landfill in Zion has indicated that it will accept the soil when treated to below characteristically hazardous levels (TCLP Pb < 5 mg/L).

4.0 Interim Measures Soil Removal Plan

Figure 3 delineates those areas of the site where soil exceeds the TCLP Lead threshold of 5 mg/L. Cross-Section A-A' (**Figure 4**) also delineates this soil management zone vertically. Based on this delineation, an estimated 500 cubic yards (c.y.) of soil will require treatment, removal and disposal.

4.1 Soil Treatment & Disposal Plan

Soil delineated on **Figures 3 and 4** will be treated to render lead levels to below TCLP characteristic thresholds, thus enabling the treated soil to be properly disposed as an Illinois Special Waste. A proprietary product (Mactite) will be spray applied in liquid form to the impacted soil, then mixed and homogenized on the ground using traditional excavating equipment. Immediately following the appropriate mixing and cure times, a soil sample will be sent for rapid turnaround (3 to 4 day) TCLP Lead analysis to confirm that lead levels meet the threshold for disposal as non-hazardous special waste. At least one sample per 100 c.y. of treated soil will be analyzed for TCLP Lead to confirm treatment to less than 5 mg/L.

Treated soil will be stockpiled on-site under secure tarping while lab analysis is performed.

Once acceptable treatment is confirmed via lab data, the soil will be loaded to trucks that are licensed special waste transporters, manifests will be completed, and treated soil will be transported to the Veolia ES Landfill in Zion, Illinois.

Appendix D contains the proposal for the soil treatment work and disposal by Tecnica Environmental Services, Inc. In addition, the appendix contains the patent for the Mactite remediation process which includes general information about the product as well as results and analysis from lab and field testing of the procedure.

4.2 Engineering & Site Controls

The excavation, mixing, treatment, loading and off-site transport will be conducted with engineering and site controls that will minimize the potential for migration of contaminants to the environment beyond the soil treatment area. These measures will include, but may not be limited to:

- Suppression of dusty work conditions via controlled application of water and the Mactite treatment media in liquid form.
- Use of site erosion control measures and best management practices (BMPs) around the delineated work zones.
- Tarping of treated, stockpiled soils when awaiting analysis, and when being transported in trucks to the landfill destination.
- Use of contaminant reduction (decon) measures for heavy equipment and trucks prior to leaving the work area.

4.3 Excavation Area Confirmation Sampling & Analysis

Excavated soil areas will be subject to TCLP and total metals analysis to confirm removal of all TCLP hazardous levels and to document remaining levels of total metals for purposes of further risk-based assessment of site conditions. **Figure 5** shows proposed excavation bottom and sidewall sample locations. This sampling and analysis will follow the previously approved QAPP.

4.4 Backfill & Restoration

Clean soil backfill or crushed aggregate from a commercial source will be placed in the excavated area(s) as backfill. The soil source will be tested to confirm that it meets IEPA TACO Tier 1 residential standards prior to placement. Further area restoration will be considered, as required for property use.

4.5 Schedule

The interim measures removal work will proceed following USEPA's approval of this interim measure report and removal plan. LSF will complete the work within 90 days of USEPA written approval of this interim measures soil removal plan.

4.6 Cost Estimate

Table 5 presents an estimate of current costs of $76,415 to implement the interim measures soil removal plan, as outlined herein.

Table 5--Interim Measures Soil Removal Cost Estimate

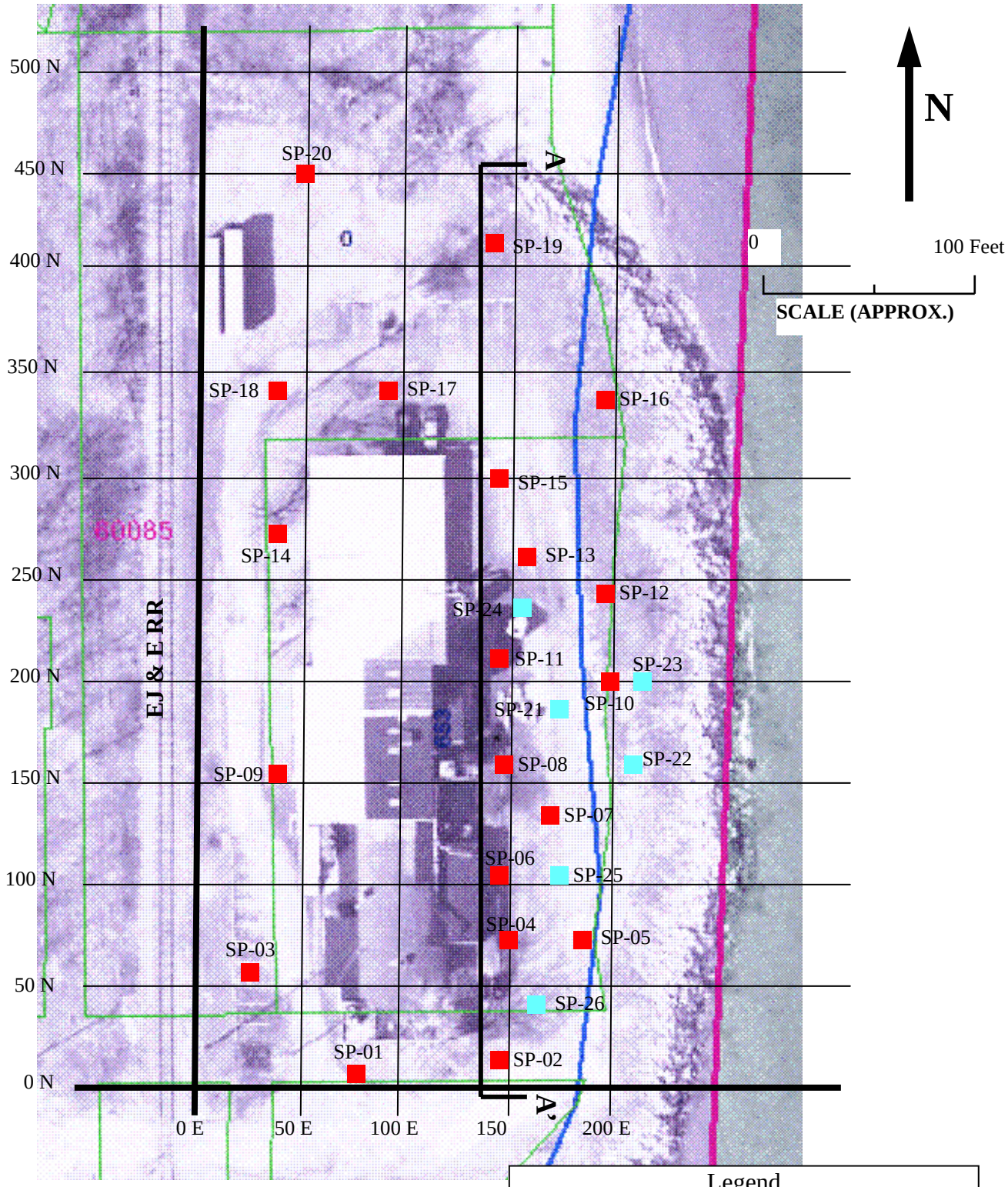
Task	Units	Unit Cost	Task Total
1. Mobilization/Site Prep	Job	$2,500	$2,500
2. Soil Excavation, Treatment, Trucking and Disposal at Zion Landfill	900 tons	$53.60	$48,240
3. Pre-disposal TCLP Analysis 3 day TAT	5 samples	$ 150.00	$750.00
4. Field sampling/Field QA/Project Management	Job	$4,500	$4,500
5. Post-Excavation Confirmation Sampling & Lab Analysis (TCLP Pb/Total RCRA Metals)	17 Samples	$225.00	$3,825
6. Crushed Recycled Concrete Aggregate Backfill	600 tons	12.00	$7,200
7. Reporting to USEPA	Job	$2,500.00	$ 2,500
SUBTOTAL			**$ 69,515**
10% Contingency			$6,900
Total Cost Estimate			**$76,415**

Figures

Interim Measures Report
Lake Shore Foundry
653 Market Street, Waukegan, Lake County, Illinois

Figure 1
Site Location Map
Lake Shore Foundry, Inc.
653 Market St., Waukegan, Lake County, IL. 60085

Deigan & Associates, LLC
Environmental Consultants



Legend

Initial Sample Location

Supplemental (Step-Out) Sample Location

A — A'

Cross Section A-A'

Figure 2- Soil Boring Location Map
Lake Shore Foundry
Waukegan, IL

Deigan & Associates, LLC
Environmental Consultants

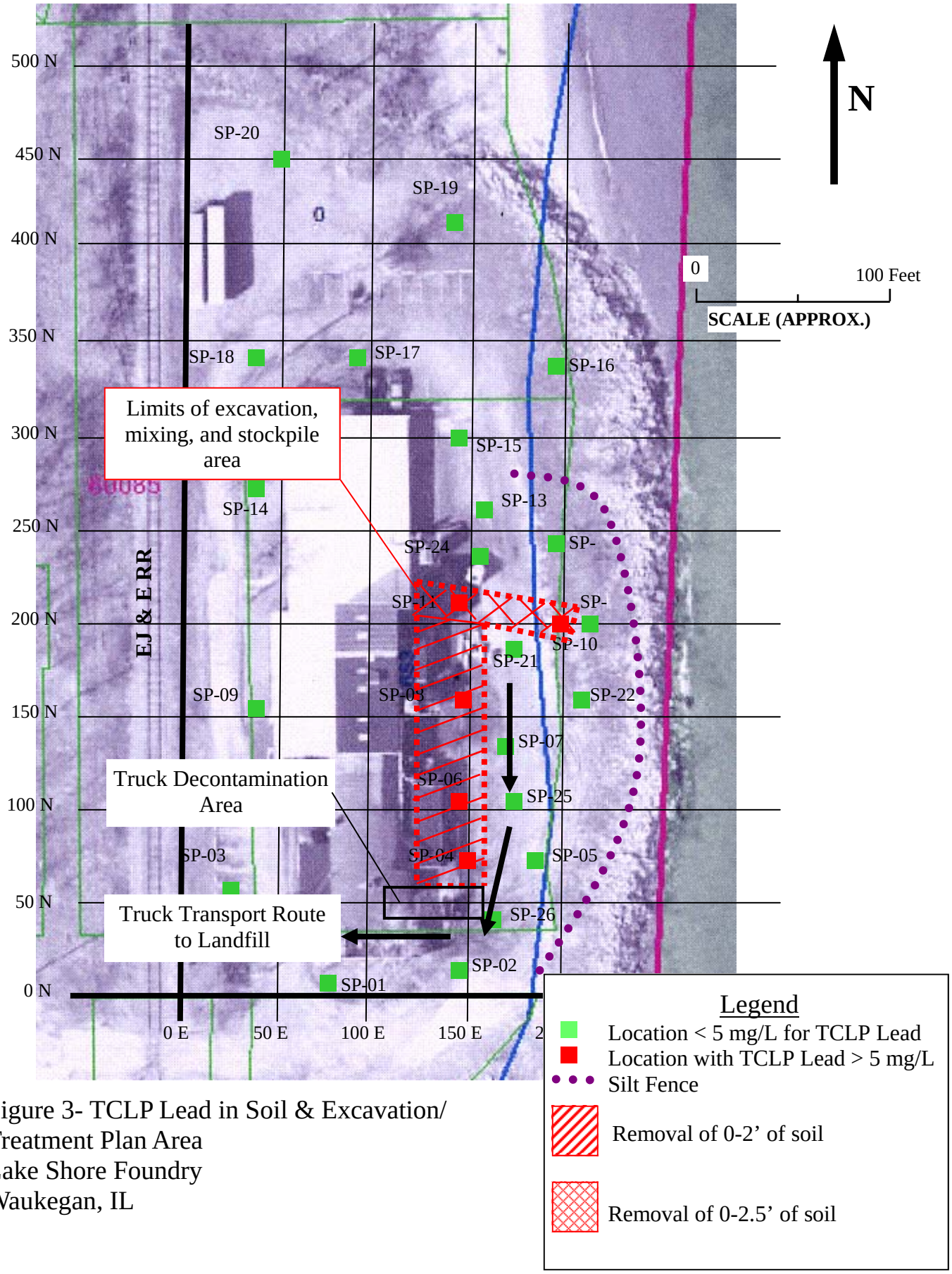


Figure 3- TCLP Lead in Soil & Excavation/ Treatment Plan Area
Lake Shore Foundry
Waukegan, IL

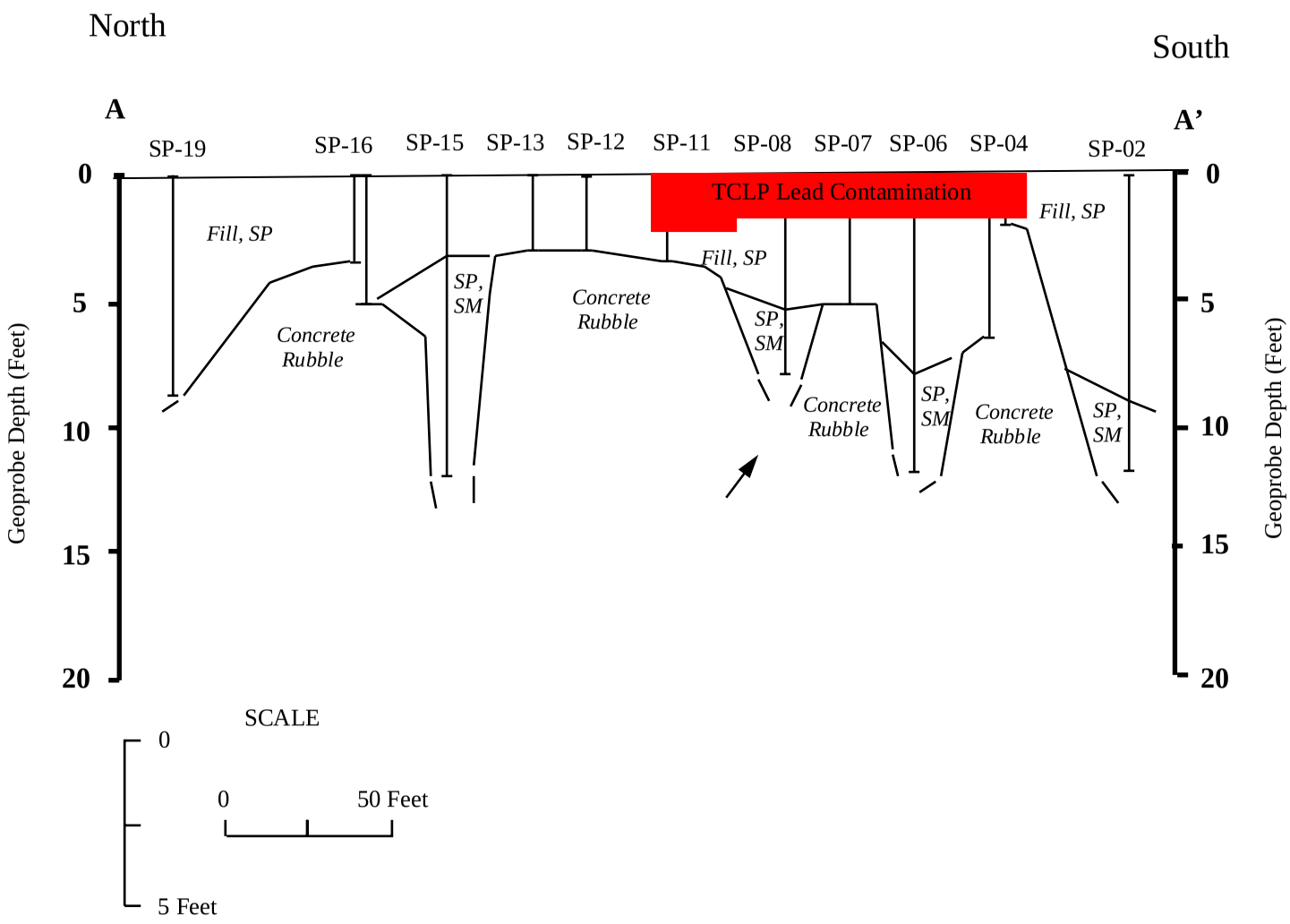
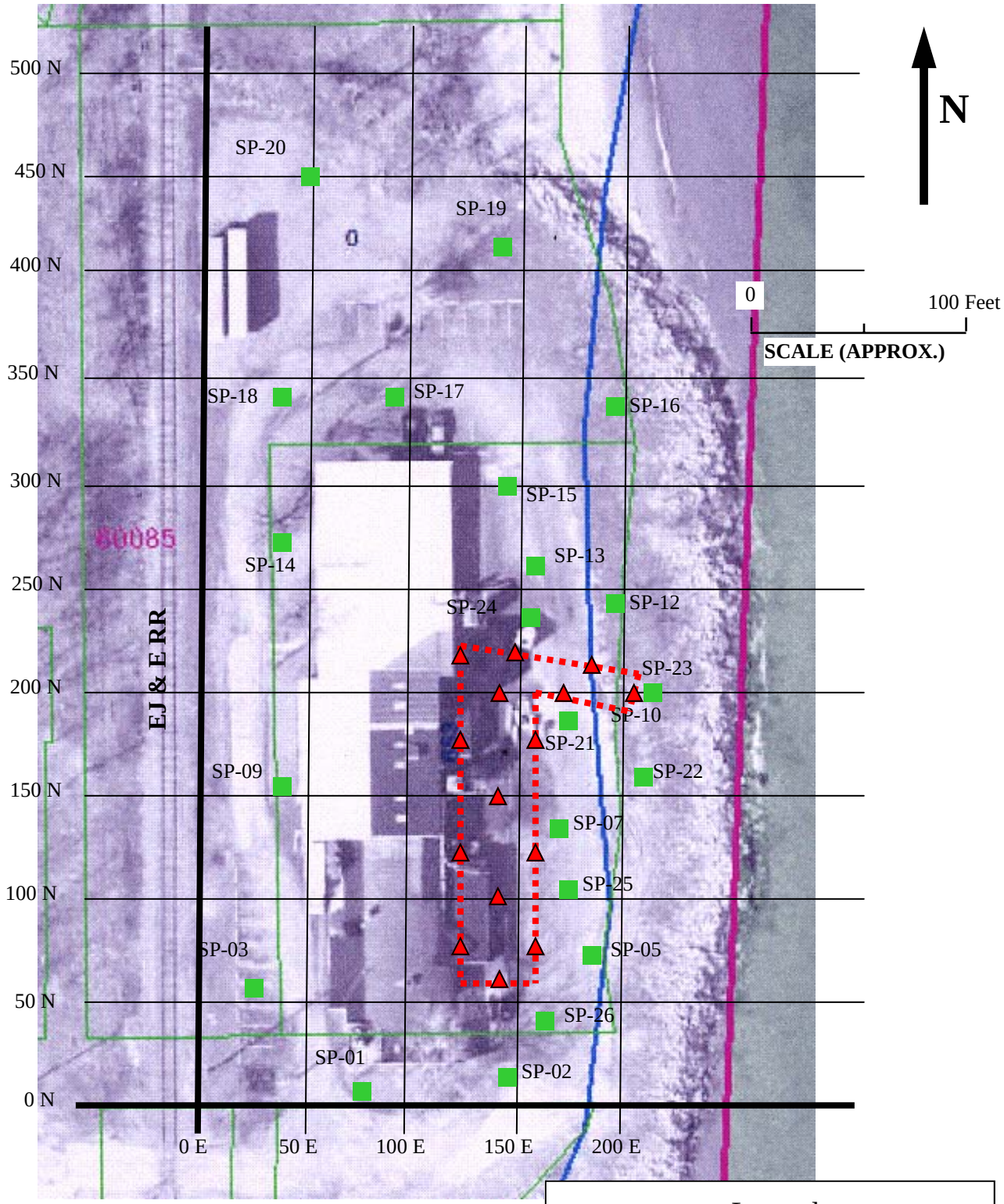


Figure 4- Cross-sectional view of Soil Impact Area (Looking East)
Site Investigation Report – Lake Shore Foundry
Waukegan, IL



Legend

- Location < 5 mg/L for TCLP Lead
- Confirmation Sample Location
- Approximate Lateral Extent Excavation Area

Figure 5 - Confirmation Sample Locations
Lake Shore Foundry
Waukegan, IL

Deigan & Associates, LLC
Environmental Consultants

Tables

Interim Measures Report
Lake Shore Foundry
653 Market Street, Waukegan, Lake County, Illinois

Table 1
Total Lead and TCLP Lead Data Comparison to Soil Remediation Objectives
Lake Shore Foundry
Waukegan, IL

Client ID	Parameter Name	Result	Qualifier	Unit	TCLP Threshold		USEPA R9 PRG	
LSF-GP-01(0-6")	Lead TCLP	0.24		mg/L	5		--	
LSF-GP-01(0-6")	Lead	260	^ V B	mg/Kg	--		800	
LSF-GP-01(4-5)	Lead TCLP	0.011		mg/L	5		--	
LSF-GP-01(4-5)	Lead	14		mg/Kg	--		800	
LSF-GP-02(0-6")	Lead TCLP	0.65		mg/L	5		--	
LSF-GP-02(0-6")	Lead	2100	^ B V	mg/Kg	--		800	>PRG
LSF-GP-02(4-5)	Lead TCLP	0.018		mg/L	5		--	
LSF-GP-02(4-5)	Lead	320	^ B V	mg/Kg	--		800	
LSF-GP-03(0-6")	Lead TCLP	0.46		mg/L	5		--	
LSF-GP-03(0-6")	Lead	570	^ B V	mg/Kg	--		800	
LSF-GP-03(4.5-5.5)	Lead TCLP	0.0069	J	mg/L	5		--	
LSF-GP-03(4.5-5.5)	Lead	26	^ B V	mg/Kg	--		800	
LSF-GP-04(0-6")	Lead TCLP	55		mg/L	5	>TCLP	--	
LSF-GP-04(0-6")	Lead	1800	^ B V	mg/Kg	--		800	>PRG
LSF-GP-04(1.5-2)	Lead TCLP	0.18		mg/L	5		--	
LSF-GP-04(1.5-2)	Lead	210	^ B V	mg/Kg	--		800	
LSF-GP-05(0-6")	Lead TCLP	0.1		mg/L	5		--	
LSF-GP-05(0-6")	Lead	230	^ B V	mg/Kg	--		800	
LSF-GP-05(1.5-2)	Lead TCLP	0.053		mg/L	5		--	
LSF-GP-05(1.5-2)	Lead	320	^ B V	mg/Kg	--		800	
LSF-GP-06(0-6")	Lead TCLP	16		mg/L	5	>TCLP	--	
LSF-GP-06(0-6")	Lead	12000	^ B V	mg/Kg	--		800	>PRG
LSF-GP-06(4-5)	Lead TCLP	0.15		mg/L	5		--	
LSF-GP-06(4-5)	Lead	270	^ B V	mg/Kg	--		800	
LSF-GP-07(0-6")	Lead TCLP	0.56		mg/L	5		--	
LSF-GP-07(0-6")	Lead	640	^ B V	mg/Kg	--		800	
LSF-GP-07(1.5-2)	Lead TCLP	0.037		mg/L	5		--	
LSF-GP-07(1.5-2)	Lead	1100	^ B V	mg/Kg	--		800	>PRG
LSF-GP-08(0-6")	Lead TCLP	19		mg/L	5	>TCLP	--	
LSF-GP-08(0-6")	Lead	750	^ B V	mg/Kg	--		800	
LSF-GP-08(1.5-2)	Lead TCLP	12		mg/L	5	>TCLP	--	
LSF-GP-08(1.5-2)	Lead	1400	^ B V	mg/Kg	--		800	>PRG
LSF-GP-09(0-6")	Lead TCLP	0.0075	U	mg/L	5		--	
LSF-GP-09(0-6")	Lead	35	^ B	mg/Kg	--		800	
LSF-GP-09(2.5-3)	Lead TCLP	0.046		mg/L	5		--	
LSF-GP-09(2.5-3)	Lead	190	^ B	mg/Kg	--		800	
LSF-GP-10(0-6")	Lead TCLP	0.92		mg/L	5		--	
LSF-GP-10(0-6")	Lead	540	^ B V	mg/Kg	--		800	
LSF-GP-10(2-2.5)	Lead TCLP	14		mg/L	5	>TCLP	--	
LSF-GP-10(2-2.5)	Lead	1400	^ B V	mg/Kg	--		800	>PRG

Table 1
Total Lead and TCLP Lead Data Comparison to Soil Remediation Objectives
Lake Shore Foundry
Waukegan, IL

Client ID	Parameter Name	Result	Qualifier	Unit	TCLP Threshold		USEPA R9 PRG	
LSF-GP-11(0-6")	Lead TCLP	5.3		mg/L	5	>TCLP	--	
LSF-GP-11(0-6")	Lead	3300	^ B V	mg/Kg	--		800	>PRG
LSF-GP-11(3-3.5)	Lead TCLP	0.0075	B	mg/L	5		--	
LSF-GP-11(3-3.5)	Lead	92	^ B	mg/Kg	--		800	
LSF-GP-12(0-6")	Lead TCLP	0.26	B	mg/L	5		--	
LSF-GP-12(0-6")	Lead	610	^ B	mg/Kg	--		800	
LSF-GP-12(1.5-2)	Lead TCLP	0.0064	J B	mg/L	5		--	
LSF-GP-12(1.5-2)	Lead	200	^ B	mg/Kg	--		800	
LSF-GP-13(0-6")	Lead TCLP	0.0075	U	mg/L	5		--	
LSF-GP-13(0-6")	Lead	280	^ B	mg/Kg	--		800	
LSF-GP-13(2-2.5)	Lead TCLP	0.0075	U	mg/L	5		--	
LSF-GP-13(2-2.5)	Lead	1300	^ B	mg/Kg	--		800	>PRG
LSF-GP-14(0-6")	Lead TCLP	0.0077		mg/L	5		--	
LSF-GP-14(0-6")	Lead	24		mg/Kg	--		800	
LSF-GP-14(1.5-2)	Lead TCLP	0.031		mg/L	5		--	
LSF-GP-14(1.5-2)	Lead	150		mg/Kg	--		800	
LSF-GP-15(0-6")	Lead TCLP	0.0075	U	mg/L	5		--	
LSF-GP-15(0-6")	Lead	180		mg/Kg	--		800	
LSF-GP-15(1.5-2)	Lead TCLP	0.013		mg/L	5		--	
LSF-GP-15(1.5-2)	Lead	58		mg/Kg	--		800	
LSF-GP-16(0-6")	Lead TCLP	0.0075	U	mg/L	5		--	
LSF-GP-16(0-6")	Lead	170		mg/Kg	--		800	
LSF-GP-16(1.5-2)	Lead TCLP	0.0077		mg/L	5		--	
LSF-GP-16(1.5-2)	Lead	150		mg/Kg	--		800	
LSF-GP-17(0-6")	Lead TCLP	0.038	U	mg/L	5		--	
LSF-GP-17(0-6")	Lead	36		mg/Kg	--		800	
LSF-GP-17(1.5-2)	Lead TCLP	0.0075	U	mg/L	5		--	
LSF-GP-17(1.5-2)	Lead	8.1		mg/Kg	--		800	
LSF-GP-18(0-6")	Lead TCLP	0.041		mg/L	5		--	
LSF-GP-18(0-6")	Lead	290		mg/Kg	--		800	
LSF-GP-18(1.5-2)	Lead TCLP	0.019		mg/L	5		--	
LSF-GP-18(1.5-2)	Lead	70		mg/Kg	--		800	
LSF-GP-19(0-6")	Lead TCLP	0.0075	U	mg/L	5		--	
LSF-GP-19(0-6")	Lead	79		mg/Kg	--		800	
LSF-GP-19(4-5)	Lead TCLP	0.0075	U	mg/L	5		--	
LSF-GP-19(4-5)	Lead	160		mg/Kg	--		800	
LSF-GP-20(0-6")	Lead TCLP	0.013		mg/L	5		--	
LSF-GP-20(0-6")	Lead	76		mg/Kg	--		800	
LSF-GP-20(2-2.5)	Lead TCLP	0.0075	U	mg/L	5		--	
LSF-GP-20(2-2.5)	Lead	7.5		mg/Kg	--		800	
SP-21, 0-0.5	Lead TCLP	0.011		mg/L	5		--	
SP-21, 1.5-2	Lead TCLP	0.21		mg/L	5		--	
SP-22, 0-0.5	Lead TCLP	0.0064	J	mg/L	5		--	

Table 1
Total Lead and TCLP Lead Data Comparison to Soil Remediation Objectives
Lake Shore Foundry
Waukegan, IL

Client ID	Parameter Name	Result	Qualifier	Unit	TCLP Threshold		USEPA R9 PRG	
SP-24, 0-0.5	Lead TCLP	0.0098		mg/L	5		--	
SP-24, 2.5-3	Lead TCLP	0.21		mg/L	5		--	
SP-25, 1-1.5	Lead TCLP	0.026		mg/L	5		--	
SP-26, 0-0.5	Lead TCLP	0.29		mg/L	5		--	
SP-26, 2-2.5	Lead TCLP	0.025		mg/L	5		--	

Qualifiers Notation Key
B- Compound was found in blank and sample
J- Result is less than the RL but greater than or equal to the MDL and the concentratin is an approximate value.
V- Serial Dilution exceeds the control limits.
^- ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, or MRL standard: Instrument related QC exceeds the control limits.

Table 2
Total Metal Data Comparison to Soil Remediation Objectives
Lake Shore Foundry
Waukegan, IL

Client ID	Parameter Name	Result	Qualifier	Unit	Tier 1 Residential Soil Remediation Objective								Commercial/Industrial				Construction Worker			
					Background		Ingestion		Inhalation		Class I GW		Ingestion	> CI ING?	Inhalation	>CI INH?	Ingestion	> CW ING?	Inhalation	> CW INH?
LSF-GP-01(0-6)	Arsenic	19		mg/Kg	13	>BKG	13	>ING	750		31		13	>CI ING	1200		61		25000	
LSF-GP-01(0-6)	Barium	100		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-01(0-6)	Chromium	14		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-01(0-6)	Selenium	0.77	J	mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-01(0-6)	Silver	2		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-01(0-6)	Cadmium	3.9		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-01(0-6)	Mercury	0.12		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	
LSF-GP-01(4-5)	Arsenic	1.6		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-01(4-5)	Barium	5.6		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-01(4-5)	Chromium	3.3		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-01(4-5)	Selenium	0.97	U	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-01(4-5)	Silver	0.48	U	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-01(4-5)	Cadmium	0.086	J	mg/Kg	0.6		78		1800		430		2000		2800		200		59000	
LSF-GP-01(4-5)	Mercury	0.01	J	mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-02(0-6)	Arsenic	15		mg/Kg	13	>BKG	13	>ING	750		31		13	>CI ING	1200		61		25000	
LSF-GP-02(0-6)	Barium	250		mg/Kg	110	>BKG	5500		690000		2100		140000		910000		14000		870000	
LSF-GP-02(0-6)	Chromium	24		mg/Kg	16.2	>BKG	230		270		28		6100		420		4100		690	
LSF-GP-02(0-6)	Selenium	0.7	J	mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-02(0-6)	Silver	12		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-02(0-6)	Cadmium	2.7		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-02(0-6)	Mercury	3		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	
LSF-GP-02(4-5)	Arsenic	5		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-02(4-5)	Barium	400		mg/Kg	110	>BKG	5500		690000		2100		140000		910000		14000		870000	
LSF-GP-02(4-5)	Chromium	18		mg/Kg	16.2	>BKG	230		270		28		6100		420		4100		690	
LSF-GP-02(4-5)	Selenium	1.1	U	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-02(4-5)	Silver	0.29	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-02(4-5)	Cadmium	0.7		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-02(4-5)	Mercury	0.41		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	
LSF-GP-03(0-6)	Arsenic	14		mg/Kg	13	>BKG	13	>ING	750		31		13	>CI ING	1200		61		25000	
LSF-GP-03(0-6)	Barium	94		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-03(0-6)	Chromium	17		mg/Kg	16.2	>BKG	230		270		28		6100		420		4100		690	
LSF-GP-03(0-6)	Selenium	1.1	J	mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-03(0-6)	Silver	4.9		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-03(0-6)	Cadmium	2.4		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-03(0-6)	Mercury	0.82		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	
LSF-GP-03(4.5-5.5)	Arsenic	4		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-03(4.5-5.5)	Barium	14		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-03(4.5-5.5)	Chromium	5.7		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-03(4.5-5.5)	Selenium	1	U	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-03(4.5-5.5)	Silver	0.16	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-03(4.5-5.5)	Cadmium	0.17	J	mg/Kg	0.6		78		1800		430		2000		2800		200		59000	
LSF-GP-03(4.5-5.5)	Mercury	0.0072	J	mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-04(0-6)	Arsenic	7.5		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-04(0-6)	Barium	320		mg/Kg	110	>BKG	5500		690000		2100		140000		910000		14000		870000	
LSF-GP-04(0-6)	Chromium	16		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-04(0-6)	Selenium	0.71	J	mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-04(0-6)	Silver	3.4		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-04(0-6)	Cadmium	2.3		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-04(0-6)	Mercury	0.57		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	
LSF-GP-04(1.5-2)	Arsenic	4.3		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-04(1.5-2)	Barium	68		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-04(1.5-2)	Chromium	13		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-04(1.5-2)	Selenium	1	U	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-04(1.5-2)	Silver	0.6		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-04(1.5-2)	Cadmium	0.68		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-04(1.5-2)	Mercury	0.24		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	

Table 2
Total Metal Data Comparison to Soil Remediation Objectives
Lake Shore Foundry
Waukegan, IL

Client ID	Parameter Name	Result	Qualifier	Unit	Tier 1 Residential Soil Remediation Objective								Commercial/Industrial				Construction Worker			
					Background		Ingestion		Inhalation		Class I GW		Ingestion	> CI ING?	Inhalation	>CI INH?	Ingestion	> CW ING?	Inhalation	> CW INH?
LSF-GP-05(0-6)	pH	8.65		SU																
LSF-GP-05(0-6)	Antimony	0.64	J	mg/Kg	4		31		--		5		820		--		82		--	
LSF-GP-05(0-6)	Arsenic	5.7		mg/Kg	13		13		750		32		13		1200		61		25000	
LSF-GP-05(0-6)	Barium	71		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-05(0-6)	Beryllium	1.2	B	mg/Kg	0.6	>BKG	160		1300		8000		4100		2100		410		44000	
LSF-GP-05(0-6)	Chromium	14		mg/Kg	16.2		230		270		24		6100		420		4100		690	
LSF-GP-05(0-6)	Cobalt	6.2		mg/Kg	8.9		4700		--		--		120000		--		12000		--	
LSF-GP-05(0-6)	Nickel	22		mg/Kg	18	>BKG	1600		13000		3800		41000		21000		4100		440000	
LSF-GP-05(0-6)	Selenium	0.49	J	mg/Kg	0.48	>BKG	390		--		1.8		10000		--		1000		--	
LSF-GP-05(0-6)	Silver	0.27	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-05(0-6)	Thallium	1.1	U	mg/Kg	0.32		6.3		--		4.4		160		--		160		--	
LSF-GP-05(0-6)	Tin	35	B	mg/Kg	--		47000		--		--		1000000		--		120000		--	
LSF-GP-05(0-6)	Vanadium	17		mg/Kg	25.2		550		--		980		14000		--		1400		--	
LSF-GP-05(0-6)	Zinc	1000	^ B V	mg/Kg	95	>BKG	23000		--		53000		610000		--		61000		--	
LSF-GP-05(0-6)	Cadmium	0.89		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-05(0-6)	Copper	690		mg/Kg	19.6	>BKG	2900		--		330000		82000		--		8200		--	
LSF-GP-05(0-6)	Mercury	0.13		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	
LSF-GP-05(1.5-2)	pH	8.78		SU																
LSF-GP-05(1.5-2)	Arsenic	5		mg/Kg	13		13		750		33		13		1200		61		25000	
LSF-GP-05(1.5-2)	Barium	79		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-05(1.5-2)	Chromium	16		mg/Kg	16.2		230		270		21		6100		420		4100		690	
LSF-GP-05(1.5-2)	Selenium	1	U	mg/Kg	0.48		390		--		1.3		10000		--		1000		--	
LSF-GP-05(1.5-2)	Silver	0.77		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-05(1.5-2)	Cadmium	0.25		mg/Kg	0.6		78		1800		430		2000		2800		200		59000	
LSF-GP-05(1.5-2)	Mercury	0.056		mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-06(0-6)	Arsenic	15		mg/Kg	13	>BKG	13	>ING	750		31		13	>CI ING	1200		61		25000	
LSF-GP-06(0-6)	Barium	81		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-06(0-6)	Chromium	16		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-06(0-6)	Selenium	1.3		mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-06(0-6)	Silver	46		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-06(0-6)	Cadmium	5		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-06(0-6)	Mercury	0.063		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	
LSF-GP-06(4-5)	Arsenic	9.2		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-06(4-5)	Barium	98		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-06(4-5)	Chromium	8.7		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-06(4-5)	Selenium	0.67	J	mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-06(4-5)	Silver	0.49	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-06(4-5)	Cadmium	1.2		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-06(4-5)	Mercury	0.29		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	
LSF-GP-07(0-6)	pH	9.44		SU																
LSF-GP-07(0-6)	Antimony	1.6	J	mg/Kg	4		31		--		5		820		--		82		--	
LSF-GP-07(0-6)	Arsenic	2.9		mg/Kg	13		13		750		33		13		1200		61		25000	
LSF-GP-07(0-6)	Barium	43		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-07(0-6)	Beryllium	1.5	B	mg/Kg	0.6	>BKG	160		1300		8000		4100		2100		410		44000	
LSF-GP-07(0-6)	Chromium	21		mg/Kg	16.2	>BKG	230		270		21		6100		420		4100		690	
LSF-GP-07(0-6)	Cobalt	4.1		mg/Kg	8.9		4700		--		--		120000		--		12000		--	
LSF-GP-07(0-6)	Nickel	43		mg/Kg	18	>BKG	1600		13000		3800		41000		21000		4100		440000	
LSF-GP-07(0-6)	Selenium	0.51	J	mg/Kg	0.48	>BKG	390		--		1.3		10000		--		1000		--	
LSF-GP-07(0-6)	Silver	0.8		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-07(0-6)	Thallium	0.99	U	mg/Kg	0.32		6.3		--		4.9		160		--		160		--	
LSF-GP-07(0-6)	Tin	160	B	mg/Kg	--		47000		--		--		1000000		--		120000		--	
LSF-GP-07(0-6)	Vanadium	8.8		mg/Kg	25.2		550		--		980		14000		--		1400		--	
LSF-GP-07(0-6)	Zinc	3900	^ B V	mg/Kg	95	>BKG	23000		--		53000		610000		--		61000		--	
LSF-GP-07(0-6)	Cadmium	4.9		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-07(0-6)	Copper	2400		mg/Kg	19.6	>BKG	2900		--		330000		82000		--		8200		--	
LSF-GP-07(0-6)	Mercury	0.041		mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-07(1.5-2)	pH	9.93		SU																
LSF-GP-07(1.5-2)	Arsenic	5.4		mg/Kg	13		13		750		33		13		1200		61		25000	
LSF-GP-07(1.5-2)	Barium	210		mg/Kg	110	>BKG	5500		690000		2100		140000		910000		14000		870000	
LSF-GP-07(1.5-2)	Chromium	29		mg/Kg	16.2	>BKG	230		270		21	>MGW	6100		420		4100		690	
LSF-GP-07(1.5-2)	Selenium	0.58	J	mg/Kg	0.48	>BKG	390		--		1.3		10000		--		1000		--	
LSF-GP-07(1.5-2)	Silver	1.3		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-07(1.5-2)	Cadmium	0.12	J	mg/Kg	0.6		78		1800		430		2000		2800		200		59000	
LSF-GP-07(1.5-2)	Mercury	0.085		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	

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Lake Shore Foundry
Waukegan, IL

Client ID	Parameter Name	Result	Qualifier	Unit	Tier 1 Residential Soil Remediation Objective								Commercial/Industrial				Construction Worker			
					Background		Ingestion		Inhalation		Class I GW		Ingestion	> CI ING?	Inhalation	>CI INH?	Ingestion	> CW ING?	Inhalation	> CW INH?
LSF-GP-08(0-6)	pH	8.58		SU																
LSF-GP-08(0-6)	Antimony	2.7		mg/Kg	4		31		--		5		820		--		82		--	
LSF-GP-08(0-6)	Arsenic	1.8		mg/Kg	13		13		750		32		13		1200		61		25000	
LSF-GP-08(0-6)	Barium	6.8		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-08(0-6)	Beryllium	0.14	J B	mg/Kg	0.6		160		1300		8000		4100		2100		410		44000	
LSF-GP-08(0-6)	Chromium	8.3		mg/Kg	16.2		230		270		21		6100		420		4100		690	
LSF-GP-08(0-6)	Cobalt	1.8		mg/Kg	8.9		4700		--		--		120000		--		12000		--	
LSF-GP-08(0-6)	Nickel	37		mg/Kg	18	>BKG	1600		13000		3800		41000		21000		4100		440000	
LSF-GP-08(0-6)	Selenium	0.69	J	mg/Kg	0.48	>BKG	390		--		1.8		10000		--		1000		--	
LSF-GP-08(0-6)	Silver	1.7		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-08(0-6)	Thallium	1.1	U	mg/Kg	0.32		6.3		--		4.4		160		--		160		--	
LSF-GP-08(0-6)	Tin	140	B	mg/Kg	--		47000		--		--		1000000		--		120000		--	
LSF-GP-08(0-6)	Vanadium	1.9		mg/Kg	25.2		550		--		980		14000		--		1400		--	
LSF-GP-08(0-6)	Zinc	2600	^ B V	mg/Kg	95	>BKG	23000		--		53000		610000		--		61000		--	
LSF-GP-08(0-6)	Cadmium	2.8		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-08(0-6)	Copper	4900		mg/Kg	19.6	>BKG	2900	>ING	--		330000		82000		--		8200		--	
LSF-GP-08(0-6)	Mercury	0.018	J	mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-08(1.5-2)	pH	8.84		SU																
LSF-GP-08(1.5-2)	Arsenic	3.8		mg/Kg	13		13		750		33		13		1200		61		25000	
LSF-GP-08(1.5-2)	Barium	78		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-08(1.5-2)	Chromium	13		mg/Kg	16.2		230		270		21		6100		420		4100		690	
LSF-GP-08(1.5-2)	Selenium	0.48	J	mg/Kg	0.48		390		--		1.3		10000		--		1000		--	
LSF-GP-08(1.5-2)	Silver	3.3		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-08(1.5-2)	Cadmium	0.72		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-08(1.5-2)	Mercury	0.019		mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-09(0-6)	Arsenic	10		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-09(0-6)	Barium	40		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-09(0-6)	Chromium	10		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-09(0-6)	Selenium	0.59	J	mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-09(0-6)	Silver	0.17	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-09(0-6)	Cadmium	0.2	U	mg/Kg	0.6		78		1800		430		2000		2800		200		59000	
LSF-GP-09(0-6)	Mercury	0.027		ug/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-09(2.5-3)	Arsenic	18		mg/Kg	13	>BKG	13	>ING	750		31		13	>CI ING	1200		61		25000	
LSF-GP-09(2.5-3)	Barium	120		mg/Kg	110	>BKG	5500		690000		2100		140000		910000		14000		870000	
LSF-GP-09(2.5-3)	Chromium	14		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-09(2.5-3)	Selenium	1.7		mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-09(2.5-3)	Silver	5.2		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-09(2.5-3)	Cadmium	7.3		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-09(2.5-3)	Mercury	0.98		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	
LSF-GP-10(0-6)	Arsenic	2.8		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-10(0-6)	Barium	23		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-10(0-6)	Chromium	9		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-10(0-6)	Selenium	0.38	J	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-10(0-6)	Silver	0.79		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-10(0-6)	Cadmium	3		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-10(0-6)	Mercury	0.031		mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-10(2-2.5)	Arsenic	1.2		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-10(2-2.5)	Barium	7.5		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-10(2-2.5)	Chromium	6.5		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-10(2-2.5)	Selenium	1	U	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-10(2-2.5)	Silver	1.9		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-10(2-2.5)	Cadmium	6.5		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-10(2-2.5)	Mercury	0.018	U	ug/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-11(0-6)	Arsenic	9.9		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-11(0-6)	Barium	170		mg/Kg	110	>BKG	5500		690000		2100		140000		910000		14000		870000	
LSF-GP-11(0-6)	Chromium	25		mg/Kg	16.2	>BKG	230		270		28		6100		420		4100		690	
LSF-GP-11(0-6)	Selenium	1.7		mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-11(0-6)	Silver	35		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-11(0-6)	Cadmium	2.8		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-11(0-6)	Mercury	0.033		mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-11(3-3.5)	Arsenic	3.3		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-11(3-3.5)	Barium	27		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-11(3-3.5)	Chromium	7.3		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-11(3-3.5)	Selenium	0.77	J	mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-11(3-3.5)	Silver	0.33	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-11(3-3.5)	Cadmium	0.85		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-11(3-3.5)	Mercury	0.045		mg/Kg	0.06		23		10		8		610		540000		61		52000	

Table 2
Total Metal Data Comparison to Soil Remediation Objectives
Lake Shore Foundry
Waukegan, IL

Client ID	Parameter Name	Result	Qualifier	Unit	Tier 1 Residential Soil Remediation Objective								Commercial/Industrial				Construction Worker			
					Background		Ingestion		Inhalation		Class I GW		Ingestion	> CI ING?	Inhalation	>CI INH?	Ingestion	> CW ING?	Inhalation	> CW INH?
LSF-GP-12(0-6)	Arsenic	3.5		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-12(0-6)	Barium	36		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-12(0-6)	Chromium	12		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-12(0-6)	Selenium	0.39	J	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-12(0-6)	Silver	0.88		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-12(0-6)	Cadmium	2.7		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-12(0-6)	Mercury	0.036		mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-12(1.5-2)	Arsenic	7		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-12(1.5-2)	Barium	45		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-12(1.5-2)	Chromium	11		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-12(1.5-2)	Selenium	1.1	U	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-12(1.5-2)	Silver	0.23	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-12(1.5-2)	Cadmium	0.71		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-12(1.5-2)	Mercury	0.048		mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-13(0-6)	Arsenic	4.8		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-13(0-6)	Barium	100		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-13(0-6)	Chromium	16		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-13(0-6)	Selenium	0.82	J	mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-13(0-6)	Silver	0.73		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-13(0-6)	Cadmium	0.76		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-13(0-6)	Mercury	0.078		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	
LSF-GP-13(2-2.5)	Arsenic	5.6		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-13(2-2.5)	Barium	160		mg/Kg	110	>BKG	5500		690000		2100		140000		910000		14000		870000	
LSF-GP-13(2-2.5)	Chromium	26		mg/Kg	16.2	>BKG	230		270		28		6100		420		4100		690	
LSF-GP-13(2-2.5)	Selenium	0.55	J	mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-13(2-2.5)	Silver	0.6		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-13(2-2.5)	Cadmium	0.36		mg/Kg	0.6		78		1800		430		2000		2800		200		59000	
LSF-GP-13(2-2.5)	Mercury	0.042		mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-14(0-6)	Arsenic	3.2		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-14(0-6)	Barium	48		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-14(0-6)	Cadmium	0.11	J	mg/Kg	0.6		78		1800		430		2000		2800		200		59000	
LSF-GP-14(0-6)	Chromium	16		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-14(0-6)	Selenium	0.99	U	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-14(0-6)	Silver	0.27	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-14(0-6)	Mercury	0.034		mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-14(1.5-2)	Arsenic	6.7		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-14(1.5-2)	Barium	46		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-14(1.5-2)	Cadmium	0.56		mg/Kg	0.6		78		1800		430		2000		2800		200		59000	
LSF-GP-14(1.5-2)	Chromium	8		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-14(1.5-2)	Selenium	0.66	J	mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-14(1.5-2)	Silver	0.31	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-14(1.5-2)	Mercury	0.14		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	
LSF-GP-15(0-6)	Arsenic	4.9		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-15(0-6)	Barium	92		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-15(0-6)	Cadmium	0.74		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-15(0-6)	Chromium	27		mg/Kg	16.2	>BKG	230		270		28		6100		420		4100		690	
LSF-GP-15(0-6)	Selenium	1.1	U	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-15(0-6)	Silver	0.39	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-15(0-6)	Mercury	0.13		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	
LSF-GP-15(1.5-2)	Arsenic	7.4		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-15(1.5-2)	Barium	42		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-15(1.5-2)	Cadmium	0.36		mg/Kg	0.6		78		1800		430		2000		2800		200		59000	
LSF-GP-15(1.5-2)	Chromium	11		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-15(1.5-2)	Selenium	1	U	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-15(1.5-2)	Silver	0.23	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-15(1.5-2)	Mercury	0.029		mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-16(0-6)	Arsenic	4.6		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-16(0-6)	Barium	39		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-16(0-6)	Cadmium	0.21	J	mg/Kg	0.6		78		1800		430		2000		2800		200		59000	
LSF-GP-16(0-6)	Chromium	9.6		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-16(0-6)	Selenium	1.1	U	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-16(0-6)	Silver	0.11	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-16(0-6)	Mercury	0.071		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	
LSF-GP-16(1.5-2)	Arsenic	4.8		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-16(1.5-2)	Barium	53		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-16(1.5-2)	Cadmium	0.61		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-16(1.5-2)	Chromium	16		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-16(1.5-2)	Selenium	0.99	U	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-16(1.5-2)	Silver	0.15	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-16(1.5-2)	Mercury	0.1		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	

Table 2
Total Metal Data Comparison to Soil Remediation Objectives
Lake Shore Foundry
Waukegan, IL

