

**PHASE I SUMMARY REPORT  
FOR  
DETROIT LEAD ASSESSMENT PROJECT  
11031 SHOEMAKER STREET SITE  
DETROIT, WAYNE COUNTY, MICHIGAN**

Prepared for:

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
REMEDIATION AND REDEVELOPMENT DIVISION**

Southeast Michigan District Office  
27700 Donald Court  
Warren, Michigan 48092-2793

Prepared by:

**WESTON SOLUTIONS OF MICHIGAN, INC.**

7800 West Outer Drive, Suite 200  
Detroit, Michigan 48235-3459

**November 2007**

W.O. No. 20083.028.001

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**LIST OF ATTACHMENTS**

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**Title**

- Attachment A**    Figures
- Attachment B**    Tables
- Attachment C**    Wind Rose Plot
- Attachment D**    Photographs of Sampling Locations
- Attachment E**    Concentration Graph
- Attachment F**    Statistical Distribution

## **EXECUTIVE SUMMARY**

Weston Solutions of Michigan, Inc. (WESTON®) was contracted by the Michigan Department of Environmental Quality Remediation and Redevelopment Division to conduct off-site sampling for the Detroit Lead Assessment Project in Detroit, Wayne County, Michigan. This Summary Report addresses sampling that was conducted in the vicinity of the 11031 Shoemaker Street Site (the Site) Detroit, Wayne County, Michigan.

The presence of lead identified on properties adjacent to or nearby the former industrial facility (the Facility), was evaluated against predominant atmospheric conditions, spatial distribution, and statistical analysis to determine if the lead at adjacent or nearby properties was indicative of aerial deposition from the Facility.

WESTON collected 13 soil samples for lead analysis at locations upwind and downwind of the Site between 21 through 28 December 2006. The data collected during the Phase I sampling does not support that an identifiable release occurred from the Facility during historic smelting operations. In addition, the City of Detroit Department of Environmental Affairs (DEA) contracted Camp Dresser & McKee to perform a Phase II Environmental Site Assessment (ESA) at the Facility. WESTON was unable to obtain a copy of the draft Phase II ESA Report for review, but was provided with the analytical results for lead and a base map showing sample locations by DEA. The Phase II ESA data provided contained analytical results for 63 lead samples, 21 of which were collected from 0 to 6-inches below ground surface (bgs) and four samples were collected from 0 to 12-inches bgs. The detected concentrations of lead ranged from 9.2 milligrams per kilogram (mg/kg) to 740 mg/kg. The levels of lead found in the soils on-Site were not indicative of long term intensive lead smelting activities.

Because lead concentrations downwind and on-Site were not indicative of smelting operations, no further action is recommended at the Site related to lead concentrations above Residential/Commercial I Direct Contact Criteria.

## SECTION 1

### INTRODUCTION

Weston Solutions of Michigan, Inc. (WESTON®) was contracted by the Michigan Department of Environmental Quality (MDEQ) Remediation and Redevelopment Division (RRD) to conduct off-site sampling for the Detroit Lead Assessment Project (the Project) in Detroit, Wayne County, Michigan. This Summary Report addresses sampling that was conducted in the vicinity of the 11031 Shoemaker Street Site, Detroit, Wayne County, Michigan. The overall objectives, technical basis, and general sampling protocols for this work are described in the *Phase I Quality Assurance Sampling Plan for the Detroit Lead Assessment Project* (WESTON, 2003).

This Phase I Summary Report for 11031 Shoemaker Site (the Site) has been organized in a format that is intended to facilitate and effectively meet the objectives of the Phase I investigation. Herein, the Site refers to the former industrial facility (the Facility) located at 11031 Shoemaker Street and the surrounding areas within 1,500 feet (ft) of the Facility. The Summary Report is organized into the following sections:

- **Section 1** – Introduction,
- **Section 2** – Site Information,
- **Section 3** – Field Activities and Procedures,
- **Section 4** – Phase I Analytical Results, and
- **Section 5** – Recommendations.