Client ID	Parameter Name	Result	Qualifier	Unit	Tier 1 Residential Soil Remediation Objective								Commercial/Industrial				Construction Worker			
					Background		Ingestion		Inhalation		Class I GW		Ingestion	> CI ING?	Inhalation	>CI INH?	Ingestion	> CW ING?	Inhalation	> CW INH?
LSF-GP-17(0-6)	pH	7.84		SU																
LSF-GP-17(0-6)	Antimony	1.5	J	mg/Kg	4		31		--		5		820		--		82		--	
LSF-GP-17(0-6)	Arsenic	22		mg/Kg	13	>BKG	13	>ING	750		31		13	>CI ING	1200		61		25000	
LSF-GP-17(0-6)	Barium	28		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-17(0-6)	Beryllium	2.7		mg/Kg	0.6	>BKG	160		1300		8000		4100		2100		410		44000	
LSF-GP-17(0-6)	Cadmium	4.6		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-17(0-6)	Chromium	9.7		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-17(0-6)	Cobalt	7.2		mg/Kg	8.9		4700		--		--		120000		--		12000		--	
LSF-GP-17(0-6)	Copper	35		mg/Kg	19.6	>BKG	2900		--		330000		82000		--		8200		--	
LSF-GP-17(0-6)	Nickel	33		mg/Kg	18	>BKG	1600		13000		3800		41000		21000		4100		440000	
LSF-GP-17(0-6)	Selenium	0.88	J	mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-17(0-6)	Silver	0.13	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-17(0-6)	Tin	2.3	B	mg/Kg	--		47000		--		--		1000000		--		120000		--	
LSF-GP-17(0-6)	Vanadium	29		mg/Kg	25.2	>BKG	550		--		980		14000		--		1400		--	
LSF-GP-17(0-6)	Zinc	400	B	mg/Kg	95	>BKG	23000		--		53000		610000		--		61000		--	
LSF-GP-17(0-6)	Thallium	0.96	J	mg/Kg	0.32	>BKG	6.3		--		3.8		160		--		160		--	
LSF-GP-17(0-6)	Mercury	0.013	J	mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-17(1.5-2)	pH	8.35		SU																
LSF-GP-17(1.5-2)	Arsenic	5		mg/Kg	13		13		750		32		13		1200		61		25000	
LSF-GP-17(1.5-2)	Barium	23		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-17(1.5-2)	Cadmium	0.23	U	mg/Kg	0.6		78		1800		430		2000		2800		200		59000	
LSF-GP-17(1.5-2)	Chromium	11		mg/Kg	16.2		230		270		24		6100		420		4100		690	
LSF-GP-17(1.5-2)	Selenium	1.6		mg/Kg	0.48	>BKG	390		--		1.8		10000		--		1000		--	
LSF-GP-17(1.5-2)	Silver	0.57	U	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-17(1.5-2)	Mercury	0.019	J	mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-18(0-6)	Arsenic	13		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-18(0-6)	Barium	81		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-18(0-6)	Cadmium	2.6		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-18(0-6)	Chromium	23		mg/Kg	16.2	>BKG	230		270		28		6100		420		4100		690	
LSF-GP-18(0-6)	Selenium	2.1		mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-18(0-6)	Silver	0.86		mg/Kg	0.55	>BKG	390		--		110		10000		--		1000		--	
LSF-GP-18(0-6)	Mercury	0.12		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	
LSF-GP-18(1.5-2)	Arsenic	5.4		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-18(1.5-2)	Barium	15		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-18(1.5-2)	Cadmium	0.65		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-18(1.5-2)	Chromium	6.8		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-18(1.5-2)	Selenium	1.1	U	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-18(1.5-2)	Silver	0.54	U	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-18(1.5-2)	Mercury	0.024		mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-19(0-6)	Arsenic	2.7		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-19(0-6)	Barium	74		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-19(0-6)	Cadmium	0.4		mg/Kg	0.6		78		1800		430		2000		2800		200		59000	
LSF-GP-19(0-6)	Chromium	9.1		mg/Kg	16.2		230		270		28		6100		420		4100		690	
LSF-GP-19(0-6)	Selenium	0.43	J	mg/Kg	0.48		390		--		2.4		10000		--		1000		--	
LSF-GP-19(0-6)	Silver	0.24	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-19(0-6)	Mercury	0.06		mg/Kg	0.06		23		10		8		610		540000		61		52000	
LSF-GP-19(4-5)	Arsenic	4.1		mg/Kg	13		13		750		31		13		1200		61		25000	
LSF-GP-19(4-5)	Barium	77		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-19(4-5)	Cadmium	1.8		mg/Kg	0.6	>BKG	78		1800		430		2000		2800		200		59000	
LSF-GP-19(4-5)	Selenium	0.56	J	mg/Kg	0.48	>BKG	390		--		2.4		10000		--		1000		--	
LSF-GP-19(4-5)	Silver	0.4	J	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-19(4-5)	Mercury	0.094		mg/Kg	0.06	>BKG	23		10		8		610		540000		61		52000	

Table 2
Total Metal Data Comparison to Soil Remediation Objectives
Lake Shore Foundry
Waukegan, IL

Client ID	Parameter Name	Result	Qualifier	Unit	Tier 1 Residential Soil Remediation Objective								Commercial/Industrial				Construction Worker			
					Background		Ingestion		Inhalation		Class I GW		Ingestion	> CI ING?	Inhalation	>CI INH?	Ingestion	> CW ING?	Inhalation	> CW INH?
LSF-GP-20(0-6)	pH	7.05		SU																
LSF-GP-20(0-6)	Antimony	1.6	J	mg/Kg	4		31		--		5		820		--		82		--	
LSF-GP-20(0-6)	Arsenic	10		mg/Kg	13		13		750		29		13		1200		61		25000	
LSF-GP-20(0-6)	Barium	43		mg/Kg	110		5500		690000		1700		140000		910000		14000		870000	
LSF-GP-20(0-6)	Beryllium	1.2		mg/Kg	0.6	>BKG	160		1300		140		4100		2100		410		44000	
LSF-GP-20(0-6)	Cadmium	1.1		mg/Kg	0.6	>BKG	78		1800		11		2000		2800		200		59000	
LSF-GP-20(0-6)	Chromium	9.2		mg/Kg	16.2		230		270		36		6100		420		4100		690	
LSF-GP-20(0-6)	Cobalt	5.3		mg/Kg	8.9		4700		--		--		120000		--		12000		--	
LSF-GP-20(0-6)	Copper	89		mg/Kg	19.6	>BKG	2900		--		200000		82000		--		8200		--	
LSF-GP-20(0-6)	Nickel	16		mg/Kg	18		1600		13000		180		41000		21000		4100		440000	
LSF-GP-20(0-6)	Selenium	1.2		mg/Kg	0.48	>BKG	390		--		4.5		10000		--		1000		--	
LSF-GP-20(0-6)	Silver	0.63		mg/Kg	0.55	>BKG	390		--		13		10000		--		1000		--	
LSF-GP-20(0-6)	Tin	6.6	B	mg/Kg	--		47000		--		--		1000000		--		120000		--	
LSF-GP-20(0-6)	Vanadium	23		mg/Kg	25.2		550		--		980		14000		--		1400		--	
LSF-GP-20(0-6)	Zinc	310	B	mg/Kg	95	>BKG	23000		--		7500		610000		--		61000		--	
LSF-GP-20(0-6)	Thallium	0.87	J	mg/Kg	0.32	>BKG	6.3		--		3		160		--		160		--	
LSF-GP-20(0-6)	Mercury	0.038		mg/Kg	0.06		23		10		3.3		610		540000		61		52000	
LSF-GP-20(2-2.5)	pH	8.32		SU																
LSF-GP-20(2-2.5)	Arsenic	1.1		mg/Kg	13		13		750		32		13		1200		61		25000	
LSF-GP-20(2-2.5)	Barium	6.9		mg/Kg	110		5500		690000		2100		140000		910000		14000		870000	
LSF-GP-20(2-2.5)	Cadmium	0.2	U	mg/Kg	0.6		78		1800		430		2000		2800		200		59000	
LSF-GP-20(2-2.5)	Chromium	5.1		mg/Kg	16.2		230		270		24		6100		420		4100		690	
LSF-GP-20(2-2.5)	Selenium	1	U	mg/Kg	0.48		390		--		1.8		10000		--		1000		--	
LSF-GP-20(2-2.5)	Silver	0.51	U	mg/Kg	0.55		390		--		110		10000		--		1000		--	
LSF-GP-20(2-2.5)	Mercury	0.0082	J	mg/Kg	0.06		23		10		8		610		540000		61		52000	

Qualifiers Notation Key
B- Compound was found in blank and sample
J- Result is less than the RL but greater than or equal to the MDL and the concentratin is an approximate value.
V- Serial Dilution exceeds the control limits.
^- ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, or MRL standard: Instrument related QC exceeds the control limits.
U- Material Analyzed for but Not Detected

Table 3
Average Lead Concentration in 0-6" Surface Soil
Lake Shore Foundry
Waukegan, IL

Client ID	Parameter Name	Result	Qualifier	Unit
LSF-GP-01(0-6")	Lead	260	^ V B	mg/Kg
LSF-GP-02(0-6")	Lead	2100	^ B V	mg/Kg
LSF-GP-03(0-6")	Lead	570	^ B V	mg/Kg
LSF-GP-05(0-6")	Lead	230	^ B V	mg/Kg
LSF-GP-07(0-6")	Lead	640	^ B V	mg/Kg
LSF-GP-09(0-6")	Lead	35	^ B	mg/Kg
LSF-GP-12(0-6")	Lead	610	^ B	mg/Kg
LSF-GP-13(0-6")	Lead	280	^ B	mg/Kg
LSF-GP-14(0-6")	Lead	24		mg/Kg
LSF-GP-15(0-6")	Lead	180		mg/Kg
LSF-GP-16(0-6")	Lead	170		mg/Kg
LSF-GP-17(0-6")	Lead	36		mg/Kg
LSF-GP-18(0-6")	Lead	290		mg/Kg
LSF-GP-19(0-6")	Lead	79		mg/Kg
LSF-GP-20(0-6")	Lead	76		mg/Kg
Average Surface Concentration		372		mg/Kg

Qualifiers Notation Key
B- Compound was found in blank and sample
J- Result is less than the RL but greater than or equal to the MDL and the concentratin is an approximate value.
V- Serial Dilution exceeds the control limits.
^- ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, or MRL standard: Instrument related QC exceeds the control limits.
U- Material Analyzed for but Not Detected

Table 4
Average Lead Concentration in 0-3 ft bgs Surface Soil
Lake Shore Foundry
Waukegan, IL

Client ID	Parameter Name	Result	Qualifier	Unit
LSF-GP-01(0-6")	Lead	260	^ V B	mg/Kg
LSF-GP-02(0-6")	Lead	2100	^ B V	mg/Kg
LSF-GP-03(0-6")	Lead	570	^ B V	mg/Kg
LSF-GP-04(1.5-2)	Lead	210	^ B V	mg/Kg
LSF-GP-05(0-6")	Lead	230	^ B V	mg/Kg
LSF-GP-05(1.5-2)	Lead	320	^ B V	mg/Kg
LSF-GP-07(0-6")	Lead	640	^ B V	mg/Kg
LSF-GP-07(1.5-2)	Lead	1100	^ B V	mg/Kg
LSF-GP-09(0-6")	Lead	35	^ B	mg/Kg
LSF-GP-09(2.5-3)	Lead	190	^ B	mg/Kg
LSF-GP-12(0-6")	Lead	610	^ B	mg/Kg
LSF-GP-12(1.5-2)	Lead	200	^ B	mg/Kg
LSF-GP-13(0-6")	Lead	280	^ B	mg/Kg
LSF-GP-13(2-2.5)	Lead	1300	^ B	mg/Kg
LSF-GP-14(0-6")	Lead	24		mg/Kg
LSF-GP-14(1.5-2)	Lead	150		mg/Kg
LSF-GP-15(0-6")	Lead	180		mg/Kg
LSF-GP-15(1.5-2)	Lead	58		mg/Kg
LSF-GP-16(0-6")	Lead	170		mg/Kg
LSF-GP-16(1.5-2)	Lead	150		mg/Kg
LSF-GP-17(0-6")	Lead	36		mg/Kg
LSF-GP-17(1.5-2)	Lead	8.1		mg/Kg
LSF-GP-18(0-6")	Lead	290		mg/Kg
LSF-GP-18(1.5-2)	Lead	70		mg/Kg
LSF-GP-19(0-6")	Lead	79		mg/Kg
LSF-GP-20(0-6")	Lead	76		mg/Kg
LSF-GP-20(2-2.5)	Lead	7.5		mg/Kg
Average Surface Concentration		346		mg/Kg

Qualifiers Notation Key
B- Compound was found in blank and sample
J- Result is less than the RL but greater than or equal to the MDL and the concentratin is an approximate value.
V- Serial Dilution exceeds the control limits.
^- ICV, CCV, ICB, CCB, ISA, ISB, CRI, CRA, or MRL standard: Instrument related QC exceeds the control limits.
U- Material Analyzed for but Not Detected

Deigan & Associates, LLC
Environmental Consultants

Appendix A

Site Photographs

Interim Measures Report
Lake Shore Foundry
653 Market Street, Waukegan, Lake County, Illinois

Photo 1 – View of SP-01 location, looking west.

Photo 2 – View of SP-03 location, looking northeast.

Photo 3 – View of Geoprobe sample tooling.

Photo 4 – View of Geoprobe sample tooling, removal of soil sample.

Photo 5 – View of soil core sample being removed from tooling.

Photo 6 – View of soil sample being opened within acetate tube liner.

Photo 7 – View of SP-04 location, looking north.

Photo 8 – View of SP-06 location and project, looking north.

Photo 9 – View of SP-08 location, looking northwest.

Photo 10 – View of soil sample and MinnieRae 2000 PID instrument.

Photo 11 – View of SP-08 location, looking east.

Photo 12 – View of SP-09 location, looking north.

Photo 13 – View of SP-15 location, looking south.

Photo 14 – View of SP-16 location, looking southeast.

Photo 15 – Another view of SP-16 location, looking northeast.

Photo 16 – View of SP-20 location, looking northwest.

Photo 17 – View of SP-17 location, looking southeast.

Photo 18 – View of SP-18 location, looking southwest.

Photo 19 – View of SP-14 location, looking south.

Photo 20 – View of SP-21 location, looking north.

Photo 21 – View of SP-22 location, looking northeast.

Photo 22 – View of SP-23 location, looking northeast.

Photo 23 – View of SP-24 location, looking northwest.

Photo 24 – View of SP-25 location, looking west.

Photo 25 – View of SP-26 location, looking south.

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Appendix B

Subsurface Soil Boring Logs

Interim Measures Report
Lake Shore Foundry
653 Market Street, Waukegan, Lake County, Illinois

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BORING NUMBER LSF-GP-01

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 12 ft.	DEPTH TO WATER Approx. 9' bgs
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 12, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 75E & 0N	
COMMENTS Asphalt drive	

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Asphalt pavement (2") over black and dark brown medium to fine sand, fill, loose, moist. PID = ND Recovery = 36"		SP
2					
4			As above, fill, moist. Below 4.5', light brown medium to fine sand, medium dense, moist. PID = ND Recovery = 30"		SP SP
6					
8			Brown silty coarse to fine sand, fine gravel, dense, wet to saturated. PID = ND Recovery = 33"		SM
10					
12					
14			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 4 to 5' bgs. Collected Archive Soil Sample at 6.5 to 7.5' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-02

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 12 ft.	DEPTH TO WATER Approximately 9' bgs
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 12, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 140E & 25N	
COMMENTS Asphalt Drive	

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Asphalt pavement (2") over dark brown and black silty medium to fine sand, fine gravel, fill, loose, moist. PID = ND Recovery = 27"		SM
2					
4			As above, fill, brick fragments, loose, moist. PID = ND Recovery = 13"		SM
6					
8			Dark gray silty to clayey coarse to fine sand, fill, wood debris, wet, loose. Below 9', light brown medium to fine sand, occasional coarse sand, medium dense, wet to saturated.		SM
					SP
10					
12					
14			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 4 to 5' bgs. Collected Archive Soil Sample at 8 to 9' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

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BORING NUMBER LSF-GP-03

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 Inches
TOTAL DEPTH 12 ft.	DEPTH TO WATER Approximately 9' bgs.
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 12, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 25E & 60N	
COMMENTS Asphalt Drive (Pavement Missing at Probe Location)	

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Black and dark brown meidum to fine sand, occasional coarse sand, fill, loose, moist. PID = ND Recovery = 31"		SP
2					
4			Light brown medium to fine sand, occasional coarse sand, fine gravel, loose, moist. PID = ND Recovery = 43"		SP
6					
8			Brown silty coarse to fine sand, fine gravel, dense, wet to saturated. PID = ND Recovery = 30"		SM
10					
12					
14			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 2 to 2.5' bgs. Collected Archive Soil Sample at 4.5 to 5.5' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
16					
18					
20					

Legend					
	Silty Clay		Gravel		Foundry Sand
	Clayey Sand		Sand		Brick

CC = Continuous Core
SS = Split Spoon
ST = Shelby Tube
AS = AugerSample
GP = Geo-Probe
HSA = Hollow-Stem Auger

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BORING NUMBER LSF-GP-04

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 6.5 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 12, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 150E & 75N	

COMMENTS Foundry Sand Fill On Surface Soil. Encountered concrete rubble at three other offsets (1, 2, 2' bgs).

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample Type
0			Dark brown medium to fine sand, foundry sand, fill, mixed with medium to fine gravel, loose, moist. PID = ND Recovery = 18"		SP GP
2					
4			As above, fill, moist. Concrete rubble at 6.5' bgs. Refusal. PID = ND Recovery = 2"		SP
6					
8			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 1.5 to 2' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
10					
12					
14					
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

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BORING NUMBER LSF-GP-05

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 3 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 12, 2007
DRILLER	GEOLOGIST Kerry Van Allen

LOCATION Approximate Grid Coordinate: 180E & 75N

COMMENTS Gravel Drive. Encountered concrete rubble at 3' bgs at three offset locations.

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Dark brown silty coarse to fine sand, occasional fine gravel, fill, medium dense, moist. Concrete rubble at 3' bgs. Refusal.		SM
2					
4					
6			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 1.5 to 2' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
8					
10					
12					
14					
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

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BORING NUMBER LSF-GP-06

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 12 ft.	DEPTH TO WATER Approximately 9' bgs
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 12, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 140E & 100N	
COMMENTS Foundry Sand Fill On Surface Soil.	

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Black and dark brown medium to fine sand, foundry sand, fill, brick fragments at 1.2 to 1.6' bgs, then black silty coarse to fine sand, fine gravel, fill, loose, moist. PID = ND Recovery = 32"		SP SM
2					
4			As above, fill, loose, moist. PID = ND Recovery = 12"		SM
6					
8			Dark brown medium to fine sand, occasional coarse sand, possible fill, moist. Below 8.5', light brown medium to fine sand, medium dense, moist. PID = ND Recovery = 18"		SP SP
10					
12					
14			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 4 to 5' bgs. Collected Archive Soil Sample at 8 to 9' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-07

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 Inches
TOTAL DEPTH 5 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 12, 2007
DRILLER	GEOLOGIST Kerry Van Allen

LOCATION Approximate Grid Coordinate: 170E & 135N

COMMENTS Gravel Drive. Encountered concrete rubble at first two offset locations (1' bgs)

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Gray and black medium to fine sand, foundry sand, metal particulate, fine gravel layers, loose, moist. PID = ND Recovery = 24"		SP GP
2					
					GP
4			As above, fill. Concrete rubble at 5' bgs.		SP
6					
8					
10					
12					
14					
16					
18					
20					

Collected Composite Soil Sample at 0 to 6" bgs.
Collected Composite Soil Sample at 1.5 to 2' bgs.
Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-08

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 6.5 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 12, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 145E & 155N	

COMMENTS Foundry Sand Fill On Surface Soil. Encountered very loose fill below 4', no recovery on two attempts.

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample Type
0			Black and dark brown medium to fine sand, foundry sand, gravel layer at 1.5' bgs, loose, moist. PID = ND Recovery = 24"		SP GP
2					
4			Fill, very loose. No recovery.		
6					
8			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 1.5 to 2' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
10					
12					
14					
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-09

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 12 ft.	DEPTH TO WATER Approx. 10' bgs.
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 12, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 30E & 150N	
COMMENTS Grass Terrace	

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Dark brown and brown silty coarse to fine sand, fill, moist. Below 2', black medium to fine sand, fill, possible cinder, moist. PID = ND Recovery = 36"		SM
2					SP
4			Dark brown and brown medium to fine sand, fill, loose, moist.		SP
			Below 4.2', light brown medium to fine sand, loose, moist. PID = ND Recovery = 32"		SP
6					
8			As above, medium to fine sand, medium dense, wet to saturated. PID = ND Recovery = 40"		SP
10					
12					
14			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 2.5 to 3' bgs. Collected Archive Soil Sample at 5 to 6' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-10

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 3.5 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 12, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 200E & 200N	

COMMENTS Gravel Drive. Encountered concrete rubble at 3 to 3.5' bgs at two offset locations.

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Dark brown and black medium to fine sand, fill, loose, moist. Gravel layer at 1.5 to 1.8' bgs, moist. PID = ND Recovery = 32"		SP
					GP
2			Encountered concrete rubble at 3 to 3.5' bgs. Refusal.		
4					
			Collected Composite Soil Sample at 0 to 6" bgs.		
			Collected Composite Soil Sample at 2 to 2.5' bgs.		
6			Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
8					
10					
12					
14					
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-11

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 Inches
TOTAL DEPTH 3.5 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 12, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 145E & 210N	

COMMENTS Foundry Fill Sand On Surface Soil. Encountered concrete rubble at 3.5' bgs at three offset locations.

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Black and dark brown medium to fine sand, foundry sand, with gravel layers, moist. PID = ND Recovery = 36"		SP GP
2			Concrete rubble at 3 to 3.5' bgs. Refusal.		
4			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 3 to 3.5' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
6					
8					
10					
12					
14					
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-12

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 4 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 12, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 200E & 245N	

COMMENTS Rubble Fill Area Toward Lake. Encountered concrete rubble at 3 to 4' bgs at two offset locations.

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample Type
0			Dark brown and light brown silty medium to fine sand, fill, brick, moist. Concrete rubble at 3 to 4' bgs. Refusal. PID = ND Recovery = 24"		SP SM
2					
4					
6			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 1.5 to 2' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
8					
10					
12					
14					
16					
18					
20					

Legend			
	Silty Clay	Gravel	Foundry Sand
	Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core
SS = Split Spoon
ST = Shelby Tube
AS = AugerSample
GP = Geo-Probe
HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-13

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 3 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 12, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 165E & 265N	
COMMENTS Gravel Drive.	

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Gray and brown silty medium to fine sand, occasional coarse sand, fine gravel, fill, medium dense, moist. Encountered concrete rubble at 3' bgs. PID = ND Recovery = 30"		SM
2					
4			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 2.5 to 3' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
6					
8					
10					
12					
14					
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-14

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 12 ft.	DEPTH TO WATER Approx. 10' bgs
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 13, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 30E & 265N	
COMMENTS Grass Terrace.	

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Black and dark brown medium to fine sand, some organics, fill, moist. Below 2.2', light brown medium to fine sand, loose, moist. PID = ND Recovery = 38"		SP
2					SP
4			Brown medium to fine sand, loose, moist. PID = ND Recovery = 22"		SP
6					
8			As above. Below 9', brown silty coarse to fine sand, medium dense, wet to saturated. PID = ND Recovery = 28"		SP
					SM
10					
12					
14			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 1.5 to 2' bgs. Collected Archive Soil Sample at 4 to 5' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-15

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 Inches
TOTAL DEPTH 12 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 13, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 140E & 300N	
COMMENTS Foundry Fill Sand On Surface Soil.	

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Brown silty medium to fine sand, foundry sand, coarse to fine gravel layers, loose to dense, moist. PID = ND Recovery = 27"		SM GP
2					
4			Brown medium to fine sand, loose, moist. PID = ND Recovery = 14"		SP
6					
8			As above, brown medium to fine sand, moist. PID = ND Recovery = 34"		SP
10					
12					
14			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 1.5 to 2' bgs. Collected Archive Soil Sample at 4 to 5' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-16

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 3.5 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 13, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 200E & 330N	

COMMENTS Rubble Fill Area Toward Lake. Encountered concrete rubble at 3 to 5' bgs at two offset locations.

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample Type
0			Brown and gray silty coarse to fine gravel, fill, moist. PID = ND		SP
			Recovery = 12" Encountered concrete rubble at 3.5 and 5' bgs.		SM
2			Refusal.		
4					
			Collected Composite Soil Sample at 0 to 6" bgs.		
6			Collected Composite Soil Sample at 1.5 to 2' bgs.		
			Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
8					
10					
12					
14					
16					
18					
20					

Legend			
Silty Clay	Gravel	Foundry Sand	
Clayey Sand	Sand	Brick/Concrete	

CC = Continuous Core
SS = Split Spoon
ST = Shelby Tube
AS = AugerSample
GP = Geo-Probe
HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-17

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 12 ft.	DEPTH TO WATER Approx. 10.5' bgs
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 13, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 90E & 345N	
COMMENTS Asphalt Drive.	

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Asphalt pavement (2") over black and dark brown silty coarse to fine sand, fill, loose, moist. PID = ND Recovery = 25"		SM
2					
4			Gray and brown silty clay, fill, occasional coarse to fine sand, moist.		SM
			Below 4.1', light brown medium to fine sand, loose, moist. PID = ND Recovery = 26"		SP
6					
8			As above, brown medium to fine sand, moist. Below 10.5', brown coarse to fine sand, saturated. PID = ND Recovery = 40"		SP
10					SW
12					
14			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 1.5 to 2' bgs. Collected Archive Soil Sample at 4 to 5' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-18

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 12 ft.	DEPTH TO WATER Approx. 9' bgs
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 13, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 25E & 350N	
COMMENTS Grass Terrace.	

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Asphalt pavement (2") over black and dark brown medium to fine sand, fill, moist. Below 2', brown medium to fine sand, loose, moist. PID = ND Recovery = 40"		SP
2					SP
4			As above, loose, moist. PID = ND Recovery = 28"		SP
6					
8			Brown silty coarse to fine sand, medium dense, saturated. PID = ND Recovery = 22"		SM
10					
12					
14			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 1.5 to 2' bgs. Collected Archive Soil Sample at 4 to 5' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-19

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 Inches
TOTAL DEPTH 9 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 13, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 140E & 420N	

COMMENTS Grass Terrace, Toward Lake. Encountered concrete rubble at 8.8' bgs, refusal at 9' bgs.

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Brown silty coarse to fine sand, fill, occasional fine gravel, loose, moist. PID = ND Recovery = 22"		SM
2					
4			As above, fill, loose, moist. PID = ND Recovery = 14"		SM
6					
8			As above, dark brown coarse to fine sand, fill, moist. Gravel fill and concrete rubble at 8.8' bgs. PID = ND Recovery = 8"		SM
			Refusal at 9' bgs.		GP
10					
12			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 4 to 5' bgs. Collected Archive Soil Sample at 8 to 9' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
14					
16					
18					
20					

Legend			
	Silty Clay	Gravel	Foundry Sand
	Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core
SS = Split Spoon
ST = Shelby Tube
AS = AugerSample
GP = Geo-Probe
HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-20

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 12 ft.	DEPTH TO WATER Approx. 9.5' bgs
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED July 13, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 50E & 450N	
COMMENTS Grass Terrace.	

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample Type
0			Black and dark brown medium to fine sand, organics, fill, moist.		SP
			Below 0.6', brown and light brown medium to fine sand, loose, moist. PID = ND Recovery = 40"		SP
2					
4			As above, becoming light brown coarse to fine sand below 6.5', moist. PID = ND Recovery = 36"		SP
6					SW
8			Brown silty coarse to fine sand, fine gravel, moist. Below 9.2', gray coarse to fine sand, fine gravel, wet to saturated. PID = ND Recovery = 30"		SM
					SW
10					
12					
14			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 2 to 2.5' bgs. Collected Archive Soil Sample at 4.5 to 5.5' bgs. Backfilled Probe Hole w/ Soil Cuttings and Bentonite Chips.		
16					
18					
20					

Legend			
	Silty Clay	Gravel	Foundry Sand
	Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core
SS = Split Spoon
ST = Shelby Tube
AS = AugerSample
GP = Geo-Probe
HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-21

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 3 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED August 10, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 175E & 175N	
COMMENTS Gravel Drive.	

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Brown silty coarse to fine sand and gravel, fill, mixed with dark brown foundry sand, moist. Refusal at 3' bgs. PID = ND Recovery = 24"		SM GM
2					
4					
6			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 1.5 to 2' bgs. Backfilled Probe Hole w/ Bentonite Chips.		
8					
10					
12					
14					
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-22

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 8 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED August 10, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 215E & 165N	

COMMENTS Grass Terrace Towards Lake. Encountered concrete rubble around 4' bgs, refusal at 7' bgs.

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Brown clayey to silty fine sand, occasional medium to coarse sand, fine gravel, fill, moist. PID = ND Recovery = 15"		SM SC
2					
4			As above, mostly silty sand, fill, with dark brown foundry sand at 5' bgs, wood debris, possible concrete slabs. Refusal at 7' bgs. PID = ND Recovery = 13"		SM
6					
8					
10			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 4 to 4.5' bgs. Backfilled Probe Hole w/ Bentonite Chips.		
12					
14					
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-23

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 Inches
TOTAL DEPTH 3.5 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED August 10, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 225E & 200N	

COMMENTS Grass Terrace, Toward Lake. Encountered concrete rubble at 3.5' bgs, refusal at 3.5' bgs.

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Brown silty clay, occasional coarse to fine sand, fill, moist. Below 1.5', mostly gravel, fill, moist. Concrete rubble at 3.5' bgs. PID = ND Recovery = 23"		
2					
4					
			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 1 to 1.5' bgs. Backfilled Probe Hole w/ Bentonite Chips.		
6					
8					
10					
12					
14					
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-24

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 3 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED August 10, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 160E & 230N	
COMMENTS Gravel Drive.	

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample Type
0			Brown and black silty medium to fine sand, fill, mixed with dark brown foundry sand, moist. Encountered concrete rubble around 3' bgs. Refusal at 3' bgs. PID = ND Recovery = 35"		SM SP
2					
4			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 2.5 to 3' bgs. Backfilled Probe Hole w/ Bentonite Chips.		
6					
8					
10					
12					
14					
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-25

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 3.5 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED August 10, 2007
DRILLER	GEOLOGIST Kerry Van Allen
LOCATION Approximate Grid Coordinate: 175E & 110N	
COMMENTS Gravel Drive.	

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Brown to dark brown silty coarse to fine sand and gravel, fill, moist. Below 2', mostly gravel, fill, moist. PID = ND Recovery = 24"		SM
					GM
2					GW
4					
			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 1 to 1.5' bgs. Backfilled Probe Hole w/ Bentonite Chips.		
6					
8					
10					
12					
14					
16					
18					
20					

Legend

Silty Clay	Gravel	Foundry Sand
Clayey Sand	Sand	Brick/Concrete

CC = Continuous Core	ST = Shelby Tube	GP = Geo-Probe
SS = Split Spoon	AS = AugerSample	HSA = Hollow-Stem Auger

Deigan & Associates

BORING NUMBER LSF-GP-26

PROJECT Lake Shore Foundry Property	PROJECT NO.
LOCATION Waukegan, Illinois	BOREHOLE DIA. 2 inches
TOTAL DEPTH 3 ft.	DEPTH TO WATER None Observed
TOC ELEV.	DRILLING METHOD GeoProbe
COMPANY CS Drilling	DATE DRILLED August 10, 2007
DRILLER	GEOLOGIST Kerry Van Allen

LOCATION Approximate Grid Coordinate: 165E & 40N

COMMENTS Gravel Drive. Encountered concrete rubble around 3' bgs, refusal at 3' bgs.

Depth (ft)	Well Record	Graphic Log	Description Soil Classification	Sample Int.	Sample USCS
0			Dark brown silty fine sand, fill, moist. Encountered concrete rubble around 3' bgs, refusal at 3' bgs. PID = ND Recovery = 32"		SM
2					
4			Collected Composite Soil Sample at 0 to 6" bgs. Collected Composite Soil Sample at 2 to 2.5' bgs. Backfilled Probe Hole w/ Bentonite Chips.		
6					
8					
10					
12					
14					
16					
18					
20					

Legend

Silty Clay
Clayey Sand
Gravel
Sand
Foundry Sand
Brick/Concrete

CC = Continuous Core
SS = Split Spoon
ST = Shelby Tube
AS = AugerSample
GP = Geo-Probe
HSA = Hollow-Stem Auger

Deigan & Associates, LLC
Environmental Consultants

Appendix C

Laboratory Data Reports

Interim Measures Report
Lake Shore Foundry
653 Market Street, Waukegan, Lake County, Illinois

ANALYTICAL REPORT

Job Number: 500-5228-1

Job Description: Lake Shore Foundry, Waukegan

For:
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Attention: Gary Deigan

Richard C Wright
Project Manager II
rwright@stl-inc.com
07/31/2007

Project Manager: Richard C Wright

These test results meet all the requirements of NELAC for accredited parameters.

The Lab Certification ID# is 100201.

All questions regarding this test report should be directed to the STL Project Manager whose signature appears on this report. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

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Job Narrative
500-J5228-1

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

GC/MS VOA
No analytical or quality issues were noted.

GC/MS Semi VOA
The LB2 had one surrogate low, but greater than ten percent. No corrective action was required.

No other analytical or quality issues were noted.

GC Semi VOA
No analytical or quality issues were noted.

Metals
Method 6010B: The serial dilution for sample 500-5228-27 was outside control limits for Cd..

Method 6010B: The CRI at line 47 in AD batch 18941 was high for Cu, Pb, and Zn.

Method 6010B: The CRI in AD batch 18941 was high for Pb. All samples were greater than 10X the RL and ok to report.

Method 7471A: The matrix spike duplicate (MSD) precision for batch 18628 and for sample 500-5228-9 was outside control limits for Hg. The associated laboratory control standard (LCS) met acceptance criteria.

No other analytical or quality issues were noted.

General Chemistry
Method 9034: (Reactive sulfide) The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 18874 were outside control limits. The associated laboratory control standard (LCS) met acceptance criteria.

No other analytical or quality issues were noted.

Organic Prep
No analytical or quality issues were noted.

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5228-1	**LSF-GP-01(0-6)**					
Arsenic		19		1.1	mg/Kg	6010B
Barium		100		1.1	mg/Kg	6010B
Cadmium		3.9		0.22	mg/Kg	6010B
Chromium		14		1.1	mg/Kg	6010B
Lead		260	^ V B	0.55	mg/Kg	6010B
Selenium		0.77	J	1.1	mg/Kg	6010B
Silver		2.0		0.55	mg/Kg	6010B
Mercury		120		18	ug/Kg	7471A
Percent Moisture		8.7		0.10	%	PercentMoisture
Percent Solids		91		0.10	%	PercentMoisture
TCLP						
Lead		0.24		0.0075	mg/L	6010B
500-5228-2	**LSF-GP-01(4-5)**					
Arsenic		1.6		0.97	mg/Kg	6010B
Barium		5.6		0.97	mg/Kg	6010B
Cadmium		0.086	J	0.19	mg/Kg	6010B
Chromium		3.3		0.97	mg/Kg	6010B
Lead		14		0.48	mg/Kg	6010B
Mercury		10	J	17	ug/Kg	7471A
Percent Moisture		3.8		0.10	%	PercentMoisture
Percent Solids		96		0.10	%	PercentMoisture
TCLP						
Lead		0.011		0.0075	mg/L	6010B
500-5228-3	**LSF-GP-02(0-6)**					
Arsenic		15		1.1	mg/Kg	6010B
Barium		250		1.1	mg/Kg	6010B
Cadmium		2.7		0.21	mg/Kg	6010B
Chromium		24		1.1	mg/Kg	6010B
Lead		2100	^ B V	0.53	mg/Kg	6010B
Selenium		0.70	J	1.1	mg/Kg	6010B
Silver		12		0.53	mg/Kg	6010B
Mercury		3000		180	ug/Kg	7471A
Percent Moisture		8.7		0.10	%	PercentMoisture
Percent Solids		91		0.10	%	PercentMoisture
TCLP						
Lead		0.65		0.0075	mg/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5228-4	**LSF-GP-02(4-5)**					
Arsenic		5.0		1.1	mg/Kg	6010B
Barium		400		1.1	mg/Kg	6010B
Cadmium		0.70		0.22	mg/Kg	6010B
Chromium		18		1.1	mg/Kg	6010B
Lead		320	^ B V	0.56	mg/Kg	6010B
Silver		0.29	J	0.56	mg/Kg	6010B
Mercury		410		20	ug/Kg	7471A
Percent Moisture		15		0.10	%	PercentMoisture
Percent Solids		85		0.10	%	PercentMoisture
TCLP						
Lead		0.018		0.0075	mg/L	6010B
500-5228-5	**LSF-GP-03(0-6)**					
Arsenic		14		1.2	mg/Kg	6010B
Barium		94		1.2	mg/Kg	6010B
Cadmium		2.4		0.24	mg/Kg	6010B
Chromium		17		1.2	mg/Kg	6010B
Lead		570	^ B V	0.59	mg/Kg	6010B
Selenium		1.1	J	1.2	mg/Kg	6010B
Silver		4.9		0.59	mg/Kg	6010B
Mercury		820		100	ug/Kg	7471A
Percent Moisture		18		0.10	%	PercentMoisture
Percent Solids		82		0.10	%	PercentMoisture
TCLP						
Lead		0.46		0.0075	mg/L	6010B
500-5228-6	**LSF-GP-03(4.5-5.5)**					
Arsenic		4.0		1.0	mg/Kg	6010B
Barium		14		1.0	mg/Kg	6010B
Cadmium		0.17	J	0.21	mg/Kg	6010B
Chromium		5.7		1.0	mg/Kg	6010B
Lead		26	^ B V	0.51	mg/Kg	6010B
Silver		0.16	J	0.51	mg/Kg	6010B
Mercury		7.2	J	18	ug/Kg	7471A
Percent Moisture		5.9		0.10	%	PercentMoisture
Percent Solids		94		0.10	%	PercentMoisture
TCLP						
Lead		0.0069	J	0.0075	mg/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5228-7	**LSF-GP-04(0-6)**					
Arsenic		7.5		0.97	mg/Kg	6010B
Barium		320		0.97	mg/Kg	6010B
Cadmium		2.3		0.19	mg/Kg	6010B
Chromium		16		0.97	mg/Kg	6010B
Lead		1800	^ B V	0.49	mg/Kg	6010B
Selenium		0.71	J	0.97	mg/Kg	6010B
Silver		3.4		0.49	mg/Kg	6010B
Mercury		570		92	ug/Kg	7471A
Percent Moisture		8.9		0.10	%	PercentMoisture
Percent Solids		91		0.10	%	PercentMoisture
TCLP						
Lead		55		0.075	mg/L	6010B
500-5228-8	**LSF-GP-04(1.5-2)**					
Arsenic		4.3		1.0	mg/Kg	6010B
Barium		68		1.0	mg/Kg	6010B
Cadmium		0.68		0.21	mg/Kg	6010B
Chromium		13		1.0	mg/Kg	6010B
Lead		210	^ B V	0.52	mg/Kg	6010B
Silver		0.60		0.52	mg/Kg	6010B
Mercury		240		18	ug/Kg	7471A
Percent Moisture		8.3		0.10	%	PercentMoisture
Percent Solids		92		0.10	%	PercentMoisture
TCLP						
Lead		0.18		0.0075	mg/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5228-9	**LSF-GP-05(0-6)**					
Antimony		0.64	J	2.2	mg/Kg	6010B
Arsenic		5.7		1.1	mg/Kg	6010B
Barium		71		1.1	mg/Kg	6010B
Beryllium		1.2	B	0.43	mg/Kg	6010B
Cadmium		0.89		0.22	mg/Kg	6010B
Chromium		14		1.1	mg/Kg	6010B
Cobalt		6.2		0.54	mg/Kg	6010B
Copper		690		1.1	mg/Kg	6010B
Lead		230	^ B V	0.54	mg/Kg	6010B
Nickel		22		1.1	mg/Kg	6010B
Selenium		0.49	J	1.1	mg/Kg	6010B
Silver		0.27	J	0.54	mg/Kg	6010B
Tin		35	B	2.2	mg/Kg	6010B
Vanadium		17		0.54	mg/Kg	6010B
Zinc		1000	^ B V	2.2	mg/Kg	6010B
Mercury		130		18	ug/Kg	7471A
pH		8.65		0.200	SU	9045C
Percent Moisture		8.0		0.10	%	PercentMoisture
Percent Solids		92		0.10	%	PercentMoisture
TCLP						
Lead		0.10		0.0075	mg/L	6010B
500-5228-10	**LSF-GP-05(1.5-2)**					
Arsenic		5.0		1.0	mg/Kg	6010B
Barium		79		1.0	mg/Kg	6010B
Cadmium		0.25		0.21	mg/Kg	6010B
Chromium		16		1.0	mg/Kg	6010B
Lead		320	^ B V	0.52	mg/Kg	6010B
Silver		0.77		0.52	mg/Kg	6010B
Mercury		56		19	ug/Kg	7471A
pH		8.78		0.200	SU	9045C
Percent Moisture		11		0.10	%	PercentMoisture
Percent Solids		89		0.10	%	PercentMoisture
TCLP						
Lead		0.053		0.0075	mg/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5228-11	**LSF-GP-06(0-6)**					
Arsenic		15		1.2	mg/Kg	6010B
Barium		81		1.2	mg/Kg	6010B
Cadmium		5.0		0.23	mg/Kg	6010B
Chromium		16		1.2	mg/Kg	6010B
Lead		12000	^ B V	5.8	mg/Kg	6010B
Selenium		1.3		1.2	mg/Kg	6010B
Silver		46		0.58	mg/Kg	6010B
Mercury		63		19	ug/Kg	7471A
Percent Moisture		14		0.10	%	PercentMoisture
Percent Solids		86		0.10	%	PercentMoisture
TCLP						
Lead		16		0.0075	mg/L	6010B
500-5228-12	**LSF-GP-06(4-5)**					
Arsenic		9.2		1.2	mg/Kg	6010B
Barium		98		1.2	mg/Kg	6010B
Cadmium		1.2		0.23	mg/Kg	6010B
Chromium		8.7		1.2	mg/Kg	6010B
Lead		270	^ B V	0.58	mg/Kg	6010B
Selenium		0.67	J	1.2	mg/Kg	6010B
Silver		0.49	J	0.58	mg/Kg	6010B
Mercury		290		19	ug/Kg	7471A
Percent Moisture		14		0.10	%	PercentMoisture
Percent Solids		86		0.10	%	PercentMoisture
TCLP						
Lead		0.15		0.0075	mg/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5228-13	**LSF-GP-07(0-6)**					
Antimony		1.6	J	2.0	mg/Kg	6010B
Arsenic		2.9		0.99	mg/Kg	6010B
Barium		43		0.99	mg/Kg	6010B
Beryllium		1.5	B	0.39	mg/Kg	6010B
Cadmium		4.9		0.20	mg/Kg	6010B
Chromium		21		0.99	mg/Kg	6010B
Cobalt		4.1		0.49	mg/Kg	6010B
Copper		2400		0.99	mg/Kg	6010B
Lead		640	^ B V	0.49	mg/Kg	6010B
Nickel		43		0.99	mg/Kg	6010B
Selenium		0.51	J	0.99	mg/Kg	6010B
Silver		0.80		0.49	mg/Kg	6010B
Tin		160	B	2.0	mg/Kg	6010B
Vanadium		8.8		0.49	mg/Kg	6010B
Zinc		3900	^ B V	2.0	mg/Kg	6010B
Mercury		41		18	ug/Kg	7471A
pH		9.44		0.200	SU	9045C
Percent Moisture		4.8		0.10	%	PercentMoisture
Percent Solids		95		0.10	%	PercentMoisture
TCLP						
Lead		0.56		0.0075	mg/L	6010B
500-5228-14	**LSF-GP-07(1.5-2)**					
Arsenic		5.4		1.1	mg/Kg	6010B
Barium		210		1.1	mg/Kg	6010B
Cadmium		0.12	J	0.22	mg/Kg	6010B
Chromium		29		1.1	mg/Kg	6010B
Lead		1100	^ B V	0.56	mg/Kg	6010B
Selenium		0.58	J	1.1	mg/Kg	6010B
Silver		1.3		0.56	mg/Kg	6010B
Mercury		85		19	ug/Kg	7471A
pH		9.93		0.200	SU	9045C
Percent Moisture		14		0.10	%	PercentMoisture
Percent Solids		86		0.10	%	PercentMoisture
TCLP						
Lead		0.037		0.0075	mg/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5228-15	**LSF-GP-08(0-6)**					
Antimony		2.7		2.1	mg/Kg	6010B
Arsenic		1.8		1.1	mg/Kg	6010B
Barium		6.8		1.1	mg/Kg	6010B
Beryllium		0.14	J B	0.42	mg/Kg	6010B
Cadmium		2.8		0.21	mg/Kg	6010B
Chromium		8.3		1.1	mg/Kg	6010B
Cobalt		1.8		0.53	mg/Kg	6010B
Copper		4900		1.1	mg/Kg	6010B
Lead		750	^ B V	0.53	mg/Kg	6010B
Nickel		37		1.1	mg/Kg	6010B
Selenium		0.69	J	1.1	mg/Kg	6010B
Silver		1.7		0.53	mg/Kg	6010B
Tin		140	B	2.1	mg/Kg	6010B
Vanadium		1.9		0.53	mg/Kg	6010B
Zinc		2600	^ B V	2.1	mg/Kg	6010B
Mercury		18	J	18	ug/Kg	7471A
pH		8.58		0.200	SU	9045C
Percent Moisture		8.5		0.10	%	PercentMoisture
Percent Solids		92		0.10	%	PercentMoisture
TCLP						
Lead		19		0.0075	mg/L	6010B
500-5228-16	**LSF-GP-08(1.5-2)**					
Arsenic		3.8		0.98	mg/Kg	6010B
Barium		78		0.98	mg/Kg	6010B
Cadmium		0.72		0.20	mg/Kg	6010B
Chromium		13		0.98	mg/Kg	6010B
Lead		1400	^ B V	0.49	mg/Kg	6010B
Selenium		0.48	J	0.98	mg/Kg	6010B
Silver		3.3		0.49	mg/Kg	6010B
Mercury		19		18	ug/Kg	7471A
pH		8.84		0.200	SU	9045C
Percent Moisture		6.0		0.10	%	PercentMoisture
Percent Solids		94		0.10	%	PercentMoisture
TCLP						
Lead		12		0.0075	mg/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5228-17	**LSF-GP-10(0-6)**					
Arsenic		2.8		1.0	mg/Kg	6010B
Barium		23		1.0	mg/Kg	6010B
Cadmium		3.0		0.20	mg/Kg	6010B
Chromium		9.0		1.0	mg/Kg	6010B
Lead		540	^ B V	0.50	mg/Kg	6010B
Selenium		0.38	J	1.0	mg/Kg	6010B
Silver		0.79		0.50	mg/Kg	6010B
Mercury		31		17	ug/Kg	7471A
Percent Moisture		3.3		0.10	%	PercentMoisture
Percent Solids		97		0.10	%	PercentMoisture
TCLP						
Lead		0.92		0.0075	mg/L	6010B
500-5228-18	**LSF-GP-10(2-2.5)**					
Arsenic		1.2		1.0	mg/Kg	6010B
Barium		7.5		1.0	mg/Kg	6010B
Cadmium		6.5		0.21	mg/Kg	6010B
Chromium		6.5		1.0	mg/Kg	6010B
Lead		1400	^ B V	0.51	mg/Kg	6010B
Silver		1.9		0.51	mg/Kg	6010B
Percent Moisture		5.8		0.10	%	PercentMoisture
Percent Solids		94		0.10	%	PercentMoisture
TCLP						
Lead		14		0.0075	mg/L	6010B
500-5228-19	**LSF-GP-11(0-6)**					
Arsenic		9.9		1.0	mg/Kg	6010B
Barium		170		1.0	mg/Kg	6010B
Cadmium		2.8		0.20	mg/Kg	6010B
Chromium		25		1.0	mg/Kg	6010B
Lead		3300	^ B V	2.5	mg/Kg	6010B
Selenium		1.7		1.0	mg/Kg	6010B
Silver		35		0.50	mg/Kg	6010B
Mercury		33		18	ug/Kg	7471A
Percent Moisture		5.5		0.10	%	PercentMoisture
Percent Solids		94		0.10	%	PercentMoisture
TCLP						
Lead		5.3		0.0075	mg/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5228-20	**LSF-GP-11(3-3.5)**					
Arsenic		3.3		0.91	mg/Kg	6010B
Barium		27		0.91	mg/Kg	6010B
Cadmium		0.85		0.18	mg/Kg	6010B
Chromium		7.3		0.91	mg/Kg	6010B
Lead		92	^ B	0.45	mg/Kg	6010B
Selenium		0.77	J	0.91	mg/Kg	6010B
Silver		0.33	J	0.45	mg/Kg	6010B
Mercury		45		18	ug/Kg	7471A
Percent Moisture		7.4		0.10	%	PercentMoisture
Percent Solids		93		0.10	%	PercentMoisture
TCLP						
Lead		0.0075	B	0.0075	mg/L	6010B
500-5228-21	**LSF-GP-12(0-6)**					
Arsenic		3.5		1.0	mg/Kg	6010B
Barium		36		1.0	mg/Kg	6010B
Cadmium		2.7		0.20	mg/Kg	6010B
Chromium		12		1.0	mg/Kg	6010B
Lead		610	^ B	0.50	mg/Kg	6010B
Selenium		0.39	J	1.0	mg/Kg	6010B
Silver		0.88		0.50	mg/Kg	6010B
Mercury		36		17	ug/Kg	7471A
Percent Moisture		2.1		0.10	%	PercentMoisture
Percent Solids		98		0.10	%	PercentMoisture
TCLP						
Lead		0.26	B	0.0075	mg/L	6010B
500-5228-22	**LSF-GP-12(1.5-2)**					
Arsenic		7.0		1.1	mg/Kg	6010B
Barium		45		1.1	mg/Kg	6010B
Cadmium		0.71		0.21	mg/Kg	6010B
Chromium		11		1.1	mg/Kg	6010B
Lead		200	^ B	0.54	mg/Kg	6010B
Silver		0.23	J	0.54	mg/Kg	6010B
Mercury		48		18	ug/Kg	7471A
Percent Moisture		6.8		0.10	%	PercentMoisture
Percent Solids		93		0.10	%	PercentMoisture
TCLP						
Lead		0.0064	J B	0.0075	mg/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5228-23	**LSF-GP-13(0-6)**					
Arsenic		4.8		1.0	mg/Kg	6010B
Barium		100		1.0	mg/Kg	6010B
Cadmium		0.76		0.20	mg/Kg	6010B
Chromium		16		1.0	mg/Kg	6010B
Lead		280	^ B	0.50	mg/Kg	6010B
Selenium		0.82	J	1.0	mg/Kg	6010B
Silver		0.73		0.50	mg/Kg	6010B
Mercury		78		18	ug/Kg	7471A
Percent Moisture		5.9		0.10	%	PercentMoisture
Percent Solids		94		0.10	%	PercentMoisture
500-5228-24	**LSF-GP-13(2-2.5)**					
Arsenic		5.6		0.93	mg/Kg	6010B
Barium		160		0.93	mg/Kg	6010B
Cadmium		0.36		0.19	mg/Kg	6010B
Chromium		26		0.93	mg/Kg	6010B
Lead		1300	^ B	0.47	mg/Kg	6010B
Selenium		0.55	J	0.93	mg/Kg	6010B
Silver		0.60		0.47	mg/Kg	6010B
Mercury		42		19	ug/Kg	7471A
Percent Moisture		11		0.10	%	PercentMoisture
Percent Solids		89		0.10	%	PercentMoisture
500-5228-25	**LSF-GP-09(0-6)**					
Arsenic		10		1.0	mg/Kg	6010B
Barium		40		1.0	mg/Kg	6010B
Chromium		10		1.0	mg/Kg	6010B
Lead		35	^ B	0.51	mg/Kg	6010B
Selenium		0.59	J	1.0	mg/Kg	6010B
Silver		0.17	J	0.51	mg/Kg	6010B
Mercury		27		18	ug/Kg	7471A
Percent Moisture		4.7		0.10	%	PercentMoisture
Percent Solids		95		0.10	%	PercentMoisture

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5228-26	**LSF-GP-09(2.5-3)**					
Arsenic		18		1.2	mg/Kg	6010B
Barium		120		1.2	mg/Kg	6010B
Cadmium		7.3		0.23	mg/Kg	6010B
Chromium		14		1.2	mg/Kg	6010B
Lead		190	^ B	0.58	mg/Kg	6010B
Selenium		1.7		1.2	mg/Kg	6010B
Silver		5.2		0.58	mg/Kg	6010B
Mercury		980		210	ug/Kg	7471A
Percent Moisture		21		0.10	%	PercentMoisture
Percent Solids		79		0.10	%	PercentMoisture
TCLP						
Lead		0.046		0.0075	mg/L	6010B
500-5228-27	**DISPOSAL SAMPLE**					
PCB-1254		29		19	ug/Kg	8082
Flashpoint		>176			Degrees F	1010
Cyanide, Reactive		0.63		0.43	mg/Kg	9014
pH		9.09		0.200	SU	9045C
Percent Moisture		13		0.10	%	PercentMoisture
Percent Solids		87		0.10	%	PercentMoisture
TCLP						
Barium		1.3		0.50	mg/L	6010B
Cadmium		0.12	V	0.0050	mg/L	6010B
Lead		3.9	B	0.050	mg/L	6010B
Mercury		0.68	J B	2.0	ug/L	7470A

METHOD SUMMARY

Client: Deigan & Associates

Job Number: 500-5228-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
TCLP Volatiles	STL CHI	SW846 8260B	
TCLP Zero Headspace Extraction	STL CHI		SW846 1311
Purge and Trap on Leachates	STL CHI		SW846 5030B
TCLP Semivolatiles	STL CHI	SW846 8270C	
Toxicity Characteristic Leaching Procedure	STL CHI		SW846 1311
Separatory Funnel Liquid-Liquid Extraction	STL CHI		SW846 3510C
TCLP Pesticides	STL CHI	SW846 8081A	
Toxicity Characteristic Leaching Procedure	STL CHI		SW846 1311
Separatory Funnel Liquid-Liquid Extraction	STL CHI		SW846 3510C
PCBs	STL CHI	SW846 8082	
Automated Soxhlet Extraction	STL CHI		SW846 3541
TCLP Herbicides	STL CHI	SW846 8151	
Toxicity Characteristic Leaching Procedure	STL CHI		SW846 1311
Chlorinated Herbicides by GC - Aqueous Prep	STL CHI		SW846 8151A
Inductively Coupled Plasma - Atomic Emission Spectrometry	STL CHI	SW846 6010B	
Acid Digestion of Sediments, Sludges, and Soils	STL CHI		SW846 3050B
Toxicity Characteristic Leaching Procedure	STL CHI		SW846 1311
Acid Digestion of Aqueous Samples and Extracts	STL CHI		SW846 3010A
Toxicity Characteristic Leaching Procedure	STL CHI		SW846 1311
Acid Digestion of Aqueous Samples and Extracts	STL CHI		SW846 3010A
TCLP Mercury	STL CHI	SW846 7470A	
Toxicity Characteristic Leaching Procedure	STL CHI		SW846 1311
Mercury in Liquid Waste (Manual Cold Vapor	STL CHI		SW846 7470A
Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)	STL CHI	SW846 7471A	
Mercury in Solid or Semi-Solid Waste (Manual	STL CHI		SW846 7471A
Pensky-Martens Closed-Cup Method for Determining Ignitability	STL CHI	SW846 1010	
Reactive Cyanide	STL CHI	SW846 9014	
Cyanide Distillation	STL CHI		SW846 9010B
Reactive Sulfide	STL CHI	EPA 7.4.4	
Sulfide, Reactive (SW7.3.4)	STL CHI		SW846 7.3.4
pH	STL CHI	SW846 9045C	
Percent Moisture	STL CHI	EPA PercentMoisture	

LAB REFERENCES:

STL CHI = STL Chicago

METHOD SUMMARY

Client: Deigan & Associates

Job Number: 500-5228-1

METHOD REFERENCES:

EPA - US Environmental Protection Agency

SW846 - "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986
And Its Updates.

METHOD / ANALYST SUMMARY

Client: Deigan & Associates

Job Number: 500-5228-1

Method	Analyst	Analyst ID
SW846 8260B	Drabek, Dave J	DJD
SW846 8270C	Bergen, Joe	JB
SW846 8081A	Thompson, Brenda J	BJT
SW846 8082	Standish, Lyndsey M	LMS
SW846 8151	Thompson, Brenda J	BJT
SW846 6010B	Kolarczyk, Paul F	PFK
SW846 6010B	Smith, Todd D	TDS
SW846 7470A	Klee, George O	GOK
SW846 7471A	Ithal, Kyle M	KMI
SW846 7471A	Klee, George O	GOK
SW846 1010	Ficarello, Pete M	PMF
EPA 7.4.4	Brogan, Mary T	MTB
SW846 9014	Brogan, Mary T	MTB
SW846 9045C	Brogan, Mary T	MTB
EPA PercentMoisture	Boyd, Cheryl L	CLB

SAMPLE SUMMARY

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
500-5228-1	LSF-GP-01(0-6)	Solid	07/12/2007 0830	07/12/2007 1600
500-5228-2	LSF-GP-01(4-5)	Solid	07/12/2007 0835	07/12/2007 1600
500-5228-3	LSF-GP-02(0-6)	Solid	07/12/2007 0910	07/12/2007 1600
500-5228-4	LSF-GP-02(4-5)	Solid	07/12/2007 0915	07/12/2007 1600
500-5228-5	LSF-GP-03(0-6)	Solid	07/12/2007 0940	07/12/2007 1600
500-5228-6	LSF-GP-03(4.5-5.5)	Solid	07/12/2007 0950	07/12/2007 1600
500-5228-7	LSF-GP-04(0-6)	Solid	07/12/2007 1010	07/12/2007 1600
500-5228-8	LSF-GP-04(1.5-2)	Solid	07/12/2007 1030	07/12/2007 1600
500-5228-9	LSF-GP-05(0-6)	Solid	07/12/2007 1100	07/12/2007 1600
500-5228-10	LSF-GP-05(1.5-2)	Solid	07/12/2007 1100	07/12/2007 1600
500-5228-11	LSF-GP-06(0-6)	Solid	07/12/2007 1105	07/12/2007 1600
500-5228-12	LSF-GP-06(4-5)	Solid	07/12/2007 1110	07/12/2007 1600
500-5228-13	LSF-GP-07(0-6)	Solid	07/12/2007 1245	07/12/2007 1600
500-5228-14	LSF-GP-07(1.5-2)	Solid	07/12/2007 1245	07/12/2007 1600
500-5228-15	LSF-GP-08(0-6)	Solid	07/12/2007 1320	07/12/2007 1600
500-5228-16	LSF-GP-08(1.5-2)	Solid	07/12/2007 1320	07/12/2007 1600
500-5228-17	LSF-GP-10(0-6)	Solid	07/12/2007 1410	07/12/2007 1600
500-5228-18	LSF-GP-10(2-2.5)	Solid	07/12/2007 1410	07/12/2007 1600
500-5228-19	LSF-GP-11(0-6)	Solid	07/12/2007 1430	07/12/2007 1600
500-5228-20	LSF-GP-11(3-3.5)	Solid	07/12/2007 1430	07/12/2007 1600
500-5228-21	LSF-GP-12(0-6)	Solid	07/12/2007 1445	07/12/2007 1600
500-5228-22	LSF-GP-12(1.5-2)	Solid	07/12/2007 1445	07/12/2007 1600
500-5228-23	LSF-GP-13(0-6)	Solid	07/12/2007 1530	07/12/2007 1600
500-5228-24	LSF-GP-13(2-2.5)	Solid	07/12/2007 1530	07/12/2007 1600
500-5228-25	LSF-GP-09(0-6)	Solid	07/12/2007 1530	07/12/2007 1600
500-5228-26	LSF-GP-09(2.5-3)	Solid	07/12/2007 1540	07/12/2007 1600
500-5228-27	DISPOSAL SAMPLE	Solid	07/12/2007 1300	07/12/2007 1600

SAMPLE RESULTS

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-01(0-6)
Lab Sample ID: 500-5228-1

Date Sampled: 07/12/2007 0830
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 1803		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.24		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0144		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	19		mg/Kg	0.29	1.1	1.0
Barium	100		mg/Kg	0.48	1.1	1.0
Chromium	14		mg/Kg	0.12	1.1	1.0
Lead	260	^ V B	mg/Kg	0.26	0.55	1.0
Selenium	0.77	J	mg/Kg	0.41	1.1	1.0
Silver	2.0		mg/Kg	0.11	0.55	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0226		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	3.9		mg/Kg	0.065	0.22	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1427		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	120		ug/Kg	5.8	18	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	8.7		%	0.10	0.10	1.0

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Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-01(4-5)
Lab Sample ID: 500-5228-2

Date Sampled: 07/12/2007 0835
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 1825		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.011		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0149		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	1.6		mg/Kg	0.26	0.97	1.0
Barium	5.6		mg/Kg	0.43	0.97	1.0
Chromium	3.3		mg/Kg	0.11	0.97	1.0
Lead	14		mg/Kg	0.23	0.48	1.0
Selenium	<0.97		mg/Kg	0.37	0.97	1.0
Silver	<0.48		mg/Kg	0.097	0.48	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0231		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	0.086	J	mg/Kg	0.058	0.19	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1502		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	10	J	ug/Kg	5.5	17	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	3.8		%	0.10	0.10	1.0

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Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-02(0-6)
Lab Sample ID: 500-5228-3

Date Sampled: 07/12/2007 0910
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 1830		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.65		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0214		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	15		mg/Kg	0.28	1.1	1.0
Barium	250		mg/Kg	0.46	1.1	1.0
Chromium	24		mg/Kg	0.12	1.1	1.0
Lead	2100	^ B V	mg/Kg	0.25	0.53	1.0
Selenium	0.70	J	mg/Kg	0.40	1.1	1.0
Silver	12		mg/Kg	0.11	0.53	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0256		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	2.7		mg/Kg	0.063	0.21	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1552		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	3000		ug/Kg	58	180	10
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	8.7		%	0.10	0.10	1.0

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Deigan & Associates
100 S. Genesee St.
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Job Number: 500-5228-1

Client Sample ID: LSF-GP-02(4-5)
Lab Sample ID: 500-5228-4

Date Sampled: 07/12/2007 0915
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 1834		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.018		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0243		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	5.0		mg/Kg	0.30	1.1	1.0
Barium	400		mg/Kg	0.49	1.1	1.0
Chromium	18		mg/Kg	0.12	1.1	1.0
Lead	320	^ B V	mg/Kg	0.27	0.56	1.0
Selenium	<1.1		mg/Kg	0.42	1.1	1.0
Silver	0.29	J	mg/Kg	0.11	0.56	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0300		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	0.70		mg/Kg	0.067	0.22	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1603		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	410		ug/Kg	6.2	20	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	15		%	0.10	0.10	1.0

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Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-03(0-6)
Lab Sample ID: 500-5228-5

Date Sampled: 07/12/2007 0940
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 1901		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.46		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0248		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	14		mg/Kg	0.32	1.2	1.0
Barium	94		mg/Kg	0.52	1.2	1.0
Chromium	17		mg/Kg	0.13	1.2	1.0
Lead	570	^ B V	mg/Kg	0.28	0.59	1.0
Selenium	1.1	J	mg/Kg	0.45	1.2	1.0
Silver	4.9		mg/Kg	0.12	0.59	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0330		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	2.4		mg/Kg	0.071	0.24	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1633		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	820		ug/Kg	32	100	5.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	18		%	0.10	0.10	1.0

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Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-03(4.5-5.5)
Lab Sample ID: 500-5228-6

Date Sampled: 07/12/2007 0950
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 1906		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.0069	J	mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0252		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	4.0		mg/Kg	0.28	1.0	1.0
Barium	14		mg/Kg	0.45	1.0	1.0
Chromium	5.7		mg/Kg	0.11	1.0	1.0
Lead	26	^ B V	mg/Kg	0.25	0.51	1.0
Selenium	<1.0		mg/Kg	0.39	1.0	1.0
Silver	0.16	J	mg/Kg	0.10	0.51	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0334		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	0.17	J	mg/Kg	0.062	0.21	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1608		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	7.2	J	ug/Kg	5.6	18	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	5.9		%	0.10	0.10	1.0

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Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-04(0-6)
Lab Sample ID: 500-5228-7

Date Sampled: 07/12/2007 1010
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/24/2007 0331		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	55		mg/L	0.050	0.075	10
Method: 6010B			Date Analyzed:	07/20/2007 0257		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	7.5		mg/Kg	0.26	0.97	1.0
Barium	320		mg/Kg	0.43	0.97	1.0
Chromium	16		mg/Kg	0.11	0.97	1.0
Lead	1800	^ B V	mg/Kg	0.23	0.49	1.0
Selenium	0.71	J	mg/Kg	0.37	0.97	1.0
Silver	3.4		mg/Kg	0.097	0.49	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0339		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	2.3		mg/Kg	0.058	0.19	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1635		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	570		ug/Kg	29	92	5.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	8.9		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-04(1.5-2)
Lab Sample ID: 500-5228-8

Date Sampled: 07/12/2007 1030
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 1915		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.18		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0301		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	4.3		mg/Kg	0.28	1.0	1.0
Barium	68		mg/Kg	0.46	1.0	1.0
Chromium	13		mg/Kg	0.11	1.0	1.0
Lead	210	^ B V	mg/Kg	0.25	0.52	1.0
Selenium	<1.0		mg/Kg	0.39	1.0	1.0
Silver	0.60		mg/Kg	0.10	0.52	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0343		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	0.68		mg/Kg	0.062	0.21	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1612		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	240		ug/Kg	5.8	18	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	8.3		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-05(0-6)
Lab Sample ID: 500-5228-9

Date Sampled: 07/12/2007 1100
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 1920		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.10		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0306		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Antimony	0.64	J	mg/Kg	0.58	2.2	1.0
Arsenic	5.7		mg/Kg	0.29	1.1	1.0
Barium	71		mg/Kg	0.48	1.1	1.0
Beryllium	1.2	B	mg/Kg	0.016	0.43	1.0
Chromium	14		mg/Kg	0.12	1.1	1.0
Cobalt	6.2		mg/Kg	0.10	0.54	1.0
Lead	230	^ B V	mg/Kg	0.26	0.54	1.0
Nickel	22		mg/Kg	0.46	1.1	1.0
Selenium	0.49	J	mg/Kg	0.41	1.1	1.0
Silver	0.27	J	mg/Kg	0.11	0.54	1.0
Thallium	<1.1		mg/Kg	0.51	1.1	1.0
Tin	35	B	mg/Kg	0.45	2.2	1.0
Vanadium	17		mg/Kg	0.19	0.54	1.0
Zinc	1000	^ B V	mg/Kg	0.27	2.2	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0348		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	0.89		mg/Kg	0.065	0.22	1.0
Method: 6010B			Date Analyzed:	07/26/2007 0221		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Copper	690		mg/Kg	0.15	1.1	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1624		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	130		ug/Kg	5.8	18	1.0
Method: 9045C			Date Analyzed:	07/16/2007 0850		
pH	8.65		SU	0.200	0.200	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	8.0		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-05(1.5-2)
Lab Sample ID: 500-5228-10

Date Sampled: 07/12/2007 1100
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 1924		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.053		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0310		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	5.0		mg/Kg	0.28	1.0	1.0
Barium	79		mg/Kg	0.46	1.0	1.0
Chromium	16		mg/Kg	0.11	1.0	1.0
Lead	320	^ B V	mg/Kg	0.25	0.52	1.0
Selenium	<1.0		mg/Kg	0.40	1.0	1.0
Silver	0.77		mg/Kg	0.10	0.52	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0352		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	0.25		mg/Kg	0.063	0.21	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1429		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	56		ug/Kg	5.9	19	1.0
Method: 9045C			Date Analyzed:	07/16/2007 0850		
pH	8.78		SU	0.200	0.200	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	11		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-06(0-6)
Lab Sample ID: 500-5228-11

Date Sampled: 07/12/2007 1105
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 1929		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	16		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0315		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	15		mg/Kg	0.31	1.2	1.0
Barium	81		mg/Kg	0.51	1.2	1.0
Chromium	16		mg/Kg	0.13	1.2	1.0
Selenium	1.3		mg/Kg	0.44	1.2	1.0
Silver	46		mg/Kg	0.12	0.58	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0752		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Lead	12000	^ B V	mg/Kg	2.8	5.8	10
Method: 6010B			Date Analyzed:	07/21/2007 0357		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	5.0		mg/Kg	0.069	0.23	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1431		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	63		ug/Kg	6.2	19	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	14		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-06(4-5)
Lab Sample ID: 500-5228-12

Date Sampled: 07/12/2007 1110
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 1933		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.15		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0326		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	9.2		mg/Kg	0.31	1.2	1.0
Barium	98		mg/Kg	0.51	1.2	1.0
Chromium	8.7		mg/Kg	0.13	1.2	1.0
Lead	270	^ B V	mg/Kg	0.28	0.58	1.0
Selenium	0.67	J	mg/Kg	0.44	1.2	1.0
Silver	0.49	J	mg/Kg	0.12	0.58	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0401		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	1.2		mg/Kg	0.069	0.23	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1434		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	290		ug/Kg	6.2	19	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	14		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-07(0-6)
Lab Sample ID: 500-5228-13

Date Sampled: 07/12/2007 1245
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 1938		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.56		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0331		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Antimony	1.6	J	mg/Kg	0.53	2.0	1.0
Arsenic	2.9		mg/Kg	0.27	0.99	1.0
Barium	43		mg/Kg	0.43	0.99	1.0
Beryllium	1.5	B	mg/Kg	0.015	0.39	1.0
Chromium	21		mg/Kg	0.11	0.99	1.0
Cobalt	4.1		mg/Kg	0.093	0.49	1.0
Lead	640	^ B V	mg/Kg	0.24	0.49	1.0
Nickel	43		mg/Kg	0.42	0.99	1.0
Selenium	0.51	J	mg/Kg	0.37	0.99	1.0
Silver	0.80		mg/Kg	0.099	0.49	1.0
Thallium	<0.99		mg/Kg	0.46	0.99	1.0
Tin	160	B	mg/Kg	0.41	2.0	1.0
Vanadium	8.8		mg/Kg	0.18	0.49	1.0
Zinc	3900	^ B V	mg/Kg	0.25	2.0	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0406		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	4.9		mg/Kg	0.059	0.20	1.0
Method: 6010B			Date Analyzed:	07/26/2007 0228		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Copper	2400		mg/Kg	0.14	0.99	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1436		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	41		ug/Kg	5.6	18	1.0
Method: 9045C			Date Analyzed:	07/16/2007 0850		
pH	9.44		SU	0.200	0.200	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	4.8		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-07(1.5-2)
Lab Sample ID: 500-5228-14

Date Sampled: 07/12/2007 1245
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 1942		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.037		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0400		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	5.4		mg/Kg	0.30	1.1	1.0
Barium	210		mg/Kg	0.49	1.1	1.0
Chromium	29		mg/Kg	0.12	1.1	1.0
Lead	1100	^ B V	mg/Kg	0.27	0.56	1.0
Selenium	0.58	J	mg/Kg	0.42	1.1	1.0
Silver	1.3		mg/Kg	0.11	0.56	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0410		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	0.12	J	mg/Kg	0.067	0.22	1.0
Method: 7471A			Date Analyzed:	07/20/2007 1429		
Prep Method: 7471A			Date Prepared:	07/20/2007 1000		
Mercury	85		ug/Kg	6.2	19	1.0
Method: 9045C			Date Analyzed:	07/16/2007 0850		
pH	9.93		SU	0.200	0.200	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	14		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-08(0-6)
Lab Sample ID: 500-5228-15

Date Sampled: 07/12/2007 1320
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 2041		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	19		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0405		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Antimony	2.7		mg/Kg	0.57	2.1	1.0
Arsenic	1.8		mg/Kg	0.28	1.1	1.0
Barium	6.8		mg/Kg	0.46	1.1	1.0
Beryllium	0.14	J B	mg/Kg	0.016	0.42	1.0
Chromium	8.3		mg/Kg	0.12	1.1	1.0
Cobalt	1.8		mg/Kg	0.099	0.53	1.0
Lead	750	^ B V	mg/Kg	0.25	0.53	1.0
Nickel	37		mg/Kg	0.45	1.1	1.0
Selenium	0.69	J	mg/Kg	0.40	1.1	1.0
Silver	1.7		mg/Kg	0.11	0.53	1.0
Thallium	<1.1		mg/Kg	0.49	1.1	1.0
Tin	140	B	mg/Kg	0.44	2.1	1.0
Vanadium	1.9		mg/Kg	0.19	0.53	1.0
Zinc	2600	^ B V	mg/Kg	0.26	2.1	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0440		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	2.8		mg/Kg	0.063	0.21	1.0
Method: 6010B			Date Analyzed:	07/26/2007 0234		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Copper	4900		mg/Kg	0.15	1.1	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1451		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	18	J	ug/Kg	5.8	18	1.0
Method: 9045C			Date Analyzed:	07/16/2007 0850		
pH	8.58		SU	0.200	0.200	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	8.5		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-08(1.5-2)
Lab Sample ID: 500-5228-16

Date Sampled: 07/12/2007 1320
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 2046		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	12		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0409		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	3.8		mg/Kg	0.27	0.98	1.0
Barium	78		mg/Kg	0.43	0.98	1.0
Chromium	13		mg/Kg	0.11	0.98	1.0
Lead	1400	^ B V	mg/Kg	0.24	0.49	1.0
Selenium	0.48	J	mg/Kg	0.37	0.98	1.0
Silver	3.3		mg/Kg	0.098	0.49	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0444		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	0.72		mg/Kg	0.059	0.20	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1453		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	19		ug/Kg	5.6	18	1.0
Method: 9045C			Date Analyzed:	07/16/2007 0850		
pH	8.84		SU	0.200	0.200	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	6.0		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-10(0-6)
Lab Sample ID: 500-5228-17

Date Sampled: 07/12/2007 1410
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 2050		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.92		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0414		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	2.8		mg/Kg	0.27	1.0	1.0
Barium	23		mg/Kg	0.44	1.0	1.0
Chromium	9.0		mg/Kg	0.11	1.0	1.0
Lead	540	^ B V	mg/Kg	0.24	0.50	1.0
Selenium	0.38	J	mg/Kg	0.38	1.0	1.0
Silver	0.79		mg/Kg	0.10	0.50	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0449		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	3.0		mg/Kg	0.060	0.20	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1455		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	31		ug/Kg	5.5	17	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	3.3		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-10(2-2.5)
Lab Sample ID: 500-5228-18

Date Sampled: 07/12/2007 1410
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 2055		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	14		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0418		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	1.2		mg/Kg	0.28	1.0	1.0
Barium	7.5		mg/Kg	0.45	1.0	1.0
Chromium	6.5		mg/Kg	0.11	1.0	1.0
Lead	1400	^ B V	mg/Kg	0.25	0.51	1.0
Selenium	<1.0		mg/Kg	0.39	1.0	1.0
Silver	1.9		mg/Kg	0.10	0.51	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0454		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	6.5		mg/Kg	0.062	0.21	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1457		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	<18		ug/Kg	5.6	18	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	5.8		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-11(0-6)
Lab Sample ID: 500-5228-19

Date Sampled: 07/12/2007 1430
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 2059		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	5.3		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0423		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Arsenic	9.9		mg/Kg	0.27	1.0	1.0
Barium	170		mg/Kg	0.44	1.0	1.0
Chromium	25		mg/Kg	0.11	1.0	1.0
Selenium	1.7		mg/Kg	0.38	1.0	1.0
Silver	35		mg/Kg	0.10	0.50	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0756		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Lead	3300	^ B V	mg/Kg	1.2	2.5	5.0
Method: 6010B			Date Analyzed:	07/21/2007 0458		
Prep Method: 3050B			Date Prepared:	07/16/2007 1020		
Cadmium	2.8		mg/Kg	0.061	0.20	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1500		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	33		ug/Kg	5.6	18	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	5.5		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-11(3-3.5)
Lab Sample ID: 500-5228-20

Date Sampled: 07/12/2007 1430
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 2117		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.0075	B	mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0522		
Prep Method: 3050B			Date Prepared:	07/16/2007 1655		
Arsenic	3.3		mg/Kg	0.24	0.91	1.0
Barium	27		mg/Kg	0.40	0.91	1.0
Chromium	7.3		mg/Kg	0.10	0.91	1.0
Lead	92	^ B	mg/Kg	0.22	0.45	1.0
Selenium	0.77	J	mg/Kg	0.34	0.91	1.0
Silver	0.33	J	mg/Kg	0.091	0.45	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0557		
Prep Method: 3050B			Date Prepared:	07/16/2007 1655		
Cadmium	0.85		mg/Kg	0.054	0.18	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1508		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	45		ug/Kg	5.7	18	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1453		
Percent Moisture	7.4		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-12(0-6)
Lab Sample ID: 500-5228-21

Date Sampled: 07/12/2007 1445
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 2202		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.26	B	mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0547		
Prep Method: 3050B			Date Prepared:	07/16/2007 1655		
Arsenic	3.5		mg/Kg	0.27	1.0	1.0
Barium	36		mg/Kg	0.44	1.0	1.0
Chromium	12		mg/Kg	0.11	1.0	1.0
Lead	610	^ B	mg/Kg	0.24	0.50	1.0
Selenium	0.39	J	mg/Kg	0.38	1.0	1.0
Silver	0.88		mg/Kg	0.10	0.50	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0622		
Prep Method: 3050B			Date Prepared:	07/16/2007 1655		
Cadmium	2.7		mg/Kg	0.060	0.20	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1510		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	36		ug/Kg	5.4	17	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1455		
Percent Moisture	2.1		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-12(1.5-2)
Lab Sample ID: 500-5228-22

Date Sampled: 07/12/2007 1445
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 2207		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	0.0064	J B	mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0552		
Prep Method: 3050B			Date Prepared:	07/16/2007 1655		
Arsenic	7.0		mg/Kg	0.29	1.1	1.0
Barium	45		mg/Kg	0.47	1.1	1.0
Chromium	11		mg/Kg	0.12	1.1	1.0
Lead	200	^ B	mg/Kg	0.26	0.54	1.0
Selenium	<1.1		mg/Kg	0.41	1.1	1.0
Silver	0.23	J	mg/Kg	0.11	0.54	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0627		
Prep Method: 3050B			Date Prepared:	07/16/2007 1655		
Cadmium	0.71		mg/Kg	0.064	0.21	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1512		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	48		ug/Kg	5.7	18	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1455		
Percent Moisture	6.8		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-13(0-6)
Lab Sample ID: 500-5228-23

Date Sampled: 07/12/2007 1530
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 2212		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	<0.0075		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0556		
Prep Method: 3050B			Date Prepared:	07/16/2007 1655		
Arsenic	4.8		mg/Kg	0.27	1.0	1.0
Barium	100		mg/Kg	0.44	1.0	1.0
Chromium	16		mg/Kg	0.11	1.0	1.0
Lead	280	^ B	mg/Kg	0.24	0.50	1.0
Selenium	0.82	J	mg/Kg	0.38	1.0	1.0
Silver	0.73		mg/Kg	0.10	0.50	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0631		
Prep Method: 3050B			Date Prepared:	07/16/2007 1655		
Cadmium	0.76		mg/Kg	0.060	0.20	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1514		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	78		ug/Kg	5.6	18	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1455		
Percent Moisture	5.9		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-13(2-2.5)
Lab Sample ID: 500-5228-24

Date Sampled: 07/12/2007 1530
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 2216		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	<0.0075		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0626		
Prep Method: 3050B			Date Prepared:	07/16/2007 1655		
Arsenic	5.6		mg/Kg	0.25	0.93	1.0
Barium	160		mg/Kg	0.41	0.93	1.0
Chromium	26		mg/Kg	0.10	0.93	1.0
Lead	1300	^ B	mg/Kg	0.22	0.47	1.0
Selenium	0.55	J	mg/Kg	0.35	0.93	1.0
Silver	0.60		mg/Kg	0.093	0.47	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0701		
Prep Method: 3050B			Date Prepared:	07/16/2007 1655		
Cadmium	0.36		mg/Kg	0.056	0.19	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1516		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	42		ug/Kg	5.9	19	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1455		
Percent Moisture	11		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-09(0-6)
Lab Sample ID: 500-5228-25

Date Sampled: 07/12/2007 1530
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/20/2007 2221		
Prep Method: 3010A			Date Prepared:	07/19/2007 1520		
Lead	<0.0075		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0630		
Prep Method: 3050B			Date Prepared:	07/16/2007 1655		
Arsenic	10		mg/Kg	0.27	1.0	1.0
Barium	40		mg/Kg	0.45	1.0	1.0
Chromium	10		mg/Kg	0.11	1.0	1.0
Lead	35	^ B	mg/Kg	0.24	0.51	1.0
Selenium	0.59	J	mg/Kg	0.39	1.0	1.0
Silver	0.17	J	mg/Kg	0.10	0.51	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0705		
Prep Method: 3050B			Date Prepared:	07/16/2007 1655		
Cadmium	<0.20		mg/Kg	0.061	0.20	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1519		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	27		ug/Kg	5.6	18	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1455		
Percent Moisture	4.7		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: LSF-GP-09(2.5-3)
Lab Sample ID: 500-5228-26

Date Sampled: 07/12/2007 1540
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/30/2007 1852		
Prep Method: 3010A			Date Prepared:	07/27/2007 1545		
Lead	0.046		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/20/2007 0635		
Prep Method: 3050B			Date Prepared:	07/16/2007 1655		
Arsenic	18		mg/Kg	0.31	1.2	1.0
Barium	120		mg/Kg	0.51	1.2	1.0
Chromium	14		mg/Kg	0.13	1.2	1.0
Lead	190	^ B	mg/Kg	0.28	0.58	1.0
Selenium	1.7		mg/Kg	0.44	1.2	1.0
Silver	5.2		mg/Kg	0.12	0.58	1.0
Method: 6010B			Date Analyzed:	07/21/2007 0710		
Prep Method: 3050B			Date Prepared:	07/16/2007 1655		
Cadmium	7.3		mg/Kg	0.069	0.23	1.0
Method: 7471A			Date Analyzed:	07/16/2007 1550		
Prep Method: 7471A			Date Prepared:	07/16/2007 1200		
Mercury	980		ug/Kg	67	210	10
Method: PercentMoisture			Date Analyzed:	07/15/2007 1455		
Percent Moisture	21		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: DISPOSAL SAMPLE
Lab Sample ID: 500-5228-27

Date Sampled: 07/12/2007 1300
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: TCLP-8260B		Date Analyzed:		07/17/2007 1416	
Prep Method: 5030B		Date Prepared:		07/17/2007 1416	
Benzene	<20	ug/L	20	20	20
Carbon tetrachloride	<20	ug/L	20	20	20
Chlorobenzene	<20	ug/L	20	20	20
Chloroform	<20	ug/L	20	20	20
1,2-Dichloroethane	<20	ug/L	20	20	20
1,1-Dichloroethene	<20	ug/L	20	20	20
2-Butanone (MEK)	<100	ug/L	100	100	20
Tetrachloroethene	<20	ug/L	20	20	20
Trichloroethene	<20	ug/L	20	20	20
Vinyl chloride	<20	ug/L	20	20	20
Surrogate				Acceptance Limits	
1,2-Dichloroethane-d4 (Surr)	111	%		70 - 125	
Toluene-d8 (Surr)	106	%		75 - 120	
4-Bromofluorobenzene (Surr)	104	%		75 - 120	
Dibromofluoromethane	108	%		75 - 120	
Method: TCLP-8270C		Date Analyzed:		07/19/2007 1800	
Prep Method: 3510C		Date Prepared:		07/18/2007 0722	
Cresol, o-	<100	ug/L	100	100	1.0
Cresol, p-	<100	ug/L	100	100	1.0
1,4-Dichlorobenzene	<100	ug/L	100	100	1.0
2,4-Dinitrotoluene	<100	ug/L	100	100	1.0
Hexachlorobenzene	<100	ug/L	100	100	1.0
Hexachloro-1,3-butadiene	<100	ug/L	100	100	1.0
Hexachloroethane	<100	ug/L	100	100	1.0
Nitrobenzene	<100	ug/L	100	100	1.0
Pentachlorophenol	<500	ug/L	500	500	1.0
Pyridine	<200	ug/L	200	200	1.0
2,4,5-Trichlorophenol	<500	ug/L	500	500	1.0
2,4,6-Trichlorophenol	<100	ug/L	100	100	1.0
Surrogate				Acceptance Limits	
2-Fluorophenol	56	%		20 - 110	
Phenol-d5	34	%		10 - 115	
Nitrobenzene-d5	96	%		35 - 120	
2-Fluorobiphenyl	85	%		37 - 123	
2,4,6-Tribromophenol	102	%		30 - 136	
Terphenyl-d14	103	%		31 - 127	

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: DISPOSAL SAMPLE
Lab Sample ID: 500-5228-27

Date Sampled: 07/12/2007 1300
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-8081A			Date Analyzed:		07/22/2007 1031	
Prep Method: 3510C			Date Prepared:		07/18/2007 0729	
Chlordane (technical)	<10		ug/L	10	10	1.0
Endrin	<5.0		ug/L	5.0	5.0	1.0
Heptachlor	<5.0		ug/L	5.0	5.0	1.0
Heptachlor epoxide	<5.0		ug/L	5.0	5.0	1.0
gamma-BHC (Lindane)	<5.0		ug/L	5.0	5.0	1.0
Methoxychlor	<10		ug/L	10	10	1.0
Toxaphene	<50		ug/L	50	50	1.0
Surrogate					Acceptance Limits	
DCB Decachlorobiphenyl	79		%		20 - 120	
Tetrachloro-m-xylene	96		%		31 - 121	
Method: 8082			Date Analyzed:		07/18/2007 2201	
Prep Method: 3541			Date Prepared:		07/16/2007 0917	
PCB-1016	<19		ug/Kg	6.2	19	1.0
PCB-1221	<19		ug/Kg	5.1	19	1.0
PCB-1232	<19		ug/Kg	5.0	19	1.0
PCB-1242	<19		ug/Kg	5.4	19	1.0
PCB-1248	<19		ug/Kg	4.0	19	1.0
PCB-1254	29		ug/Kg	4.1	19	1.0
PCB-1260	<19		ug/Kg	3.7	19	1.0
Surrogate					Acceptance Limits	
Tetrachloro-m-xylene	73		%		39 - 115	
DCB Decachlorobiphenyl	71		%		47 - 116	
Method: TCLP-8151			Date Analyzed:		07/20/2007 1324	
Prep Method: 8151A			Date Prepared:		07/19/2007 0845	
2,4-D	<100		ug/L	100	100	10
Silvex (2,4,5-TP)	<10		ug/L	10	10	10
Surrogate					Acceptance Limits	
DCAA	95		%		42 - 120	
Method: TCLP-6010B			Date Analyzed:		07/19/2007 1140	
Prep Method: 3010A			Date Prepared:		07/17/2007 1500	
Arsenic	<0.050		mg/L	0.010	0.050	1.0
Barium	1.3		mg/L	0.010	0.50	1.0
Cadmium	0.12	V	mg/L	0.0020	0.0050	1.0
Chromium	<0.025		mg/L	0.010	0.025	1.0
Lead	3.9	B	mg/L	0.0050	0.050	1.0
Selenium	<0.050		mg/L	0.010	0.050	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: DISPOSAL SAMPLE
Lab Sample ID: 500-5228-27

Date Sampled: 07/12/2007 1300
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Silver	<0.025		mg/L	0.0050	0.025	1.0
Method: TCLP-7470A			Date Analyzed:	07/18/2007 1358		
Prep Method: 7470A			Date Prepared:	07/18/2007 0945		
Mercury	0.68	J B	ug/L	0.20	2.0	1.0
Method: 7.4.4			Date Analyzed:	07/19/2007 1522		
Prep Method: 7.3.4			Date Prepared:	07/19/2007 1405		
Sulfide, Reactive	<56		mg/Kg	9.9	56	1.0
Method: 9014			Date Analyzed:	07/18/2007 1044		
Prep Method: 9010B			Date Prepared:	07/18/2007 0600		
Cyanide, Reactive	0.63		mg/Kg	0.086	0.43	1.0
Method: 9045C			Date Analyzed:	07/16/2007 0850		
pH	9.09		SU	0.200	0.200	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1455		
Percent Moisture	13		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5228-1

Client Sample ID: DISPOSAL SAMPLE
Lab Sample ID: 500-5228-27

Date Sampled: 07/12/2007 1300
Date Received: 07/12/2007 1600
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	NONE	NONE	Dilution
Method: 1010			Date Analyzed:	07/24/2007 0906	
Flashpoint	>176	Degrees F			1.0

DATA REPORTING QUALIFIERS

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Section	Qualifier	Description
GC/MS Semi VOA		
	X	Surrogate exceeds the control limits
Metals		
	B	Compound was found in the blank and sample.
	F	Duplicate RPD exceeds the control limit
	^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA or MRL standard: Instrument related QC exceeds the control limits.
	F	MS or MSD exceeds the control limits
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	F	RPD of the MS and MSD exceeds the control limits
	V	Serial Dilution exceeds the control limits
General Chemistry		
	F	MS or MSD exceeds the control limits

QUALITY CONTROL RESULTS

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC/MS VOA					
Prep Batch: 500-18611					
500-5228-27	DISPOSAL SAMPLE	P	Solid	1311	
Analysis Batch:500-18664					
LCS 500-18664/4	Lab Control Spike	T	Water	8260B	
MB 500-18664/3	Method Blank	T	Water	8260B	
500-626-B-1 LB1	Leachate Blank 1	T	Water	8260B	
500-5228-27	DISPOSAL SAMPLE	P	Solid	8260B	

Report Basis
P = TCLP
T = Total

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC/MS Semi VOA					
Prep Batch: 500-18610					
LB 500-18610/1-D	TCLP SPLPE Leachate Blank	P	Solid	1311	
LB2 500-18610/2-C	TCLP SPLPW Leachate Blank	P	Solid	1311	
500-5228-27	DISPOSAL SAMPLE	P	Solid	1311	
Prep Batch: 500-18720					
LCS 500-18720/2-A	Lab Control Spike	T	Water	3510C	
MB 500-18720/1-A	Method Blank	T	Water	3510C	
LB 500-18610/1-D	TCLP SPLPE Leachate Blank	P	Solid	3510C	500-18610
LB2 500-18610/2-C	TCLP SPLPW Leachate Blank	P	Solid	3510C	500-18610
500-5228-27	DISPOSAL SAMPLE	P	Solid	3510C	500-18610
Analysis Batch:500-18899					
LB 500-18610/1-D	TCLP SPLPE Leachate Blank	P	Solid	8270C	500-18720
LB2 500-18610/2-C	TCLP SPLPW Leachate Blank	P	Solid	8270C	500-18720
LCS 500-18720/2-A	Lab Control Spike	T	Water	8270C	500-18720
MB 500-18720/1-A	Method Blank	T	Water	8270C	500-18720
500-5228-27	DISPOSAL SAMPLE	P	Solid	8270C	500-18720

Report Basis
P = TCLP
T = Total

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC Semi VOA					
Prep Batch: 500-18562					
LCS 500-18562/2-A	Lab Control Spike	T	Solid	3541	
MB 500-18562/1-A	Method Blank	T	Solid	3541	
500-5228-27	DISPOSAL SAMPLE	T	Solid	3541	
Prep Batch: 500-18610					
LB 500-18610/1-E	TCLP SPLPE Leachate Blank	P	Solid	1311	
LB 500-18610/1-G	TCLP SPLPE Leachate Blank	P	Solid	1311	
LB2 500-18610/2-D	TCLP SPLPW Leachate Blank	P	Solid	1311	
LB2 500-18610/2-F	TCLP SPLPW Leachate Blank	P	Solid	1311	
500-5228-27	DISPOSAL SAMPLE	P	Solid	1311	
Prep Batch: 500-18726					
LCS 500-18726/2-A	Lab Control Spike	T	Water	3510C	
LCS 500-18726/3-A	Lab Control Spike	T	Water	3510C	
MB 500-18726/1-A	Method Blank	T	Water	3510C	
LB 500-18610/1-E	TCLP SPLPE Leachate Blank	P	Solid	3510C	500-18610
LB2 500-18610/2-D	TCLP SPLPW Leachate Blank	P	Solid	3510C	500-18610
500-5228-27	DISPOSAL SAMPLE	P	Solid	3510C	500-18610
Prep Batch: 500-18808					
LCS 500-18808/2-A	Lab Control Spike	T	Water	8151A	
MB 500-18808/1-A	Method Blank	T	Water	8151A	
LB 500-18610/1-G	TCLP SPLPE Leachate Blank	P	Solid	8151A	500-18610
LB2 500-18610/2-F	TCLP SPLPW Leachate Blank	P	Solid	8151A	500-18610
500-5228-27	DISPOSAL SAMPLE	P	Solid	8151A	500-18610
Analysis Batch:500-18868					
LCS 500-18562/2-A	Lab Control Spike	T	Solid	8082	500-18562
MB 500-18562/1-A	Method Blank	T	Solid	8082	500-18562
500-5228-27	DISPOSAL SAMPLE	T	Solid	8082	500-18562
Analysis Batch:500-18977					
LB 500-18610/1-G	TCLP SPLPE Leachate Blank	P	Solid	8151	500-18808
LB2 500-18610/2-F	TCLP SPLPW Leachate Blank	P	Solid	8151	500-18808
LCS 500-18808/2-A	Lab Control Spike	T	Water	8151	500-18808
MB 500-18808/1-A	Method Blank	T	Water	8151	500-18808
500-5228-27	DISPOSAL SAMPLE	P	Solid	8151	500-18808
Analysis Batch:500-19071					
LB 500-18610/1-E	TCLP SPLPE Leachate Blank	P	Solid	8081A	500-18726
LB2 500-18610/2-D	TCLP SPLPW Leachate Blank	P	Solid	8081A	500-18726
LCS 500-18726/2-A	Lab Control Spike	T	Water	8081A	500-18726
LCS 500-18726/3-A	Lab Control Spike	T	Water	8081A	500-18726
MB 500-18726/1-A	Method Blank	T	Water	8081A	500-18726
500-5228-27	DISPOSAL SAMPLE	P	Solid	8081A	500-18726

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch

Report Basis
P = TCLP
T = Total

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 500-18566					
LCS 500-18566/2-A	Lab Control Spike	T	Solid	3050B	
MB 500-18566/1-A	Method Blank	T	Solid	3050B	
500-5228-1	LSF-GP-01(0-6)	T	Solid	3050B	
500-5228-2	LSF-GP-01(4-5)	T	Solid	3050B	
500-5228-2DU	Duplicate	T	Solid	3050B	
500-5228-2MS	Matrix Spike	T	Solid	3050B	
500-5228-2MSD	Matrix Spike Duplicate	T	Solid	3050B	
500-5228-3	LSF-GP-02(0-6)	T	Solid	3050B	
500-5228-4	LSF-GP-02(4-5)	T	Solid	3050B	
500-5228-5	LSF-GP-03(0-6)	T	Solid	3050B	
500-5228-6	LSF-GP-03(4.5-5.5)	T	Solid	3050B	
500-5228-7	LSF-GP-04(0-6)	T	Solid	3050B	
500-5228-8	LSF-GP-04(1.5-2)	T	Solid	3050B	
500-5228-9	LSF-GP-05(0-6)	T	Solid	3050B	
500-5228-10	LSF-GP-05(1.5-2)	T	Solid	3050B	
500-5228-11	LSF-GP-06(0-6)	T	Solid	3050B	
500-5228-12	LSF-GP-06(4-5)	T	Solid	3050B	
500-5228-13	LSF-GP-07(0-6)	T	Solid	3050B	
500-5228-14	LSF-GP-07(1.5-2)	T	Solid	3050B	
500-5228-15	LSF-GP-08(0-6)	T	Solid	3050B	
500-5228-16	LSF-GP-08(1.5-2)	T	Solid	3050B	
500-5228-17	LSF-GP-10(0-6)	T	Solid	3050B	
500-5228-18	LSF-GP-10(2-2.5)	T	Solid	3050B	
500-5228-19	LSF-GP-11(0-6)	T	Solid	3050B	
Prep Batch: 500-18610					
LB2 500-18610/2-B	TCLP SPLPW Leachate Blank	P	Solid	1311	
LB2 500-18610/2-E	TCLP SPLPW Leachate Blank	P	Solid	1311	
500-5228-27	DISPOSAL SAMPLE	P	Solid	1311	
500-5228-27DU	Duplicate	P	Solid	1311	
500-5228-27MS	Matrix Spike	P	Solid	1311	
Prep Batch: 500-18618					
LCS 500-18618/2-A	Lab Control Spike	T	Solid	3050B	
MB 500-18618/1-A	Method Blank	T	Solid	3050B	
500-5228-20	LSF-GP-11(3-3.5)	T	Solid	3050B	
500-5228-20DU	Duplicate	T	Solid	3050B	
500-5228-20MS	Matrix Spike	T	Solid	3050B	
500-5228-20MSD	Matrix Spike Duplicate	T	Solid	3050B	
500-5228-21	LSF-GP-12(0-6)	T	Solid	3050B	
500-5228-22	LSF-GP-12(1.5-2)	T	Solid	3050B	
500-5228-23	LSF-GP-13(0-6)	T	Solid	3050B	
500-5228-24	LSF-GP-13(2-2.5)	T	Solid	3050B	
500-5228-25	LSF-GP-09(0-6)	T	Solid	3050B	
500-5228-26	LSF-GP-09(2.5-3)	T	Solid	3050B	

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:500-18628					
LCS 500-18662/2-A	Lab Control Spike	T	Solid	7471A	500-18662
MB 500-18662/1-A	Method Blank	T	Solid	7471A	500-18662
LCS 500-18663/2-A	Lab Control Spike	T	Solid	7471A	500-18663
MB 500-18663/1-A	Method Blank	T	Solid	7471A	500-18663
500-5228-1	LSF-GP-01(0-6)	T	Solid	7471A	500-18662
500-5228-2	LSF-GP-01(4-5)	T	Solid	7471A	500-18662
500-5228-3	LSF-GP-02(0-6)	T	Solid	7471A	500-18662
500-5228-4	LSF-GP-02(4-5)	T	Solid	7471A	500-18663
500-5228-5	LSF-GP-03(0-6)	T	Solid	7471A	500-18663
500-5228-6	LSF-GP-03(4.5-5.5)	T	Solid	7471A	500-18663
500-5228-7	LSF-GP-04(0-6)	T	Solid	7471A	500-18663
500-5228-8	LSF-GP-04(1.5-2)	T	Solid	7471A	500-18663
500-5228-9	LSF-GP-05(0-6)	T	Solid	7471A	500-18663
500-5228-9DU	Duplicate	T	Solid	7471A	500-18663
500-5228-9MS	Matrix Spike	T	Solid	7471A	500-18663
500-5228-9MSD	Matrix Spike Duplicate	T	Solid	7471A	500-18663
500-5228-10	LSF-GP-05(1.5-2)	T	Solid	7471A	500-18662
500-5228-11	LSF-GP-06(0-6)	T	Solid	7471A	500-18662
500-5228-12	LSF-GP-06(4-5)	T	Solid	7471A	500-18662
500-5228-13	LSF-GP-07(0-6)	T	Solid	7471A	500-18662
500-5228-15	LSF-GP-08(0-6)	T	Solid	7471A	500-18662
500-5228-16	LSF-GP-08(1.5-2)	T	Solid	7471A	500-18662
500-5228-17	LSF-GP-10(0-6)	T	Solid	7471A	500-18662
500-5228-18	LSF-GP-10(2-2.5)	T	Solid	7471A	500-18662
500-5228-19	LSF-GP-11(0-6)	T	Solid	7471A	500-18662
500-5228-20	LSF-GP-11(3-3.5)	T	Solid	7471A	500-18662
500-5228-21	LSF-GP-12(0-6)	T	Solid	7471A	500-18662
500-5228-22	LSF-GP-12(1.5-2)	T	Solid	7471A	500-18662
500-5228-23	LSF-GP-13(0-6)	T	Solid	7471A	500-18662
500-5228-24	LSF-GP-13(2-2.5)	T	Solid	7471A	500-18662
500-5228-25	LSF-GP-09(0-6)	T	Solid	7471A	500-18662
500-5228-26	LSF-GP-09(2.5-3)	T	Solid	7471A	500-18662