Attachments to this Summary Report include the following:

- **Attachment A** – Figures,
- **Attachment B** – Tables,
- **Attachment C** – Wind Rose Plot,
- **Attachment D** – Photographs of Sampling Locations,
- **Attachment E** – Concentration Graph, and
- **Attachment F** – Statistical Distribution.

## SECTION 2

### SITE INFORMATION

#### 2.1 SITE DESCRIPTION

The Site, located in the vicinity of 11031 Shoemaker Street in Detroit, Wayne County, Michigan (Detroit Metropolitan Area Map, **Attachment A**), was suspected of historical smelting operations and was chosen for investigation based on research previously performed by MDEQ. The addresses of off-site properties sampled are presented in **Table 1** in **Attachment B**.

There are two vacant industrial/office buildings and vacant watchman office on the property. The Site is bounded to the north by Olga Street, to the west by Fairview Street, to the south by Shoemaker Street and to the east by rail road tracks and St. Jean Street. The vicinity of the Site is mostly residential and commercial areas.

##### 2.1.1 Site History

WESTON was contracted by the MDEQ RRD to perform data investigation and eventual off-site sampling activities associated with 12 of the potential smelters as a part of the Detroit Lead Assessment Project. WESTON initially reviewed historical information related to each facility including Bresser's Directory data, Sanborn Fire Insurance Maps from various years, aerial photographs from various years, fire marshal records, Baseline Environmental Assessments, and other available information to evaluate the potential for historical smelting activities to have occurred at the facilities. The results of this effort are summarized in the *Summary Report for Data Investigation and Detroit Lead Assessment Project* (WESTON, 2003). WESTON concluded through the available historical information that the Site (and 11 others) was a possible lead smelter.

The Bresser's directory review showed that Federal Mogul Corporation owned the property from 1946 to 1971. Co-owners of the property are included in the following table.

<b>Historical Co-Owners at the 11031 Shoemaker Street Facility</b>	
<b>Date</b>	<b>Name</b>
1946	Federal Bearing & Bushing Corporation, Jones Edwin Olney, Mogul Metal Company, Muzzy Lyons Company, and Reynolds Stafford C
1951	Reynolds Stafford C, Jones Edwin Olney OFC, National Formetal Company, and Dixon HP
1961	HF Dixon and Edwin Olney Jones
1971	Bower Roller Bearing
1981	Erwin Trucking and RPM Distributing

Review of Sanborn maps indicated the chronology of the Facility as summarized in the following table.

<b>Sanborn Chronology of the 11031 Shoemaker Street Facility</b>	
<b>Date</b>	<b>Name</b>
1969	Federal Mogul-Bower Bearings listed with a foundry shown
1972	Facility building shown
1977	Aetna Metals listed with facility building shown
1978	Facility building shown, but listed as vacant
1984	Facility building shown
1998	Facility building demolished

The aerial photograph review indicated this area was industrialized from 1957 to 1994 and current land use also appears to be industrial and vacant. Structures identified from a 2003 aerial photograph include buildings in the south and west portions of the property with undeveloped space to the east and north. Adjacent to the Facility, to the west, a high-density residential area was shown.

WESTON's review of the *Phase I Environmental Site Assessment Report* (The Traverse Group, 2003) indicated that the facility was previously operated as an industrial facility by Federal Mogul Corporation, Bower Bearing Manufacturers, and Ernst Realty Company/Ernst Fuel & Supply Company from 1925 until the 1970's. In addition, a lead foundry was located in the central portion of the west building and contained approximately eight kettles and a furnace in a concrete floor depicted south in the babbitting room.



In addition, the City of Detroit Department of Environmental Affairs (DEA) contracted Camp Dresser & McKee to perform a Phase II Environmental Site Assessment (ESA) at the Facility. WESTON was unable to obtain a copy of the draft Phase II ESA Report for review, but was provided with the analytical results for lead and a base map showing sample locations by DEA. The Phase II data provided contained analytical results for 63 lead samples, 21 of which were collected from 0 to 6-inches below ground surface (bgs) and four samples were collected from 0 to 12-inches bgs. The detected concentrations of lead ranged from 9.2 milligrams per kilogram (mg/kg) to 740 mg/kg. The levels of lead found in the soils on-Site are not indicative of long term intensive lead smelting activities.