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 500-18662					
LCS 500-18662/2-A	Lab Control Spike	T	Solid	7471A	
MB 500-18662/1-A	Method Blank	T	Solid	7471A	
500-5228-1	LSF-GP-01(0-6)	T	Solid	7471A	
500-5228-2	LSF-GP-01(4-5)	T	Solid	7471A	
500-5228-3	LSF-GP-02(0-6)	T	Solid	7471A	
500-5228-10	LSF-GP-05(1.5-2)	T	Solid	7471A	
500-5228-11	LSF-GP-06(0-6)	T	Solid	7471A	
500-5228-12	LSF-GP-06(4-5)	T	Solid	7471A	
500-5228-13	LSF-GP-07(0-6)	T	Solid	7471A	
500-5228-15	LSF-GP-08(0-6)	T	Solid	7471A	
500-5228-16	LSF-GP-08(1.5-2)	T	Solid	7471A	
500-5228-17	LSF-GP-10(0-6)	T	Solid	7471A	
500-5228-18	LSF-GP-10(2-2.5)	T	Solid	7471A	
500-5228-19	LSF-GP-11(0-6)	T	Solid	7471A	
500-5228-20	LSF-GP-11(3-3.5)	T	Solid	7471A	
500-5228-21	LSF-GP-12(0-6)	T	Solid	7471A	
500-5228-22	LSF-GP-12(1.5-2)	T	Solid	7471A	
500-5228-23	LSF-GP-13(0-6)	T	Solid	7471A	
500-5228-24	LSF-GP-13(2-2.5)	T	Solid	7471A	
500-5228-25	LSF-GP-09(0-6)	T	Solid	7471A	
500-5228-26	LSF-GP-09(2.5-3)	T	Solid	7471A	
Prep Batch: 500-18663					
LCS 500-18663/2-A	Lab Control Spike	T	Solid	7471A	
MB 500-18663/1-A	Method Blank	T	Solid	7471A	
500-5228-4	LSF-GP-02(4-5)	T	Solid	7471A	
500-5228-5	LSF-GP-03(0-6)	T	Solid	7471A	
500-5228-6	LSF-GP-03(4.5-5.5)	T	Solid	7471A	
500-5228-7	LSF-GP-04(0-6)	T	Solid	7471A	
500-5228-8	LSF-GP-04(1.5-2)	T	Solid	7471A	
500-5228-9	LSF-GP-05(0-6)	T	Solid	7471A	
500-5228-9DU	Duplicate	T	Solid	7471A	
500-5228-9MS	Matrix Spike	T	Solid	7471A	
500-5228-9MSD	Matrix Spike Duplicate	T	Solid	7471A	
Prep Batch: 500-18704					
LCS 500-18704/3-A	Lab Control Spike	T	Water	3010A	
LB2 500-18610/2-B	TCLP SPLPW Leachate Blank	P	Solid	3010A	500-18610
500-5228-27	DISPOSAL SAMPLE	P	Solid	3010A	500-18610
500-5228-27DU	Duplicate	P	Solid	3010A	500-18610
500-5228-27MS	Matrix Spike	P	Solid	3010A	500-18610

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:500-18773					
LB2 500-18610/2-E	TCLP SPLPW Leachate Blank	P	Solid	7470A	500-18782
LCS 500-18782/2-A	Lab Control Spike	T	Water	7470A	500-18782
MB 500-18782/1-A	Method Blank	T	Water	7470A	500-18782
500-5228-27	DISPOSAL SAMPLE	P	Solid	7470A	500-18782
Prep Batch: 500-18778					
LB 500-18778/1-B	TCLP SPLPE Leachate Blank	P	Solid	1311	
500-5228-1	LSF-GP-01(0-6)	P	Solid	1311	
500-5228-1DU	Duplicate	P	Solid	1311	
500-5228-1MS	Matrix Spike	P	Solid	1311	
500-5228-2	LSF-GP-01(4-5)	P	Solid	1311	
500-5228-3	LSF-GP-02(0-6)	P	Solid	1311	
500-5228-4	LSF-GP-02(4-5)	P	Solid	1311	
500-5228-5	LSF-GP-03(0-6)	P	Solid	1311	
500-5228-6	LSF-GP-03(4.5-5.5)	P	Solid	1311	
500-5228-7	LSF-GP-04(0-6)	P	Solid	1311	
500-5228-8	LSF-GP-04(1.5-2)	P	Solid	1311	
500-5228-9	LSF-GP-05(0-6)	P	Solid	1311	
500-5228-10	LSF-GP-05(1.5-2)	P	Solid	1311	
500-5228-11	LSF-GP-06(0-6)	P	Solid	1311	
500-5228-12	LSF-GP-06(4-5)	P	Solid	1311	
500-5228-13	LSF-GP-07(0-6)	P	Solid	1311	
500-5228-14	LSF-GP-07(1.5-2)	P	Solid	1311	
500-5228-15	LSF-GP-08(0-6)	P	Solid	1311	
500-5228-16	LSF-GP-08(1.5-2)	P	Solid	1311	
500-5228-17	LSF-GP-10(0-6)	P	Solid	1311	
500-5228-18	LSF-GP-10(2-2.5)	P	Solid	1311	
500-5228-19	LSF-GP-11(0-6)	P	Solid	1311	
Prep Batch: 500-18779					
LB 500-18779/1-B	TCLP SPLPE Leachate Blank	P	Solid	1311	
LB 500-18779/1-D	TCLP SPLPE Leachate Blank	P	Solid	1311	
500-5228-20	LSF-GP-11(3-3.5)	P	Solid	1311	
500-5228-20DU	Duplicate	P	Solid	1311	
500-5228-20MS	Matrix Spike	P	Solid	1311	
500-5228-21	LSF-GP-12(0-6)	P	Solid	1311	
500-5228-22	LSF-GP-12(1.5-2)	P	Solid	1311	
500-5228-23	LSF-GP-13(0-6)	P	Solid	1311	
500-5228-24	LSF-GP-13(2-2.5)	P	Solid	1311	
500-5228-25	LSF-GP-09(0-6)	P	Solid	1311	
500-5228-26	LSF-GP-09(2.5-3)	P	Solid	1311	

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 500-18782					
LCS 500-18782/2-A	Lab Control Spike	T	Water	7470A	
MB 500-18782/1-A	Method Blank	T	Water	7470A	
LB2 500-18610/2-E	TCLP SPLPW Leachate Blank	P	Solid	7470A	500-18610
500-5228-27	DISPOSAL SAMPLE	P	Solid	7470A	500-18610
Analysis Batch:500-18857					
LB2 500-18610/2-B	TCLP SPLPW Leachate Blank	P	Solid	6010B	500-18704
LCS 500-18704/3-A	Lab Control Spike	T	Water	6010B	500-18704
500-5228-27	DISPOSAL SAMPLE	P	Solid	6010B	500-18704
500-5228-27DU	Duplicate	P	Solid	6010B	500-18704
500-5228-27MS	Matrix Spike	P	Solid	6010B	500-18704
Prep Batch: 500-18881					
LCS 500-18881/2-A	Lab Control Spike	T	Water	3010A	
LB 500-18778/1-B	TCLP SPLPE Leachate Blank	P	Solid	3010A	500-18778
500-5228-1	LSF-GP-01(0-6)	P	Solid	3010A	500-18778
500-5228-1DU	Duplicate	P	Solid	3010A	500-18778
500-5228-1MS	Matrix Spike	P	Solid	3010A	500-18778
500-5228-2	LSF-GP-01(4-5)	P	Solid	3010A	500-18778
500-5228-3	LSF-GP-02(0-6)	P	Solid	3010A	500-18778
500-5228-4	LSF-GP-02(4-5)	P	Solid	3010A	500-18778
500-5228-5	LSF-GP-03(0-6)	P	Solid	3010A	500-18778
500-5228-6	LSF-GP-03(4.5-5.5)	P	Solid	3010A	500-18778
500-5228-7	LSF-GP-04(0-6)	P	Solid	3010A	500-18778
500-5228-8	LSF-GP-04(1.5-2)	P	Solid	3010A	500-18778
500-5228-9	LSF-GP-05(0-6)	P	Solid	3010A	500-18778
500-5228-10	LSF-GP-05(1.5-2)	P	Solid	3010A	500-18778
500-5228-11	LSF-GP-06(0-6)	P	Solid	3010A	500-18778
500-5228-12	LSF-GP-06(4-5)	P	Solid	3010A	500-18778
500-5228-13	LSF-GP-07(0-6)	P	Solid	3010A	500-18778
500-5228-14	LSF-GP-07(1.5-2)	P	Solid	3010A	500-18778
500-5228-15	LSF-GP-08(0-6)	P	Solid	3010A	500-18778
500-5228-16	LSF-GP-08(1.5-2)	P	Solid	3010A	500-18778
500-5228-17	LSF-GP-10(0-6)	P	Solid	3010A	500-18778
500-5228-18	LSF-GP-10(2-2.5)	P	Solid	3010A	500-18778
500-5228-19	LSF-GP-11(0-6)	P	Solid	3010A	500-18778

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 500-18882					
LCS 500-18882/2-A	Lab Control Spike	T	Water	3010A	
LB 500-18779/1-B	TCLP SPLPE Leachate Blank	P	Solid	3010A	500-18779
500-5228-20	LSF-GP-11(3-3.5)	P	Solid	3010A	500-18779
500-5228-20DU	Duplicate	P	Solid	3010A	500-18779
500-5228-20MS	Matrix Spike	P	Solid	3010A	500-18779
500-5228-21	LSF-GP-12(0-6)	P	Solid	3010A	500-18779
500-5228-22	LSF-GP-12(1.5-2)	P	Solid	3010A	500-18779
500-5228-23	LSF-GP-13(0-6)	P	Solid	3010A	500-18779
500-5228-24	LSF-GP-13(2-2.5)	P	Solid	3010A	500-18779
500-5228-25	LSF-GP-09(0-6)	P	Solid	3010A	500-18779

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:500-18941					
LCS 500-18566/2-A	Lab Control Spike	T	Solid	6010B	500-18566
MB 500-18566/1-A	Method Blank	T	Solid	6010B	500-18566
LCS 500-18618/2-A	Lab Control Spike	T	Solid	6010B	500-18618
MB 500-18618/1-A	Method Blank	T	Solid	6010B	500-18618
500-5228-1	LSF-GP-01(0-6)	T	Solid	6010B	500-18566
500-5228-2	LSF-GP-01(4-5)	T	Solid	6010B	500-18566
500-5228-2DU	Duplicate	T	Solid	6010B	500-18566
500-5228-2MS	Matrix Spike	T	Solid	6010B	500-18566
500-5228-2MSD	Matrix Spike Duplicate	T	Solid	6010B	500-18566
500-5228-3	LSF-GP-02(0-6)	T	Solid	6010B	500-18566
500-5228-4	LSF-GP-02(4-5)	T	Solid	6010B	500-18566
500-5228-5	LSF-GP-03(0-6)	T	Solid	6010B	500-18566
500-5228-6	LSF-GP-03(4.5-5.5)	T	Solid	6010B	500-18566
500-5228-7	LSF-GP-04(0-6)	T	Solid	6010B	500-18566
500-5228-8	LSF-GP-04(1.5-2)	T	Solid	6010B	500-18566
500-5228-9	LSF-GP-05(0-6)	T	Solid	6010B	500-18566
500-5228-10	LSF-GP-05(1.5-2)	T	Solid	6010B	500-18566
500-5228-11	LSF-GP-06(0-6)	T	Solid	6010B	500-18566
500-5228-12	LSF-GP-06(4-5)	T	Solid	6010B	500-18566
500-5228-13	LSF-GP-07(0-6)	T	Solid	6010B	500-18566
500-5228-14	LSF-GP-07(1.5-2)	T	Solid	6010B	500-18566
500-5228-15	LSF-GP-08(0-6)	T	Solid	6010B	500-18566
500-5228-16	LSF-GP-08(1.5-2)	T	Solid	6010B	500-18566
500-5228-17	LSF-GP-10(0-6)	T	Solid	6010B	500-18566
500-5228-18	LSF-GP-10(2-2.5)	T	Solid	6010B	500-18566
500-5228-19	LSF-GP-11(0-6)	T	Solid	6010B	500-18566
500-5228-20	LSF-GP-11(3-3.5)	T	Solid	6010B	500-18618
500-5228-20DU	Duplicate	T	Solid	6010B	500-18618
500-5228-20MS	Matrix Spike	T	Solid	6010B	500-18618
500-5228-20MSD	Matrix Spike Duplicate	T	Solid	6010B	500-18618
500-5228-21	LSF-GP-12(0-6)	T	Solid	6010B	500-18618
500-5228-22	LSF-GP-12(1.5-2)	T	Solid	6010B	500-18618
500-5228-23	LSF-GP-13(0-6)	T	Solid	6010B	500-18618
500-5228-24	LSF-GP-13(2-2.5)	T	Solid	6010B	500-18618
500-5228-25	LSF-GP-09(0-6)	T	Solid	6010B	500-18618
500-5228-26	LSF-GP-09(2.5-3)	T	Solid	6010B	500-18618

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:500-18989					
LB 500-18778/1-B	TCLP SPLPE Leachate Blank	P	Solid	6010B	500-18881
LCS 500-18881/2-A	Lab Control Spike	T	Water	6010B	500-18881
LB 500-18779/1-B	TCLP SPLPE Leachate Blank	P	Solid	6010B	500-18882
LCS 500-18882/2-A	Lab Control Spike	T	Water	6010B	500-18882
500-5228-1	LSF-GP-01(0-6)	P	Solid	6010B	500-18881
500-5228-1DU	Duplicate	P	Solid	6010B	500-18881
500-5228-1MS	Matrix Spike	P	Solid	6010B	500-18881
500-5228-2	LSF-GP-01(4-5)	P	Solid	6010B	500-18881
500-5228-3	LSF-GP-02(0-6)	P	Solid	6010B	500-18881
500-5228-4	LSF-GP-02(4-5)	P	Solid	6010B	500-18881
500-5228-5	LSF-GP-03(0-6)	P	Solid	6010B	500-18881
500-5228-6	LSF-GP-03(4.5-5.5)	P	Solid	6010B	500-18881
500-5228-8	LSF-GP-04(1.5-2)	P	Solid	6010B	500-18881
500-5228-9	LSF-GP-05(0-6)	P	Solid	6010B	500-18881
500-5228-10	LSF-GP-05(1.5-2)	P	Solid	6010B	500-18881
500-5228-11	LSF-GP-06(0-6)	P	Solid	6010B	500-18881
500-5228-12	LSF-GP-06(4-5)	P	Solid	6010B	500-18881
500-5228-13	LSF-GP-07(0-6)	P	Solid	6010B	500-18881
500-5228-14	LSF-GP-07(1.5-2)	P	Solid	6010B	500-18881
500-5228-15	LSF-GP-08(0-6)	P	Solid	6010B	500-18881
500-5228-16	LSF-GP-08(1.5-2)	P	Solid	6010B	500-18881
500-5228-17	LSF-GP-10(0-6)	P	Solid	6010B	500-18881
500-5228-18	LSF-GP-10(2-2.5)	P	Solid	6010B	500-18881
500-5228-19	LSF-GP-11(0-6)	P	Solid	6010B	500-18881
500-5228-20	LSF-GP-11(3-3.5)	P	Solid	6010B	500-18882
500-5228-20DU	Duplicate	P	Solid	6010B	500-18882
500-5228-20MS	Matrix Spike	P	Solid	6010B	500-18882
500-5228-21	LSF-GP-12(0-6)	P	Solid	6010B	500-18882
500-5228-22	LSF-GP-12(1.5-2)	P	Solid	6010B	500-18882
500-5228-23	LSF-GP-13(0-6)	P	Solid	6010B	500-18882
500-5228-24	LSF-GP-13(2-2.5)	P	Solid	6010B	500-18882
500-5228-25	LSF-GP-09(0-6)	P	Solid	6010B	500-18882

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:500-18990					
LCS 500-18566/2-A	Lab Control Spike	T	Solid	6010B	500-18566
MB 500-18566/1-A	Method Blank	T	Solid	6010B	500-18566
LCS 500-18618/2-A	Lab Control Spike	T	Solid	6010B	500-18618
MB 500-18618/1-A	Method Blank	T	Solid	6010B	500-18618
500-5228-1	LSF-GP-01(0-6)	T	Solid	6010B	500-18566
500-5228-2	LSF-GP-01(4-5)	T	Solid	6010B	500-18566
500-5228-2DU	Duplicate	T	Solid	6010B	500-18566
500-5228-2MS	Matrix Spike	T	Solid	6010B	500-18566
500-5228-2MSD	Matrix Spike Duplicate	T	Solid	6010B	500-18566
500-5228-3	LSF-GP-02(0-6)	T	Solid	6010B	500-18566
500-5228-4	LSF-GP-02(4-5)	T	Solid	6010B	500-18566
500-5228-5	LSF-GP-03(0-6)	T	Solid	6010B	500-18566
500-5228-6	LSF-GP-03(4.5-5.5)	T	Solid	6010B	500-18566
500-5228-7	LSF-GP-04(0-6)	T	Solid	6010B	500-18566
500-5228-8	LSF-GP-04(1.5-2)	T	Solid	6010B	500-18566
500-5228-9	LSF-GP-05(0-6)	T	Solid	6010B	500-18566
500-5228-10	LSF-GP-05(1.5-2)	T	Solid	6010B	500-18566
500-5228-11	LSF-GP-06(0-6)	T	Solid	6010B	500-18566
500-5228-12	LSF-GP-06(4-5)	T	Solid	6010B	500-18566
500-5228-13	LSF-GP-07(0-6)	T	Solid	6010B	500-18566
500-5228-14	LSF-GP-07(1.5-2)	T	Solid	6010B	500-18566
500-5228-15	LSF-GP-08(0-6)	T	Solid	6010B	500-18566
500-5228-16	LSF-GP-08(1.5-2)	T	Solid	6010B	500-18566
500-5228-17	LSF-GP-10(0-6)	T	Solid	6010B	500-18566
500-5228-18	LSF-GP-10(2-2.5)	T	Solid	6010B	500-18566
500-5228-19	LSF-GP-11(0-6)	T	Solid	6010B	500-18566
500-5228-20	LSF-GP-11(3-3.5)	T	Solid	6010B	500-18618
500-5228-20DU	Duplicate	T	Solid	6010B	500-18618
500-5228-20MS	Matrix Spike	T	Solid	6010B	500-18618
500-5228-20MSD	Matrix Spike Duplicate	T	Solid	6010B	500-18618
500-5228-21	LSF-GP-12(0-6)	T	Solid	6010B	500-18618
500-5228-22	LSF-GP-12(1.5-2)	T	Solid	6010B	500-18618
500-5228-23	LSF-GP-13(0-6)	T	Solid	6010B	500-18618
500-5228-24	LSF-GP-13(2-2.5)	T	Solid	6010B	500-18618
500-5228-25	LSF-GP-09(0-6)	T	Solid	6010B	500-18618
500-5228-26	LSF-GP-09(2.5-3)	T	Solid	6010B	500-18618
Prep Batch: 500-19060					
LCS 500-19060/2-A	Lab Control Spike	T	Solid	7471A	
MB 500-19060/1-A	Method Blank	T	Solid	7471A	
500-5228-14	LSF-GP-07(1.5-2)	T	Solid	7471A	

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:500-19065					
LCS 500-19060/2-A	Lab Control Spike	T	Solid	7471A	500-19060
MB 500-19060/1-A	Method Blank	T	Solid	7471A	500-19060
500-5228-14	LSF-GP-07(1.5-2)	T	Solid	7471A	500-19060
Analysis Batch:500-19102					
MRL 500-19102/27	Method Reporting Limit Check	T	Water	6010B	
500-5228-7	LSF-GP-04(0-6)	P	Solid	6010B	500-18881
Analysis Batch:500-19226					
LCS 500-18566/2-A	Lab Control Spike	T	Solid	6010B	500-18566
MB 500-18566/1-A	Method Blank	T	Solid	6010B	500-18566
500-5228-9	LSF-GP-05(0-6)	T	Solid	6010B	500-18566
500-5228-13	LSF-GP-07(0-6)	T	Solid	6010B	500-18566
500-5228-15	LSF-GP-08(0-6)	T	Solid	6010B	500-18566
Prep Batch: 500-19451					
LCS 500-19451/4-A	Lab Control Spike	T	Water	3010A	
LB 500-18779/1-D	TCLP SPLPE Leachate Blank	P	Solid	3010A	500-18779
500-5228-26	LSF-GP-09(2.5-3)	P	Solid	3010A	500-18779
Analysis Batch:500-19572					
LB 500-18779/1-D	TCLP SPLPE Leachate Blank	P	Solid	6010B	500-19451
LCS 500-19451/4-A	Lab Control Spike	T	Water	6010B	500-19451
500-5228-26	LSF-GP-09(2.5-3)	P	Solid	6010B	500-19451

Report Basis
P = TCLP
T = Total

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:500-18547					
500-5228-1	LSF-GP-01(0-6)	T	Solid	PercentMoisture	
500-5228-1DU	Duplicate	T	Solid	PercentMoisture	
500-5228-2	LSF-GP-01(4-5)	T	Solid	PercentMoisture	
500-5228-3	LSF-GP-02(0-6)	T	Solid	PercentMoisture	
500-5228-4	LSF-GP-02(4-5)	T	Solid	PercentMoisture	
500-5228-5	LSF-GP-03(0-6)	T	Solid	PercentMoisture	
500-5228-6	LSF-GP-03(4.5-5.5)	T	Solid	PercentMoisture	
500-5228-7	LSF-GP-04(0-6)	T	Solid	PercentMoisture	
500-5228-8	LSF-GP-04(1.5-2)	T	Solid	PercentMoisture	
500-5228-9	LSF-GP-05(0-6)	T	Solid	PercentMoisture	
500-5228-10	LSF-GP-05(1.5-2)	T	Solid	PercentMoisture	
500-5228-11	LSF-GP-06(0-6)	T	Solid	PercentMoisture	
500-5228-12	LSF-GP-06(4-5)	T	Solid	PercentMoisture	
500-5228-13	LSF-GP-07(0-6)	T	Solid	PercentMoisture	
500-5228-14	LSF-GP-07(1.5-2)	T	Solid	PercentMoisture	
500-5228-15	LSF-GP-08(0-6)	T	Solid	PercentMoisture	
500-5228-16	LSF-GP-08(1.5-2)	T	Solid	PercentMoisture	
500-5228-17	LSF-GP-10(0-6)	T	Solid	PercentMoisture	
500-5228-18	LSF-GP-10(2-2.5)	T	Solid	PercentMoisture	
500-5228-19	LSF-GP-11(0-6)	T	Solid	PercentMoisture	
500-5228-20	LSF-GP-11(3-3.5)	T	Solid	PercentMoisture	
Analysis Batch:500-18548					
500-5228-21	LSF-GP-12(0-6)	T	Solid	PercentMoisture	
500-5228-21DU	Duplicate		Solid	PercentMoisture	
500-5228-22	LSF-GP-12(1.5-2)	T	Solid	PercentMoisture	
500-5228-23	LSF-GP-13(0-6)	T	Solid	PercentMoisture	
500-5228-24	LSF-GP-13(2-2.5)	T	Solid	PercentMoisture	
500-5228-25	LSF-GP-09(0-6)	T	Solid	PercentMoisture	
500-5228-26	LSF-GP-09(2.5-3)	T	Solid	PercentMoisture	
500-5228-27	DISPOSAL SAMPLE	T	Solid	PercentMoisture	
Analysis Batch:500-18602					
500-5228-9	LSF-GP-05(0-6)	T	Solid	9045C	
500-5228-9DU	Duplicate		Solid	9045C	
500-5228-10	LSF-GP-05(1.5-2)	T	Solid	9045C	
500-5228-13	LSF-GP-07(0-6)	T	Solid	9045C	
500-5228-14	LSF-GP-07(1.5-2)	T	Solid	9045C	
500-5228-15	LSF-GP-08(0-6)	T	Solid	9045C	
500-5228-16	LSF-GP-08(1.5-2)	T	Solid	9045C	
500-5228-27	DISPOSAL SAMPLE	T	Solid	9045C	

Client: Deigan & Associates

Job Number: 500-5228-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Prep Batch: 500-18748					
LCS 500-18748/2-A	Lab Control Spike	T	Solid	9010B	
MB 500-18748/1-A	Method Blank	T	Solid	9010B	
500-5228-27	DISPOSAL SAMPLE	T	Solid	9010B	
Analysis Batch:500-18751					
LCS 500-18748/2-A	Lab Control Spike	T	Solid	9014	500-18748
MB 500-18748/1-A	Method Blank	T	Solid	9014	500-18748
500-5228-27	DISPOSAL SAMPLE	T	Solid	9014	500-18748
Prep Batch: 500-18873					
LCS 500-18873/2-A	Lab Control Spike	T	Solid	7.3.4	
MB 500-18873/1-A	Method Blank	T	Solid	7.3.4	
500-5228-27	DISPOSAL SAMPLE	T	Solid	7.3.4	
500-5228-27MS	Matrix Spike	T	Solid	7.3.4	
500-5228-27MSD	Matrix Spike Duplicate	T	Solid	7.3.4	
Analysis Batch:500-18874					
LCS 500-18873/2-A	Lab Control Spike	T	Solid	7.4.4	500-18873
MB 500-18873/1-A	Method Blank	T	Solid	7.4.4	500-18873
500-5228-27	DISPOSAL SAMPLE	T	Solid	7.4.4	500-18873
500-5228-27MS	Matrix Spike	T	Solid	7.4.4	500-18873
500-5228-27MSD	Matrix Spike Duplicate	T	Solid	7.4.4	500-18873
Analysis Batch:500-19170					
500-5228-27	DISPOSAL SAMPLE	T	Solid	1010	

Report Basis
= Total/NA
T = Total

Client: Deigan & Associates

Job Number: 500-5228-1

Surrogate Recovery Report

8260B TCLP Volatiles

Client Matrix: Solid TCLP

Lab Sample ID	Client Sample ID	(BFB) (%Rec)	(DCE) (%Rec)	(DFM) (%Rec)	(TOL) (%Rec)
500-5228-27	DISPOSAL SAMPLE	104	111	108	106

Surrogate		Acceptance Limits
(BFB)	4-Bromofluorobenzene (Surr)	75 - 120
(DCE)	1,2-Dichloroethane-d4 (Surr)	70 - 125
(DFM)	Dibromofluoromethane	75 - 120
(TOL)	Toluene-d8 (Surr)	75 - 120

Client: Deigan & Associates

Job Number: 500-5228-1

Surrogate Recovery Report

8260B TCLP Volatiles

Client Matrix: Water

Lab Sample ID	Client Sample ID	(BFB) (%Rec)	(DCE) (%Rec)	(DFM) (%Rec)	(TOL) (%Rec)
500-626-B-1 LB1		107	113	111	107
LCS 500-18664/4		105	111	107	106
MB 500-18664/3		110	113	109	105

Surrogate		Acceptance Limits
(BFB)	4-Bromofluorobenzene (Surr)	75 - 120
(DCE)	1,2-Dichloroethane-d4 (Surr)	70 - 125
(DFM)	Dibromofluoromethane	75 - 120
(TOL)	Toluene-d8 (Surr)	75 - 120

Client: Deigan & Associates

Job Number: 500-5228-1

Surrogate Recovery Report

8270C TCLP Semivolatiles

Client Matrix: Solid TCLP

Lab Sample ID	Client Sample ID	(2FP) (%Rec)	(FBP) (%Rec)	(NBZ) (%Rec)	(PHL) (%Rec)	(TBP) (%Rec)	(TPH) (%Rec)
500-5228-27	DISPOSAL SAMPLE	56	85	96	34	102	103
LB 500-18610/1-D		46	67	77	32	87	72
LB2 500-18610/2-C		19 X	82	96	13	44	96

Surrogate		Acceptance Limits
(2FP)	2-Fluorophenol	20 - 110
(FBP)	2-Fluorobiphenyl	37 - 123
(NBZ)	Nitrobenzene-d5	35 - 120
(PHL)	Phenol-d5	10 - 115
(TBP)	2,4,6-Tribromophenol	30 - 136
(TPH)	Terphenyl-d14	31 - 127

Client: Deigan & Associates

Job Number: 500-5228-1

Surrogate Recovery Report

8270C TCLP Semivolatiles

Client Matrix: Water

Lab Sample ID	Client Sample ID	(2FP) (%Rec)	(FBP) (%Rec)	(NBZ) (%Rec)	(PHL) (%Rec)	(TBP) (%Rec)	(TPH) (%Rec)
LCS 500-18720/2-A		54	82	97	34	121	97
MB 500-18720/1-A		56	84	97	36	106	97

Surrogate		Acceptance Limits
(2FP)	2-Fluorophenol	20 - 110
(FBP)	2-Fluorobiphenyl	37 - 123
(NBZ)	Nitrobenzene-d5	35 - 120
(PHL)	Phenol-d5	10 - 115
(TBP)	2,4,6-Tribromophenol	30 - 136
(TPH)	Terphenyl-d14	31 - 127

Client: Deigan & Associates

Job Number: 500-5228-1

Surrogate Recovery Report

8081A TCLP Pesticides

Client Matrix: Solid TCLP

Lab Sample ID	Client Sample ID	(DCB1) (%Rec)	(TCX1) (%Rec)
500-5228-27	DISPOSAL SAMPLE	79	96
LB 500-18610/1-E		68	88
LB2 500-18610/2-D		66	90

Surrogate		Acceptance Limits
(DCB1)	DCB Decachlorobiphenyl	20 - 120
(TCX1)	Tetrachloro-m-xylene	31 - 121

Client: Deigan & Associates

Job Number: 500-5228-1

Surrogate Recovery Report

8081A TCLP Pesticides

Client Matrix: Water

Lab Sample ID	Client Sample ID	(DCB1) (%Rec)	(TCX1) (%Rec)
LCS 500-18726/2-A		46	85
LCS 500-18726/3-A		42	86
MB 500-18726/1-A		54	88

Surrogate		Acceptance Limits
(DCB1)	DCB Decachlorobiphenyl	20 - 120
(TCX1)	Tetrachloro-m-xylene	31 - 121

Client: Deigan & Associates

Job Number: 500-5228-1

Surrogate Recovery Report

8082 PCBs

Client Matrix: Solid

Lab Sample ID	Client Sample ID	(DCB1) (%Rec)	(TCX1) (%Rec)
500-5228-27	DISPOSAL SAMPLE	71	73
LCS 500-18562/2-A		91	67
MB 500-18562/1-A		90	64

Surrogate		Acceptance Limits
(DCB1)	DCB Decachlorobiphenyl	47 - 116
(TCX1)	Tetrachloro-m-xylene	39 - 115

Client: Deigan & Associates

Job Number: 500-5228-1

Surrogate Recovery Report

8151 TCLP Herbicides

Client Matrix: Solid TCLP

Lab Sample ID	Client Sample ID	(DCPA) (%Rec)
500-5228-27	DISPOSAL SAMPLE	95
LB 500-18610/1-G		52
LB2 500-18610/2-F		112

Surrogate		Acceptance Limits
(DCPA)	DCAA	42 - 120

Client: Deigan & Associates

Job Number: 500-5228-1

Surrogate Recovery Report

8151 TCLP Herbicides

Client Matrix: Water

Lab Sample ID	Client Sample ID	(DCPA) (%Rec)
LCS 500-18808/2-A		91
MB 500-18808/1-A		95

Surrogate		Acceptance Limits
(DCPA)	DCAA	42 - 120

Client: Deigan & Associates

Job Number: 500-5228-1

Method Blank - Batch: 500-18664

Method: 8260B
Preparation: 5030B

Lab Sample ID: MB 500-18664/3
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/17/2007 0921
Date Prepared: 07/17/2007 0921

Analysis Batch: 500-18664
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 6890N GC - 5973N
Lab File ID: 2M0717A.D
Initial Weight/Volume: 10 mL
Final Weight/Volume: 10 mL

Analyte	Result	Qual	MDL	RL
Benzene	<1.0		1.0	1.0
Carbon tetrachloride	<1.0		1.0	1.0
Chlorobenzene	<1.0		1.0	1.0
Chloroform	<1.0		1.0	1.0
1,2-Dichloroethane	<1.0		1.0	1.0
1,1-Dichloroethene	<1.0		1.0	1.0
2-Butanone (MEK)	<5.0		5.0	5.0
Tetrachloroethene	<1.0		1.0	1.0
Trichloroethene	<1.0		1.0	1.0
Vinyl chloride	<1.0		1.0	1.0

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	113	70 - 125
Toluene-d8 (Surr)	105	75 - 120
4-Bromofluorobenzene (Surr)	110	75 - 120
Dibromofluoromethane	109	75 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Leachate Blank 1 - Batch: 500-18664

Method: 8260B
Preparation: 5030B

Lab Sample ID: 500-626-B-1 LB1
Client Matrix: Water
Dilution: 20
Date Analyzed: 07/17/2007 1308
Date Prepared: 07/17/2007 1308

Analysis Batch: 500-18664
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 6890N GC - 5973N
Lab File ID: 2x0717A.D
Initial Weight/Volume: 10 mL
Final Weight/Volume: 10 mL

Analyte	Result	Qual	MDL	RL
Benzene	<20		20	20
Carbon tetrachloride	<20		20	20
Chlorobenzene	<20		20	20
Chloroform	<20		20	20
1,2-Dichloroethane	<20		20	20
1,1-Dichloroethene	<20		20	20
2-Butanone (MEK)	<100		100	100
Tetrachloroethene	<20		20	20
Trichloroethene	<20		20	20
Vinyl chloride	<20		20	20

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	113	70 - 125
Toluene-d8 (Surr)	107	75 - 120
4-Bromofluorobenzene (Surr)	107	75 - 120
Dibromofluoromethane	111	75 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Control Spike - Batch: 500-18664

Method: 8260B
Preparation: 5030B

Lab Sample ID: LCS 500-18664/4
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/17/2007 0944
Date Prepared: 07/17/2007 0944

Analysis Batch: 500-18664
Prep Batch: N/A
Units: ug/L

Instrument ID: Agilent 6890N GC - 5973N
Lab File ID: 2S0717.D
Initial Weight/Volume: 10 mL
Final Weight/Volume: 10 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Benzene	25.0	21.4	85	68 - 120	
Carbon tetrachloride	25.0	21.3	85	67 - 121	
Chlorobenzene	25.0	21.6	86	75 - 120	
Chloroform	25.0	21.1	84	65 - 127	
1,2-Dichloroethane	25.0	21.4	86	68 - 120	
1,1-Dichloroethene	25.0	19.7	79	50 - 121	
2-Butanone (MEK)	25.0	26.0	104	36 - 157	
Tetrachloroethene	25.0	21.8	87	65 - 120	
Trichloroethene	25.0	21.6	86	73 - 120	
Vinyl chloride	25.0	20.7	83	57 - 135	

Surrogate	% Rec	Acceptance Limits
1,2-Dichloroethane-d4 (Surr)	111	70 - 125
Toluene-d8 (Surr)	106	75 - 120
4-Bromofluorobenzene (Surr)	105	75 - 120
Dibromofluoromethane	107	75 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Method Blank - Batch: 500-18720

Method: 8270C
Preparation: 3510C

Lab Sample ID: MB 500-18720/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/19/2007 1320
Date Prepared: 07/18/2007 0722

Analysis Batch: 500-18899
Prep Batch: 500-18720
Units: ug/L

Instrument ID: Agilent 6890N GC - 5973N
Lab File ID: 18720M.D
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Cresol, o-	<10		10	10
Cresol, p-	<10		10	10
1,4-Dichlorobenzene	<10		10	10
2,4-Dinitrotoluene	<10		10	10
Hexachlorobenzene	<10		10	10
Hexachloro-1,3-butadiene	<10		10	10
Hexachloroethane	<10		10	10
Nitrobenzene	<10		10	10
Pentachlorophenol	<50		50	50
Pyridine	<20		20	20
2,4,5-Trichlorophenol	<50		50	50
2,4,6-Trichlorophenol	<10		10	10

Surrogate	% Rec	Acceptance Limits
2-Fluorophenol	56	20 - 110
Phenol-d5	36	10 - 115
Nitrobenzene-d5	97	35 - 120
2-Fluorobiphenyl	84	37 - 123
2,4,6-Tribromophenol	106	30 - 136
Terphenyl-d14	97	31 - 127

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

TCLP SPLPE Leachate Blank - Batch: 500-18720

Method: 8270C
Preparation: 3510C
TCLP

Lab Sample ID: LB 500-18610/1-D
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/19/2007 1454
Date Prepared: 07/18/2007 0722
Date Leached: 07/16/2007 1521

Analysis Batch: 500-18899
Prep Batch: 500-18720
Units: ug/L
Leachate Batch: 500-18610

Instrument ID: Agilent 6890N GC - 5973N
Lab File ID: 18610LB.D
Initial Weight/Volume: 100 mL
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Cresol, o-	<100		100	100
Cresol, p-	<100		100	100
1,4-Dichlorobenzene	<100		100	100
2,4-Dinitrotoluene	<100		100	100
Hexachlorobenzene	<100		100	100
Hexachloro-1,3-butadiene	<100		100	100
Hexachloroethane	<100		100	100
Nitrobenzene	<100		100	100
Pentachlorophenol	<500		500	500
Pyridine	<200		200	200
2,4,5-Trichlorophenol	<500		500	500
2,4,6-Trichlorophenol	<100		100	100

Surrogate	% Rec	Acceptance Limits
2-Fluorophenol	46	20 - 110
Phenol-d5	32	10 - 115
Nitrobenzene-d5	77	35 - 120
2-Fluorobiphenyl	67	37 - 123
2,4,6-Tribromophenol	87	30 - 136
Terphenyl-d14	72	31 - 127

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

TCLP SPLPW Leachate Blank - Batch: 500-18720

Method: 8270C
Preparation: 3510C
TCLP

Lab Sample ID: LB2 500-18610/2-C
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/19/2007 1517
Date Prepared: 07/18/2007 0722
Date Leached: 07/16/2007 1521

Analysis Batch: 500-18899
Prep Batch: 500-18720
Units: ug/L
Leachate Batch: 500-18610

Instrument ID: Agilent 6890N GC - 5973N
Lab File ID: 18610LB2.D
Initial Weight/Volume: 100 mL
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Result	Qual	MDL	RL
Cresol, o-	<100		100	100
Cresol, p-	<100		100	100
1,4-Dichlorobenzene	<100		100	100
2,4-Dinitrotoluene	<100		100	100
Hexachlorobenzene	<100		100	100
Hexachloro-1,3-butadiene	<100		100	100
Hexachloroethane	<100		100	100
Nitrobenzene	<100		100	100
Pentachlorophenol	<500		500	500
Pyridine	<200		200	200
2,4,5-Trichlorophenol	<500		500	500
2,4,6-Trichlorophenol	<100		100	100

Surrogate	% Rec		Acceptance Limits
2-Fluorophenol	19	X	20 - 110
Phenol-d5	13		10 - 115
Nitrobenzene-d5	96		35 - 120
2-Fluorobiphenyl	82		37 - 123
2,4,6-Tribromophenol	44		30 - 136
Terphenyl-d14	96		31 - 127

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Control Spike - Batch: 500-18720

Method: 8270C
Preparation: 3510C

Lab Sample ID: LCS 500-18720/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/19/2007 1343
Date Prepared: 07/18/2007 0722

Analysis Batch: 500-18899
Prep Batch: 500-18720
Units: ug/L

Instrument ID: Agilent 6890N GC - 5973N
Lab File ID: 18720BS.D
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 1.0 mL
Injection Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cresol, o-	50.0	32.6	65	39 - 110	
Cresol, p-	50.0	29.0	58	35 - 110	
1,4-Dichlorobenzene	50.0	37.5	75	39 - 110	
2,4-Dinitrotoluene	50.0	52.2	104	64 - 119	
Hexachlorobenzene	50.0	46.5	93	57 - 116	
Hexachloro-1,3-butadiene	50.0	48.9	98	34 - 110	
Hexachloroethane	50.0	40.3	81	34 - 110	
Nitrobenzene	50.0	45.5	91	54 - 111	
Pentachlorophenol	50.0	45.6	91	32 - 124	
Pyridine	50.0	12.7	25	10 - 110	
2,4,5-Trichlorophenol	50.0	43.5	87	63 - 118	
2,4,6-Trichlorophenol	50.0	50.7	101	58 - 116	

Surrogate	% Rec	Acceptance Limits
2-Fluorophenol	54	20 - 110
Phenol-d5	34	10 - 115
Nitrobenzene-d5	97	35 - 120
2-Fluorobiphenyl	82	37 - 123
2,4,6-Tribromophenol	121	30 - 136
Terphenyl-d14	97	31 - 127

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Method Blank - Batch: 500-18726

Method: 8081A
Preparation: 3510C

Lab Sample ID: MB 500-18726/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/22/2007 0647
Date Prepared: 07/18/2007 0729

Analysis Batch: 500-19071
Prep Batch: 500-18726
Units: ug/L

Instrument ID: HP 6890 GC
Lab File ID: 07210716_026.d
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 100.0 mL
Injection Volume:
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Chlordane (technical)	<1.0		1.0	1.0
Endrin	<0.50		0.50	0.50
Heptachlor	<0.50		0.50	0.50
Heptachlor epoxide	<0.50		0.50	0.50
gamma-BHC (Lindane)	<0.50		0.50	0.50
Methoxychlor	<1.0		1.0	1.0
Toxaphene	<5.0		5.0	5.0

Surrogate	% Rec	Acceptance Limits
DCB Decachlorobiphenyl	54	20 - 120
Tetrachloro-m-xylene	88	31 - 121

TCLP SPLPE Leachate Blank - Batch: 500-18726

Method: 8081A
Preparation: 3510C
TCLP

Lab Sample ID: LB 500-18610/1-E
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/22/2007 0827
Date Prepared: 07/18/2007 0729
Date Leached: 07/16/2007 1521

Analysis Batch: 500-19071
Prep Batch: 500-18726
Units: ug/L

Leachate Batch: 500-18610

Instrument ID: HP 6890 GC
Lab File ID: 07210716_030.d
Initial Weight/Volume: 100 mL
Final Weight/Volume: 100.0 mL
Injection Volume:
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Chlordane (technical)	<10		10	10
Endrin	<5.0		5.0	5.0
Heptachlor	<5.0		5.0	5.0
Heptachlor epoxide	<5.0		5.0	5.0
gamma-BHC (Lindane)	<5.0		5.0	5.0
Methoxychlor	<10		10	10
Toxaphene	<50		50	50

Surrogate	% Rec	Acceptance Limits
DCB Decachlorobiphenyl	68	20 - 120
Tetrachloro-m-xylene	88	31 - 121

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

TCLP SPLPW Leachate Blank - Batch: 500-18726

Method: 8081A
Preparation: 3510C
TCLP

Lab Sample ID: LB2 500-18610/2-D
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/22/2007 0852
Date Prepared: 07/18/2007 0729
Date Leached: 07/16/2007 1521

Analysis Batch: 500-19071
Prep Batch: 500-18726
Units: ug/L
Leachate Batch: 500-18610

Instrument ID: HP 6890 GC
Lab File ID: 07210716_031.d
Initial Weight/Volume: 100 mL
Final Weight/Volume: 100.0 mL
Injection Volume:
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
Chlordane (technical)	<10		10	10
Endrin	<5.0		5.0	5.0
Heptachlor	<5.0		5.0	5.0
Heptachlor epoxide	<5.0		5.0	5.0
gamma-BHC (Lindane)	<5.0		5.0	5.0
Methoxychlor	<10		10	10
Toxaphene	<50		50	50

Surrogate	% Rec	Acceptance Limits
DCB Decachlorobiphenyl	66	20 - 120
Tetrachloro-m-xylene	90	31 - 121

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Control Spike - Batch: 500-18726

Method: 8081A
Preparation: 3510C

Lab Sample ID: LCS 500-18726/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/22/2007 0712
Date Prepared: 07/18/2007 0729

Analysis Batch: 500-19071
Prep Batch: 500-18726
Units: ug/L

Instrument ID: HP 6890 GC
Lab File ID: 07210716_027.d
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 100.0 mL
Injection Volume:
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Endrin	1.00	0.841	84	63 - 119	
Heptachlor	1.00	0.842	84	69 - 110	
Heptachlor epoxide	1.00	0.877	88	73 - 110	
gamma-BHC (Lindane)	1.00	0.849	85	75 - 110	
Methoxychlor	10.0	8.56	86	67 - 113	

Surrogate	% Rec	Acceptance Limits
DCB Decachlorobiphenyl	46	20 - 120
Tetrachloro-m-xylene	85	31 - 121

Lab Control Spike - Batch: 500-18726

Method: 8081A
Preparation: 3510C

Lab Sample ID: LCS 500-18726/3-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/22/2007 0737
Date Prepared: 07/18/2007 0729

Analysis Batch: 500-19071
Prep Batch: 500-18726
Units: ug/L

Instrument ID: HP 6890 GC
Lab File ID: 07210716_028.d
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 100.0 mL
Injection Volume:
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Toxaphene	95.7	87.6	91	69 - 116	

Surrogate	% Rec	Acceptance Limits
DCB Decachlorobiphenyl	42	20 - 120
Tetrachloro-m-xylene	86	31 - 121

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Method Blank - Batch: 500-18562

Method: 8082
Preparation: 3541

Lab Sample ID: MB 500-18562/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/18/2007 1649
Date Prepared: 07/16/2007 0917

Analysis Batch: 500-18868
Prep Batch: 500-18562
Units: ug/Kg

Instrument ID: HP 6890N GC
Lab File ID: 07180731_050.d
Initial Weight/Volume: 15.000 g
Final Weight/Volume: 5.0 mL
Injection Volume:
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
PCB-1016	<17		5.6	17
PCB-1221	<17		4.6	17
PCB-1232	<17		4.5	17
PCB-1242	<17		4.9	17
PCB-1248	<17		3.6	17
PCB-1254	<17		3.7	17
PCB-1260	<17		3.3	17

Surrogate	% Rec	Acceptance Limits
Tetrachloro-m-xylene	64	39 - 115
DCB Decachlorobiphenyl	90	47 - 116

Lab Control Spike - Batch: 500-18562

Method: 8082
Preparation: 3541

Lab Sample ID: LCS 500-18562/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/18/2007 1703
Date Prepared: 07/16/2007 0917

Analysis Batch: 500-18868
Prep Batch: 500-18562
Units: ug/Kg

Instrument ID: HP 6890N GC
Lab File ID: 07180731_051.d
Initial Weight/Volume: 15.000 g
Final Weight/Volume: 5.0 mL
Injection Volume:
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
PCB-1016	167	125	75	48 - 113	
PCB-1260	167	146	87	62 - 117	

Surrogate	% Rec	Acceptance Limits
Tetrachloro-m-xylene	67	39 - 115
DCB Decachlorobiphenyl	91	47 - 116

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Method Blank - Batch: 500-18808

Method: 8151
Preparation: 8151A

Lab Sample ID: MB 500-18808/1-A
Client Matrix: Water
Dilution: 10
Date Analyzed: 07/20/2007 0735
Date Prepared: 07/19/2007 0845

Analysis Batch: 500-18977
Prep Batch: 500-18808
Units: ug/L

Instrument ID: HP 6890 GC
Lab File ID: 07190742_018.d
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 10.0 mL
Injection Volume:
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
2,4-D	<10		10	10
Silvex (2,4,5-TP)	<1.0		1.0	1.0

Surrogate	% Rec	Acceptance Limits
DCAA	95	42 - 120

TCLP SPLPE Leachate Blank - Batch: 500-18808

Method: 8151
Preparation: 8151A
TCLP

Lab Sample ID: LB 500-18610/1-G
Client Matrix: Solid
Dilution: 10
Date Analyzed: 07/20/2007 0902
Date Prepared: 07/19/2007 0845
Date Leached: 07/16/2007 1521

Analysis Batch: 500-18977
Prep Batch: 500-18808
Units: ug/L

Leachate Batch: 500-18610

Instrument ID: HP 6890 GC
Lab File ID: 07190742_021.d
Initial Weight/Volume: 100 mL
Final Weight/Volume: 10.0 mL
Injection Volume:
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
2,4-D	<100		100	100
Silvex (2,4,5-TP)	<10		10	10

Surrogate	% Rec	Acceptance Limits
DCAA	52	42 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

TCLP SPLPW Leachate Blank - Batch: 500-18808

Method: 8151
Preparation: 8151A
TCLP

Lab Sample ID: LB2 500-18610/2-F
Client Matrix: Solid
Dilution: 10
Date Analyzed: 07/20/2007 0931
Date Prepared: 07/19/2007 0845
Date Leached: 07/16/2007 1521

Analysis Batch: 500-18977
Prep Batch: 500-18808
Units: ug/L

Leachate Batch: 500-18610

Instrument ID: HP 6890 GC
Lab File ID: 07190742_022.d
Initial Weight/Volume: 100 mL
Final Weight/Volume: 10.0 mL
Injection Volume:
Column ID: PRIMARY

Analyte	Result	Qual	MDL	RL
2,4-D	<100		100	100
Silvex (2,4,5-TP)	<10		10	10

Surrogate	% Rec	Acceptance Limits
DCAA	112	42 - 120

Lab Control Spike - Batch: 500-18808

Method: 8151
Preparation: 8151A

Lab Sample ID: LCS 500-18808/2-A
Client Matrix: Water
Dilution: 10
Date Analyzed: 07/20/2007 1618
Date Prepared: 07/19/2007 0845

Analysis Batch: 500-18977
Prep Batch: 500-18808
Units: ug/L

Instrument ID: HP 6890 GC
Lab File ID: 07190742_036.d
Initial Weight/Volume: 1000 mL
Final Weight/Volume: 10.0 mL
Injection Volume:
Column ID: PRIMARY

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
2,4-D	51.3	52.8	103	11 - 110	
Silvex (2,4,5-TP)	10.2	8.11	79	39 - 110	

Surrogate	% Rec	Acceptance Limits
DCAA	91	42 - 120

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Method Blank - Batch: 500-18566

Method: 6010B
Preparation: 3050B

Lab Sample ID: MB 500-18566/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 0128
Date Prepared: 07/16/2007 1020

Analysis Batch: 500-18941
Prep Batch: 500-18566
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50719C
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Antimony	<2.0		0.54	2.0
Arsenic	<1.0		0.27	1.0
Barium	<1.0		0.44	1.0
Beryllium	0.019	J	0.015	0.40
Chromium	<1.0		0.11	1.0
Cobalt	<0.50		0.094	0.50
Lead	0.29	J ^	0.24	0.50
Nickel	<1.0		0.43	1.0
Selenium	<1.0		0.38	1.0
Silver	<0.50		0.10	0.50
Thallium	<1.0		0.47	1.0
Tin	1.3	J	0.42	2.0
Vanadium	<0.50		0.18	0.50
Zinc	0.79	J ^	0.25	2.0

Method Blank - Batch: 500-18566

Method: 6010B
Preparation: 3050B

Lab Sample ID: MB 500-18566/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/21/2007 0217
Date Prepared: 07/16/2007 1020

Analysis Batch: 500-18990
Prep Batch: 500-18566
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50720D
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Cadmium	<0.20		0.060	0.20

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Method Blank - Batch: 500-18566

Method: 6010B
Preparation: 3050B

Lab Sample ID: MB 500-18566/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/26/2007 0203
Date Prepared: 07/16/2007 1020

Analysis Batch: 500-19226
Prep Batch: 500-18566
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P40724A
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Copper	0.78	J	0.14	1.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Control Spike - Batch: 500-18566

Method: 6010B
Preparation: 3050B

Lab Sample ID: LCS 500-18566/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 0133
Date Prepared: 07/16/2007 1020

Analysis Batch: 500-18941
Prep Batch: 500-18566
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50719C
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Antimony	50.0	44.1	88	80 - 120	
Arsenic	10.0	9.03	90	80 - 120	
Barium	200	185	93	80 - 120	
Beryllium	5.00	4.63	93	80 - 120	
Chromium	20.0	18.9	95	80 - 120	
Cobalt	50.0	46.2	92	80 - 120	
Lead	10.0	9.61	96	80 - 120	^
Nickel	50.0	46.4	93	80 - 120	
Selenium	10.0	8.70	87	80 - 120	
Silver	5.00	4.37	87	80 - 120	
Thallium	10.0	8.73	87	80 - 120	
Tin	100	91.9	92	80 - 120	
Vanadium	50.0	46.7	93	80 - 120	
Zinc	50.0	46.8	94	80 - 120	^

Lab Control Spike - Batch: 500-18566

Method: 6010B
Preparation: 3050B

Lab Sample ID: LCS 500-18566/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/21/2007 0222
Date Prepared: 07/16/2007 1020

Analysis Batch: 500-18990
Prep Batch: 500-18566
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50720D
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cadmium	5.00	4.63	93	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Control Spike - Batch: 500-18566

Method: 6010B
Preparation: 3050B

Lab Sample ID: LCS 500-18566/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/26/2007 0215
Date Prepared: 07/16/2007 1020

Analysis Batch: 500-19226
Prep Batch: 500-18566
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P40724A
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Copper	25.0	24.3	97	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-18566

Method: 6010B
Preparation: 3050B

MS Lab Sample ID:	500-5228-2	Analysis Batch:	500-18941	Instrument ID:	TJA ICAP 61E Trace
Client Matrix:	Solid	Prep Batch:	500-18566	Lab File ID:	P50719C
Dilution:	1.0			Initial Weight/Volume:	1.0115 g
Date Analyzed:	07/20/2007 0202			Final Weight/Volume:	100 mL
Date Prepared:	07/16/2007 1020				

MSD Lab Sample ID:	500-5228-2	Analysis Batch:	500-18941	Instrument ID:	TJA ICAP 61E Trace Analy
Client Matrix:	Solid	Prep Batch:	500-18566	Lab File ID:	P50719C
Dilution:	1.0			Initial Weight/Volume:	1.0459 g
Date Analyzed:	07/20/2007 0207			Final Weight/Volume:	100 mL
Date Prepared:	07/16/2007 1020				

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Antimony	75	82	75 - 125	5	20		
Arsenic	99	106	75 - 125	3	20		
Barium	94	98	75 - 125	1	20		
Beryllium	92	96	75 - 125	0	20		
Chromium	100	102	75 - 125	1	20		
Cobalt	90	92	75 - 125	0	20		
Lead	172	691	75 - 125	90	20	F	F
Nickel	96	102	75 - 125	3	20		
Selenium	91	93	75 - 125	2	20		
Silver	92	91	75 - 125	4	20		
Thallium	93	93	75 - 125	3	20		
Tin	89	94	75 - 125	2	20		
Vanadium	96	97	75 - 125	2	20		
Zinc	139	214	75 - 125	26	20	F	F

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-18566

Method: 6010B
Preparation: 3050B

MS Lab Sample ID:	500-5228-2	Analysis Batch: 500-18990	Instrument ID: TJA ICAP 61E Trace
Client Matrix:	Solid	Prep Batch: 500-18566	Lab File ID: P50720D
Dilution:	1.0		Initial Weight/Volume: 1.0115 g
Date Analyzed:	07/21/2007 0244		Final Weight/Volume: 100 mL
Date Prepared:	07/16/2007 1020		

MSD Lab Sample ID:	500-5228-2	Analysis Batch: 500-18990	Instrument ID: TJA ICAP 61E Trace Analy
Client Matrix:	Solid	Prep Batch: 500-18566	Lab File ID: P50720D
Dilution:	1.0		Initial Weight/Volume: 1.0459 g
Date Analyzed:	07/21/2007 0249		Final Weight/Volume: 100 mL
Date Prepared:	07/16/2007 1020		

	% Rec.						
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Cadmium	96	96	75 - 125	3	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Duplicate - Batch: 500-18566

Method: 6010B
Preparation: 3050B

Lab Sample ID: 500-5228-2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 0158
Date Prepared: 07/16/2007 1020

Analysis Batch: 500-18941
Prep Batch: 500-18566
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50719C
Initial Weight/Volume: 1.0322 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Antimony	0.55	J	0.819	40	20	J
Arsenic	1.6		1.54	3	20	
Barium	5.6		7.64	31	20	F
Beryllium	0.26	J	0.389	41	20	J
Chromium	3.3		3.74	13	20	
Cobalt	1.7		1.73	4	20	
Lead	14		27.0	65	20	F
Nickel	4.1		5.03	21	20	
Selenium	<0.97		0.211	NC	20	
Silver	<0.48		-0.0503	NC	20	
Thallium	<0.97		-0.0584	NC	20	
Tin	2.6		3.40	28	20	
Vanadium	13		12.3	8	20	
Zinc	44		55.9	25	20	F

Duplicate - Batch: 500-18566

Method: 6010B
Preparation: 3050B

Lab Sample ID: 500-5228-2
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/21/2007 0240
Date Prepared: 07/16/2007 1020

Analysis Batch: 500-18990
Prep Batch: 500-18566
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50720D
Initial Weight/Volume: 1.0322 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Cadmium	0.086	J	0.125	37	20	J

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Method Blank - Batch: 500-18618

Method: 6010B
Preparation: 3050B

Lab Sample ID: MB 500-18618/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 0513
Date Prepared: 07/16/2007 1655

Analysis Batch: 500-18941
Prep Batch: 500-18618
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50719C
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Arsenic	<1.0		0.27	1.0
Barium	<1.0		0.44	1.0
Chromium	<1.0		0.11	1.0
Lead	0.34	J ^	0.24	0.50
Selenium	<1.0		0.38	1.0
Silver	<0.50		0.10	0.50

Method Blank - Batch: 500-18618

Method: 6010B
Preparation: 3050B

Lab Sample ID: MB 500-18618/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/21/2007 0548
Date Prepared: 07/16/2007 1655

Analysis Batch: 500-18990
Prep Batch: 500-18618
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50720D
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Cadmium	<0.20		0.060	0.20

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Lab Control Spike - Batch: 500-18618

Method: 6010B
Preparation: 3050B

Lab Sample ID: LCS 500-18618/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 0517
Date Prepared: 07/16/2007 1655

Analysis Batch: 500-18941
Prep Batch: 500-18618
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50719C
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Arsenic	10.0	9.36	94	80 - 120	
Barium	200	189	95	80 - 120	
Chromium	20.0	19.3	96	80 - 120	
Lead	10.0	9.84	98	80 - 120	^
Selenium	10.0	8.94	89	80 - 120	
Silver	5.00	4.54	91	80 - 120	

Lab Control Spike - Batch: 500-18618

Method: 6010B
Preparation: 3050B

Lab Sample ID: LCS 500-18618/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/21/2007 0553
Date Prepared: 07/16/2007 1655

Analysis Batch: 500-18990
Prep Batch: 500-18618
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50720D
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cadmium	5.00	4.83	97	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-18618

Method: 6010B
Preparation: 3050B

MS Lab Sample ID:	500-5228-20	Analysis Batch: 500-18941	Instrument ID: TJA ICAP 61E Trace
Client Matrix:	Solid	Prep Batch: 500-18618	Lab File ID: P50719C
Dilution:	1.0		Initial Weight/Volume: 1.0071 g
Date Analyzed:	07/20/2007 0536		Final Weight/Volume: 100 mL
Date Prepared:	07/16/2007 1655		

MSD Lab Sample ID:	500-5228-20	Analysis Batch: 500-18941	Instrument ID: TJA ICAP 61E Trace Analy
Client Matrix:	Solid	Prep Batch: 500-18618	Lab File ID: P50719C
Dilution:	1.0		Initial Weight/Volume: 1.0110 g
Date Analyzed:	07/20/2007 0540		Final Weight/Volume: 100 mL
Date Prepared:	07/16/2007 1655		

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Arsenic	94	91	75 - 125	2	20		
Barium	92	95	75 - 125	2	20		
Chromium	100	104	75 - 125	3	20		
Lead	449	483	75 - 125	2	20	^ 4	^ 4
Selenium	84	83	75 - 125	2	20		
Silver	89	88	75 - 125	1	20		

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-18618

Method: 6010B
Preparation: 3050B

MS Lab Sample ID:	500-5228-20	Analysis Batch: 500-18990	Instrument ID: TJA ICAP 61E Trace
Client Matrix:	Solid	Prep Batch: 500-18618	Lab File ID: P50720D
Dilution:	1.0		Initial Weight/Volume: 1.0071 g
Date Analyzed:	07/21/2007 0611		Final Weight/Volume: 100 mL
Date Prepared:	07/16/2007 1655		

MSD Lab Sample ID:	500-5228-20	Analysis Batch: 500-18990	Instrument ID: TJA ICAP 61E Trace Analy
Client Matrix:	Solid	Prep Batch: 500-18618	Lab File ID: P50720D
Dilution:	1.0		Initial Weight/Volume: 1.0110 g
Date Analyzed:	07/21/2007 0615		Final Weight/Volume: 100 mL
Date Prepared:	07/16/2007 1655		

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Cadmium	100	91	75 - 125	8	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Duplicate - Batch: 500-18618

Method: 6010B
Preparation: 3050B

Lab Sample ID: 500-5228-20
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 0531
Date Prepared: 07/16/2007 1655

Analysis Batch: 500-18941
Prep Batch: 500-18618
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50719C
Initial Weight/Volume: 1.0959 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Arsenic	3.3		3.04	8	20	
Barium	27		28.7	8	20	
Chromium	7.3		12.2	50	20	F
Lead	92		108	16	20	^
Selenium	0.77	J	0.189	NC	20	
Silver	0.33	J	0.367	10	20	J

Duplicate - Batch: 500-18618

Method: 6010B
Preparation: 3050B

Lab Sample ID: 500-5228-20
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/21/2007 0606
Date Prepared: 07/16/2007 1655

Analysis Batch: 500-18990
Prep Batch: 500-18618
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50720D
Initial Weight/Volume: 1.0959 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Cadmium	0.85	0.797	7	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

TCLP SPLPW Leachate Blank - Batch: 500-18704

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: LB2 500-18610/2-B
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/19/2007 1127
Date Prepared: 07/17/2007 1500
Date Leached: 07/16/2007 1521

Analysis Batch: 500-18857
Prep Batch: 500-18704
Units: mg/L
Leachate Batch: 500-18610

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P40719A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Arsenic	<0.050		0.010	0.050
Barium	<0.50		0.010	0.50
Cadmium	<0.0050		0.0020	0.0050
Chromium	<0.025		0.010	0.025
Lead	0.013	J	0.0050	0.050
Selenium	<0.050		0.010	0.050
Silver	<0.025		0.0050	0.025

Lab Control Spike - Batch: 500-18704

Method: 6010B
Preparation: 3010A

Lab Sample ID: LCS 500-18704/3-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/19/2007 1134
Date Prepared: 07/17/2007 1500

Analysis Batch: 500-18857
Prep Batch: 500-18704
Units: mg/L

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P40719A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Arsenic	0.100	0.0930	93	80 - 120	
Barium	2.00	1.84	92	80 - 120	
Cadmium	0.0500	0.0467	93	80 - 120	
Chromium	0.200	0.192	96	80 - 120	
Lead	0.100	0.0986	99	80 - 120	
Selenium	0.100	0.0983	98	80 - 120	
Silver	0.0500	0.0430	86	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Matrix Spike - Batch: 500-18704

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: 500-5228-27
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/19/2007 1200
Date Prepared: 07/17/2007 1500
Date Leached: 07/16/2007 1521

Analysis Batch: 500-18857
Prep Batch: 500-18704
Units: mg/L
Leachate Batch: 500-18610

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P40719A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Arsenic	<0.050	5.00	4.60	92	50 - 150	
Cadmium	0.12	1.00	0.974	85	50 - 150	
Chromium	<0.025	5.00	4.44	89	50 - 150	
Lead	3.9	5.00	7.79	77	50 - 150	
Selenium	<0.050	1.00	0.954	95	50 - 150	
Silver	<0.025	1.00	0.966	97	50 - 150	

Duplicate - Batch: 500-18704

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: 500-5228-27
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/19/2007 1153
Date Prepared: 07/17/2007 1500
Date Leached: 07/16/2007 1521

Analysis Batch: 500-18857
Prep Batch: 500-18704
Units: mg/L
Leachate Batch: 500-18610

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P40719A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Arsenic	<0.050	0.00238	NC	20	
Barium	1.3	1.27	1	20	
Cadmium	0.12	0.121	1	20	
Chromium	<0.025	0.00332	NC	20	
Lead	3.9	3.86	2	20	
Selenium	<0.050	0.00319	NC	20	
Silver	<0.025	-0.000520	NC	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

TCLP SPLPE Leachate Blank - Batch: 500-18881

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: LB 500-18778/1-B
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 1754
Date Prepared: 07/19/2007 1520
Date Leached: 07/18/2007 1415

Analysis Batch: 500-18989
Prep Batch: 500-18881
Units: mg/L
Leachate Batch: 500-18778

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50720C
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Lead	<0.0075		0.0050	0.0075

Lab Control Spike - Batch: 500-18881

Method: 6010B
Preparation: 3010A

Lab Sample ID: LCS 500-18881/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/20/2007 1758
Date Prepared: 07/19/2007 1520

Analysis Batch: 500-18989
Prep Batch: 500-18881
Units: mg/L

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50720C
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Lead	0.100	0.0962	96	80 - 120	

Matrix Spike - Batch: 500-18881

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: 500-5228-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 1816
Date Prepared: 07/19/2007 1520
Date Leached: 07/18/2007 1415

Analysis Batch: 500-18989
Prep Batch: 500-18881
Units: mg/L
Leachate Batch: 500-18778

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50720C
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Lead	0.24	5.00	4.11	77	50 - 150	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Duplicate - Batch: 500-18881

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: 500-5228-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 1812
Date Prepared: 07/19/2007 1520
Date Leached: 07/18/2007 1415

Analysis Batch: 500-18989
Prep Batch: 500-18881
Units: mg/L

Leachate Batch: 500-18778

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50720C
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Lead	0.24	0.234	2	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

TCLP SPLPE Leachate Blank - Batch: 500-18882

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: LB 500-18779/1-B
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 2108
Date Prepared: 07/19/2007 1520
Date Leached: 07/18/2007 1415

Analysis Batch: 500-18989
Prep Batch: 500-18882
Units: mg/L

Leachate Batch: 500-18779

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50720C
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Lead	0.011		0.0050	0.0075

Lab Control Spike - Batch: 500-18882

Method: 6010B
Preparation: 3010A

Lab Sample ID: LCS 500-18882/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/20/2007 2113
Date Prepared: 07/19/2007 1520

Analysis Batch: 500-18989
Prep Batch: 500-18882
Units: mg/L

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50720C
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Lead	0.100	0.107	107	80 - 120	

Matrix Spike - Batch: 500-18882

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: 500-5228-20
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 2153
Date Prepared: 07/19/2007 1520
Date Leached: 07/18/2007 1415

Analysis Batch: 500-18989
Prep Batch: 500-18882
Units: mg/L

Leachate Batch: 500-18779

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50720C
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Lead	0.0075	5.00	4.79	96	50 - 150	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Duplicate - Batch: 500-18882

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: 500-5228-20
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 2126
Date Prepared: 07/19/2007 1520
Date Leached: 07/18/2007 1415

Analysis Batch: 500-18989
Prep Batch: 500-18882
Units: mg/L

Leachate Batch: 500-18779

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50720C
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Lead	0.0075	0.00565	28	20	J

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Method Reporting Limit Check - Batch: 500-19102

Method: 6010B
Preparation: N/A

Lab Sample ID: MRL 500-19102/27
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/23/2007 2219
Date Prepared: N/A

Analysis Batch: 500-19102
Prep Batch: N/A
Units: mg/L

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50723A
Initial Weight/Volume: mL
Final Weight/Volume: 1 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Lead	0.00500	0.00509	102	70 - 130	J

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

TCLP SPLPE Leachate Blank - Batch: 500-19451

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: LB 500-18779/1-D
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/30/2007 1833
Date Prepared: 07/27/2007 1545
Date Leached: 07/18/2007 1415

Analysis Batch: 500-19572
Prep Batch: 500-19451
Units: mg/L

Leachate Batch: 500-18779

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50730B
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Lead	<0.0075		0.0050	0.0075

Lab Control Spike - Batch: 500-19451

Method: 6010B
Preparation: 3010A

Lab Sample ID: LCS 500-19451/4-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/30/2007 1847
Date Prepared: 07/27/2007 1545

Analysis Batch: 500-19572
Prep Batch: 500-19451
Units: mg/L

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50730B
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Lead	0.100	0.102	102	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Method Blank - Batch: 500-18782

Method: 7470A
Preparation: 7470A

Lab Sample ID: MB 500-18782/1-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/18/2007 1337
Date Prepared: 07/18/2007 0945

Analysis Batch: 500-18773
Prep Batch: 500-18782
Units: ug/L

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 25 mL
Final Weight/Volume: 25 mL

Analyte	Result	Qual	MDL	RL
Mercury	0.059	J	0.020	0.20

TCLP SPLPW Leachate Blank - Batch: 500-18782

Method: 7470A
Preparation: 7470A
TCLP

Lab Sample ID: LB2 500-18610/2-E
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/18/2007 1356
Date Prepared: 07/18/2007 0945
Date Leached: 07/16/2007 1521

Analysis Batch: 500-18773
Prep Batch: 500-18782
Units: ug/L

Leachate Batch: 500-18610

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 2.5 mL
Final Weight/Volume: 25 mL

Analyte	Result	Qual	MDL	RL
Mercury	0.67	J	0.20	2.0

Lab Control Spike - Batch: 500-18782

Method: 7470A
Preparation: 7470A

Lab Sample ID: LCS 500-18782/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/18/2007 1339
Date Prepared: 07/18/2007 0945

Analysis Batch: 500-18773
Prep Batch: 500-18782
Units: ug/L

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 25 mL
Final Weight/Volume: 25 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	2.00	2.01	101	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Method Blank - Batch: 500-18662

Method: 7471A
Preparation: 7471A

Lab Sample ID: MB 500-18662/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/16/2007 1423
Date Prepared: 07/16/2007 1200

Analysis Batch: 500-18628
Prep Batch: 500-18662
Units: ug/Kg

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	<17		5.3	17

Lab Control Spike - Batch: 500-18662

Method: 7471A
Preparation: 7471A

Lab Sample ID: LCS 500-18662/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/16/2007 1425
Date Prepared: 07/16/2007 1200

Analysis Batch: 500-18628
Prep Batch: 500-18662
Units: ug/Kg

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	167	174	104	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Method Blank - Batch: 500-18663

Method: 7471A
Preparation: 7471A

Lab Sample ID: MB 500-18663/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/16/2007 1558
Date Prepared: 07/16/2007 1200

Analysis Batch: 500-18628
Prep Batch: 500-18663
Units: ug/Kg

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	<17		5.3	17

Lab Control Spike - Batch: 500-18663

Method: 7471A
Preparation: 7471A

Lab Sample ID: LCS 500-18663/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/16/2007 1601
Date Prepared: 07/16/2007 1200

Analysis Batch: 500-18628
Prep Batch: 500-18663
Units: ug/Kg

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	167	181	108	80 - 120	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-18663

Method: 7471A
Preparation: 7471A

MS Lab Sample ID: 500-5228-9
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/16/2007 1628
Date Prepared: 07/16/2007 1200

Analysis Batch: 500-18628
Prep Batch: 500-18663

Instrument ID: Leeman Labs PS200 Mer
Lab File ID: N/A
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

MSD Lab Sample ID: 500-5228-9
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/16/2007 1631
Date Prepared: 07/16/2007 1200

Analysis Batch: 500-18628
Prep Batch: 500-18663

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Mercury	86	67	75 - 125	9	20		F

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Duplicate - Batch: 500-18663

Method: 7471A
Preparation: 7471A

Lab Sample ID: 500-5228-9
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/16/2007 1626
Date Prepared: 07/16/2007 1200

Analysis Batch: 500-18628
Prep Batch: 500-18663
Units: ug/Kg

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Mercury	130	149	16	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Method Blank - Batch: 500-19060

Method: 7471A
Preparation: 7471A

Lab Sample ID: MB 500-19060/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 1622
Date Prepared: 07/20/2007 1000

Analysis Batch: 500-19065
Prep Batch: 500-19060
Units: ug/Kg

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.60 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	<17		5.3	17

Lab Control Spike - Batch: 500-19060

Method: 7471A
Preparation: 7471A

Lab Sample ID: LCS 500-19060/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 1624
Date Prepared: 07/20/2007 1000

Analysis Batch: 500-19065
Prep Batch: 500-19060
Units: ug/Kg

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.60 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	167	171	102	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Method Blank - Batch: 500-18873

Method: 7.4.4
Preparation: 7.3.4

Lab Sample ID: MB 500-18873/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/19/2007 1520
Date Prepared: 07/19/2007 1405

Analysis Batch: 500-18874
Prep Batch: 500-18873
Units: mg/Kg

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10 g
Final Weight/Volume: 10 mL

Analyte	Result	Qual	MDL	RL
Sulfide, Reactive	<50		8.8	50

Lab Control Spike - Batch: 500-18873

Method: 7.4.4
Preparation: 7.3.4

Lab Sample ID: LCS 500-18873/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/19/2007 1521
Date Prepared: 07/19/2007 1405

Analysis Batch: 500-18874
Prep Batch: 500-18873
Units: mg/Kg

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10 g
Final Weight/Volume: 10 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfide, Reactive	202	191	94	25 - 116	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-18873

Method: 7.4.4
Preparation: 7.3.4

MS Lab Sample ID: 500-5228-27
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/19/2007 1523
Date Prepared: 07/19/2007 1405

Analysis Batch: 500-18874
Prep Batch: 500-18873

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10.48 g
Final Weight/Volume: 10 mL

MSD Lab Sample ID: 500-5228-27
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/19/2007 1524
Date Prepared: 07/19/2007 1405

Analysis Batch: 500-18874
Prep Batch: 500-18873

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: 10.51 g
Final Weight/Volume: 10 mL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Sulfide, Reactive	0	0	25 - 116	NC	50	F	F

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Method Blank - Batch: 500-18748

Method: 9014
Preparation: 9010B

Lab Sample ID: MB 500-18748/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/18/2007 1038
Date Prepared: 07/18/2007 0600

Analysis Batch: 500-18751
Prep Batch: 500-18748
Units: mg/Kg

Instrument ID: Shimadzu UV mini 1240V
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Cyanide, Reactive	<0.010		0.0020	0.010

Lab Control Spike - Batch: 500-18748

Method: 9014
Preparation: 9010B

Lab Sample ID: LCS 500-18748/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/18/2007 1041
Date Prepared: 07/18/2007 0600

Analysis Batch: 500-18751
Prep Batch: 500-18748
Units: mg/Kg

Instrument ID: Shimadzu UV mini 1240V
Lab File ID: N/A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Cyanide, Reactive	0.100	0.0996	100	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Deigan & Associates

Job Number: 500-5228-1

Duplicate - Batch: 500-18602

Method: 9045C
Preparation: N/A

Lab Sample ID: 500-5228-9
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/16/2007 0850
Date Prepared: N/A

Analysis Batch: 500-18602
Prep Batch: N/A
Units: SU

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume: mL
Final Weight/Volume: mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
pH	8.65	8.55			

Calculations are performed before rounding to avoid round-off errors in calculated results.

Quality Control Results

Client: Deigan & Associates

Job Number: 500-5228-1

Duplicate - Batch: 500-18547

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: 500-5228-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/15/2007 1453
Date Prepared: N/A

Analysis Batch: 500-18547
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Percent Moisture	8.7	8.70			
Percent Solids	91	91.3	0	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5228-1

Duplicate - Batch: 500-18548

Method: PercentMoisture
Preparation: N/A

Lab Sample ID: 500-5228-21
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/15/2007 1455
Date Prepared: N/A

Analysis Batch: 500-18548
Prep Batch: N/A
Units: %

Instrument ID: No Equipment Assigned
Lab File ID: N/A
Initial Weight/Volume:
Final Weight/Volume:

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Percent Moisture	2.1	2.36			
Percent Solids	98	97.6	0	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

SEVERN TRENT **STL**

STL Chicago
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Gary Brigan
Company: Dolgan & Assoc. LLC
Address: 100 S. Genesee
Waukegan IL 60085
Phone: (847) 623-9336
Fax: ( ) 9335
E-Mail:

Bill To:
Contact: Same
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only 1 of

Lab Lot# 500-5228

Package Sealed	Samples Sealed
Yes (No)	Yes (No)
Received on Ice	**Samples Intact**
(Yes) No	(Yes) No

Temperature °C of Cooler: (3.5) (3.8)

07/31/2007

Sampler Name: Kerry VanAllen
Signature:
Project Name: Lake Shore Foundry
Project Number:
Project Location: Waukegan IL
Lab PM: D. Wright
Date Required — Hard Copy: __/__/__ Fax: __/__/__

Within Hold Time: (Yes) No
Preserv. Indicated: (Yes) No NA
pH Check OK: Yes No (NA)
Res Cl_2 Check OK: Yes No (NA)
Sample Labels and COC Agree: (Yes) No COC not present

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	TCLP Lead	Total Solids Matrix	Total metals Matrix	pH							Additional Analyses / Remarks
Refrig #							1	1	1								
# / Cont.							1	1	1								
Volume							500	500	500								
Preserv							-	-	-	-							
1		LSF-GP-01 (0-5')	7/12/07	8:20	S	G	X	X									
2		LSF-GP-01 (4-5')		8:35	S	G	X	X									
3		LSF-GP-02 (0-6')		9:10	S	G	X	X									
4		LSF-GP-02 (4-5')		9:15	S	G	X	X									
5		LSF-GP-03 (0-5')		9:40	S	G	X	X									
6		LSF-GP-03 (4.5-5')		9:50	S	G	X	X									
7		LSF-GP-04 (0-6')		10:30	S	G	X	X	*	*							
8		LSF-GP-04 (1.5-2')		10:30	S	G	X	X		*							
9		LSF-GP-05 (0-6")		11:00	S	G	X		X	X							
10		LSF-GP-05 (1.5-2')		11:00	S	G	X	X		X							
11		LSF-GP-06 (0-6")		11:20	S	G	X	X									
12		LSF-GP-06 (4-5')		11:20	S	G	X	X									

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[signature]	Dolgan & Assoc. LLC	7/12/07	1:00	[signature]	STL	7/12/07	1600
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. Cool to 4°
7. None

COMMENTS

Date Received 7 / 12 / 07
Courier: STL
Hand Delivered [X]
Bill of Lading

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STL-8208 (0600)

SEVERN TRENT **STL**

STL Chicago
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Gary Deisen
Company: Deisen & Associates LLC
Address: 100 S. Genesee
Waukegan IL 60085
Phone: (847) 623-9356
Fax: ( ) " 9355
E-Mail:

Bill To:
Contact: SAME
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only 2 of 3

Lab Lot# 500-5228

Package Sealed	Samples Sealed
Yes No	Yes No
Received on Ice	**Samples Intact**
Yes No	Yes No

Temperature °C of Cooler

07/31/2007

Sampler Name: Kerry VanAllen
Signature:
Project Name: Lakeshore Foundry
Project Number:
Project Location: Waukegan IL
Lab PM: D. Wright
Date Required Hard Copy: __/__/__ Fax: __/__/__

Within Hold Time	Preserv. Indicated
Yes No	Yes No NA
pH Check OK	**Res Cl_2 Check OK**
Yes No NA	Yes No NA

Sample Labels and COC Agree
Yes No COC not present

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	TCLP Metals	TCLP Metals	Appendix IX Metals	pH							Additional Analyses / Remarks
Refrg #																	
# / Cont.							1	1	1								
Volume							8oz	8oz	8oz								
Preserv							—	—	—	—							
13		LSF-GP-07(0-6")	7/12/07	12:40	S	G	X		X	X							
14		LSF-GP-07(1.5-2')		12:45	S	G	X	X		X							
15		LSF-GP-08(0-6")		1:20	S	G	X		X	X							
16		LSF-GP-08(1.5-2')		1:20	S	G	X	X		X							
17		LSF-GP-10(0-6")		2:10	S	G	X	X									
18		LSF-GP-10(2-2.5')		2:10	S	G	X	X									
19		LSF-GP-11(0-6")		2:30	S	G	X	X									
20		LSF-GP-11(3-3.5')		2:30	S	G	X	X									
21		LSF-GP-12(0-6")		2:45	S	G	X	X									
22		LSF-GP-12(1.5-2')		2:45	S	G	X	X									
23		LSF-GP-13(0-6")		3:00	S	G	X	X									
24		LSF-GP-13(2-2.5')		3:00	S	G	X	X									

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[signature]	Deisen & Associates LLC	7/12/07	4:00	[signature]	STL	7/12/07	1600
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. Cool to 4°
7. None

COMMENTS

Date Received 7 / 12 / 07
Courier: STL **Hand Delivered** X
Bill of Lading

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STL-8208 (0600)

SEVERN TRENT **STL**

STL Chicago
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Greg Davis
Company: Disc Asso. LLC
Address: 120 S. Genesee
Waukegan IL 60085
Phone: (847) 623 9356
Fax: (") 9361
E-Mail:

Bill To:
Contact: SAME
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only 3 of 3

Lab Lot# 500-5228

Package Sealed	Samples Sealed
Yes No	Yes No
Received on Ice	**Samples Intact**
Yes No	Yes No

Temperature °C of Cooler

Within Hold Time	Preserv. Indicated
Yes No	Yes No NA
pH Check OK	**Res Cl_2 Check OK**
Yes No NA	Yes No NA

Sample Labels and COC Agree: Yes No COC not present

Sampler Name: Kevin Vanallen
Signature:
Project Name: Lake Shore Fishing
Project Number:
Project Location: Waukegan IL
Lab PM: D Wright
Date Required: Hard Copy: __/__/__ Fax: __/__/__

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	TCL + Lead	Total Metals	Dissolved (Cr, Fe, Mn, Ni, Pb, Zn)								Additional Analyses / Remarks
Refrg #																	
# / Cont.							1	1	1								
Volume							8oz	8oz	16oz								
Preserv								HNO3									
25		LSF-GP-09(0-6")	7/12/07	3:30	S	G	X	X									
26		LSF-GP-09(2.5-3')	"	3:40	S	G	X	X									
27		Disposal Sample	"	1:00	S	G			X								

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[signature]	Disc Asso. LLC	7/12/07	4:00	[signature]	STL	7/12/07	1600
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. Cool to 4°
7. None

COMMENTS

Date Received 7 / 12 / 07
Courier: STL
Hand Delivered X
Bill of Lading

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STL-5208 (0600)

07/31/2007

LOGIN SAMPLE RECEIPT CHECK LIST

Client: Deigan & Associates

Job Number: 500-5228-1

Login Number: 5228

Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	NA	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	3.5,3.8
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

ANALYTICAL REPORT

Job Number: 500-5271-1

Job Description: Lake Shore Foundry, Waukegan

For:
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Attention: Gary Deigan

Richard C Wright
Project Manager II
richard.wright@testamericainc.com
07/27/2007

Project Manager: Richard C Wright

These test results meet all the requirements of NELAC for accredited parameters.

The Lab Certification ID# is 100201.

All questions regarding this test report should be directed to the STL Project Manager whose signature appears on this report. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

Severn Trent Laboratories, Inc.
STL Chicago 2417 Bond Street, University Park, IL 60466
Tel (708) 534-5200 Fax (708) 534-5211 www.stl-inc.com

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

Metals
No analytical or quality issues were noted.

General Chemistry
No analytical or quality issues were noted.

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5271-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5271-1	**LSF-GP-15(0-6)**					
Arsenic		4.9		1.1	mg/Kg	6010B
Barium		92		1.1	mg/Kg	6010B
Cadmium		0.74		0.22	mg/Kg	6010B
Chromium		27		1.1	mg/Kg	6010B
Lead		180		0.55	mg/Kg	6010B
Silver		0.39	J	0.55	mg/Kg	6010B
Mercury		130		19	ug/Kg	7471A
Percent Moisture		11		0.10	%	PercentMoisture
Percent Solids		89		0.10	%	PercentMoisture
500-5271-2	**LSF-GP-15(1.5-2)**					
Arsenic		7.4		1.0	mg/Kg	6010B
Barium		42		1.0	mg/Kg	6010B
Cadmium		0.36		0.21	mg/Kg	6010B
Chromium		11		1.0	mg/Kg	6010B
Lead		58		0.52	mg/Kg	6010B
Silver		0.23	J	0.52	mg/Kg	6010B
Mercury		29		18	ug/Kg	7471A
Percent Moisture		7.1		0.10	%	PercentMoisture
Percent Solids		93		0.10	%	PercentMoisture
TCLP						
Lead		0.013		0.0075	mg/L	6010B
500-5271-3	**LSF-GP-16(0-6)**					
Arsenic		4.6		1.1	mg/Kg	6010B
Barium		39		1.1	mg/Kg	6010B
Cadmium		0.21	J	0.21	mg/Kg	6010B
Chromium		9.6		1.1	mg/Kg	6010B
Lead		170		0.53	mg/Kg	6010B
Silver		0.11	J	0.53	mg/Kg	6010B
Mercury		71		18	ug/Kg	7471A
Percent Moisture		7.1		0.10	%	PercentMoisture
Percent Solids		93		0.10	%	PercentMoisture

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5271-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5271-4	**LSF-GP-16(1.5-2)**					
Arsenic		4.8		0.99	mg/Kg	6010B
Barium		53		0.99	mg/Kg	6010B
Cadmium		0.61		0.20	mg/Kg	6010B
Chromium		16		0.99	mg/Kg	6010B
Lead		150		0.50	mg/Kg	6010B
Silver		0.15	J	0.50	mg/Kg	6010B
Mercury		100		17	ug/Kg	7471A
Percent Moisture		2.1		0.10	%	PercentMoisture
Percent Solids		98		0.10	%	PercentMoisture
TCLP						
Lead		0.0077		0.0075	mg/L	6010B
500-5271-5	**LSF-GP-19(0-6)**					
Arsenic		2.7		0.97	mg/Kg	6010B
Barium		74		0.97	mg/Kg	6010B
Cadmium		0.40		0.19	mg/Kg	6010B
Chromium		9.1		0.97	mg/Kg	6010B
Lead		79		0.49	mg/Kg	6010B
Selenium		0.43	J	0.97	mg/Kg	6010B
Silver		0.24	J	0.49	mg/Kg	6010B
Mercury		60		18	ug/Kg	7471A
Percent Moisture		5.8		0.10	%	PercentMoisture
Percent Solids		94		0.10	%	PercentMoisture
500-5271-6	**LSF-GP-19(4-5)**					
Arsenic		4.1		1.0	mg/Kg	6010B
Barium		77		1.0	mg/Kg	6010B
Cadmium		1.8		0.20	mg/Kg	6010B
Chromium		15		1.0	mg/Kg	6010B
Lead		160		0.50	mg/Kg	6010B
Selenium		0.56	J	1.0	mg/Kg	6010B
Silver		0.40	J	0.50	mg/Kg	6010B
Mercury		94		19	ug/Kg	7471A
Percent Moisture		12		0.10	%	PercentMoisture
Percent Solids		88		0.10	%	PercentMoisture

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5271-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5271-7	**LSF-GP-20(0-6)**					
Antimony		1.6	J	2.1	mg/Kg	6010B
Arsenic		10		1.0	mg/Kg	6010B
Barium		43		1.0	mg/Kg	6010B
Beryllium		1.2		0.42	mg/Kg	6010B
Cadmium		1.1		0.21	mg/Kg	6010B
Chromium		9.2		1.0	mg/Kg	6010B
Cobalt		5.3		0.52	mg/Kg	6010B
Copper		89		1.0	mg/Kg	6010B
Lead		76		0.52	mg/Kg	6010B
Nickel		16		1.0	mg/Kg	6010B
Selenium		1.2		1.0	mg/Kg	6010B
Silver		0.63		0.52	mg/Kg	6010B
Thallium		0.87	J	1.0	mg/Kg	6010B
Tin		6.6	B	2.1	mg/Kg	6010B
Vanadium		23		0.52	mg/Kg	6010B
Zinc		310	B	2.1	mg/Kg	6010B
Mercury		38		18	ug/Kg	7471A
pH		7.05		0.200	SU	9045C
Percent Moisture		5.9		0.10	%	PercentMoisture
Percent Solids		94		0.10	%	PercentMoisture
TCLP						
Lead		0.013		0.0075	mg/L	6010B
500-5271-8	**LSF-GP-20(2-2.5)**					
Arsenic		1.1		1.0	mg/Kg	6010B
Barium		6.9		1.0	mg/Kg	6010B
Chromium		5.1		1.0	mg/Kg	6010B
Lead		7.5		0.51	mg/Kg	6010B
Mercury		8.2	J	17	ug/Kg	7471A
pH		8.32		0.200	SU	9045C
Percent Moisture		3.3		0.10	%	PercentMoisture
Percent Solids		97		0.10	%	PercentMoisture

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5271-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5271-9	**LSF-GP-17(0-6)**					
Antimony		1.5	J	2.1	mg/Kg	6010B
Arsenic		22		1.1	mg/Kg	6010B
Barium		28		1.1	mg/Kg	6010B
Beryllium		2.7		0.42	mg/Kg	6010B
Cadmium		4.6		0.21	mg/Kg	6010B
Chromium		9.7		1.1	mg/Kg	6010B
Cobalt		7.2		0.53	mg/Kg	6010B
Copper		35		1.1	mg/Kg	6010B
Lead		36		0.53	mg/Kg	6010B
Nickel		33		1.1	mg/Kg	6010B
Selenium		0.88	J	1.1	mg/Kg	6010B
Silver		0.13	J	0.53	mg/Kg	6010B
Thallium		0.96	J	1.1	mg/Kg	6010B
Tin		2.3	B	2.1	mg/Kg	6010B
Vanadium		29		0.53	mg/Kg	6010B
Zinc		400	B	2.1	mg/Kg	6010B
Mercury		13	J	18	ug/Kg	7471A
pH		7.84		0.200	SU	9045C
Percent Moisture		7.0		0.10	%	PercentMoisture
Percent Solids		93		0.10	%	PercentMoisture
500-5271-10	**LSF-GP-17(1.5-2)**					
Arsenic		5.0		1.1	mg/Kg	6010B
Barium		23		1.1	mg/Kg	6010B
Chromium		11		1.1	mg/Kg	6010B
Lead		8.1		0.57	mg/Kg	6010B
Selenium		1.6		1.1	mg/Kg	6010B
Mercury		19	J	19	ug/Kg	7471A
pH		8.35		0.200	SU	9045C
Percent Moisture		12		0.10	%	PercentMoisture
Percent Solids		88		0.10	%	PercentMoisture

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5271-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5271-11	**LSF-GP-18(0-6)**					
Arsenic		13		1.1	mg/Kg	6010B
Barium		81		1.1	mg/Kg	6010B
Cadmium		2.6		0.23	mg/Kg	6010B
Chromium		23		1.1	mg/Kg	6010B
Lead		290		0.57	mg/Kg	6010B
Selenium		2.1		1.1	mg/Kg	6010B
Silver		0.86		0.57	mg/Kg	6010B
Mercury		120		20	ug/Kg	7471A
Percent Moisture		16		0.10	%	PercentMoisture
Percent Solids		84		0.10	%	PercentMoisture
TCLP						
Lead		0.041		0.0075	mg/L	6010B
500-5271-12	**LSF-GP-18(1.5-2)**					
Arsenic		5.4		1.1	mg/Kg	6010B
Barium		15		1.1	mg/Kg	6010B
Cadmium		0.65		0.22	mg/Kg	6010B
Chromium		6.8		1.1	mg/Kg	6010B
Lead		70		0.54	mg/Kg	6010B
Mercury		24		20	ug/Kg	7471A
Percent Moisture		15		0.10	%	PercentMoisture
Percent Solids		85		0.10	%	PercentMoisture
TCLP						
Lead		0.019		0.0075	mg/L	6010B
500-5271-13	**LSF-GP-14(0-6)**					
Arsenic		3.2		0.99	mg/Kg	6010B
Barium		48		0.99	mg/Kg	6010B
Cadmium		0.11	J	0.20	mg/Kg	6010B
Chromium		16		0.99	mg/Kg	6010B
Lead		24		0.50	mg/Kg	6010B
Silver		0.27	J	0.50	mg/Kg	6010B
Mercury		34		17	ug/Kg	7471A
Percent Moisture		3.3		0.10	%	PercentMoisture
Percent Solids		97		0.10	%	PercentMoisture
TCLP						
Lead		0.0077		0.0075	mg/L	6010B

EXECUTIVE SUMMARY - Detections

Client: Deigan & Associates

Job Number: 500-5271-1

Lab Sample ID Analyte	Client Sample ID	Result / Qualifier		Reporting Limit	Units	Method
500-5271-14	**LSF-GP-14(1.5-2)**					
Arsenic		6.7		1.1	mg/Kg	6010B
Barium		46		1.1	mg/Kg	6010B
Cadmium		0.56		0.21	mg/Kg	6010B
Chromium		8.0		1.1	mg/Kg	6010B
Lead		150		0.53	mg/Kg	6010B
Selenium		0.66	J	1.1	mg/Kg	6010B
Silver		0.31	J	0.53	mg/Kg	6010B
Mercury		140		18	ug/Kg	7471A
Percent Moisture		7.5		0.10	%	PercentMoisture
Percent Solids		93		0.10	%	PercentMoisture
TCLP						
Lead		0.031		0.0075	mg/L	6010B

METHOD SUMMARY

Client: Deigan & Associates

Job Number: 500-5271-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Inductively Coupled Plasma - Atomic Emission Spectrometry	STL CHI	SW846 6010B	
Acid Digestion of Sediments, Sludges, and Soils	STL CHI		SW846 3050B
Toxicity Characteristic Leaching Procedure	STL CHI		SW846 1311
Acid Digestion of Aqueous Samples and Extracts	STL CHI		SW846 3010A
Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)	STL CHI	SW846 7471A	
Mercury in Solid or Semi-Solid Waste (Manual	STL CHI		SW846 7471A
pH	STL CHI	SW846 9045C	
Percent Moisture	STL CHI	EPA PercentMoisture	

LAB REFERENCES:

STL CHI = STL Chicago

METHOD REFERENCES:

EPA - US Environmental Protection Agency

SW846 - "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986
And Its Updates.

METHOD / ANALYST SUMMARY

Client: Deigan & Associates

Job Number: 500-5271-1

Method	Analyst	Analyst ID
SW846 6010B	Kolarczyk, Paul F	PFK
SW846 7471A	Ithal, Kyle M	KMI
SW846 7471A	Klee, George O	GOK
SW846 9045C	Brogan, Mary T	MTB
EPA PercentMoisture	Boyd, Cheryl L	CLB

SAMPLE SUMMARY

Client: Deigan & Associates

Job Number: 500-5271-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
500-5271-1	LSF-GP-15(0-6)	Solid	07/13/2007 0815	07/14/2007 1200
500-5271-2	LSF-GP-15(1.5-2)	Solid	07/13/2007 0820	07/14/2007 1200
500-5271-3	LSF-GP-16(0-6)	Solid	07/13/2007 0845	07/14/2007 1200
500-5271-4	LSF-GP-16(1.5-2)	Solid	07/13/2007 0845	07/14/2007 1200
500-5271-5	LSF-GP-19(0-6)	Solid	07/13/2007 0900	07/14/2007 1200
500-5271-6	LSF-GP-19(4-5)	Solid	07/13/2007 0910	07/14/2007 1200
500-5271-7	LSF-GP-20(0-6)	Solid	07/13/2007 0930	07/14/2007 1200
500-5271-8	LSF-GP-20(2-2.5)	Solid	07/13/2007 0930	07/14/2007 1200
500-5271-9	LSF-GP-17(0-6)	Solid	07/13/2007 0935	07/14/2007 1200
500-5271-10	LSF-GP-17(1.5-2)	Solid	07/13/2007 0935	07/14/2007 1200
500-5271-11	LSF-GP-18(0-6)	Solid	07/13/2007 1015	07/14/2007 1200
500-5271-12	LSF-GP-18(1.5-2)	Solid	07/13/2007 1015	07/14/2007 1200
500-5271-13	LSF-GP-14(0-6)	Solid	07/13/2007 1040	07/14/2007 1200
500-5271-14	LSF-GP-14(1.5-2)	Solid	07/13/2007 1040	07/14/2007 1200

SAMPLE RESULTS

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5271-1

Client Sample ID: LSF-GP-15(0-6)
Lab Sample ID: 500-5271-1

Date Sampled: 07/13/2007 0815
Date Received: 07/14/2007 1200
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/24/2007 0129		
Prep Method: 3010A			Date Prepared:	07/23/2007 0830		
Lead	<0.0075		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/21/2007 1141		
Prep Method: 3050B			Date Prepared:	07/18/2007 0950		
Arsenic	4.9		mg/Kg	0.30	1.1	1.0
Barium	92		mg/Kg	0.48	1.1	1.0
Cadmium	0.74		mg/Kg	0.066	0.22	1.0
Chromium	27		mg/Kg	0.12	1.1	1.0
Lead	180		mg/Kg	0.26	0.55	1.0
Selenium	<1.1		mg/Kg	0.42	1.1	1.0
Silver	0.39	J	mg/Kg	0.11	0.55	1.0
Method: 7471A			Date Analyzed:	07/17/2007 1427		
Prep Method: 7471A			Date Prepared:	07/17/2007 1050		
Mercury	130		ug/Kg	5.9	19	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1459		
Percent Moisture	11		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5271-1

Client Sample ID: LSF-GP-15(1.5-2)
Lab Sample ID: 500-5271-2

Date Sampled: 07/13/2007 0820
Date Received: 07/14/2007 1200
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/24/2007 0147		
Prep Method: 3010A			Date Prepared:	07/23/2007 0830		
Lead	0.013		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/21/2007 1145		
Prep Method: 3050B			Date Prepared:	07/18/2007 0950		
Arsenic	7.4		mg/Kg	0.28	1.0	1.0
Barium	42		mg/Kg	0.46	1.0	1.0
Cadmium	0.36		mg/Kg	0.063	0.21	1.0
Chromium	11		mg/Kg	0.12	1.0	1.0
Lead	58		mg/Kg	0.25	0.52	1.0
Selenium	<1.0		mg/Kg	0.40	1.0	1.0
Silver	0.23	J	mg/Kg	0.10	0.52	1.0
Method: 7471A			Date Analyzed:	07/17/2007 1429		
Prep Method: 7471A			Date Prepared:	07/17/2007 1050		
Mercury	29		ug/Kg	5.7	18	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1459		
Percent Moisture	7.1		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5271-1

Client Sample ID: LSF-GP-16(0-6)
Lab Sample ID: 500-5271-3

Date Sampled: 07/13/2007 0845
Date Received: 07/14/2007 1200
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/24/2007 0214		
Prep Method: 3010A			Date Prepared:	07/23/2007 0830		
Lead	<0.0075		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/21/2007 1150		
Prep Method: 3050B			Date Prepared:	07/18/2007 0950		
Arsenic	4.6		mg/Kg	0.29	1.1	1.0
Barium	39		mg/Kg	0.47	1.1	1.0
Cadmium	0.21	J	mg/Kg	0.064	0.21	1.0
Chromium	9.6		mg/Kg	0.12	1.1	1.0
Lead	170		mg/Kg	0.26	0.53	1.0
Selenium	<1.1		mg/Kg	0.40	1.1	1.0
Silver	0.11	J	mg/Kg	0.11	0.53	1.0
Method: 7471A			Date Analyzed:	07/17/2007 1431		
Prep Method: 7471A			Date Prepared:	07/17/2007 1050		
Mercury	71		ug/Kg	5.7	18	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1459		
Percent Moisture	7.1		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5271-1

Client Sample ID: LSF-GP-16(1.5-2)
Lab Sample ID: 500-5271-4

Date Sampled: 07/13/2007 0845
Date Received: 07/14/2007 1200
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/24/2007 0219		
Prep Method: 3010A			Date Prepared:	07/23/2007 0830		
Lead	0.0077		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/21/2007 1154		
Prep Method: 3050B			Date Prepared:	07/18/2007 0950		
Arsenic	4.8		mg/Kg	0.27	0.99	1.0
Barium	53		mg/Kg	0.44	0.99	1.0
Cadmium	0.61		mg/Kg	0.060	0.20	1.0
Chromium	16		mg/Kg	0.11	0.99	1.0
Lead	150		mg/Kg	0.24	0.50	1.0
Selenium	<0.99		mg/Kg	0.38	0.99	1.0
Silver	0.15	J	mg/Kg	0.099	0.50	1.0
Method: 7471A			Date Analyzed:	07/17/2007 1434		
Prep Method: 7471A			Date Prepared:	07/17/2007 1050		
Mercury	100		ug/Kg	5.4	17	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1459		
Percent Moisture	2.1		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5271-1

Client Sample ID: LSF-GP-19(0-6)
Lab Sample ID: 500-5271-5

Date Sampled: 07/13/2007 0900
Date Received: 07/14/2007 1200
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/24/2007 0223		
Prep Method: 3010A			Date Prepared:	07/23/2007 0830		
Lead	<0.0075		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/21/2007 1159		
Prep Method: 3050B			Date Prepared:	07/18/2007 0950		
Arsenic	2.7		mg/Kg	0.26	0.97	1.0
Barium	74		mg/Kg	0.43	0.97	1.0
Cadmium	0.40		mg/Kg	0.058	0.19	1.0
Chromium	9.1		mg/Kg	0.11	0.97	1.0
Lead	79		mg/Kg	0.23	0.49	1.0
Selenium	0.43	J	mg/Kg	0.37	0.97	1.0
Silver	0.24	J	mg/Kg	0.097	0.49	1.0
Method: 7471A			Date Analyzed:	07/17/2007 1436		
Prep Method: 7471A			Date Prepared:	07/17/2007 1050		
Mercury	60		ug/Kg	5.6	18	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1459		
Percent Moisture	5.8		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5271-1

Client Sample ID: LSF-GP-19(4-5)
Lab Sample ID: 500-5271-6

Date Sampled: 07/13/2007 0910
Date Received: 07/14/2007 1200
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/24/2007 0228		
Prep Method: 3010A			Date Prepared:	07/23/2007 0830		
Lead	<0.0075		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/21/2007 1203		
Prep Method: 3050B			Date Prepared:	07/18/2007 0950		
Arsenic	4.1		mg/Kg	0.27	1.0	1.0
Barium	77		mg/Kg	0.44	1.0	1.0
Cadmium	1.8		mg/Kg	0.060	0.20	1.0
Chromium	15		mg/Kg	0.11	1.0	1.0
Lead	160		mg/Kg	0.24	0.50	1.0
Selenium	0.56	J	mg/Kg	0.38	1.0	1.0
Silver	0.40	J	mg/Kg	0.10	0.50	1.0
Method: 7471A			Date Analyzed:	07/17/2007 1449		
Prep Method: 7471A			Date Prepared:	07/17/2007 1050		
Mercury	94		ug/Kg	6.0	19	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1459		
Percent Moisture	12		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5271-1

Client Sample ID: LSF-GP-20(0-6)
Lab Sample ID: 500-5271-7

Date Sampled: 07/13/2007 0930
Date Received: 07/14/2007 1200
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/24/2007 0232		
Prep Method: 3010A			Date Prepared:	07/23/2007 0830		
Lead	0.013		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/21/2007 1208		
Prep Method: 3050B			Date Prepared:	07/18/2007 0950		
Antimony	1.6	J	mg/Kg	0.57	2.1	1.0
Arsenic	10		mg/Kg	0.28	1.0	1.0
Barium	43		mg/Kg	0.46	1.0	1.0
Beryllium	1.2		mg/Kg	0.016	0.42	1.0
Cadmium	1.1		mg/Kg	0.063	0.21	1.0
Chromium	9.2		mg/Kg	0.12	1.0	1.0
Cobalt	5.3		mg/Kg	0.098	0.52	1.0
Copper	89		mg/Kg	0.15	1.0	1.0
Lead	76		mg/Kg	0.25	0.52	1.0
Nickel	16		mg/Kg	0.45	1.0	1.0
Selenium	1.2		mg/Kg	0.40	1.0	1.0
Silver	0.63		mg/Kg	0.10	0.52	1.0
Tin	6.6	B	mg/Kg	0.44	2.1	1.0
Vanadium	23		mg/Kg	0.19	0.52	1.0
Zinc	310	B	mg/Kg	0.26	2.1	1.0
Method: 6010B			Date Analyzed:	07/26/2007 0150		
Prep Method: 3050B			Date Prepared:	07/18/2007 0950		
Thallium	0.87	J	mg/Kg	0.48	1.0	1.0
Method: 7471A			Date Analyzed:	07/17/2007 1451		
Prep Method: 7471A			Date Prepared:	07/17/2007 1050		
Mercury	38		ug/Kg	5.6	18	1.0
Method: 9045C			Date Analyzed:	07/16/2007 0850		
pH	7.05		SU	0.200	0.200	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1459		
Percent Moisture	5.9		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5271-1

Client Sample ID: LSF-GP-20(2-2.5)
Lab Sample ID: 500-5271-8

Date Sampled: 07/13/2007 0930
Date Received: 07/14/2007 1200
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/24/2007 0237		
Prep Method: 3010A			Date Prepared:	07/23/2007 0830		
Lead	<0.0075		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/21/2007 1212		
Prep Method: 3050B			Date Prepared:	07/18/2007 0950		
Arsenic	1.1		mg/Kg	0.28	1.0	1.0
Barium	6.9		mg/Kg	0.45	1.0	1.0
Cadmium	<0.20		mg/Kg	0.061	0.20	1.0
Chromium	5.1		mg/Kg	0.11	1.0	1.0
Lead	7.5		mg/Kg	0.25	0.51	1.0
Selenium	<1.0		mg/Kg	0.39	1.0	1.0
Silver	<0.51		mg/Kg	0.10	0.51	1.0
Method: 7471A			Date Analyzed:	07/17/2007 1453		
Prep Method: 7471A			Date Prepared:	07/17/2007 1050		
Mercury	8.2	J	ug/Kg	5.5	17	1.0
Method: 9045C			Date Analyzed:	07/16/2007 0850		
pH	8.32		SU	0.200	0.200	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1459		
Percent Moisture	3.3		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5271-1

Client Sample ID: LSF-GP-17(0-6)
Lab Sample ID: 500-5271-9

Date Sampled: 07/13/2007 0935
Date Received: 07/14/2007 1200
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/24/2007 0241		
Prep Method: 3010A			Date Prepared:	07/23/2007 0830		
Lead	<0.038		mg/L	0.025	0.038	5.0
Method: 6010B			Date Analyzed:	07/21/2007 1258		
Prep Method: 3050B			Date Prepared:	07/18/2007 0950		
Antimony	1.5	J	mg/Kg	0.57	2.1	1.0
Arsenic	22		mg/Kg	0.29	1.1	1.0
Barium	28		mg/Kg	0.47	1.1	1.0
Beryllium	2.7		mg/Kg	0.016	0.42	1.0
Cadmium	4.6		mg/Kg	0.063	0.21	1.0
Chromium	9.7		mg/Kg	0.12	1.1	1.0
Cobalt	7.2		mg/Kg	0.099	0.53	1.0
Copper	35		mg/Kg	0.15	1.1	1.0
Lead	36		mg/Kg	0.25	0.53	1.0
Nickel	33		mg/Kg	0.45	1.1	1.0
Selenium	0.88	J	mg/Kg	0.40	1.1	1.0
Silver	0.13	J	mg/Kg	0.11	0.53	1.0
Tin	2.3	B	mg/Kg	0.44	2.1	1.0
Vanadium	29		mg/Kg	0.19	0.53	1.0
Zinc	400	B	mg/Kg	0.26	2.1	1.0
Method: 6010B			Date Analyzed:	07/26/2007 0156		
Prep Method: 3050B			Date Prepared:	07/18/2007 0950		
Thallium	0.96	J	mg/Kg	0.50	1.1	1.0
Method: 7471A			Date Analyzed:	07/17/2007 1506		
Prep Method: 7471A			Date Prepared:	07/17/2007 1050		
Mercury	13	J	ug/Kg	5.7	18	1.0
Method: 9045C			Date Analyzed:	07/16/2007 0850		
pH	7.84		SU	0.200	0.200	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1459		
Percent Moisture	7.0		%	0.10	0.10	1.0

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Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5271-1

Client Sample ID: LSF-GP-17(1.5-2)
Lab Sample ID: 500-5271-10

Date Sampled: 07/13/2007 0935
Date Received: 07/14/2007 1200
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/24/2007 0246		
Prep Method: 3010A			Date Prepared:	07/23/2007 0830		
Lead	<0.0075		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/21/2007 1302		
Prep Method: 3050B			Date Prepared:	07/18/2007 0950		
Arsenic	5.0		mg/Kg	0.31	1.1	1.0
Barium	23		mg/Kg	0.50	1.1	1.0
Cadmium	<0.23		mg/Kg	0.068	0.23	1.0
Chromium	11		mg/Kg	0.12	1.1	1.0
Lead	8.1		mg/Kg	0.27	0.57	1.0
Selenium	1.6		mg/Kg	0.43	1.1	1.0
Silver	<0.57		mg/Kg	0.11	0.57	1.0
Method: 7471A			Date Analyzed:	07/20/2007 1453		
Prep Method: 7471A			Date Prepared:	07/20/2007 1000		
Mercury	19	J	ug/Kg	6.0	19	1.0
Method: 9045C			Date Analyzed:	07/16/2007 0850		
pH	8.35		SU	0.200	0.200	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1459		
Percent Moisture	12		%	0.10	0.10	1.0

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Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5271-1

Client Sample ID: LSF-GP-18(0-6)
Lab Sample ID: 500-5271-11

Date Sampled: 07/13/2007 1015
Date Received: 07/14/2007 1200
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	07/24/2007 0251		
Prep Method: 3010A		Date Prepared:	07/23/2007 0830		
Lead	0.041	mg/L	0.0050	0.0075	1.0
Method: 6010B		Date Analyzed:	07/21/2007 1307		
Prep Method: 3050B		Date Prepared:	07/18/2007 0950		
Arsenic	13	mg/Kg	0.31	1.1	1.0
Barium	81	mg/Kg	0.50	1.1	1.0
Cadmium	2.6	mg/Kg	0.068	0.23	1.0
Chromium	23	mg/Kg	0.13	1.1	1.0
Lead	290	mg/Kg	0.27	0.57	1.0
Selenium	2.1	mg/Kg	0.43	1.1	1.0
Silver	0.86	mg/Kg	0.11	0.57	1.0
Method: 7471A		Date Analyzed:	07/20/2007 1455		
Prep Method: 7471A		Date Prepared:	07/20/2007 1000		
Mercury	120	ug/Kg	6.3	20	1.0
Method: PercentMoisture		Date Analyzed:	07/15/2007 1459		
Percent Moisture	16	%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5271-1

Client Sample ID: LSF-GP-18(1.5-2)
Lab Sample ID: 500-5271-12

Date Sampled: 07/13/2007 1015
Date Received: 07/14/2007 1200
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	07/24/2007 0255		
Prep Method: 3010A		Date Prepared:	07/23/2007 0830		
Lead	0.019	mg/L	0.0050	0.0075	1.0
Method: 6010B		Date Analyzed:	07/21/2007 1311		
Prep Method: 3050B		Date Prepared:	07/18/2007 0950		
Arsenic	5.4	mg/Kg	0.29	1.1	1.0
Barium	15	mg/Kg	0.47	1.1	1.0
Cadmium	0.65	mg/Kg	0.065	0.22	1.0
Chromium	6.8	mg/Kg	0.12	1.1	1.0
Lead	70	mg/Kg	0.26	0.54	1.0
Selenium	<1.1	mg/Kg	0.41	1.1	1.0
Silver	<0.54	mg/Kg	0.11	0.54	1.0
Method: 7471A		Date Analyzed:	07/20/2007 1457		
Prep Method: 7471A		Date Prepared:	07/20/2007 1000		
Mercury	24	ug/Kg	6.2	20	1.0
Method: PercentMoisture		Date Analyzed:	07/15/2007 1459		
Percent Moisture	15	%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5271-1

Client Sample ID: LSF-GP-14(0-6)
Lab Sample ID: 500-5271-13

Date Sampled: 07/13/2007 1040
Date Received: 07/14/2007 1200
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/24/2007 0322		
Prep Method: 3010A			Date Prepared:	07/23/2007 0830		
Lead	0.0077		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/21/2007 1316		
Prep Method: 3050B			Date Prepared:	07/18/2007 0950		
Arsenic	3.2		mg/Kg	0.27	0.99	1.0
Barium	48		mg/Kg	0.44	0.99	1.0
Cadmium	0.11	J	mg/Kg	0.060	0.20	1.0
Chromium	16		mg/Kg	0.11	0.99	1.0
Lead	24		mg/Kg	0.24	0.50	1.0
Selenium	<0.99		mg/Kg	0.38	0.99	1.0
Silver	0.27	J	mg/Kg	0.099	0.50	1.0
Method: 7471A			Date Analyzed:	07/20/2007 1500		
Prep Method: 7471A			Date Prepared:	07/20/2007 1000		
Mercury	34		ug/Kg	5.5	17	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1459		
Percent Moisture	3.3		%	0.10	0.10	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5271-1

Client Sample ID: LSF-GP-14(1.5-2)
Lab Sample ID: 500-5271-14

Date Sampled: 07/13/2007 1040
Date Received: 07/14/2007 1200
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B			Date Analyzed:	07/24/2007 0327		
Prep Method: 3010A			Date Prepared:	07/23/2007 0830		
Lead	0.031		mg/L	0.0050	0.0075	1.0
Method: 6010B			Date Analyzed:	07/21/2007 1320		
Prep Method: 3050B			Date Prepared:	07/18/2007 0950		
Arsenic	6.7		mg/Kg	0.29	1.1	1.0
Barium	46		mg/Kg	0.47	1.1	1.0
Cadmium	0.56		mg/Kg	0.064	0.21	1.0
Chromium	8.0		mg/Kg	0.12	1.1	1.0
Lead	150		mg/Kg	0.26	0.53	1.0
Selenium	0.66	J	mg/Kg	0.41	1.1	1.0
Silver	0.31	J	mg/Kg	0.11	0.53	1.0
Method: 7471A			Date Analyzed:	07/20/2007 1502		
Prep Method: 7471A			Date Prepared:	07/20/2007 1000		
Mercury	140		ug/Kg	5.7	18	1.0
Method: PercentMoisture			Date Analyzed:	07/15/2007 1459		
Percent Moisture	7.5		%	0.10	0.10	1.0

DATA REPORTING QUALIFIERS

Client: Deigan & Associates

Job Number: 500-5271-1

Lab Section	Qualifier	Description
Metals		
	B	Compound was found in the blank and sample.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

QUALITY CONTROL RESULTS

Client: Deigan & Associates

Job Number: 500-5271-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 500-18684					
LCS 500-18684/2-A	Lab Control Spike	T	Solid	7471A	
MB 500-18684/1-A	Method Blank	T	Solid	7471A	
500-5271-1	LSF-GP-15(0-6)	T	Solid	7471A	
500-5271-2	LSF-GP-15(1.5-2)	T	Solid	7471A	
500-5271-3	LSF-GP-16(0-6)	T	Solid	7471A	
500-5271-4	LSF-GP-16(1.5-2)	T	Solid	7471A	
500-5271-5	LSF-GP-19(0-6)	T	Solid	7471A	
Prep Batch: 500-18685					
LCS 500-18685/2-A	Lab Control Spike	T	Solid	7471A	
MB 500-18685/1-A	Method Blank	T	Solid	7471A	
500-5271-6	LSF-GP-19(4-5)	T	Solid	7471A	
500-5271-7	LSF-GP-20(0-6)	T	Solid	7471A	
500-5271-8	LSF-GP-20(2-2.5)	T	Solid	7471A	
500-5271-8DU	Duplicate	T	Solid	7471A	
500-5271-8MS	Matrix Spike	T	Solid	7471A	
500-5271-8MSD	Matrix Spike Duplicate	T	Solid	7471A	
500-5271-9	LSF-GP-17(0-6)	T	Solid	7471A	
Analysis Batch:500-18695					
LCS 500-18684/2-A	Lab Control Spike	T	Solid	7471A	500-18684
MB 500-18684/1-A	Method Blank	T	Solid	7471A	500-18684
LCS 500-18685/2-A	Lab Control Spike	T	Solid	7471A	500-18685
MB 500-18685/1-A	Method Blank	T	Solid	7471A	500-18685
500-5271-1	LSF-GP-15(0-6)	T	Solid	7471A	500-18684
500-5271-2	LSF-GP-15(1.5-2)	T	Solid	7471A	500-18684
500-5271-3	LSF-GP-16(0-6)	T	Solid	7471A	500-18684
500-5271-4	LSF-GP-16(1.5-2)	T	Solid	7471A	500-18684
500-5271-5	LSF-GP-19(0-6)	T	Solid	7471A	500-18684
500-5271-6	LSF-GP-19(4-5)	T	Solid	7471A	500-18685
500-5271-7	LSF-GP-20(0-6)	T	Solid	7471A	500-18685
500-5271-8	LSF-GP-20(2-2.5)	T	Solid	7471A	500-18685
500-5271-8DU	Duplicate	T	Solid	7471A	500-18685
500-5271-8MS	Matrix Spike	T	Solid	7471A	500-18685
500-5271-8MSD	Matrix Spike Duplicate	T	Solid	7471A	500-18685
500-5271-9	LSF-GP-17(0-6)	T	Solid	7471A	500-18685

Client: Deigan & Associates

Job Number: 500-5271-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 500-18738					
LCS 500-18738/2-A	Lab Control Spike	T	Solid	3050B	
MB 500-18738/1-A	Method Blank	T	Solid	3050B	
500-5271-1	LSF-GP-15(0-6)	T	Solid	3050B	
500-5271-2	LSF-GP-15(1.5-2)	T	Solid	3050B	
500-5271-3	LSF-GP-16(0-6)	T	Solid	3050B	
500-5271-4	LSF-GP-16(1.5-2)	T	Solid	3050B	
500-5271-5	LSF-GP-19(0-6)	T	Solid	3050B	
500-5271-6	LSF-GP-19(4-5)	T	Solid	3050B	
500-5271-7	LSF-GP-20(0-6)	T	Solid	3050B	
500-5271-8	LSF-GP-20(2-2.5)	T	Solid	3050B	
500-5271-8DU	Duplicate	T	Solid	3050B	
500-5271-8MS	Matrix Spike	T	Solid	3050B	
500-5271-8MSD	Matrix Spike Duplicate	T	Solid	3050B	
500-5271-9	LSF-GP-17(0-6)	T	Solid	3050B	
500-5271-10	LSF-GP-17(1.5-2)	T	Solid	3050B	
500-5271-11	LSF-GP-18(0-6)	T	Solid	3050B	
500-5271-12	LSF-GP-18(1.5-2)	T	Solid	3050B	
500-5271-13	LSF-GP-14(0-6)	T	Solid	3050B	
500-5271-14	LSF-GP-14(1.5-2)	T	Solid	3050B	
Prep Batch: 500-18866					
LB 500-18866/1-B	TCLP SPLPE Leachate Blank	P	Solid	1311	
500-5271-1	LSF-GP-15(0-6)	P	Solid	1311	
500-5271-1DU	Duplicate	P	Solid	1311	
500-5271-1MS	Matrix Spike	P	Solid	1311	
500-5271-2	LSF-GP-15(1.5-2)	P	Solid	1311	
500-5271-3	LSF-GP-16(0-6)	P	Solid	1311	
500-5271-4	LSF-GP-16(1.5-2)	P	Solid	1311	
500-5271-5	LSF-GP-19(0-6)	P	Solid	1311	
500-5271-6	LSF-GP-19(4-5)	P	Solid	1311	
500-5271-7	LSF-GP-20(0-6)	P	Solid	1311	
500-5271-8	LSF-GP-20(2-2.5)	P	Solid	1311	
500-5271-9	LSF-GP-17(0-6)	P	Solid	1311	
500-5271-10	LSF-GP-17(1.5-2)	P	Solid	1311	
500-5271-11	LSF-GP-18(0-6)	P	Solid	1311	
500-5271-12	LSF-GP-18(1.5-2)	P	Solid	1311	
500-5271-13	LSF-GP-14(0-6)	P	Solid	1311	
500-5271-14	LSF-GP-14(1.5-2)	P	Solid	1311	

Client: Deigan & Associates

Job Number: 500-5271-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:500-19023					
LCS 500-18738/2-A	Lab Control Spike	T	Solid	6010B	500-18738
MB 500-18738/1-A	Method Blank	T	Solid	6010B	500-18738
500-5271-1	LSF-GP-15(0-6)	T	Solid	6010B	500-18738
500-5271-2	LSF-GP-15(1.5-2)	T	Solid	6010B	500-18738
500-5271-3	LSF-GP-16(0-6)	T	Solid	6010B	500-18738
500-5271-4	LSF-GP-16(1.5-2)	T	Solid	6010B	500-18738
500-5271-5	LSF-GP-19(0-6)	T	Solid	6010B	500-18738
500-5271-6	LSF-GP-19(4-5)	T	Solid	6010B	500-18738
500-5271-7	LSF-GP-20(0-6)	T	Solid	6010B	500-18738
500-5271-8	LSF-GP-20(2-2.5)	T	Solid	6010B	500-18738
500-5271-8DU	Duplicate	T	Solid	6010B	500-18738
500-5271-8MS	Matrix Spike	T	Solid	6010B	500-18738
500-5271-8MSD	Matrix Spike Duplicate	T	Solid	6010B	500-18738
500-5271-9	LSF-GP-17(0-6)	T	Solid	6010B	500-18738
500-5271-10	LSF-GP-17(1.5-2)	T	Solid	6010B	500-18738
500-5271-11	LSF-GP-18(0-6)	T	Solid	6010B	500-18738
500-5271-12	LSF-GP-18(1.5-2)	T	Solid	6010B	500-18738
500-5271-13	LSF-GP-14(0-6)	T	Solid	6010B	500-18738
500-5271-14	LSF-GP-14(1.5-2)	T	Solid	6010B	500-18738
Prep Batch: 500-19033					
LCS 500-19033/2-A	Lab Control Spike	T	Water	3010A	
LB 500-18866/1-B	TCLP SPLPE Leachate Blank	P	Solid	3010A	500-18866
500-5271-1	LSF-GP-15(0-6)	P	Solid	3010A	500-18866
500-5271-1DU	Duplicate	P	Solid	3010A	500-18866
500-5271-1MS	Matrix Spike	P	Solid	3010A	500-18866
500-5271-2	LSF-GP-15(1.5-2)	P	Solid	3010A	500-18866
500-5271-3	LSF-GP-16(0-6)	P	Solid	3010A	500-18866
500-5271-4	LSF-GP-16(1.5-2)	P	Solid	3010A	500-18866
500-5271-5	LSF-GP-19(0-6)	P	Solid	3010A	500-18866
500-5271-6	LSF-GP-19(4-5)	P	Solid	3010A	500-18866
500-5271-7	LSF-GP-20(0-6)	P	Solid	3010A	500-18866
500-5271-8	LSF-GP-20(2-2.5)	P	Solid	3010A	500-18866
500-5271-9	LSF-GP-17(0-6)	P	Solid	3010A	500-18866
500-5271-10	LSF-GP-17(1.5-2)	P	Solid	3010A	500-18866
500-5271-11	LSF-GP-18(0-6)	P	Solid	3010A	500-18866
500-5271-12	LSF-GP-18(1.5-2)	P	Solid	3010A	500-18866
500-5271-13	LSF-GP-14(0-6)	P	Solid	3010A	500-18866
500-5271-14	LSF-GP-14(1.5-2)	P	Solid	3010A	500-18866

Client: Deigan & Associates

Job Number: 500-5271-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 500-19060					
LCS 500-19060/2-A	Lab Control Spike	T	Solid	7471A	
MB 500-19060/1-A	Method Blank	T	Solid	7471A	
500-5271-10	LSF-GP-17(1.5-2)	T	Solid	7471A	
500-5271-11	LSF-GP-18(0-6)	T	Solid	7471A	
500-5271-12	LSF-GP-18(1.5-2)	T	Solid	7471A	
500-5271-13	LSF-GP-14(0-6)	T	Solid	7471A	
500-5271-14	LSF-GP-14(1.5-2)	T	Solid	7471A	
Analysis Batch:500-19065					
LCS 500-19060/2-A	Lab Control Spike	T	Solid	7471A	500-19060
MB 500-19060/1-A	Method Blank	T	Solid	7471A	500-19060
500-5271-10	LSF-GP-17(1.5-2)	T	Solid	7471A	500-19060
500-5271-11	LSF-GP-18(0-6)	T	Solid	7471A	500-19060
500-5271-12	LSF-GP-18(1.5-2)	T	Solid	7471A	500-19060
500-5271-13	LSF-GP-14(0-6)	T	Solid	7471A	500-19060
500-5271-14	LSF-GP-14(1.5-2)	T	Solid	7471A	500-19060
Analysis Batch:500-19102					
MRL 500-19102/27	Method Reporting Limit Check	T	Water	6010B	
LB 500-18866/1-B	TCLP SPLPE Leachate Blank	P	Solid	6010B	500-19033
LCS 500-19033/2-A	Lab Control Spike	T	Water	6010B	500-19033
500-5271-1	LSF-GP-15(0-6)	P	Solid	6010B	500-19033
500-5271-1DU	Duplicate	P	Solid	6010B	500-19033
500-5271-1MS	Matrix Spike	P	Solid	6010B	500-19033
500-5271-2	LSF-GP-15(1.5-2)	P	Solid	6010B	500-19033
500-5271-3	LSF-GP-16(0-6)	P	Solid	6010B	500-19033
500-5271-4	LSF-GP-16(1.5-2)	P	Solid	6010B	500-19033
500-5271-5	LSF-GP-19(0-6)	P	Solid	6010B	500-19033
500-5271-6	LSF-GP-19(4-5)	P	Solid	6010B	500-19033
500-5271-7	LSF-GP-20(0-6)	P	Solid	6010B	500-19033
500-5271-8	LSF-GP-20(2-2.5)	P	Solid	6010B	500-19033
500-5271-9	LSF-GP-17(0-6)	P	Solid	6010B	500-19033
500-5271-10	LSF-GP-17(1.5-2)	P	Solid	6010B	500-19033
500-5271-11	LSF-GP-18(0-6)	P	Solid	6010B	500-19033
500-5271-12	LSF-GP-18(1.5-2)	P	Solid	6010B	500-19033
500-5271-13	LSF-GP-14(0-6)	P	Solid	6010B	500-19033
500-5271-14	LSF-GP-14(1.5-2)	P	Solid	6010B	500-19033
Analysis Batch:500-19226					
LCS 500-18738/2-A	Lab Control Spike	T	Solid	6010B	500-18738
MB 500-18738/1-A	Method Blank	T	Solid	6010B	500-18738
500-5271-7	LSF-GP-20(0-6)	T	Solid	6010B	500-18738
500-5271-9	LSF-GP-17(0-6)	T	Solid	6010B	500-18738

Client: Deigan & Associates

Job Number: 500-5271-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Report Basis					
P = TCLP					
T = Total					
General Chemistry					
Analysis Batch:500-18549					
500-5271-1	LSF-GP-15(0-6)	T	Solid	PercentMoisture	
500-5271-2	LSF-GP-15(1.5-2)	T	Solid	PercentMoisture	
500-5271-3	LSF-GP-16(0-6)	T	Solid	PercentMoisture	
500-5271-4	LSF-GP-16(1.5-2)	T	Solid	PercentMoisture	
500-5271-5	LSF-GP-19(0-6)	T	Solid	PercentMoisture	
500-5271-6	LSF-GP-19(4-5)	T	Solid	PercentMoisture	
500-5271-7	LSF-GP-20(0-6)	T	Solid	PercentMoisture	
500-5271-8	LSF-GP-20(2-2.5)	T	Solid	PercentMoisture	
500-5271-9	LSF-GP-17(0-6)	T	Solid	PercentMoisture	
500-5271-10	LSF-GP-17(1.5-2)	T	Solid	PercentMoisture	
500-5271-11	LSF-GP-18(0-6)	T	Solid	PercentMoisture	
500-5271-12	LSF-GP-18(1.5-2)	T	Solid	PercentMoisture	
500-5271-13	LSF-GP-14(0-6)	T	Solid	PercentMoisture	
500-5271-14	LSF-GP-14(1.5-2)	T	Solid	PercentMoisture	
Analysis Batch:500-18602					
500-5271-7	LSF-GP-20(0-6)	T	Solid	9045C	
500-5271-8	LSF-GP-20(2-2.5)	T	Solid	9045C	
500-5271-9	LSF-GP-17(0-6)	T	Solid	9045C	
500-5271-10	LSF-GP-17(1.5-2)	T	Solid	9045C	

Report Basis
T = Total

Client: Deigan & Associates

Job Number: 500-5271-1

Method Blank - Batch: 500-18738

Method: 6010B
Preparation: 3050B

Lab Sample ID: MB 500-18738/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/21/2007 1132
Date Prepared: 07/18/2007 0950

Analysis Batch: 500-19023
Prep Batch: 500-18738
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50721A
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Antimony	<2.0		0.54	2.0
Arsenic	<1.0		0.27	1.0
Barium	<1.0		0.44	1.0
Beryllium	<0.40		0.015	0.40
Cadmium	<0.20		0.060	0.20
Chromium	<1.0		0.11	1.0
Cobalt	<0.50		0.094	0.50
Copper	<1.0		0.14	1.0
Lead	<0.50		0.24	0.50
Nickel	<1.0		0.43	1.0
Selenium	<1.0		0.38	1.0
Silver	<0.50		0.10	0.50
Tin	1.5	J	0.42	2.0
Vanadium	<0.50		0.18	0.50
Zinc	0.72	J	0.25	2.0

Method Blank - Batch: 500-18738

Method: 6010B
Preparation: 3050B

Lab Sample ID: MB 500-18738/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/26/2007 0131
Date Prepared: 07/18/2007 0950

Analysis Batch: 500-19226
Prep Batch: 500-18738
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P40724A
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 100 mL

Analyte	Result	Qual	MDL	RL
Thallium	<1.0		0.47	1.0

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5271-1

Lab Control Spike - Batch: 500-18738

Method: 6010B
Preparation: 3050B

Lab Sample ID: LCS 500-18738/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/21/2007 1136
Date Prepared: 07/18/2007 0950

Analysis Batch: 500-19023
Prep Batch: 500-18738
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50721A
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Antimony	50.0	45.7	91	80 - 120	
Arsenic	10.0	9.02	90	80 - 120	
Barium	200	192	96	80 - 120	
Beryllium	5.00	4.79	96	80 - 120	
Cadmium	5.00	4.84	97	80 - 120	
Chromium	20.0	19.5	98	80 - 120	
Cobalt	50.0	47.7	95	80 - 120	
Copper	25.0	25.0	100	80 - 120	
Lead	10.0	9.82	98	80 - 120	
Nickel	50.0	47.9	96	80 - 120	
Selenium	10.0	9.16	92	80 - 120	
Silver	5.00	4.47	89	80 - 120	
Tin	100	94.7	95	80 - 120	
Vanadium	50.0	48.5	97	80 - 120	
Zinc	50.0	48.0	96	80 - 120	

Lab Control Spike - Batch: 500-18738

Method: 6010B
Preparation: 3050B

Lab Sample ID: LCS 500-18738/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/26/2007 0143
Date Prepared: 07/18/2007 0950

Analysis Batch: 500-19226
Prep Batch: 500-18738
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P40724A
Initial Weight/Volume: 1.0000 g
Final Weight/Volume: 100 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Thallium	10.0	8.27	83	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5271-1

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-18738

Method: 6010B
Preparation: 3050B

MS Lab Sample ID: 500-5271-8
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/21/2007 1249
Date Prepared: 07/18/2007 0950

Analysis Batch: 500-19023
Prep Batch: 500-18738

Instrument ID: TJA ICAP 61E Trace
Lab File ID: P50721A
Initial Weight/Volume: 1.0245 g
Final Weight/Volume: 100 mL

MSD Lab Sample ID: 500-5271-8
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/21/2007 1253
Date Prepared: 07/18/2007 0950

Analysis Batch: 500-19023
Prep Batch: 500-18738

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50721A
Initial Weight/Volume: 1.0960 g
Final Weight/Volume: 100 mL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Arsenic	92	96	75 - 125	2	20		
Barium	93	95	75 - 125	5	20		
Cadmium	91	91	75 - 125	6	20		
Chromium	102	101	75 - 125	6	20		
Lead	84	85	75 - 125	3	20		
Selenium	91	92	75 - 125	5	20		
Silver	91	93	75 - 125	5	20		

Duplicate - Batch: 500-18738

Method: 6010B
Preparation: 3050B

Lab Sample ID: 500-5271-8
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/21/2007 1244
Date Prepared: 07/18/2007 0950

Analysis Batch: 500-19023
Prep Batch: 500-18738
Units: mg/Kg

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50721A
Initial Weight/Volume: 1.0312 g
Final Weight/Volume: 100 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Arsenic	1.1	1.19	6	20	
Barium	6.9	7.07	3	20	
Cadmium	<0.20	-0.117	NC	20	
Chromium	5.1	5.28	3	20	
Lead	7.5	6.32	17	20	
Selenium	<1.0	0.106	NC	20	
Silver	<0.51	-0.0110	NC	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5271-1

TCLP SPLPE Leachate Blank - Batch: 500-19033

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: LB 500-18866/1-B
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/24/2007 0120
Date Prepared: 07/23/2007 0830
Date Leached: 07/19/2007 1310

Analysis Batch: 500-19102
Prep Batch: 500-19033
Units: mg/L
Leachate Batch: 500-18866

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50723A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Lead	<0.0075		0.0050	0.0075

Lab Control Spike - Batch: 500-19033

Method: 6010B
Preparation: 3010A

Lab Sample ID: LCS 500-19033/2-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/24/2007 0125
Date Prepared: 07/23/2007 0830

Analysis Batch: 500-19102
Prep Batch: 500-19033
Units: mg/L

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50723A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Lead	0.100	0.0937	94	80 - 120	

Matrix Spike - Batch: 500-19033

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: 500-5271-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/24/2007 0143
Date Prepared: 07/23/2007 0830
Date Leached: 07/19/2007 1310

Analysis Batch: 500-19102
Prep Batch: 500-19033
Units: mg/L
Leachate Batch: 500-18866

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50723A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Lead	<0.0075	5.00	4.64	93	50 - 150	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5271-1

Duplicate - Batch: 500-19033

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: 500-5271-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/24/2007 0138
Date Prepared: 07/23/2007 0830
Date Leached: 07/19/2007 1310

Analysis Batch: 500-19102
Prep Batch: 500-19033
Units: mg/L

Leachate Batch: 500-18866

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50723A
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Lead	<0.0075	0.00366	NC	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5271-1

Method Reporting Limit Check - Batch: 500-19102

Method: 6010B
Preparation: N/A

Lab Sample ID: MRL 500-19102/27
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 07/23/2007 2219
Date Prepared: N/A

Analysis Batch: 500-19102
Prep Batch: N/A
Units: mg/L

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50723A
Initial Weight/Volume: mL
Final Weight/Volume: 1 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Lead	0.00500	0.00509	102	70 - 130	J

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5271-1

Method Blank - Batch: 500-18684

Method: 7471A
Preparation: 7471A

Lab Sample ID: MB 500-18684/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/17/2007 1325
Date Prepared: 07/17/2007 1050

Analysis Batch: 500-18695
Prep Batch: 500-18684
Units: ug/Kg

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	<17		5.3	17

Lab Control Spike - Batch: 500-18684

Method: 7471A
Preparation: 7471A

Lab Sample ID: LCS 500-18684/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/17/2007 1327
Date Prepared: 07/17/2007 1050

Analysis Batch: 500-18695
Prep Batch: 500-18684
Units: ug/Kg

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	167	168	100	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5271-1

Method Blank - Batch: 500-18685

Method: 7471A
Preparation: 7471A

Lab Sample ID: MB 500-18685/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/17/2007 1444
Date Prepared: 07/17/2007 1050

Analysis Batch: 500-18695
Prep Batch: 500-18685
Units: ug/Kg

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	<17		5.3	17

Lab Control Spike - Batch: 500-18685

Method: 7471A
Preparation: 7471A

Lab Sample ID: LCS 500-18685/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/17/2007 1446
Date Prepared: 07/17/2007 1050

Analysis Batch: 500-18695
Prep Batch: 500-18685
Units: ug/Kg

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	167	168	100	80 - 120	

Matrix Spike/
Matrix Spike Duplicate Recovery Report - Batch: 500-18685

Method: 7471A
Preparation: 7471A

MS Lab Sample ID: 500-5271-8
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/17/2007 1457
Date Prepared: 07/17/2007 1050

Analysis Batch: 500-18695
Prep Batch: 500-18685

Instrument ID: Leeman Labs PS200 Mer
Lab File ID: N/A
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

MSD Lab Sample ID: 500-5271-8
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/17/2007 1503
Date Prepared: 07/17/2007 1050

Analysis Batch: 500-18695
Prep Batch: 500-18685

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

Analyte	% Rec. MS	% Rec. MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Mercury	101	100	75 - 125	1	20		

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5271-1

Duplicate - Batch: 500-18685

Method: 7471A
Preparation: 7471A

Lab Sample ID: 500-5271-8
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/17/2007 1455
Date Prepared: 07/17/2007 1050

Analysis Batch: 500-18695
Prep Batch: 500-18685
Units: ug/Kg

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.6 g
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual		Result	RPD	Limit	Qual
Mercury	8.2	J	2.67	NC	20	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5271-1

Method Blank - Batch: 500-19060

Method: 7471A
Preparation: 7471A

Lab Sample ID: MB 500-19060/1-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 1622
Date Prepared: 07/20/2007 1000

Analysis Batch: 500-19065
Prep Batch: 500-19060
Units: ug/Kg

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.60 g
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Mercury	<17		5.3	17

Lab Control Spike - Batch: 500-19060

Method: 7471A
Preparation: 7471A

Lab Sample ID: LCS 500-19060/2-A
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 07/20/2007 1624
Date Prepared: 07/20/2007 1000

Analysis Batch: 500-19065
Prep Batch: 500-19060
Units: ug/Kg

Instrument ID: Leeman Labs PS200 Merc
Lab File ID: N/A
Initial Weight/Volume: 0.60 g
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Mercury	167	171	102	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

SEVERN TRENT **STL**

STL Chicago
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Gary Deiss
Company: Deiss & Assoc. LLC
Address: 100 S. Genesee
Waukegan IL 60085
Phone: (847) 623-9336
Fax: ( ) " -9355
E-Mail:

Bill To:
Contact: SAME
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only 1 of 2

Lab Lot# 500-5271

Package Sealed	Samples Sealed
Yes No	Yes No
Received on Ice	**Samples Intact**
Yes No	Yes No

Temperature °C of Cooler (3.7) (4.1)

Within Hold Time	Preserv. Indicated
Yes No	Yes No NA
pH Check OK	**Res Cl_2 Check OK**
Yes No NA	Yes No NA

Sample Labels and COC Agree: Yes No COC not present

07/27/2007

Sampler Name: Kerry VanAllen
Signature: KL
Project Name: Lake Shore Foundry
Project Number:
Project Location: Waukegan IL
Lab PM: D. Gregory
Date Required Hard Copy: __/__/__ Fax: __/__/__

Refrg #			
# / Cont.	1	1	1
Volume	8oz	8oz	8oz
Preserv	-	-	-

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	TCLP Lead	TPH DRO/RRO Method	Total Aromatics TX Method	PH							Additional Analyses / Remarks
1		LSF-GP-15 (0-6")	7/13/07	8:15	S	G	X	X									
2		LSF-GP-15 (1.5-2')		8:5	S	G	X	X									
3		LSF-GP-16 (0-6")		8:45	S	G	X	X									
4		LSF-GP-16 (1.5-2')		8:45	S	G	X	X									
5		LSF-GP-19 (0-6")		9:00	S	G	X	X									
6		LSF-GP-19 (2-5')		9:10	S	G	X	X									
7		LSF-GP-20 (0-6")		9:30	S	G	X		X	X							
8		LSF-GP-20 (2-2.5')		9:30	S	G	X	X		X							
9		LSF-GP-17 (0-6")		9:35	S	G	X		X	X							
10		LSF-GP-17 (1.5-2')		9:35	S	G	X	X		X							
11		LSF-GP-18 (0-6")		10:15	S	G	X	X									
12		LSF-GP-18 (1.5-2')		10:15	S	G	X	X									

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
KL	Deiss & Assoc. LLC	7/13/07	11:30	[illegible]	SL	7/14/07	1200
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. Cool to 4°
7. None

COMMENTS

Date Received 7, 14, 07
Courier: FX **Hand Delivered** ☐
Bill of Lading see attach

STL Chicago is a part of Severn Trent Laboratories, Inc.

STL-8208 (0600)

SEVERN TRENT **STL**

STL Chicago
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Report To:
Contact: Greg Dreyer
Company: Dreyer Associates LLC
Address: 100 S. Genesee
Waukegan IL 60085
Phone: (847) 623-9356
Fax: (") " 9335
E-Mail:

Bill To:
Contact: Same
Company:
Address:
Phone:
Fax:
PO#: Quote:

Shaded Areas For Internal Use Only 2 of 2

Lab Lot# 500-5271

Package Sealed	Samples Sealed
Yes No	Yes No
Received on Ice	**Samples Intact**
Yes No	Yes No

Temperature °C of Cooler

07/27/2007

Sampler Name: Kevin VanAllen
Signature: KL
Project Name: Lake Shore Foundry
Project Number:
Project Location: Waukegan IL
Lab PM: D. Wright
Date Required Hard Copy: __/__/__ Fax: __/__/__

Within Hold Time	Preserv. Indicated
Yes No	Yes No NA
pH Check OK	**Res Cl_2 Check OK**
Yes No NA	Yes No NA

Sample Labels and COC Agree: Yes No COC not present

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	TCLP Lead	Total TCRA Metals	Additional Analyses / Remarks
Refrg #									
# / Cont.							1	1	
Volume							8oz	8oz	
Preserv									
13		LSF-GP-14(0-6")	7/13/07	10:45	S	G	X	X	
14		LSF-GP-14(1.5-2')	"	10:40	S	G	X	X	

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
KL	Dreyer Associates LLC	7/13/07	11:30	[illegible]	SN	7/14/07	1200
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. Cool to 4°
7. None

COMMENTS

Date Received 7/14/07
Courier: FX Hand Delivered ☐
Bill of Lading

STL Chicago is a part of Severn Trent Laboratories, Inc.

STL-8208 (0600)

LOGIN SAMPLE RECEIPT CHECK LIST

Client: Deigan & Associates

Job Number: 500-5271-1

Login Number: 5271

Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	3.7,4.1
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

ANALYTICAL REPORT

Job Number: 500-5946-1

Job Description: Lake Shore Foundry, Waukegan

For:
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Attention: Gary Deigan

Richard C Wright
Project Manager II
rwright@stl-inc.com
08/23/2007

These test results meet all the requirements of NELAC for accredited parameters.

The Lab Certification ID# is 100201.

All questions regarding this test report should be directed to the TestAmerica Project Manager whose signature appears on this report. All pages of this report are integral parts of the analytical data. Therefore, this report should be

Job Narrative
500-J5946-1

Comments
No additional comments.

Receipt
All samples were received in good condition within temperature requirements.

Metals
No analytical or quality issues were noted.

METHOD SUMMARY

Client: Deigan & Associates

Job Number: 500-5946-1

Description	Lab Location	Method	Preparation Method
Matrix: Solid			
Lead	TAL CHI	SW846 6010B	
Toxicity Characteristic Leaching Procedure	TAL CHI		SW846 1311
Acid Digestion of Aqueous Samples and Extracts for	TAL CHI		SW846 3010A

Lab References:

TAL CHI = TestAmerica Chicago

Method References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

SAMPLE SUMMARY

Client: Deigan & Associates

Job Number: 500-5946-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
500-5946-1	SP-21, 0-0.5	Solid	08/10/2007 1255	08/11/2007 0955
500-5946-2	SP-21, 1.5-2	Solid	08/10/2007 1255	08/11/2007 0955
500-5946-3	SP-22, 0-0.5	Solid	08/10/2007 1315	08/11/2007 0955
500-5946-4	SP-22, 4-4.5	Solid	08/10/2007 1320	08/11/2007 0955
500-5946-5	SP-23, 0-0.5	Solid	08/10/2007 1325	08/11/2007 0955
500-5946-6	SP-23, 1-1.5	Solid	08/10/2007 1325	08/11/2007 0955
500-5946-7	SP-24, 0-0.5	Solid	08/10/2007 1340	08/11/2007 0955
500-5946-8	SP-24, 2.5-3	Solid	08/10/2007 1340	08/11/2007 0955
500-5946-9	SP-25, 0-0.5	Solid	08/10/2007 1350	08/11/2007 0955
500-5946-10	SP-25, 1-1.5	Solid	08/10/2007 1350	08/11/2007 0955
500-5946-11	SP-26, 0-0.5	Solid	08/10/2007 1405	08/11/2007 0955
500-5946-12	SP-26, 2-2.5	Solid	08/10/2007 1405	08/11/2007 0955

SAMPLE RESULTS

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5946-1

Client Sample ID: SP-21, 0-0.5
Lab Sample ID: 500-5946-1

Date Sampled: 08/10/2007 1255
Date Received: 08/11/2007 0955
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	08/17/2007 2008		
Prep Method: 3010A		Date Prepared:	08/16/2007 1650		
Lead	0.011	mg/L	0.0050	0.0075	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5946-1

Client Sample ID: SP-21, 1.5-2
Lab Sample ID: 500-5946-2

Date Sampled: 08/10/2007 1255
Date Received: 08/11/2007 0955
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	08/17/2007 2030		
Prep Method: 3010A		Date Prepared:	08/16/2007 1650		
Lead	0.21	mg/L	0.0050	0.0075	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5946-1

Client Sample ID: SP-22, 0-0.5
Lab Sample ID: 500-5946-3

Date Sampled: 08/10/2007 1315
Date Received: 08/11/2007 0955
Client Matrix: Solid

Analyte	Result/Qualifier		Unit	MDL	RL	Dilution
Method: TCLP-6010B				Date Analyzed:	08/17/2007 2035	
Prep Method: 3010A				Date Prepared:	08/16/2007 1650	
Lead	0.0064	J	mg/L	0.0050	0.0075	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5946-1

Client Sample ID: SP-22, 4-4.5
Lab Sample ID: 500-5946-4

Date Sampled: 08/10/2007 1320
Date Received: 08/11/2007 0955
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	08/17/2007 2039		
Prep Method: 3010A		Date Prepared:	08/16/2007 1650		
Lead	<0.0075	mg/L	0.0050	0.0075	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5946-1

Client Sample ID: SP-23, 0-0.5
Lab Sample ID: 500-5946-5

Date Sampled: 08/10/2007 1325
Date Received: 08/11/2007 0955
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	08/17/2007 2106		
Prep Method: 3010A		Date Prepared:	08/16/2007 1650		
Lead	<0.0075	mg/L	0.0050	0.0075	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5946-1

Client Sample ID: SP-23, 1-1.5
Lab Sample ID: 500-5946-6

Date Sampled: 08/10/2007 1325
Date Received: 08/11/2007 0955
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	08/17/2007 2111		
Prep Method: 3010A		Date Prepared:	08/16/2007 1650		
Lead	<0.0075	mg/L	0.0050	0.0075	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5946-1

Client Sample ID: SP-24, 0-0.5
Lab Sample ID: 500-5946-7

Date Sampled: 08/10/2007 1340
Date Received: 08/11/2007 0955
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	08/17/2007 2115		
Prep Method: 3010A		Date Prepared:	08/16/2007 1650		
Lead	0.0098	mg/L	0.0050	0.0075	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5946-1

Client Sample ID: SP-24, 2.5-3
Lab Sample ID: 500-5946-8

Date Sampled: 08/10/2007 1340
Date Received: 08/11/2007 0955
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	08/17/2007 2120		
Prep Method: 3010A		Date Prepared:	08/16/2007 1650		
Lead	0.21	mg/L	0.0050	0.0075	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5946-1

Client Sample ID: SP-25, 0-0.5
Lab Sample ID: 500-5946-9

Date Sampled: 08/10/2007 1350
Date Received: 08/11/2007 0955
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	08/17/2007 2124		
Prep Method: 3010A		Date Prepared:	08/16/2007 1650		
Lead	<0.0075	mg/L	0.0050	0.0075	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5946-1

Client Sample ID: SP-25, 1-1.5
Lab Sample ID: 500-5946-10

Date Sampled: 08/10/2007 1350
Date Received: 08/11/2007 0955
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	08/17/2007 2129		
Prep Method: 3010A		Date Prepared:	08/16/2007 1650		
Lead	0.026	mg/L	0.0050	0.0075	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5946-1

Client Sample ID: SP-26, 0-0.5
Lab Sample ID: 500-5946-11

Date Sampled: 08/10/2007 1405
Date Received: 08/11/2007 0955
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	08/17/2007 2134		
Prep Method: 3010A		Date Prepared:	08/16/2007 1650		
Lead	0.29	mg/L	0.0050	0.0075	1.0

Gary Deigan
Deigan & Associates
100 S. Genesee St.
Waukegan, IL 60085

Job Number: 500-5946-1

Client Sample ID: SP-26, 2-2.5
Lab Sample ID: 500-5946-12

Date Sampled: 08/10/2007 1405
Date Received: 08/11/2007 0955
Client Matrix: Solid

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: TCLP-6010B		Date Analyzed:	08/17/2007 2138		
Prep Method: 3010A		Date Prepared:	08/16/2007 1650		
Lead	0.025	mg/L	0.0050	0.0075	1.0

DATA REPORTING QUALIFIERS

Client: Deigan & Associates

Job Number: 500-5946-1

Lab Section	Qualifier	Description
Metals		
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

QUALITY CONTROL RESULTS

Client: Deigan & Associates

Job Number: 500-5946-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 500-20684					
LB 500-20684/1-B	TCLP SPLPE Leachate Blank	P	Solid	1311	
LB2 500-20684/2-B	TCLP SPLPW Leachate Blank	P	Solid	1311	
500-5946-1	SP-21, 0-0.5	P	Solid	1311	
500-5946-1MS	Matrix Spike	P	Solid	1311	
500-5946-2	SP-21, 1.5-2	P	Solid	1311	
500-5946-3	SP-22, 0-0.5	P	Solid	1311	
500-5946-4	SP-22, 4-4.5	P	Solid	1311	
500-5946-5	SP-23, 0-0.5	P	Solid	1311	
500-5946-6	SP-23, 1-1.5	P	Solid	1311	
500-5946-7	SP-24, 0-0.5	P	Solid	1311	
500-5946-8	SP-24, 2.5-3	P	Solid	1311	
500-5946-9	SP-25, 0-0.5	P	Solid	1311	
500-5946-10	SP-25, 1-1.5	P	Solid	1311	
500-5946-11	SP-26, 0-0.5	P	Solid	1311	
500-5946-12	SP-26, 2-2.5	P	Solid	1311	
Prep Batch: 500-20815					
LCS 500-20815/3-A	Lab Control Spike	T	Water	3010A	
LB 500-20684/1-B	TCLP SPLPE Leachate Blank	P	Solid	3010A	500-20684
LB2 500-20684/2-B	TCLP SPLPW Leachate Blank	P	Solid	3010A	500-20684
500-5946-1	SP-21, 0-0.5	P	Solid	3010A	500-20684
500-5946-1MS	Matrix Spike	P	Solid	3010A	500-20684
500-5946-2	SP-21, 1.5-2	P	Solid	3010A	500-20684
500-5946-3	SP-22, 0-0.5	P	Solid	3010A	500-20684
500-5946-4	SP-22, 4-4.5	P	Solid	3010A	500-20684
500-5946-5	SP-23, 0-0.5	P	Solid	3010A	500-20684
500-5946-6	SP-23, 1-1.5	P	Solid	3010A	500-20684
500-5946-7	SP-24, 0-0.5	P	Solid	3010A	500-20684
500-5946-8	SP-24, 2.5-3	P	Solid	3010A	500-20684
500-5946-9	SP-25, 0-0.5	P	Solid	3010A	500-20684
500-5946-10	SP-25, 1-1.5	P	Solid	3010A	500-20684
500-5946-11	SP-26, 0-0.5	P	Solid	3010A	500-20684
500-5946-12	SP-26, 2-2.5	P	Solid	3010A	500-20684

Client: Deigan & Associates

Job Number: 500-5946-1

QC Association Summary

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Analysis Batch:500-20923					
LB 500-20684/1-B	TCLP SPLPE Leachate Blank	P	Solid	6010B	500-20815
LB2 500-20684/2-B	TCLP SPLPW Leachate Blank	P	Solid	6010B	500-20815
LCS 500-20815/3-A	Lab Control Spike	T	Water	6010B	500-20815
500-5946-1	SP-21, 0-0.5	P	Solid	6010B	500-20815
500-5946-1MS	Matrix Spike	P	Solid	6010B	500-20815
500-5946-2	SP-21, 1.5-2	P	Solid	6010B	500-20815
500-5946-3	SP-22, 0-0.5	P	Solid	6010B	500-20815
500-5946-4	SP-22, 4-4.5	P	Solid	6010B	500-20815
500-5946-5	SP-23, 0-0.5	P	Solid	6010B	500-20815
500-5946-6	SP-23, 1-1.5	P	Solid	6010B	500-20815
500-5946-7	SP-24, 0-0.5	P	Solid	6010B	500-20815
500-5946-8	SP-24, 2.5-3	P	Solid	6010B	500-20815
500-5946-9	SP-25, 0-0.5	P	Solid	6010B	500-20815
500-5946-10	SP-25, 1-1.5	P	Solid	6010B	500-20815
500-5946-11	SP-26, 0-0.5	P	Solid	6010B	500-20815
500-5946-12	SP-26, 2-2.5	P	Solid	6010B	500-20815

Report Basis
P = TCLP
T = Total

Client: Deigan & Associates

Job Number: 500-5946-1

TCLP SPLPE Leachate Blank - Batch: 500-20815

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: LB 500-20684/1-B
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/17/2007 1954
Date Prepared: 08/16/2007 1650
Date Leached: 08/15/2007 1225

Analysis Batch: 500-20923
Prep Batch: 500-20815
Units: mg/L
Leachate Batch: 500-20684

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50817B
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Lead	<0.0075		0.0050	0.0075

TCLP SPLPW Leachate Blank - Batch: 500-20815

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: LB2 500-20684/2-B
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/17/2007 1958
Date Prepared: 08/16/2007 1650
Date Leached: 08/15/2007 1225

Analysis Batch: 500-20923
Prep Batch: 500-20815
Units: mg/L
Leachate Batch: 500-20684

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50817B
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Lead	<0.0075		0.0050	0.0075

Lab Control Spike - Batch: 500-20815

Method: 6010B
Preparation: 3010A

Lab Sample ID: LCS 500-20815/3-A
Client Matrix: Water
Dilution: 1.0
Date Analyzed: 08/17/2007 2003
Date Prepared: 08/16/2007 1650

Analysis Batch: 500-20923
Prep Batch: 500-20815
Units: mg/L

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50817B
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Lead	0.100	0.101	101	80 - 120	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Deigan & Associates

Job Number: 500-5946-1

Matrix Spike - Batch: 500-20815

Method: 6010B
Preparation: 3010A
TCLP

Lab Sample ID: 500-5946-1
Client Matrix: Solid
Dilution: 1.0
Date Analyzed: 08/17/2007 2021
Date Prepared: 08/16/2007 1650
Date Leached: 08/15/2007 1225

Analysis Batch: 500-20923
Prep Batch: 500-20815
Units: mg/L

Leachate Batch: 500-20684

Instrument ID: TJA ICAP 61E Trace Analy
Lab File ID: P50817B
Initial Weight/Volume: 50 mL
Final Weight/Volume: 50 mL

Analyte	Sample Result/Qual	Spike Amount	Result	% Rec.	Limit	Qual
Lead	0.011	5.00	4.83	96	50 - 150	

Calculations are performed before rounding to avoid round-off errors in calculated results.

SEVERN TRENT **STL**

STL Chicago
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

Contact: Gary Deisem
Company: Deisem Assoc LLC
Address: 100 S. Genesee
Waukegan IL 60085
Phone: (847) 623-9356
Fax: (") " 9355
E-Mail:

Contact: SAME
Company:
Address:
Phone:
Fax:
PO#: Quote:

Lab Lot# 500-5946

Package Sealed	Samples Sealed
Yes No	Yes No
Received on Ice	**Samples Intact**
Yes No	Yes No

Temperature °C of Cooler 4.6

08/23/2007

Sampler Name: K. VanAllen
Signature:
Project Name: Lake Shore Fabricating
Project Number:
Project Location: Waukegan IL
Lab PM: D. Wright
Date Required
Hard Copy: ___/___/___
Fax: ___/___/___

Within Held Time	Preserv. Indicated
Yes No	Yes No NA
pH Check OK	**Res Cl_2 Check OK**
Yes No NA	Yes No NA
Sample Labels and COC Agree	
Yes No	COC not present

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	TCLP Lead									Additional Analyses / Remarks
Refrg #																
# / Cont.							1									
Volume							8oz									
Preserv							–									
1		SP-21, 0-0.5'	8/10/07	12:55	S	C	X									
2		SP-21, 1.5-2.0'		12:55			X									
3		SP-22, 0-0.5'		1:15			X									
4		SP-22, 4-4.5'		1:20			X									
5		SP-23, 0-0.5'		1:25			X									
6		SP-23, 1-1.5'		1:25			X									
7		SP-24, 0-0.5'		1:40			X									
8		SP-24, 2.5-3'		1:40			X									
9		SP-25, 0-0.5'		1:50			X									
10		SP-25, 1-1.5'		1:50			X									
11		SP-26, 0-0.5'		2:05			X									
12		SP-26, 2-2.5'		2:05			X									

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[signature]	Deisem Assoc. LLC	8/10/07	3:00 PM	[signature]	STL	8-11-07	0955
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. Cool to 4°
7. None

COMMENTS

Date Received / /
Courier: **Hand Delivered**
Bill of Lading

STL Chicago is a part of Severn Trent Laboratories, Inc.

STL-8208 (0600)

LOGIN SAMPLE RECEIPT CHECK LIST

Client: Deigan & Associates

Job Number: 500-5946-1

Login Number: 5946

Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.6
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	NA	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

Deigan & Associates, LLC
Environmental Consultants

Appendix D

Proposed Approach to Soil Treatment & Disposal

Interim Measures Report
Lake Shore Foundry
653 Market Street, Waukegan, Lake County, Illinois

TECNICA ENVIRONMETAL SERVICES, INC.

August 17, 2007

Mr. Gary Deigan
Deigan & Associates, LLC
100 S. Genesee St.
Waukegan, Illinois 60085

Subject: **Soil Remediation**
Lake Shore Foundry
Waukegan, Illinois

Dear Mr. Deigan:

Tecnica Environmental Services Inc. (TES) is pleased to present this proposal for site remediation services at the subject site.

BACKGROUND

Approximately 500 CY (900 tons) of foundry sand at the Site have been found to contain elevated lead concentrations. Laboratory soil sample results indicate lead levels analyzed by TCLP to range up to 55 milligrams per liter (mg/L). Lead concentrations above 5 mg/L by TCLP categorize the material as a Hazardous Waste. TES proposes to treat the material so it can be transported and disposed as a Special Waste.

SCOPE OF WORK

TES proposes to conduct the following tasks:

- Prepare and submit a waste profile to obtain landfill approval for disposal of the contaminated soil. As we understand it, laboratory analysis for the waste characterization sample will be provided by others.

- Prepare a health and safety plan for TES personnel working at the Site.

- Prepare the required manifests necessary for the transportation and disposal of the wastes.

- Mobilize the necessary equipment and personnel (excavators, pumps, hoses, etc.) required to complete the work.

- Delineate the immediate work areas (Hot Zones) using mobile A-frames and plastic fencing (orange snow fence), or similar to control access to the work areas.

1612 West Fulton Street · Chicago, Illinois 60612
Phone (312) 243-0077 · Fax (312) 243-0046

- Treat lead-impacted soils will with a phosphoric acid based, liquid reagent to stabilize the lead ions. The soils will be mechanically mixed in situ using a conventional track-mounted backhoe.

- Collect composite soil samples from the treated soils and submit them to Deigan & Assoc. who will arrange and/or provide for analytical testing of each sample for TCLP lead on a 24- to 36-hour turnaround time. An estimated one sample should be collected for each 100 CY.

- Upon receipt of soil sample results indicating TCLP lead concentrations below 5.0 mg/L, the treated soils will be loaded directly into dump trucks for transportation to an Illinois EPA approved landfill as a Special Waste. TES will prepare the required manifests necessary for the transportation and disposal of the soils. If samples are above 5.0 mg/L the soil will be re-treated and sampled.

- As we understand it, backfilling the excavated areas will not be needed.

COST ESTIMATE

TES proposes to conduct the work as follows:

Description	**Estimated Amount**	**Unit**	**Unit Price**	**Cost**
• Mobilization	1	LS	$1,500	$2,500
• Soil Treatment, Mixing, Excavation and Disposal	900	Tons	$53.60	$48,240
ESTIMATED FEE				**$50,740**

RELEVANT EXPERIENCE

Soil Remediation, O'Hare Modernization Program, Northwest Acquisition Area, Des Plaines, IL Remediation of two parcels including the treatment, stabilization and removal of 88,000 tons of hazardous waste soils (characteristically hazardous for lead). The hazardous waste soils where treated with a liquid reagent to stabilize the lead and allow the soils to be disposed as a non-hazardous waste (less than 2% of the treated soils had to be re-treated). Work also included demolition of concrete slabs and footings/foundations (approximately 10,000 tons); and backfilling with 33,000 tons of re-cycled concrete and crushed stone from a nearby borrow site.

Site Remediation, Site Preparation and Backfill, Future Home Depot Store, South Loop. Work consisted of preparing the site for new development. TES was responsible

for the subsurface work including the treatment, testing, removal and disposal of 22,000 tons of contaminated soils, characteristically hazardous for lead. The excavations ranged from shallow soils (2'-4') up to 9' deep. The work also included the removal and disposal of 7,000 tons of asphalt pavement and concrete slabs and footings; sidewalk and curb removal; backfill and compaction with 16,000 tons of crushed stone; installation of 400,000 SF of geotextile fabric; and final site grading for installation of the new building slab.

We appreciate the opportunity to present this proposal. Please contact us should you have any questions.

Very truly yours,
Tecnica Environmental Services, Inc.

RCalderon

Ray E. Calderon
V.P., Site Remediation

Patent Storm

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United States Patent 5994608

Reduction of leachability and solubility of radionuclides and radioactive substances in contaminated soils and materials

US Patent Issued on November 30, 1999

Inventor(s)

Dhiraj Pal
Karl W. Yost
Steven A. Chisick

Assignee

Sevenson Environmental Services, Inc.

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Examiners

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US Patent References

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Today In History

August 15, 1989
President George Bush issued a proclamation commemorating the bicentennial anniversary of the 1st patent and copyright laws.

ABSTRACT CLAIMS DESCRIPTION FULL TEXT

Description

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FIELD OF THE INVENTION

The present invention pertains to the field of chemical fixation of hazardous waste materials, including metal-bearing materials and radionuclides and radioactive substances, in debris, soils, solid materials, sludges and materials precipitated or filtered from liquids, rendering such hazardous waste materials within a stabilized, insoluble, non-leachable, non-zeolitic and pH stable form suitable for safe and ecologically-acceptable disposal; typically regulated by the U.S. Department of Energy, the U.S. Environmental Protection Agency ("USEPA"), and others. The ecologically safe state of the treated materials is not altered by exposure of the treated materials to acidic leachate, acid rain, or radioactive groundwater. In addition, the safe state of the treated materials is not altered by exposure to changing weather conditions; including rain, heat, freeze and thaw.

BACKGROUND OF THE INVENTION

Various forms of hazardous wastes pose a serious threat to the environment and safe and cost efficient methods for treating and disposing of these wastes has become increasingly important.

Hazardous wastes containing excessive amounts of leachable lead are banned from land disposal. The regulatory threshold limit under Resource Conservation and Recovery Act is 5 mg/l of leachable lead as measured by TCLP (toxicity characteristic leaching procedure) test criteria, United States Environmental Protection Agency (USEPA) method 1311 (SW-846). Waste materials containing TCLP lead levels in excess of 5 mg/l are defined as lead-toxic hazardous waste and are as such restricted from land-filling under current land ban regulations. The cost of disposing lead toxic hazardous waste materials is in excess of $200.00 per ton plus the cost of transporting the hazardous material to landfills for hazardous wastes, which do not exist in every state. This makes the disposal of lead toxic hazardous waste material very expensive. Therefore, treating the lead-bearing process materials and waste streams to render them non-hazardous by RCRA definition would cut down the costs of transportation and disposal tremendously.

Conventional treatment methods for radionuclides and other radioactive substances can be categorized into three groups: 1) separation; 2) structural containment; and 3) physical stabilization/solidification. These treatment methods are complex, costly, expand volumes, and are only temporary solutions.

Various conventional methods have been tried to remove leachable, mobile radionuclides and radioactive substances from soils and other materials. Removal of contamination from soils and solid materials by leaching, centrifugation, extraction and/or washing procedures is extremely expensive and cost-prohibitive because these methods generate vast quantities of contaminated liquid wastes which require further treatment and disposal.

Conventional solidification methods based on cementation technology require up to twenty-eight (28) days curing time, increase the waste volume and may raise the pH above 12.5. USEPA defines a pH above 12.5 as hazardous. Hardened cementitious material is not conducive to retreatment in the event treatment fails obligatory confirmation testing. Solidification methods utilizing lime kiln dust, calcium carbonate and/or powdered lime for fixation are, at best, temporary solutions. Furthermore, these methods increase the waste volume and mass. A primary concern is that cementitious methods dilute the parameters of concern in the final waste matrix.

In the past, radionuclide and radioactive wastes have been temporarily stored; frequently as a liquid, a sludge, or a contaminated fine-grained solid in conjunction with contaminated soils. The art has recognized that a means must be provided for permanent disposal of these wastes, preferably as non-leachable solids, containing non-migratory radionuclides. Such solids must have certain characteristics which make the solids

safe and economical for the long term (10^3 to 10^6 years) retention of radioactive isotopes.

SUMMARY OF THE INVENTION

The present invention discloses a method of treating hazardous waste materials, including metal-bearing materials and radionuclides and radioactive substances.

One embodiment of the present invention relates to a chemical treatment technology for immobilizing leachable lead in contaminated soils and solid waste materials. According to the present invention, a process for treating lead-toxic solid wastes in order to stabilize the leachable lead is disclosed, comprising the steps of (i) mixing the solid waste with a sulfate compound, such as calcium sulfate dihydrate (gypsum powder) or sulfuric acid, having at least one sulfate ion for contacting waste particles and reacting with said leachable lead to produce a substantially insoluble lead composition, such as anglesite and/or calcium-substituted anglesite; and, (ii) mixing said solid waste and sulfate compound with a phosphate reagent, such as phosphoric acid, having at least one phosphate ion for reacting with said leachable lead to produce a substantially insoluble lead composition. The treated material from this process is substantially solid in form and passes the Paint Filter Test while satisfying the regulatory standard for TCLP lead. In all instances, application of this process has been found very reliable in meeting the treatment objectives and in consistently decreasing waste volume.

It is an object of the present invention to provide a technology for treatment of lead-containing solid waste and soil that produces an acceptably low level of leachable lead in the final product to comply with the statutory requirements of TCLP and to pass the Paint Filter Test.

Another object of the invention is to provide such a process while producing no wastewater or secondary waste streams during said process.

Still another object of the invention is to provide such a process which also causes the solid waste material to undergo a volume reduction as a result of treatment.

Yet another object of the invention is to cause fixation of the leachable lead in the solid waste that is permanent under both ordinary and extreme environmental conditions.

The present invention relates to treatment methods employed to chemically convert leachable metal in metal-bearing solid and liquid waste materials to a non-leachable form by mixing the material with one or a combination of components, for example, lime or gypsum and phosphoric acid. The solid and liquid waste materials include contaminated sludges, slurries, soils, waste waters, spent carbon, sand, wire chips, plastic fluff, cracked battery casings, bird and buck shots and tetraethyl lead contaminated organic peat and muck. The metal-bearing materials referred to herein which the present invention treats include those materials having leachable lead, aluminum, arsenic (III), barium, bismuth, cadmium, chromium (III), cooper, iron, nickel, selenium, silver and zinc. The present invention discloses a process comprising a single step mixing of one or more treatment additives, and a process comprising a two step mixing wherein the sequence of performing the steps may be reversible. The present invention provides a novel way of treating a plurality of metal-contaminated materials at a wide range of pH. The method works under acidic, alkaline and neutral conditions.

The processes of the present invention provide reactions that convert leachable metals, especially lead, into a non-leachable form which is geochemically stable for indefinite periods and is expected to withstand acid rain impacts as well as the conditions of a landfill environment.

A first group of treatment chemicals for use in the processes of the present invention includes lime, gypsum, alum, halites, Portland cement, and other similar products that can supply sulfates, halites, hydroxides and/or silicates.

A second group consists of treatment chemicals which can supply phosphate ions. This group includes products such as phosphoric acid, pyrophosphates, triple super phosphate (TSP), trisodium phosphate, potassium phosphates, ammonium phosphates and/or others capable of supplying phosphate anion when mixed with a metal-bearing process material or with a metal-toxic hazardous waste. Depending on the process material or waste (i) matrix (solid, liquid or mixture thereof), (ii) category (RCRA or Superfund/CERCLIS), (iii) chemical composition (TCLP lead, total lead level, pH) and (iv) size and form (wire fluff, shots, sand, peat, sludge, slurry, clay, gravel, soil, broken battery casings, carbon with lead dross, etc.) the metal-bearing material is mixed with one or more treatment chemicals in sufficient quantity so as to render the metal substantially non-leachable, that is, to levels below the regulatory threshold limit under the TCLP test criteria of the USEPA. For lead-bearing materials, the treatment additives render the lead below the regulatory threshold limit of 5 mg/l by the TCLP test criteria of the USEPA. The disposal of lead-hazardous and other metal-hazardous waste materials in landfills is precluded under land ban regulations.

It is an object of the present invention to provide a method of treating metal-bearing materials, contaminated soils and waste effluent, and solid wastes containing hazardous levels of leachable metal. It is a further object to provide a method which decreases the leaching of lead in lead-bearing materials to levels below the regulatory limit of 5 mg/l by TCLP test criteria.

It is another object of the present invention to provide a method to immobilize lead to leachable levels below 5 mg/l by TCLP test criteria, through the use of inexpensive, readily accessible treatment chemicals. With this method, the leachability of lead is diminished, usually allowing municipal landfill disposal which would not otherwise be permitted.

Yet another object of the present invention is to provide a treatment method for metal-bearing wastes, particularly lead-bearing wastes, which comprises a single step mixing process or a two-step process wherein the sequence of the two steps may be reversed.

Another object of the present invention is to provide a method of treating a wide variety of lead bearing process materials, wire fluff and chips, cracked battery plastics, carbon with lead dross, foundry sand, lead base paint, leaded gasoline contaminated soils, peat and muck, sludges and slurries, lagoon sediment, and bird and buck shots, in order to render the material non-hazardous by RCRA definition, and pass the EPTOX, MEP, ANS Calvet and DI Water Extract tests.

Another object of the present invention is to extend the scope for broad application in-situ as well as ex-situ on small as well as large quantities of metal-bearing process materials or generated waste streams.

The present invention provides a method which converts metal-toxic process materials and hazardous wastes into a material which has a lower leachability of metal as determined by EPA's TCLP test. Such treated waste material can then be interned in a licensed landfill, a method of disposal only possible when the leachability of metal is diminished/reduced to levels below the regulatory threshold limit by TCLP test criteria, e.g., lead below 5 mg/l.

Another embodiment of the present invention relates to a chemical treatment process that reduces the leachability and solubility of radionuclides and other radioactive substances contained in debris, soils, sludges and solid materials ("the host material" or "the host matrix"). The process for treating radionuclides and other radioactive substances employs the same methods and treatment chemicals used for treating metal-bearing hazardous waste materials. The process comprises contacting radionuclides and other radioactive substances in the host matrix with the first and second group treatment chemicals to promote recrystallization of the host material into Apatitic-structured end-products. Preferred reactants are comprised of at least one phosphate group and create mineral species of Apatitic geometric structures with reduced nuclide leachability and solubility. In the preferred embodiment, technical grade phosphoric acid (TGPA) is used in a one step process. TGPA contains sulfate as an impurity in addition to a phosphate anion source.

The Apatite-structure ($(AB)_5 (PO_4)_3 Z$) is preferred since the anion Z position is usually a halogen or a hydroxyl, both active scavengers of cations. The unique properties of the Apatitic-structure, $(AB)_5 (XO_4)_3 Z$, are key to this invention. Just as low-temperature Apatite is nature's ion-prison in the biological/biosphere environment and high-temperature Apatite is natures ion-prison in the pegmatites/igneous lithosphere environment, Apatites can do the same in man-made (unnatural/synthetic) radioactive environments. The supplementary problem of metamict lattice disruptions, from the generation of excess heat and ion-cannon recoil damage by radioactive decay, is also self-resolved in Apatites.

Both low-temperature and high-temperature Apatitic-structures are self-healing and non-leaching. In one embodiment of the present invention, the flow of normal groundwater through the treated material should be encouraged since the groundwater will disperse the build-up of heat and eliminate the requirement for costly cooling of monolithic encasement structures. In another embodiment of the present invention, treated material contacted with groundwater contaminated with radionuclides and radioactive substances reduces the radioactive level of the ground water.

Natural scavenging of Lanthanides and Actinides by Apatitic-structure phosphate-complexing phases is well-documented from research conducted in connection with the mining of oceanic deposits throughout the world to produce phosphate products. To date, more than 300 Apatite mineral species have been classified by geologists.

Substitution within Apatites are extremely complex. Many require a charge-compensating mechanism that can be grossly estimated from ionic radii and coordination numbers. Common substitution mechanisms noted are as follows: 1) simple within-site substitutions; 2) coupled substitutions involving chemically similar cations; 3) substitutions involving large cation, such as Cs, with with smaller cations; 4) substitutions involving cation vacancies ; 5) substitutions coupling specific cations with specific anions; 6) substitutions involving anions; 7) substitutions involving anion vacancies; and 8) substitutions involving a change in valence.

From the structural and compositional studies of natural and synthetic Apatites, it is known that Apatites are complex geological structures. The present invention has found that Apatites can sustain a great variety of substitutions following the general formula $(AB)_5 (XO_4)_3 Z$, [sometimes written, $(AB)_{10} (XO_4)_6 Z_2$], wherein:

```
A =   Coordination Number 7 thru 12, most commonly 9. Cations
   smaller than Mn+2 are to small for an 8 coordination number,
        unless combined with a larger cation.
  = Ca, Sr, Mn, Pb, Mg, Ba, Zn, Cd, Fe, Ni, Co, Sn, Eu, Cu, and Be
        among divalent elements.
  = Na, K, Rb, Ag, Cs and possibly Li among monovalent elements.
  = Al, Fe, Y, rare earth elements (REE) except Eu and Ce, Bi and
        possibly Nb, Sb and Ti among trivalent elements.
  = U, Pb, Th, Zr, Ce, Transuranics and possibly Tl among
   quadrivalent elements.
  = [ ] minor lattice vacancies.
  B = Coordination Number 6 thru 9; most commonly 8. Cations
   smaller than W+6 are small for 6 coordination number and those
        larger than Zr+4 are too large.
```

```
= Ca, Sr, Mn, Pb, Mg, Ba, Zn, Cd, Fe, Ni, Co, Sn, Cu, and Be
 among divalent elements.
= Na, K, Rb, Ag, Li possibly among monovalent elements.
= Al, Fe, Sc, Sb, Y, Eu and Ce REE, Nb, Bi and possibly Ta
 among trivalent elements.
= Si, Mn, Ti, Mo, W, Sn, U, Th, Zr, C among quadrivalent
 elements.
= Actinide ion species conforming to Metal.O2 (especially UO2)
    .
= [ ] minor lattice vacancies.
XO4 = PO4, SiO4, SO4, AsO4, VO4, CrO4
    , BeO4, MoO4, CO3,
 CO3 F, WO4, MnO4, CO3 OH, BO4, AlO4,
    Fe3 O4, possibly
 GeO4, and SeO4
Z = F, OH, Cl, Br, I, O and [ ] minor lattice vacancy in structure
      of defective Apatites.
```

Element 43--Technetium is effected by the process with leachability greatly reduced; however, its positioning within the Apatitic-structure has not been determined with certainty.

Additionally, the radius ratios among A, B and XO_4 components, and their respective coordination number, can have a strong influence on the Apatite-structure. Problems occur when an element's ionic radius is small for A and large for B; therefore, a single site cannot be considered alone and a partitioning between A and B sites is proposed. The partitioning is extremely difficult to predict since the amounts involved may be very minor as well as promoting localized crystal disorder.

In its simplest and most efficient form, the current invention provides for the addition of at least one member selected from a first group of treatment chemicals that can supply sulfates, halides, hydroxides and/or silicates and at least one member selected from a second group of treatment chemicals that can supply phosphate ions to material consisting of, or containing, radionuclides and other radioactive substances. Technical grade phosphoric acid ("TGPA") that contains up to 70% (by weight) phosphate (as P_2O_5) and sulfate (SO_4^{-2}), typically as sulfuric acid in the range of 2.5% to 7% (by weight) as an impurity, is a source of both a sulfate ion and a phosphate ion and can, therefore, be used as a single reactant. The addition of water at any point in the process aids in the dispersion of the TGPA throughout the host matrix. As the TGPA disperses and permeates through the matrix and during the course of subsequent reactions, the leachability and solubility of radionuclides and other radioactive substances is reduced. Supplemental mechanical or physical mixing can also be employed to enhance the contact of the TGPA with the leachable species in the host material.

As a true chemical process, an object of the invention relies on molecular bonding and crystal nucleation principles to reduce nuclide solubility and to create conditions suitable for matrix volume reduction resulting, in part, from the dehydration properties of the treatment chemicals. When TGPA is utilized, molecular rearrangement and minimized addition of treatment agents is characteristic of the invention and supplemental buffering agents or traditional strength enhancement physical-binding additives typical of physically stabilized mixtures are not required. The end-product of the invention is a material that contains no free liquids and produces no supernatant wastewater or secondary waste streams. A further loss of water weight is achieved by capillary drying and evaporation which also contribute to volume reduction. Some volume reduction can be attributed to acidic carbonate destruction, especially those not incorporated into the Apatitic structures. The end product is friable and can be handled with traditional earth- moving equipment, as it is not monolithic in form.

Moreover, the end-product can be made to have enhanced geotechnical properties without compromising the chemistry of the nuclide leachability/solubility reduction. The addition of water, either to suppress dust or due to rainfall, and excavation or other material handling activities do not affect the nuclide leachability or solubility of the end-product.

Another object of the invention is to increase the level of protection offered by disposal facility designs engineered specifically to control, isolate, or contain material characterized with leachable radionuclides; and to minimize the migration of radionuclides and other radioactive substances from material that is accessed by the percolation of rain and surface waters, and/or the intrusion and flow-through of groundwater or leachate that can act as an ion-carrier. When groundwater contaminated with radionuclides and radioactive substances are contacted with materials treated by the present invention, the radioactive level of the groundwater will be reduced. The radionuclides and radioactive substances in the groundwater react with the phosphate compounds and sulfate compounds in the treated materials to form geochemically stable Apatite-structures.

A further object of the present invention is the addition of liquid or solid reagents to a solid material or sludge without creating secondary byproducts or separable streams. Another object of the present invention is to engage and employ preexisting carbonates, borates, sulfates, and/or silicates within the matrix at the time of phosphate anion addition so that they contribute to the formation of Apatitic-structures that reduce nuclide leachability and solubility and host matrix volume. An additional objective of the invention is the immediate initiation of process reactions upon the contacting of phosphate anion with the leachable or soluble species, without the separation of nuclides or other byproducts from the matrix. Another objective is the in situ or ex

situ application of process reagents to nuclide material; wherein fixation of the nuclides is permanent under both ordinary and extreme environmental conditions. Still another object of the invention is the use of acidity to enhance dissassociation of semi-soluble species so that problematic nuclides are freed to nucleate within the Apatite crystals. These and other objects will be apparent from the detailed description of the invention set forth below.

The invention may be more fully understood with reference to the accompanying drawings and the following description of the embodiments shown in those drawings. The invention is not limited to the exemplary embodiments but should be recognized as contemplating all modifications within the skill of an ordinary artisan.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 exhibits the single step mixing method of treatment chemicals metered into the pugmill or Maxon Mixer capable of processing lead hazardous waste materials at rates up to 100 tons/hour;

FIG. 2(a) exhibits the two step mixing with addition of group one treatment chemicals during step I and addition of group two treatment chemicals during step II;

FIG. 2(b) exhibits the two step mixing method with addition of group two treatment chemicals during step I and addition of group one treatment chemicals during step II. The reversibility of steps and combination of both steps into a single step is the discovery that is disclosed in this invention and illustrated in FIG. 1 and 2 (a) and (b).

FIG. 3 exhibits an embodiment of the invention which mixes gypsum and a liquid reagent to treat contaminated soil or toxic waste.

DESCRIPTION OF THE PREFERRED EMBODIMENT

According to the present invention, leachable lead in treated materials is decreased to levels well below 5.0 mg/l, measured by TCLP test criteria. Waste and process materials having TCLP lead level in excess of 5 mg/l are considered hazardous and must be treated to be brought into compliance with regulatory requirements. Other metal-bearing materials having leachable metals may also be treated according to the present invention to achieve acceptable metal levels.

The treatment technology according to another embodiment of the present invention consists of a two step process for treating contaminated soils and/or solid waste materials with chemical treating agents that convert leachable lead to synthetic (man-made) substantially insoluble lead mineral crystals. As used here, "substantially insoluble" means the leachable lead content in the treated waste sample is less than 5.0 mg/l in the extract by the TCLP Test.

Another preferred embodiment of the present invention consists of applying technical grade phosphoric acid (TGPA) that contains sulfate as an impurity to leachable and soluble radionuclides and other radioactive substances often found in debris, soils and solid materials. The addition of water aids in the dispersion and percolation of TGPA throughout the contaminated host matrix. Water can be added at any point of the process, either before or after the TGPA addition, or by diluting the TGPA and applying the dilute TGPA to the target matrix. Mixing of the TGPA with the host matrix is optional, dependent upon the permeability and porosity of the host material. When employed, mixing enhances the uniformity of reagent dispersion through the host material.

Treatment Chemicals and Additives

The treatment chemicals useful in the present invention may be divided into two groups. The addition of water with the additives may facilitate the ultimate mixing and reaction.

A first group, "group one", comprises a source of sulfate, hydroxide, chloride, fluoride and/or silicates. These sources are gypsum, lime, sodium silicate, cement, calcium fluoride, alum and/or like similar products.

The second group, "group two", comprises a source of phosphate anion. This group consists of products like phosphoric acid (phosphoric), pyrophosphates, triple super phosphate, trisodium phosphates, potassium phosphates, ammonium phosphates and/or similar compounds capable of supplying a phosphate anion.

The first step of this novel process comprises the reaction of leachable lead in contaminated soils or solid waste materials with a gypsum powder, calcium sulfate dihydrate ($CaSO_{4.2H.sub.2}$ O). Calcium sulfate dihydrate powder reacts with leachable and mobile lead species in wastes to form hard sulfates, which are relatively insoluble in water. In the invention, the powder form of dry calcium sulfate dihydrate, or gypsum, is preferred for blending with lead contaminated materials because it provides a uniform cover or dry coating over the surfaces of the waste particles and aggregates under low moisture conditions. The greatest benefit and fastest reaction is achieved under conditions wherein 95% of the powder is passable through a 100 mesh sieve, and the remaining 5% is passable through a 20 mesh sieve.

The amount of gypsum powder employed is typically from 0-30 percent of the weight of solid waste material being treated. The actual amount employed will vary with the degree and type of lead contamination in the waste material or soil, and with the initial composition as well as the condition of the waste material, among other factors.

Alternatively, sulfuric acid, or alum in liquid or powder form can also be used as sources of sulfate ion in

certain solid wastes that contain sufficient calcium prior to treatment.

Treatment Method

At lease one component from group one is added to the mixing vessel or reactor, preferably as a dry powder, although slurries could be pumped under certain circumstances. At least one component from group two is added to the mixing vessel or reactor as either liquid reagent or as granular solid materials.

The ingredients of group one and group two can be added to the hazardous waste materials simultaneously, and they are pre-mixed and added in a single step. Alternatively, the components of group one and two can be added sequentially in a two-step process with either component added first. That is, the two steps may occur in any order. At least one ingredient of group one can be added in step I or step II. Likewise, at least one ingredient of group two can be added in either step I or step II. Enough water may be added to allow good mixing to prevent dust formation, and to permit good chemical reaction. Not too much water is added to solid materials if the treated waste is to pass the paint filter test.

In the first step of the instant process, a thorough and uniform mixing of gypsum powder with the solid waste is accomplished by mixing shredded and screened waste particles with small gypsum particles in, for example, a grizzly or other mixing device. The calcium ions from the gypsum powder displace lead from soil complexes and organic micelles present in the contaminated soil and solid waste material The following equations (1) and (2) describe the reaction of leachable lead with gypsum. ##STR1##

The reaction of lead with gypsum forms a "hard sulfate" which crystallizes into mineral species of the barite family --anglesites and calcium-substituted anglesites --which are insoluble in water. The solubility product of lead sulfate is 1.8×10^{-8}, indicating that anglesite crystals would continue to develop over the geologic periods.

In the second step of the process, the solid waste material as amended with gypsum powder is treated with a phosphate-supplying reagent, such as (for example), phosphoric acid. Upon contact with the soil or solid waste, the phosphate-supplying reagent reacts chemically to immobilize the remaining leachable lead. The phosphate-supplying reagent includes phosphate ion sources having one or more reactive phosphate ions, such as phosphoric acid, trisodium phosphate, a potassium phosphate and monobasic or dibasic calcium phosphates.

The quantity of phosphate-supplying reagent employed will vary with the characteristics of the solid waste being treated, including particularly such factors as leachable lead content, total lead, and buffering capacity, among other factors. It has been determined that in most instances a quantity of phosphoric acid up to 30 percent of the weight of the waste material is sufficient. The concentration of phosphoric acid in solution will typically range from about 2 to 75 percent by weight. The solution and treatment process are maintained above 30° F. to permit the handling of the phosphoric acid as a liquid reagent. Below 30° F., the phosphoric acid tends to gel while water freezes to form ice, thus creating material handling problems.

Free lead, along with calcium ions found in the solid waste (including those imparted through the first step of the process), reacts with the phosphate to form insoluble superhard rock phosphates or calcium substituted hydroxy lead Apatites as shown in Equations (3a) and (3b): ##STR2##

The phosphate ions are added to the contaminated soils in solution form; for example, phosphoric acid may be added to water in amounts ranging from about 2 percent to about 75 percent by weight. Phosphoric acid decomposes carbonates and bicarbonates in wastes leading to the synthesis of Apatites and evolution of carbon dioxide gas. Destruction of carbonates and bicarbonates contributes to desirable volume reductions.

Although water molecules are generated during the carbonate and bicarbonate decomposition process, it is preferred to have soil moisture at about 10 per cent to about 40 per cent by weight of the soil in order to accelerate the fixation of the leachable lead with the phosphate ions. At this moisture range, material handling is also easy and efficient. It is apparent from Equations (2), (3a) and (3b) that gypsum and phosphoric acid decompose carbonates and bicarbonates during synthesis of new stable minerals of the barite, apatite, and pyromorphite families in soils (as shown in Table I). Decomposition of carbonates and bicarbonates is usually associated with the evolution of carbon dioxide, formation of hydroxyl group, (OH--), and the release of water molecules. As the water evaporates and carbon dioxide molecules are lost to the atmosphere, the treated waste mass and volume are decreased significantly.

The solid sulfate powder and the phosphate-supplying reagent are added to contaminated soil and solid waste material having a typical moisture content ranging from about 10 percent to about 40 percent by weight. At a moisture level within the foregoing range, the curing time of the treated materials is approximately 4 hours, which provides adequate time for chemical reactions to occur and immobilize the leachable lead species. Crystals of various lead mineral species begin to form immediately, but will continue over long time periods with an excess of treatment chemicals present. This contributes to "self-healing," as noted during treatability studies as well as full scale treatment operations.

Under the foregoing conditions, the immobilization of leachable lead occurs in a relatively dry environment because no wet byproducts, slurries or wastewater are produced by the process of the present invention. Operation of the process under relatively dry conditions beneficially allows cost-efficient handling of the contaminated soils and the waste materials. This allows compliance with Paint Filter Test for solid wastes required by USEPA and RCRA approved solid waste landfill facilities. Effective mechanical mixing, as by a pug mill or other such mixing device, eliminates the need for diffusion in the nonaqueous solid waste matrix.

The water resistant and insoluble lead minerals synthesized in soils and solid wastes according to this

process are stable, and would behave like naturally occurring rock phosphates and hard sulfates. A list of these synthetic lead mineral species and complexes is presented in Table I below, in order of the relative abundance found during characterization of treated soil by x-ray florescence spectrometry, polarized light microscopy (PLM) and scanning electron microscopy (SEM).

TABLE I

SYNTHETIC MINERAL SPECIES OF LEAD DETECTED IN A TREATED SAMPLE (LISTED IN DECREASING ORDER OF ABUNDANCE)
31-41% Calcium Substituted Hydroxy Lead Apatites, $Ca_{0.5-1.5}\ Pb_{3.5-4.5}\ (OH)(PO_4)_3$
28-29% Mixed Calcium Lead Phosphate Sulfates, $Ca_{0.05-0.2}\ Pb_{0.8-0.95}\ (PO_4)_{0.15-0.5}\ (SO_4)$.sub. 0.25-0.75
20-22% Mixed Calcium Anglesites, $Ca_{0.05-0.3}\ Pb_{0.7-0.95}\ (SO_4)$
3-6% Anglesites, $PbSO_4$
2-7% Lead Hydroxy/Chlor Apatite, $Pb_5\ (PO_4)_3\ (OH)_{0.5}\ Cl_{0.5}$
1-3% Pyromorphite, $Pb_3\ (PO_4)_2$
1-2% Organo-Lead Phosphate Sulfate, Humus-o-$Pb_3\ (PO_4)(SO_4)$

Some of the chemical reactions that occur during the curing stage, and lead to the development of mixed minerals containing both sulfates and phosphates, are illustrated in Equations (4) and (5). ##STR3##

The process of the present invention beneficially decreases the volume of the waste materials through: (i) the evolution of carbon dioxide during the chemical decomposition of carbonates and bicarbonates, upon reaction with the acidic components in gypsum and phosphoric acid, and (ii) hardening and chemical compaction as a result of the synthesis of new minerals which result in changes in interstitial spaces and interlattice structures. Applications of the process on a lead contaminated soil was associated with pore space decrease from 38.8% to 34.3% by volume. A decrease in pore space was associated with increased compaction of the treated soils and a decrease in overall waste volume ranging from 21.4% to 23.0%. For different waste types, the volume decrease varies with the amount of treatment chemicals used in the process. In another lead toxic solid waste, application of this process resulted in a volume decrease of the order of 36.4% while decreasing the leachable lead to levels below the regulatory threshold.

This reduction in volume of the contaminated soil and the solid waste material makes the process of the present invention particularly beneficial for off-site disposal in a secured landfill by cutting down the costs of transportation and storage space. The process can be accomplished at a cost-efficient engineering scale on-site or off-site for ex-situ treatment of lead-toxic solid wastes. This innovative treatment technology also offers a great potential for in-situ application to immobilize lead most economically without generation of any wastewater or byproducts.

FIG. 3 illustrates schematically the process of the present invention. The lead-contaminated uncontrolled hazardous waste site 10 with lead-toxic wastes is subject to excavation and segregation 20 of waste piles based on their total lead and TCLP lead contents into (a) heavily contaminated pile 30A, (b) moderately contaminated waste pile 30B and (c) least contaminated waste pile 30C. The staged soil and solid waste material in piles 30A, 30B and 30C is subjected to grinding, shredding, mixing 40 and screening 50 through an appropriately sized mesh sieve. The screening yields particles that are usually less than 5 inches in diameter for mixing with gypsum powder 60 in a grizzly that allows a uniform coating of gypsum over the soil particles and waste aggregates during the grinding, shredding and/or mixing step. Alternatively, as shown by the dashed line, gypsum powder 10 may be added continuously to the screened solid waste material in prescribed amounts as determined during treatability trials. Most of the leachable lead binds chemically with gypsum at molecular level to form lead sulfate, which crystallizes into a synthetic nucleus of mixed calcium anglesite and pure anglesite minerals identified in the treated material by chemical microscopy techniques.

The gypsum-coated waste particles and aggregates are then transported on a belt conveyor 70 or other conveying means to an area where an effective amount of phosphoric acid solution 80 of specified strengths in water 90 is added or sprayed just prior to thorough mixing in a pug mill 100 (or other mixing means). The temperature of the phosphoric solution is preferably maintained above 30° F. to prevent it from gelling. The treated soil and wastes are subject to curing 110 and drying 120 on a curing/drying pad, or may less preferably be cured and dried using thermal or mechanical techniques. The end product of the process passes the Paint Filter Test. During the curing time of about four hours, various "super-hard phosphate" mineral species, such as calcium-substituted hydroxy lead-Apatites and mixed calcium-lead phosphate-sulfate mineral species, are formed in treated waste media 130. Crystals of these mineral species (in early stages of development) have been identified in the treated soil materials and solid wastes by geo-chemical and microscopy techniques like PLM and SEM.

The proportions of waste materials and reagents used in the process may be varied within relatively wide limits. For example, the amount of gypsum powder should be sufficient to produce lead sulfate in contaminated solid or solid waste material. In addition, the amount of phosphate-supplying reagent is

prescribed in an amount sufficient to produce mineral species such as hydroxy-lead apatite in contaminated soil or solid waste material during a relatively short curing time of 4 hours, usually ranging from about 3 to about 5 hours. Further drying of the treated material may take 24 to 96 hours, but has not been required in any application to date. Table II documents the optimum curing time of 4 hours for the process. In all instances, the leachable lead as measured by the EP Toxicity Test Procedure was found below 0.6 mg/l and the differences between analytical values below this level and statistically insignificant.

TABLE II

DOCUMENTATION OF OPTIMUM CURING TIME
USING EP TOXICITY TEST CRITERIA FOR LEAD FIXATION

	EP Toxic Pb Concentration in mg/l		
EP Toxic Pb found Waste in processed sample (Untreated at a Curing Time of Sample)	4 Hrs.	48 Hrs.	96 Hrs.
Matrix Category	mg/l	mg/l	mg/l
Pb Toxic Soil A	495	0.4	0.4	0.6
Pb Toxic Soil B	46	0.3	0.2	0.2
Pb Toxic Soil C	520	0.3	0.5	0.5

The amount of the gypsum powder and the phosphoric acid employed will be dependent on the amount of contaminant present in the soil, initial characteristics of the solid waste material, whether the material is in-situ or is excavated and brought to an off-site facility for treatment; the same is true for other sulfate compounds and phosphate reagents. The following Example I describes various ratios of the chemical reagents for application to the excavated lead-contaminated solid wastes in order to render the leachable lead substantially insoluble; i.e., to reduce the leachable lead to levels below 5.0 mg/l by EP Toxicity Test lead and TCLP Test criteria now in force under current land-ban regulations.

When the present invention is used to treat radionuclides and other radioactive materials, the amounts of treatment chemicals added are a function of the contaminated host matrix geochemistry, the concentration of radionuclides in the host matrix, and the presence of potential interferences that could inhibit the reactions, and the geotechnical properties of the host material. A preferred rate of TGPA addition is in the range of 0.1 to 20% by weight of the matrix to be treated. Preferred water content will also vary with the characteristics of the host material to be treated, but should be in the range of 5% to 50% by weight. Water content may affect the rate of reaction with lower water content requiring longer reaction periods and increased need for supplemental mixing. Higher water content, on the other hand, may adversely impact subsequent material handling, and volume reduction results. Water supplied to an excess will yield a material that will contain free liquids. In these cases, the treated material should be allowed to react for a longer period of time to permit a decrease in moisture content by capillary drying and/or evaporation. In some instances, dewatering or other drying techniques may be used to form a material that contains no free liquids.

When TGPA is not utilized as the group two treatment chemical reagent, other compounds that provide soluble phosphates, or phosphates that can be solubilized may be substituted. The phosphates may be applied in a liquid form or as a solid. Prior to employing the process of the present invention at a site, laboratory tests should be conducted to determine the amounts of group one and group two treatment chemicals that will be needed for the contaminated matrix that is to be treated. Identification of carbonates, borates, sulfates, silicates and/or phosphates in the host material will facilitate the selection of the optimum quantities of treatment chemicals.

Temperature and Pressure

Ambient temperature and pressure may be used for the disclosed treatment process, permitted the operations of the feeding and mixing equipment allow such. Under sub-freezing conditions, phosphoric acid may be heated to 50° F. to prevent it from gelling and in order to keep it in a pumpable viscosity range.

Treatment System Design

The treatment may be performed under a batch or continuous system of using, for example, a weight-feed belt or platform scale for the metal-hazardous waste materials and a proportionate weight-belt feed system for the dry ingredient or ingredients and powders of at least one of the groups. A metering device, e.g., pump or auger feed system, may instead, or additionally, be used to feed the ingredients of at least one of the groups. The same equipment used for treating metal-hazardous waste material is used for treating soils and waste materials contaminated with radionuclides and other radioactive substances.

EXAMPLE 1

Single Step Mixing of Treatment Chemicals A lead contaminated soil from a battery cracking, burning, and recycling abandoned site was obtained and treated with group one and group two chemicals in one single step at bench-scale. The contaminated soil contained total lead in the range of 11.44% to 25.6% and TCLP lead in the ranged of 1781.3 mg/l to 3440 mg/l. The bulk density of contaminated soil was nearly 1.7 g/ml at moisture content of 10.3%. The contaminated soil pH was 5.1 with an oxidation reduction potential value of

89.8 mV. To each 100 g lot of lead hazardous waste soil, sufficient amounts of group one and group two treatment chemicals and reagents were added as illustrated in Table III, in order to render it nonhazardous by RCRA (Resource Conservation and Recovery Act) definition.

TABLE III

Test Run	Treatment Additive(s)	TCLP Lead (mg/l)
I	5% lime, 5% gypsum, 10.2% phosphoric	0.5
II	12% phosphoric, 10% potassium sulfate	2.2
III	12% phosphoric, 10% sodium sulfate	3.5
IV	15% TSP	3.7
V	12% phosphoric, 10% Portland Cement I	0.2
VI	12% phosphoric, 10% Portland Cement II	0.9
VII	12% phosphoric, 10% Portland Cement III	0.3
VIII	12% phosphoric, 10% gypsum	4.6
IX	15% TSP, 10% Portland Cement	0.1
X	15% TSP, 10% Portland Cement II	0.2
XI	15% TSP, 10% Portland Cement III	0.2
XII	15.1% phosphoric	3.6
XIII	10% trisodium phosphate, 10% TSP	1.2
XIV	6.8% phosphoric, 4% TSP	4.5
XV	10% gypsum	340
XVI	12% phosphoric, 5% lime	0.9
Control	Untreated Check	3,236.0

It is obvious from TCLP lead analyses of fifteen test runs that the single step mixing of at least one component of either or both group one and group two treatment chemicals is very effective in diminishing the TCLP lead values. In test run I, mixing of lime and gypsum from group one additives and phosphoric from group two decreased the TCLP lead to levels below 1 mg/l from 3440 mg/l with a curing time of less than 5 hours. Although the treatment chemicals of group two are more effective in decreasing the TCLP lead than the treatment chemicals of group one, as illustrated by the comparison of test runs XII and XV for this waste soil, but the combined effect of both groups is even more pronounced in decreasing the leachable lead. Results of these bench-scale studies were confirmed during engineering-scale tests. Single step mixing of 5% lime, 11.76% phosphoric acid and 15% water in a 2000 g hazardous soil diminished the TCLP lead values form 3440 mg/l to 0.77 mg/l in less than 5 hours. Likewise, single step mixing of 300 g Triple Super Phosphate (TSP), 200 g Portland Cement (PC) and 300 ml water in 200 g hazardous soil decreased the TCLP lead to levels below 0.3 mg/l within a relatively short curing time. Single step mixing of both groups of treatment chemicals can dramatically reduce treatment costs making this invention highly attractive and efficient for commercial use.

The first advantage of using lime and phosphoric acid combination over the use of TSP and PC is that in the former a volume decrease of 6% was realized when compared to the original volume of untreated material. In the later case, a volume increase of 37% was measured due to hydration of cement. The second advantage of using phosphoric and lime combination is that the mass increase is less than the mass increase when TSP and PC are added. Quantitatively, the mass increase in this hazardous waste soil treatment was approximately 16.7% due to combination of lime and phosphoric whereas the mass increase was about 40% due addition of TSP and PC. And therefore, those skilled scientists and engineers learning this art from this patent, must make an economic judgment for each lead contaminated process material and waste stream which chemical quantity from each group would be most effective in rendering the treated material non-hazardous.

The third advantage in using lime and phosphoric over the use of TSP and PC is that the former does not change in physical and mechanical properties of original material and if a batch fails for shortage of treatment chemicals, it can be retreated rather easily by adding more of the treatment reagent. The material treated with PC hardens and may form a monolith which is difficult to retreat in case of a batch failure.

EXAMPLE 2

Interchangeability of Two Step Mixing Method

In the lead contaminated soil from the abandoned battery recycling operations, the treatment chemicals of either group can be added first and mixed thoroughly in an amount sufficient to decrease the TCLP lead below the regulatory threshold. Two step mixing method of the group one and group two treatment additives is as effective as single step mixing of same quantity of treatment chemicals selected from group one and group two.

Table IV illustrates data that confirm that the application of group one treatment chemicals in step I is about as effective as application in step II. The same is true for group two treatment chemicals. Thus, the two steps are essentially interchangeable. The reversibility of the steps according to the present invention make it very flexible for optimization during commercial use, scaling up and retreatment of any batches that fail to

pass the regulatory threshold criteria.

TABLE IV

```
TREATMENT ADDITIVES
  TWO STEP MIXING METHODS
                                          TCLP
  TEST   TOTAL LEAD
  RUN STEP I STEP II LEAD mg/l
I      10% gypsum &
                   12% phosphoric
                                20.8   1.8
   2% lime acid
   (Group I) (Group II)
  II 12% phosphoric 10% gypsum & 24.4 1.9
   (Group II) 2% lime
    (Group I)
  III 10% gypsum 10.6% phosphoric 24.4 3.4
   (Group I) (Group II)
  IV 10.6% phosphoric 10% gypsum 22.4 3.5
   (Group II) (Group I)
       Single Step Mixing Method
  V 10% gypsum and 12% phosphoric 23.6 3.5
  Untreated Control/Check 23.1 3440
```

EXAMPLE 3

Retreatability and Single Step Mixing

A sample of hazardous cracked battery casings of 1/2"-1" size containing 14% to 25.2% total lead and about 3298 mg/l of TCLP was obtained for several test runs of the invention to verify the retreatability of batches that fail because of the insufficient dose of treatment chemical added. The results of initial treatment and retreatment are presented in Table V and compared with single step mixing treatment additives from both groups. About 200 g of hazardous material was treated with 10.5% phosphoric acid, 2.5% gypsum and 1.25% lime, all mixed in one single step. The TCLP lead was decreased from 3298 mg/l to 2.5 mg/l as a result of single step mixing in test run V (TABLE V).

When the amount of additive from group two was less than the optimum dose needed, the TCLP lead decreased from 3298 mg/l to: (i) 1717 mg/l when 4.2% phosphoric and 1% lime were added during step I and II respectively, and (ii) 2763 mg/l when 4.2% phosphoric and 5% gypsum were added, compared to untreated control.

Since the TCLP lead did not pass the regulatory criteria of 5 mg/l, treated material from test runs I and II were retreated during test runs II and IV, respectively, using sufficient amounts to phosphoric acid (an additive from group two) in sufficient amount to lower the TCLP lead to 2.4 mg/l and 2.5 mg/l, respectively. Furthermore, this example confirms that lime is more effective in decreasing TCLP lead than gypsum among different additives of group one. And as a result, the requirement of group two treatment reagent is lessened by use of lime over gypsum. The example also illustrates that one or more compounds of the same group can be used together to meet the regulatory threshold limit.

TABLE V

```
TREATMENT ADDITIVES
  TWO STEP MIXING METHODS
                                     TCLP
     Lead
  Test Run Step I Step II mg/l
I       4.2% phosphoric
                     1% lime       1717
  II 4.2% phosphoric 5% gypsum 2763
  Untreated   3296
  Control
        Retreatment (Single Step Mixing) Method
  III-I 6.8% phosphoric 2.4
  IV-II 8.5% phosphoric 3.5
   Single Step Mixing
  V 10.5% phosphoric, 2.5% gypsum, 1.25% lime 2.5
```

EXAMPLE 4

Wide Range of Applications and Process Flexibility in Curing time Moisture Content and Treatment Operations

TABLE VI illustrates different types of waste matrix that have been successfully treated employing the one step and two step mixing treatment additives from group one and group two. For these diverse waste types and process materials, total lead ranged form 0.3% to 23.5%. This example discloses the flexibility and dynamics of the treatment process of the invention in rendering non-hazardous, by RCRA definition, a wide range of lead-hazardous and other metal-hazardous materials within a relatively short period of time, usually in less than 5 hours. It is expected that this process will also render bismuth, cadmium, zinc, chromium (III), arsenic (III), aluminum,, copper, iron, nickel, selenium, silver and other metals also less leachable in these different types of wastes. The moisture content of the waste matrix is not critical and the invented process works on different process materials and waste types independent of the moisture content. The treatment operations can be carried out at any level--bench, engineering, pilot and full-scale--on relatively small amounts of hazardous waste material in laboratory to large amounts of contaminated process materials, soils, solid wastes, waste waters, sludges, slurries and sediments outdoor on-site. The process is applicable in-situ as well as ex-situ.

TABLE VI

UNIVERSE OF APPLICATION FOR THE INVENTION MACTITE TREATMENT PROCESS

LEACHABLE LEAD (mg/l)

LEAD CONTAMINATED

TREATMENT

TOTAL

Before

After

VOLUME

WASTE TYPE ADDITIVE LEAD % Treatment Treatment DECREASE

OLD DIRT 3.4% Phosphoric

2.2 164.4

1.5 16.7

WASTE WITH BROKEN 8.1% Lime 2.7 197.5 ND (<.5)

BATTERY CASING 1% Gypsum and

3.4% Phosphoric

SLAG-LEAD SHELTER 10.2% Phosphoric 6.6 21.3 2.0

LEAD-BIRD SHOT 16% Phosphoric 16.1 3720 ND (<.5)

14% Lime and

30% Gypsum

LEAD-BUCK SHOT 16% Phosphoric 11.4 1705 ND (<.5)

14% Lime and

28% Gypsum

BATTERY CASINGS 5% Gypsum 12 288 0.6 0

ORGANIC HUMUS SOIL 0.5% Lime 1.9 23.2 ND (<.5) 29

2.0% Phosphoric

50:50 MIXTURE OF 4% Gypsum 0.5 687 0.7 3.3

CASINGS AND SAND 4% Phosphoric 422.2 0.95 23.6

SOLID WASTE SOIL 3% Lime 23.5 12.0 6.0

Contaminated With 12% Phosphoric

Tetraethyl lead

SOIL CONTAMINATED 10% Gypsum 4.74 590 13.7

WITH LEADED 6% Phosphoric

GASOLINE

3% Lime 3.2 213 1.6

5.1% Phosphoric

CARBON WITH 4.7% Phosphoric 12.6 105.6 0.5

LEAD DROSS

WIRE FLUFF 1.7% Phosphoric 0.3 19 0.7

WIRE CHIP 0.75% Phosphoric 0.4 28 ND (<.2)

LAGOON SEDIMENT 0.6% TSP 0.3 3.9 0.23

0.5% Phosphoric 5.6 0.3

RCRA ORGANIC SLUDGE 0.6% Phosphoric 9.4 580 ND (<.5)

10% Gypsum

FILTER CAKE 8.5% Phosphoric 2.9 245.3 1.1

GRAVEL 5% Gypsum 0.16 7.5 0.5

2.2% Phosphoric

ROAD GRAVEL 10% Gypsum 0.34 46 ND (<.5)

8.4% Phosphoric

MIXTURE OF BATTERY 2.5% Gypsum 1.3 75 0.6 19.6

CASINGS (SOLD WASTE) 3.4% Phosphoric

AND SOIL

INDUSTRIAL WASTE 1 g Lime 2.75 91 0.7

(B) 3.4% Phosphoric

INDUSTRIAL PROCESS 3.4% Phosphoric 1.3 61 ND (<.5)

MAT (G)

SOIL (B) 3.4% Phosphoric 4.1 129.5 0.6 25.6

```
  SOIL (S) 50% Gypsum 11 <0.01
  SOIL (O) 1.3% Phosphoric 0.38 34.6 ND (<.5)
  SOIL (C) 5% Lime 11.78 130.6 0.33
   8.5% Phosphoric
  BATTERY CASINGS 5% Gypsum 2.5 110.1 1.9
   3.4% Phosphoric
  GRAY CLAY SOIL 5% Trisodium 2.2 46.6 0.2
   Phosphate
```

EXAMPLE 5

Nearly twenty (20) different chemicals and products from various vendors and supply houses were screened for chemical fixation of leachable lead in hazardous solid waste samples. Only six (6) of these treatments chemicals were found effective in decreasing the leachable lead as measured by: (1) the EP Toxicity Test and (2) the TCLP Test. Table VII presents a summary of leachable lead found in untreated and treated waste samples allowed to cure for a minimum of 4 hours after treatment with at least one of the effective chemicals. Treatment chemicals found relatively ineffective for lead fixation included a variety of proprietary products from American Colloid Company and Oil Dri, different sesquioxides like alumina and silica, calcium silicate, sodium silicate, Portland cement, lime, and alum from different vendors. Results for these ineffective chemicals are not shown in Table VII.

```
                TABLE VII
RELATIVE EFFECTIVENESS OF VARIOUS
  TREATMENT CHEMICALS SCREENED TO
  DECHARACTERIZE THE LEAD-TOXIC SOLID WASTES
                    Leachable Lead in mg/l
Treatment Chemical (Step)
                    Toxicity Test
                              EP TCLP Test
I.  Untreated Control   221.4     704.5
  II. Single Treatment Chemical
   (One Step Treatment)
a.    Sulfuric Acid (I) 11.7      39.8
  b. Phosphoric Acid (I) 1.0 5.9
  c. Superphosphate Granular (I) 2.7 11.4
  d. Liquid Phosphate Fertilizer (I) 19.4  64.3
  e. Gypsum Powder (I) 24.9  81.8
  f. Sodium Phosphate (I) 28.7  93.9
III.
    Two Step Treatment
        g.    Sulfuric (I) & Lime (II)
                              20.6    68.1
  h. Gypsum Powder (I) & Alum (II) 3.9 15.3
  i. Sodium Phosphate (I) & 3.1 12.6
   Phosphoric (II)
  j. Gypsum (I) & Phosphoric (II)  N.D.* 1.6
IV. Three Step Treatment
        k.    Gypsum (I), Alum (II) &
                              12.8    43.3
   Sodium Phosphate (III)
  l. Gypsum (I), Phosphoric (II) &  N.D.* 1.4
   Sodium Phosphate (III)
 *N.D. means nondetectable at <0.50 mg/l.
```

Evaluation of a single treatment chemical in one step reveals that phosphoric acid was most effective in fixation of leachable lead followed by granular super-phosphate, a fertilizer grade product available in nurseries and farm supply houses. However, neither treatment effectively treated leachable lead to the USEPA treatment standard of 5.0 mg/l by TCLP methodology.

Although both phosphoric acid and granular superphosphate were effective in meeting the now obsolete EP Toxicity Test criteria at 5.0 mg/l, this test has been replaced by TCLP Test criteria for lead of 5.0 mg/l. Single application of the phosphoric acid, granular superphosphate or any other chemical was short of meeting the regulatory threshold of 5.0 mg/l by TCLP Test criteria for lead.

In a two-step treatment process, application of gypsum during Step I and treatment with phosphoric acid in Step II resulted in decrease of TCLP-lead consistently and repeatedly below the regulatory threshold of 5.0 mg/l. The results of this two-step treatment process utilizing gypsum in Step I and phosphoric acid in Step II are most reliable and hence, the two-step process may be applied to a wide variety of lead contaminated wastes as exhibited in Example II.

A three-step process, as set forth in Table VII, was not perceived to be as economically viable as a two-step treatment process, despite its ability to reduce lead levels in satisfaction of the TCLP Test criteria. A process that employees the beneficial combination of treatment first with a sulfate compound and then with a phosphate reagent in accord with the present invention, in combination with one or more additional treatment steps, may nevertheless be within the scope of the invention.

In order to illustrate the relative proportions of two chemicals, e.g., gypsum and phosphoric acid, needed for treatment of lead-toxic wastes, three soil samples from a lead contaminated test site were processed using the present invention, in which gypsum powder was used in the first step, and phosphoric acid solution in water at concentrations of about 7, 15 and 22 percent by weight in the second step. The soil was measured for lead content in accordance with the EP Toxicity Test before and after treatment. A level of leachable lead below 5 mg/l was considered non-hazardous according to this procedure. During these test runs, the EP Toxicity Test criteria were in force for treated waste material. The results of these tests are set forth in Table VIII:

TABLE VIII

EFFECTIVENESS IN FIXATION AND STABILIZATION OF LEACHABLE LEAD IN LEAD TOXIC SOILS

Soil Sample (Lead-toxic waste)	Step I Gypsum (g/kg soil)	Step II Phosphoric (g/kg soil)	EP TOXIC LEAD Before Treatment mg/l	EP TOXIC LEAD After Treatment mg/l
1 Low lead contamination	20	10	8	<0.1
2. Moderate contamination	30	20	61	<0.1
3. High lead contamination	40	30	3,659	1.7

The foregoing results demonstrate that the process of the present invention was effective in all three samples, representing 3 different levels of lead contamination. The process is flexible and is usually optimized during bench scale treatability studies for each waste type to immobilize the leachable lead and to decharacterize or transform the lead-toxic waste into non-toxic solid waste acceptable to TSD facilities under current land ban regulations. A net reduction of 36.4% in waste volume through use of the instant process has been observed. Typical volume reductions are set forth in Table IX.

TABLE IX

CHANGES IN SOLID WASTE VOLUME AS A RESULT OF TREATMENT WITH THE TWO-STEP PROCESS

SOLID WASTE MATERIAL (Treatment Scale)	SOLID WASTE VOLUME Initial (Before Application of Process)	Final (After Application of Process and Curing)	Decrease in Volume (%)
1. Low toxic soil (full scale)	3,850 cu. yd.	2,450 cu. yd.	36.4
2. Lead-toxic Solid Waste (Bench Scale)			
Test Run I	106.1 cu. in.	81.51 cu. in.	23.0
Test Run II	22.0 cu. in.	17.3 cu. in.	21.4

The most profound effect of the process of the present invention is at a structural level, where the break-down of granular aggregates is associated with a loss of fluffiness and a decrease in pore space and increased compaction due to physical, mechanical and chemical forces at different levels. At a molecular level, phosphoric acid breaks down the minerals containing carbonates and bicarbonates, including cerussites, in stoichiometric proportions. Soon after the addition of phosphoric acid to a solid waste containing cerussites, extensive effervescence and frothing becomes evident for several minutes and sometimes for a few hours. The phosphoric acid breaks down the acid sensitive carbonates and

bicarbonates leading to the formation of carbon dioxide, water and highly stable and insoluble sulfate and phosphate mineral compounds. Thus, structural changes due to interlattice reorganization as well as interstitial rearrangement in waste during processing are associated with an overall decrease in waste volume. Depending on the extent of carbon dioxide loss from the breakdown of carbonates and bicarbonates present in the lead-toxic solid waste, the process may lead to a slight loss of waste mass as well. Water generated during the chemical reactions is lost by evaporation, which further decreases the mass and volume of the treated solid wastes and soils.

The cost of the process of the present invention is moderate to low, depending upon (i) waste characteristics, (ii) treatment system sizing, (iii) site access, (iv) internment of final disposition of treated material and (v) site support requirements. The costs of treatment and disposal are presently on the order of $115 per ton of lead-toxic waste, as compared to off-site conventional treatment and disposal costs of over $250 per ton if no treatment in accord with the invention had been performed. Moreover, recent land ban regulations would prohibit the disposal of all lead-toxic wastes in landfills. The foregoing Example makes clear that the process of the present invention provides an efficient technology that is economically attractive and commercially viable in meeting regulatory criteria for landfills.

EXAMPLE 6

The process of the present invention was applied on bench scale to five different lead-toxic waste materials that were characterized for total lead, TCLP-lead, moisture content and pH before and after treatment. A curing time of 5 hours was allowed for completion of the treatment process. The results compiled in Table X exhibit the profound effects of the process in decreasing the TCLP lead in a wide range of lead-toxic soils and solid wastes containing total lead as high as 39,680 mg/kg and TCLP lead as high as 542 mg/l. In each of the five cases, the instant process immobilizes the leachable lead to levels below the regulatory threshold of 5 mg/l set by the TCLP Test criteria for lead currently in force under the land ban regulations of the United States Environmental Protection Agency.

TABLE X

TYPICAL CHANGES IN SOLID WASTE CHARACTERISTICS DUE TO PROCESS EFFECTS

SOLID WASTE CHARACTERISTICS	MEASURED VALUES Before Treatment	After Treatment & Curing
I. Lead-toxic SW-A		
Total lead, %	1.442	1.314
TCLP-Lead, mg/l	542.0	2.0
Moisture, %	23.0	33.0
pH, S.U.	8.1	4.8
II. Lead-toxic SW-B		
Total lead, %	0.847	0.838
TLCP-Lead, mg/l	192.0	2.4
Moisture, %	27	36
pH, S.U.	8.0	5.3
III. Lead-toxic SW-C		
Total lead, %	3.968	3.066
TLCP-Lead, mg/l	257.6	1.0
Moisture, %	10.0	18.1
pH, S.U.	7.2	4.5
IV. Lead Toxic SW-D		
Total lead, %	2.862	2.862
TLCP-Lead, mg/l	245.3	0.38
Moisture, %	71.6	84.1
pH, S.U.	8.1	6.3
V. Lead Toxic SW-E		
Total lead, %	0.16	0.12
TLCP-Lead, mg/l	7.5	1.87
Moisture, %	12.3	23.0
pH, S.U.	7.0	5.4

It is obvious from Table X that the instant process operates over a wide range of moisture and pH conditions. It is associated with 8 to 11% rise in moisture content. The end product of the treatment process may contain moisture in a typical range of 18% to 36% on a dry weight basis. The end product passes the Paint Filter Test for solids and there are not other byproducts or side streams generated during the process. The treated solid waste is cured in 4 to 5 hours and may be allowed to dry for 2 to 3 days after treatment for loss of unwanted moisture prior to final internment and disposition. This time is sufficient for the TCLP Tests to be completed as part of the disposal analysis under land ban regulations enforced by the USEPA.

It is necessary to establish the quantities of gypsum and phosphate reagent on a case-by-case basis, because the consumption of these materials will depend not only upon the initial lead level in the waste or soil, but also upon other waste characteristics such as cation exchange capacity, total buffering capacity, and the amounts of carbonates and bicarbonates present, among others. Bench scale treatability studies for

each solid waste considered will be necessary to determine the optimum levels of the materials that are employed. The treatability studies are designed to optimize the amount and grade of gypsum powder (or other sulfate compound) needed during step I, and the amount and concentration of phosphoric acid (or other phosphate compound) needed in step II for cost-effective operation of the treatment system. Those skilled in the art are knowledgeable of such bench studies, which are usually carried out as precursors to fill scale treatment.

Several series of studies were performed on host matrices containing leachable and soluble radionuclides and other radioactive substances using the present invention.

EXAMPLE 7

Sample material from a site in the eastern United States was homogeneously mixed in a container. The material consisted of silts, clays, sand and gravel mixed with glass, nails, rocks and debris. The material was collected from an environmental restoration project where site efforts focused on excavation, packaging, transportation and disposal of Thorium contaminated soil and materials from beneath residential homes.

Three 300 g sub-samples of untreated material were prepared from the sample material with the materials in each of the sub-samples sized to less than 3/8 inch and suitable for USEPA SW-846 Method 1311 (TCLP) extraction. Sample 1 (US-1) was extracted using TCLP fluid No. 1, Sample 2 (US-2) was extracted using TCLP fluid No. 2, and Sample 3 (US-3) was extracted using laboratory grade deionized ("DI") water as the only modification to the EPA method. This soil characterization step was conducted for purposes of determining the most harsh extraction conditions for the untreated material. TCLP fluid No. 1 was prepared with glacial acetic acid and 1N NaOH with an end pH of 4.93±0.05 S.U. TCLP fluid No. 2 was prepared with glacial acetic acid and deionized water with an end pH of 2.88±0.05 S.U. The laboratory grade DI water had a pH of 6.82±0.05 S.U.

After tumbling 100 g of the 300 g sub-sample in 200 ml of extraction fluid for eighteen (18) hours at 30±2 rpm in a longitudinal rotary TCLP agitator, the extracts were decanted from the settled solids, filtered as per the method, and then placed in Marinelli containers. Radionuclide leachability was determined by conducting total gamma spectroscopy analysis on each extract in accordance with accepted quantification methods using a Nuclear Data Genie Model ND9900 Gamma Spectrometer integrated with a DEC Micro VAX II computer. Each extract was counted for sixteen (16) hours. All results presented below are in the units of picocuries per liter (pCi/l).

TABLE XI

EASTERN UNITED STATES UNTREATED SAMPLE MATERIAL CHARACTERIZATION

Radionuclide	US-1 Untreated TCLP Fluid 1	US-2 Untreated TCLP Fluid 2	US-3 Untreated Deionized Water
Pb-210	329 ± 30	173 ± 45	175 ± 37
Bi-211	2,751 ± 736	3,360 ± 797	3,451 ± 560
Bi-214	772 ± 93	1,002 ± 120	1,017 ± 106
Pb-214	810 ± 350	910 ± 242	966 ± 202
Fr-223	2,183 ± 660	3,768 ± 73	3,228 ± 531
Ra-223	939 ± 404	1,514 ± 383	714 ± 148
Ra-224	1,551 ± 503	1,772 ± 358	1,868 ± 321
Ra-226	1,090 ± 167	1,294 ± 162	1,352 ± 156
Ac-227	213 ± 20	243 ± 54	173 ± 31
Th-227	533 ± 163	921 ± 179	788 ± 131
Th-228	8,335 ± 1014	16,490 ± 12	13,170 ± 1,371
Pa-231	1,136 ± 476	1,764 ± 467	1,490 ± 307
Th-234	22 ± 6	19 ± 13	10 ± 9
U-235	190 ± 22	313 ± 38	281 ± 29

As shown by the gamma spectral analysis of each extract, TCLP fluid No. 2 was identified as the most rigorous extraction fluid for the soil material, primarily because of leachable Thorium and Uranium levels. This fluid was then selected to be used for extraction of the treated samples for the remainder of the studies.

In the second portion of the study, two (2) 300 g samples were prepared from the eastern U.S. sample material and labeled as TS-1 and TS-2. Each sample was placed in a laboratory beaker and 35 ml of deionized water and 5% (TS-1) and 10% (TS-2) by weight TGPA were added. The contents in each of the beakers were then mixed by folding with a laboratory spatula in order to simulate blending achievable using full-scale methods in the field. The samples were then allowed to react overnight. Each beaker was then sub-sampled, material particles sized to less than 3/8 inch, and prepared for USEPA SW-846 Method 1311 (TCLP) extraction using 100 g of treated sub-sample material and 2000 ml TCLP Fluid No. 2. Table XII presents the data from the gamma spectral analysis with all units reported as pCi/l. The results from Table XI for untreated materials extracted using TCLP Fluid No. 2 were used as a control and are shown in the fourth column.

TABLE XII

EASTERN UNITED STATES SAMPLE MATERIAL TREATED WITH DI WATER AND TGPA TCLP EXTRACTION FLUID NO. 2 RESULTS

Radionuclide	TS-1 5% TGPA	TS-2 10% TGPA	US-2 TCLP Fluid No. 2
Pb-210	<MDA*	<MDA	173 ± 45
Bi-211	<MDA	<MDA	3,360 ± 797
Bi-214	<MDA	<MDA	1,002 ± 120
Pb-214	<MDA	<MDA	910 ± 242
Fr-223	<MDA	<MDA	3,768 ± 73
Ra-223	<MDA	<MDA	1,514 ± 383
Ra-224	<MDA	<MDA	1,772 ± 358
Ra-226	<MDA	<MDA	1,294 ± 162
Ac-227	<MDA	<MDA	243 ± 54
Th-227	<MDA	<MDA	921 ± 179
Th-228	<MDA	<MDA	16,490 ± 12
Pa-231	<MDA	<MDA	1,764 ± 467
Th-234	<MDA	<MDA	19 ± 13
U-235	<MDA	<MDA	313 ± 38

*<MDA = less than the calculated Minimum Detectable Activity for the counted sample.
MDA is the smallest amount of activity that can be detected in a sample.
Data from TS1 was corroborated by a second laboratory on duplicate sample extract for QA/QC data validation purposes.

As indicated by the data from Tables XI and XII, TGPA substantially reduces the leachability of radionuclides in soil as determined by USEPA SW-846 Method 1311 (TCLP) extraction with fluid No. 2 and gamma-spectral analysis of resultant extract. It should be noted that the soil sample materials were not sized to less than 3/8 inch until after the TGPA and deionized water were mixed and allowed to cure overnight.

The leaching of Thorium, its decay-daughters, and other radionuclides from untreated material was effectively reduced by the addition of TGPA to the material. The treated material was moist after curing overnight, but contained no free liquids. After exposure to the air for forty-eight (48) hours, the treated material was dry and crumbly with nonuniform cohesivity. Volume reduction was observed, but not quantified.

EXAMPLE 8

In another study, samples of the untreated material used in Example 7 were mixed with TGPA and other compounds. For this study, gypsum, calcium oxide, triple superphosphate (TSP), and TGPA were selected based upon a generally desired pH range of the end product. Four 300 g samples were prepared: TS-3=35 ml DI water+8% gypsum+5% TGPA; TS-4=35 ml DI water+90% calcium oxide+8% TGPA; TS-5=35 ml DI water+3% calcium oxide+5% TGPA; and TS-6=45 ml DI water+10% TSP+1.6% calcium oxide.

Treatment samples received variable amounts of water so that after mixing, the consistency of the mixtures was uniform for all of the samples and there were no free liquids. The water assisted in the dispersement of the reagent and calcium oxide hydration; and hence, the disassociation of the phosphate to a soluble form. Additional water was required in TS-6 because of the solid reagent forms and the hydration demand of CaO in the presence of dry TSP.

Table XIII presents the data from USEPA SW-846 Method 1311 (TCLP) extracts of TS-3, TS-4, TS-5, and TS-6 analyzed by total gamma-spectroscopy in accordance with procedures outlined in Example 7. All samples were analyzed with TCLP fluid No. 2 (acetic acid +water with a pH of 2.88±0.05 S.U.).

TABLE XIII

EASTERN UNITED STATES SAMPLE MATERIAL TREATED WITH OTHER EMBODIMENTS TCLP EXTRACTION FLUID NO. 2 RESULTS

Radionuclide	TS-3	TS-4	TS-5	TS-6
Pb-210	<MDA*	<MDA	<MDA	<MDA
Bi-211	<MDA	180 ± 69	296 ± 106	<MDA
Bi-214	<MDA	55 ± 23	75 ± 29	<MDA
Pb 214	<MDA	<MDA	50 ± 50	<MDA
Fr-223	<MDA	<MDA	<MDA	<MDA
Ra-223	<MDA	245 ± 97	84 ± 34	<MDA
Ra-224	<MDA	<MDA	<MDA	<MDA
Ra-226	<MDA	<MDA	122 ± 114	<MDA

```
Ac-227 <MDA <MDA 286 ± 47  <MDA
Th-227 <MDA <MDA 552 ± 131 <MDA
Th-228 <MDA <MDA <MDA <MDA
Pa-231 <MDA <MDA <MDA <MDA
Th-234 <MDA <MDA 139 ± 53  <MDA
U-235 <MDA <MDA 79 ± 35 <MDA
```

*<MDA = less than the calculated Minimum Detectable Activity (MDA) for th counted sample
Data from samples TS3 and TS6 was corroborated by a second laboratory on duplicate sample extracts for QA/QC data validation purposes.

As evidenced by the data, the treatment regimes utilizing gypsum+TGPA, calcium oxide+TGPA, and triple superphosphate (TSP) + calcium oxide resulted in the reduction of nuclide leachability. Each of the treatment regimes provided soluble phosphates, or phosphates that were solubilized by pH manipulation in the presence of a fluid. Each of the treatments resulted in the formation of Apatites within the host material, with mineral crystal nucleation chemically incorporating the radionuclides.

EXAMPLE 9

The tests in Example 9 were performed to study the volume change of materials treated by the process of the present invention. In Example 9, soil volume was examined prior to and after the addition of TGPA. Because of the difficulty in examining volume changes due to varied conditions, geometric configuration, and chemical properties of material differing between pre- and post-treatment, a special device was constructed to account for changes in density, moisture content, and geotechnical properties.

The test apparatus used for measuring the volume consisted of a removable stainless steel cylindrical cup with a flat bottom ("the cup"). The cup had a 10.3 cm inside diameter and a 29.6 cm inside height and mounted vertically to the base of the test apparatus. Mounted above the cup on the apparatus frame was a pneumatic piston with a 1.4 cm thick plate fixed to the piston shaft. When activated with compressed air, a 10.2 cm diameter close-tolerance plate fixed to the piston shaft extended downward and into the open end of the cup. Compressed air operated the piston and was adjusted with a valve so that from 1 to 100 psi could be exerted on soil placed within the cup.

The untreated material from Example 7 was used to prepare ten aliquots (of approximately 100 g) which were individually weighed using a top-loading electronic balance (±0.01 g). The ten aliquots were then sequentially emptied into the cup. After the addition of each 100 g aliquot, the cylindrical cup was placed in the apparatus and the piston activated to exert a pressure of 10 psi on the soil column. This procedure was repeated until all ten 100 g aliquots had been added and compacted. The height of the soil column was then determined by measuring from the top of the cup to the top of the plate, correcting for the plate thickness, and subtracting the total from the inside height of the cup.

The untreated material was then removed from the cup and placed in a laboratory beaker. Care was taken to ensure all visible material was removed and transferred. Water was added to the beaker on a weight basis equal to 12% of the untreated material. TGPA was then added at a dose of 5%, also by weight, of the untreated material. The untreated material and amendments were mixed with a laboratory spatula by folding and allowed to sit overnight.

The treated material was then removed from the beaker and placed in the cylindrical cup in ten stages of approximately 100 g each. The pneumatic piston was activated at the same 10 psi pressure each time treated material was added to the cup. After all of the treated material was transferred and compacted with the apparatus, the resultant column height was calculated as previously described. After the material had been allowed to sit for approximately seven (7) days, the volume test was performed again in the same manner. The results of the study are presented in Table XIV.

TABLE XIV

VOLUME CHANGE OF EASTERN UNITED STATES
SAMPLE MATERIAL TREATED WITH 5% (WT.) TGPA

Mass Untreated (grams)	Height Untreated (cm)	Mass Treated <24 hours (grams)	Height Treated <24 hours (cm)	Mass Treated 7 days (grams)	Height Treated 7 days (cm)
1003.09	8.2	1074.77	7.4	942.51	6.7

These test results show a total volume reduction of 9.75% after 24 hours and 22.4% after 7 days, relative to the initial untreated material.

In the next series of studies, sample material from a site in the Midwestern United States was utilized in

treatability studies. The material contained small soil grains (with 100% passing through a 9.5 mm sieve) and was comprised of 30% sand, 47% silt, and 23% clay as determined by ASTM D-422 (Particle-Size Distribution). The average density of the material was 1.43 g/cc and the material had a moisture content of 16 percent by weight and a pH of 6.0 S.U.

As in the previous examples, the sample material was characterized for radionuclides and other radioactive substances. Nuclide leachability was examined utilizing the Toxic Characteristic Leaching Procedure (TCLP) extraction procedure (USEPA SW-846, Method 1311) Material was also subjected to other leaching tests including the Synthetic Precipitation Leaching Procedure (SPLP) extraction procedure (USEPA SW 846, Method 1312), and a modified version of the TCLP extraction method, where deionized water was substituted for the extraction fluid (DI/TCLP). Results of the gamma-spectral, Uranium, and Technetium-99 characterization analyses on extraction fluids are presented in Table XV.

TABLE XV

UNTREATED MIDWESTERN
UNITED STATES SAMPLE MATERIAL
RADIONUCLIDE LEACHABILITY CHARACTERISTICS

Radionuclide/ Isotope/Item	US-4 Method 1311 TCLP	US-5 Method 1312 SPLP	US-6 Modified-1311 DI/TCLP
Ra-226	3,644 ± 895	3,120 ± 494	556 ± 219
U-235	266 ± 66	190 ± 43	39 ± 25
U-238*	12,308 ± 969	11,210 ± 92	2,590 ± 45
Pb-212	16 ± 4	<MDA	<MDA
Th-234	485 ± 138	355 ± 90	228 ± 73
Tc-99	238 ± 11	152 ± 10	235 ± 11
U	8,698 ± 68	7,922 ± 65	1,830 ± 32
U, total (ug/l)	17,979	16,375	3,783

NOTE:
All units in pCi/l, unless indicated
*U238 concentrations were calculated.
<MDA = less than the calculated Minimum Detectable Activity (MDA) for the counted sample.

EXAMPLE 10

In this example, four 400 g samples of soil material (TS-7, TS-8, TS-9 and TS-10) were prepared from the untreated Midwestern U.S. sample material and placed in separate laboratory beakers. Sample TS-7 was used as a control and mixed only with 120 ml of deionized water. For each of the three other samples, 120 ml of deionized water and varying amounts of TGPA were added to each beaker and mixed until a uniform consistency was achieved: TS-8 =120 ml DI water+3% (wt.) TGPA; TS-9=120 ml DI water+5% (wt.) TGPA; and TS-10=120 ml DI water+10% (wt.) TGPA. When the mixing was completed, no free liquids were present.

After sitting overnight, a 100 g sample of treated material was removed from each beaker and extracted by USEPA SW-846, Method 1311 (TCLP), using Fluid No. 2, to simulate exposure to acidic landfill leachate. The radionuclide leachability for each extract was then quantified by gamma spectroscopy. Total Uranium and Technetium-99 tests were also conducted. Uranium-238 was calculated, assuming the total Uranium present was 100% depleted. The levels of leachable radionuclides and other radioactive substances in the sample material after treatment are presented below in Table XVI. The results in Table XVI can be compared to the results for sample US-4 in Table XV for reference.

TABLE XVI

RADIONUCLIDE LEACHABILITY OF
MIDWESTERN UNITED STATES SAMPLE MATERIAL
IN USEPA SW-846, METHOD 1311 (TCLP)
FLUID NO. 2 EXTRACT AFTER TREATMENT WITH TGPA

Radio-nuclide/ Isotope/Item	TS-7 DI WATER	TS-8 3% TGPA	TS-9 5% TGPA	TS-10 10% TGPA
Ra-226	3,114 ± 568	<MDA	<MDA	<MDA
U-235	231 ± 55	<MDA	<MDA	<MDA
U-238*	5,847 ± 184	54.5 ± 1.7	51.7 ± 1.7	53.5 ± 1.7
Th-234	230 ± 97	<MDA	<MDA	<MDA
Tc-99	213 ± 14.3	67.6 ± 8.5	55.6 ± 10.4	3.7 ± 4.8
U	4,132 ± 130	38.5 ± 1.2		

(ug/l)

```
                                    36.5 ± 1.2  37.8 ± 1.2
                                     U, total 8,541 80 75 78
  (ug/l)
_____________________________________
 NOTE:
 All units in pCi/l, unless indicated
 *U238 concentrations were calculated.
 <MDA = less than the calculated Minimum Detectable Activity (MDA) for the
 counted sample
```

EXAMPLE 11

100 g samples of material treated in Example 10 (TS-7, TS-8, TS-9 and TS-10) were sub-sampled, extracted and analyzed by USEPA SW-846, Method 1312 (SPLP), where the extraction fluid utilized simulated acid rain. Each extract was then quantified for radionuclides by gamma-spectroscopy, and total Uranium and Technetium-99 tests were conducted. Uranium-238 was calculated, assuming the total Uranium present was 100% depleted. The results of the leachable radionuclides and other radioactive substances in the soil after treatment are presented below in Table XVII. The results in Table XVII can be compared to the results for sample US-5 in Table XV for reference.

```
                TABLE XVII
_____________________________________
RADIONUCLIDE LEACHABILITY IN EPA SW-846, METHOD 1312
  (SPLP) EXTRACT AFTER TREATMENT WITH TGPA
  Radio-
  nuclide/ TS-7 TS-8 TS-9 TS-10
  Isotope/Item CONTROL 3% TGPA 5% TGPA 10% TGPA
_____________________________________
Ra-226  2,622 ± 443
                   233 ± 136
                              <MDA    <MDA
  U-235 153 ± 37  <MDA <MDA <MDA
  U-238* 6,065 ± 192   30.1 ± 1.0  8.8 ± 0.1 7.3 ± 0.1
                                     Th-234 170 ± 81  <MDA <MDA <MDA
                                     Tc-99 210 ± 15  55.6 ± 7.8
                                    23.2 ± 6.5  69.8 ± 7.6
                                     U 4,286 ± 136   21.3 ± 0.7
                                    6.3 ± 0.1 5.2 ± 0.1
  U, total 8,859 44 13.9 10.7
  (ug/l)
_____________________________________
 NOTE:
 All units in pCi/l, unless indicated
 *U238 concentrations were calculated.
 <MDA = less than the calculated Minimum Detectable Activity (MDA) for the
 counted sample
```

EXAMPLE 12

100 g samples of treated soil material in Example 10 (TS-7, TS-8, TS-9 and TS-10) were subsampled and extracted by USEPA SW-846, Method 1311 with laboratory grade deionized water substituted for the extraction fluid. Although material treated by the invention would never likely be exposed to similar fluid except in the laboratory settings, deionized water is considered by many to be a harsh extraction test as leachable ionic species will tend to diffuse from zones of high concentration to zones of low concentration. Each DI water extract was then quantified for radionuclides by gamma-spectroscopy, and total Uranium and Technetium-99 tests were conducted. Uranium-238 was calculated, assuming the total Uranium present was 100% depleted. The results showing the level of leachable radionuclides and other radioactive substances in the soil after treatment are presented below in Table XVIII for TS-7, TS-8, TS-9 and TS-10. The results in Table XVIII can be compared to the results for sample US-6 in Table XV for reference.

```
                TABLE XVIII
_____________________________________
RADIONUCLIDE LEACHABILITY IN EPA SW-846,
  MODIFIED METHOD 1311 WITH DI EXTRACTION WATER
  AFTER TREATMENT WITH TGPA
  Radio-
  nuclide/ TS-7 TS-8 TS-9 TS-10
  Isotope/Item CONTROL 3% TGPA 5% TGPA 10% TGPA
_____________________________________
Ra-226  940 ± 278
                   <MDA      <MDA    <MDA
  U-235 55 ± 40 <MDA <MDA <MDA
  U-238* 1,807 ± 57   30.1 ± 1.0  8.8 ± 0.1 7.3 ± 0.1
```

Th-234 103 ± 89 <MDA <MDA <MDA
Tc-99 207 ± 15 55.6 ± 7.8
23.2 ± 6.5 --
U 1,277 ± 40 4.4 ± 0.1 5.2 ± 0.1 5.9 ± 0.1
U, total 2,640 9.1 10.6 12.1
(ug/l)

NOTE:
All units in pCi/l, unless indicated
*U238 concentrations were calculated.
<MDA = less than the calculated Minimum Detectable Activity (MDA) for the counted sample

Examples 13 and 14 demonstrate additional uses for the present invention. Sample material and RGW for Examples 13 and 14 were obtained from the Midwestern United States site. To establish baseline untreated characterization data, RGW and soil+RGW samples were tested for radionuclides and other radioactive substances using SPLP and RGW/TCLP extraction methods, prior to adding TGPA to the sample material. The following tests were performed:

1) RGW was tested for total radionuclides and other radioactive substances (US-7);

2) RGW was mixed into the sample material at 30% (wt.). Radionuclides and other radioactive substances were examined in the amended sample material's SPLP extract (US-8); and

(3) DI water was mixed into the sample material at 30% (wt.). Radionuclides and other radioactive substances were examined in the amended sample material's modified TCLP extract where RGW was utilized as the substitute TCLP extraction fluid (US-9).

Table XIX presents the baseline data. Previous SPLP extraction test results from the same sample material amended only with DI water (US-5) are presented for comparison.

TABLE XIX

BASELINE RADIONUCLIDE LEACHABILITY FOR
UNTREATED SAMPLE MATERIAL USING RADIOACTIVE GROUNDWATER (RGW)
AS A DISPERSING AGENT AND EXTRACTION FLUID

Radionuclide/ Isotope/Item	US-7 30% RGW Totals	US-8 30% DI RGW SPLP Extract	US-9 H_2O RGW as SPLP TCLP Fluid	US-5 30% DI Water Extract
Bi-211	234 ± 18	<MDA	<MDA	<MDA
Ra-224	<MDA	<MDA	254 ± 131	<MDA
Pb-212	<MDA	<MDA	27.8 ± 11.7	<MDA
Ra-226	6 ± 7	<MDA	<MDA	<MDA
U-235	9,251 ± 1,341	261 ± 49	8,353 ± 115	9,190 ± 43
Th-234	35,940 ± 5,027	560 ± 113	26,220 ± 462	3,355 ± 90
U, total (mg/l)	97,431	7,813	66,471	16,375
U-238 (ug/l)	45,793	3,696	31,441	11,210
Tc-99	126,790	580 ± 30	63,241 ± 589	152 ± 10
pH (S.U.)	7.5			
TSS (mg/l)	1,320			
TDS (mg/l)	4,400			
Hardness [$CaCO_3$ (mg/l)]	1,734			

*U-238 concentrations were calculated.
All units expressed as pCi/l, unless indicated
<MDA = less than Minimum Detectable Activity for the counted sample.

EXAMPLE 13

In Example 13, the effects of extracting TGPA treated radioactive sample material containing RGW with USEPA's simulated acid rain leaching method (SPLP) are presented. In this example, RGW was used as a dispersion agent in place of deionized water. Contaminated sample material (characterized in Table XIX) was mixed with RGW at 30% (wt.). Three (3) equivalent aliquots of the sample material mixed with RGW were placed in separate beakers. In the first beaker, TGPA was added at a dose of 2% (wt.) and mixed (TS-11). In the second beaker, TGPA was added at a dose of 5% (wt.) and mixed (TS-12). In the third beaker, TGPA was added at a dose of 10% (wt.) and mixed (TS-13). The amount of TGPA added was calculated from the base mass of the untreated sample material exclusive of the RGW mass added.

Table XX presents the data from the analysis of SPLP extract for each of the treated samples (TS-11, 12, and 13). The untreated characterization data from samples (US-7, and US-8) are presented in Table XIX for comparison. The SPLP extraction (SW-846, Method 1312) is USEPA's procedure for simulating soil exposure to acid rain. The SPLP method calls for the extraction of 100 g of material with 2000 ml of simulated acid rain fluid.

TABLE XX

TGPA SOIL TREATMENT RESULTS:
RADIONUCLIDES IN SPLP EXTRACT OF SAMPLE MATERIAL
MIXED WITH 30% (WT.) RADIOACTIVE GROUNDWATER

Radionuclide/ Isotope/ Item	TS-11 Treated 2% TGPA	TS-12 Treated 5% TGPA	TS-13 Treated 10% TGPA
Bi-211	<MDA	<MDA	<MDA
Ra-226	<MDA	<MDA	<MDA
U-235	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	<MDA
U, total, (mg/l)	30	19	38
U-238 (ug/l)*	14	9	18
Tc-99	292 ± 21	322 ± 23	280 ± 21

RGW (characterized in US7) was added to TS11, TS12, and TS13 at a dose of 30% (wt.) prior to TGPA addition.
All units expressed as pCi/l, unless indicated.
<MDA = less than Minimum Detectable Activity for the counted sample
*U238 concentrations were calculated.

EXAMPLE 14

In Example 14, sample materials containing radionuclides and other radioactive substances was treated with varying doses of TGPA and DI water was utilized as a dispersing agent. These treated samples were then extracted using the modified TCLP method (RGW/TCLP) where RGW was substituted for the specified extraction fluid (TCLP Fluid No. 2). The sample material was mixed with DI water and three (3) equivalent aliquots of the material were placed in separate beakers. In the first beaker, TGPA was added at a dose of 2% (wt.) and mixed (TS-14). In the second beaker, TGPA was added at a dose of 5% (wt.) and mixed (TS-15). In the third beaker, TGPA was added at a dose of 10% (wt.) and mixed (TS-16). The percent weight of TGPA added was calculated from the initial base mass of the untreated sample material exclusive of the RGW mass added.

Each of the treated samples were then extracted using the RGW/TCLP method with RGW fluid added at the method specified volume and ratio (100 g soil: 2000 ml fluid).

Table XXI presents the data from the analysis of the modified RGW/TCLP extract for each of the treated samples (TS-14, 15, and 16). The untreated characterization data from RGW (US-7) and untreated soil extract by RGW/TCLP (US-9) are presented in Table XIX for comparison.

TABLE XXI

TGPA TREATMENT RESULTS:
RADIONUCLIDES IN MODIFIED RGW/TCLP EXTRACT
OF SAMPLE MATERIAL MIXED WITH 30% (WT.) DI WATER

Radionuclide/ Isotope	TS-14 2% TGPA RGW/TCLP	TS-15 5% TGPA RGW/TCLP	TS-16 10% TGPA RGW/TCLP
Bi-211	<MDA	<MDA	<MDA
Ra-226	<MDA	<MDA	<MDA
U-235	2,513 ± 461	1,919 ± 267	<MDA
Th-234	<MDA	5,656 ± 790	200 ± 170
U, total (mg/l)	18,191	11,880	18
U-238 (ug/l)*	8,604	5,619	9
Tc-99	45,738 ± 222	60,398 ± 255	35,176 ± 195

2000 ml of RGW (characterized in US7) was added as the TCLP extraction fluid to 100 g of the treated sample matrix.
All units expressed as pCi/l, unless indicated.
<MDA = less than Minimum Detectable Activity for the counted sample.
*U238 concentrations were calculated.

Examples 13 and 14 show that the present invention can use radioactive groundwater as a dispersing agent

and that materials treated by the present invention can be used to treat RGW. These examples also demonstrate that acid rain will not affect treated material.

EXAMPLE 15

Example 15 examines the leachability of constituents from a host material based on a calculation of the distribution coefficient (K_d) for a given analyte (e.g., a specific constituent measured by the analyses). The distribution coefficient is expressed in mug and calculated as the quotient of the activity of nuclide sorbed per unit mass of host material (expressed in pCi/g), and the activity of the nuclide in extract solution per unit volume of extract (expressed in pCi/ml). K_d is an equilibrium value often calculated to determine the sorption affinity of waste analytes (e.g., nuclides) by host matrix (e.g., contaminated material) in aqueous or other fluid suspensions. In this example, the distribution coefficients are calculated for the untreated (Table XXII) and TGPA treated material (Table XXIII). The same calculations can be made for similar extractions using other extraction fluids such as, deionized water, SPLP or RGW.

TABLE XXII

CALCULATED DISTRIBUTION COEFFICIENT (KD) OF UNTREATED SAMPLE MATERIAL MODIFIED USING SW-846, METHOD 1311 EXTRACTION METHOD

ANALYTE	Total Activity (pCi/g)	US-10 TCLP Fluid 2 (pCi/l)	US-1 TCLP Fluid 2 (pCi/ml)	US-1 Distribution Coefficient (K_d) (ml/g)	Modified
Pb-210	179	173	0.173	1,034.7	
Bi-211	4,212	3,360	3.360	1,253.6	
Bi-214	1,321	910	0.910	1,373.6	
Fr-223	3,919	3,768	3.768	1,040.1	
Ra-223	1,574	1,514	1.514	1,039.6	
Ra-224	2,463	1,772	1.772	1,390.0	
Ra-226	1,800	1,294	1.294	1,391.0	
Ac-227	188	243	0.243	773.7	
Th-227	960	921	6.921	1,042.3	
Th-228	17,110	16,490	16.490	1,037.6	
Pa-231	1,857	1,764	1.764	1,052.7	
U-235	326	313	0.313	1,041.5	
Th-234	NT	19	0.019	--	

TABLE XXIII

CALCULATED DISTRIBUTION COEFFICIENT (KD) OF TGPA TREATED SAMPLE MATERIAL MODIFIED USING SW-846, METHOD 1311 EXTRACTION METHOD

ANALYTE	Untreated Material Total Activity (pCi/g)	5% TGPA TCLP Extract (pCi/l)	5% TGPA TCLP Extract (pCi/ml)	Modified Distribution Coefficient (K_d) (ml/g)
Pb-210	179	<82	<0.082	>2,183
Bi-211	4,212	<21	<0.021	>200,571
Bi-214	1,321	<21	<0.021	>62,905
Pb-214	1,250	<20	<0.020	>62,500
Fr-223	3,919	<226	<0.226	>17,341
Ra-223	1,574	<37	<0.037	>42,541
Ra-224	2,463	<50	<0.050	>49,260
Ra-226	1,800	<190	<0.190	>9,474
Ac-227	188	<44	<0.044	>4,273
Th-227	960	<56	<0.056	>17,143
Th-228	17,110	<588	<0.588	>29,099
Pa-231	1,857	<272	<0.272	>6,827
U-235	326	<104	<0.104	>3,135
Th-234	NT	<12	<0.012	NA

Tables XXII and XXIII show an increase of the sorption affinity of the radionuclides by the host material as a result of treatment with TGPA. Further, the calculations in Tables XXII and XXIII utilize the MDA values for the equation denominator. The MDA is based on numerous factors, including count times, background, detector efficiency, recovery, decay, and other variables. Therefore, the K_d values for radionuclides in materials treated with TGPA are actually higher than what can be empirically determined when the nuclide presence in extract is <MDA.

Although the present invention has been described in connection with preferred embodiments, it will be

appreciated by those skilled in the art that additions, modifications, substitutions and deletions not specifically described may be made without departing from the spirit and scope of the invention defined in the appended claims.

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