Currently, the Site is partially occupied by the City of Detroit Department of Water and Sewerage Department Maintenance Group. There are two vacant industrial office buildings and a vacant watchman office. It appears there is at least one stack located on the building but the height is unknown.

## **2.2 SITE CONCERNS**

The primary concern associated with the Site is the potential off-site release through aerial deposition of smelter-related metals, specifically lead, to soils in the surrounding neighborhood.

## SECTION 3

### FIELD ACTIVITIES AND PROCEDURES

#### 3.1 OVERVIEW OF SAMPLING ACTIVITIES

The goal of the Phase I sampling was to determine if lead concentrations consistent with smelter related releases were present off-site and could be attributed to the Facility. Sampling was performed in accordance with the *Limited Sampling Plan for the 11031 Shoemaker Street Site* (WESTON, December 2006).

Prior to sample collection, upwind and downwind sampling areas were established within an approximate 1,500 foot radius of the Facility. These areas were established based on mean wind direction from 1984 to 1991 for the Detroit Metropolitan Area. A copy of the wind rose plot is provided in **Attachment C**. Soil samples were collected from city and/or state owned properties located within these established areas.

The city and/or state owned parcels identified for sampling were those closest to the average wind direction and at varying distances from the Facility. Where individual city and/or state owned parcels were not available, right-of-ways were used and have been identified on the location sketches included in **Attachment A**. Photographs of the sampling locations have been included in **Attachment D**. Exposure units and appropriate sample grids were established in accordance with the *Quality Assurance Sampling Plan (QASP)* (WESTON, 2003) to guide the sampling activities.

Sampling activities (sample collection, record keeping, and photo documentation) were conducted as described in the Comprehensive Summary. A total of four composite samples were collected from two upwind properties. Right-of-ways owned by the City of Detroit were sampled in the downwind direction due to the large size and availability of the property, and two right-of-ways were sampled in the upwind direction. Downwind samples collected within the right-of-ways were collected in 30 foot sections to be considered representative of local residential lot sizes that are approximately 30 ft wide. Thirteen composite samples were

collected from the area upwind and downwind of the Facility and are shown on the sample location sketches and figures included in **Attachment A**.

### **3.2 FIELD ACTIVITIES**

WESTON personnel conducted field sampling on 21 and 28 December 2006. Since 12 city and/or state owned parcels were not available both upwind and downwind, WESTON selected six upwind properties/right-of-ways and two downwind properties/right-of-ways prior to the sampling event and requested access from the City of Detroit to sample the properties/right-of-ways. One sample was designated as a matrix spike/matrix spike duplicates and two samples were designated as duplicate samples in accordance with the QASP.

## SECTION 4

### PHASE I ANALYTICAL RESULTS

#### 4.1 SUMMARY OF ANALYSIS

During Phase I soil sampling, the following samples were collected upwind and downwind of the Facility:

- Seven composite soil samples in the upwind direction, and
- Six composite soil samples in the downwind direction.

Sample locations from both the upwind and downwind areas are listed in **Table 1** included in **Attachment B**.

In accordance with the QASP, a total of 13 samples were sent to the MDEQ Environmental Laboratory located in Lansing, Michigan for lead analysis using United States Environmental Protection Agency solid waste method 6010B for total, fine, and coarse fractions of soil. One sample collected downwind of the Facility and one sample collected upwind of the Facility contained concentrations of lead (coarse fraction and fine fraction, respectively) above Part 201 Residential/Commercial I Direct Contact Criteria (RCDCC) (400 mg/kg). A summary of the Phase I sampling results are included in the table below.

Location	Number of Samples	Number Equal to or Greater than 400 mg/kg	Coarse Fraction Lead Concentration Range (mg/kg)	Fine Fraction Lead Concentration Range (mg/kg)	Total Lead Concentration Range (mg/kg)
Upwind	7	1	87-290	130-410	92-300
Downwind	6	1	40-640	78-310	61-590
Total	13	2	40-640	78-410	92-590

#### 4.2 ATMOSPHERIC CONDITIONS

During Phase I soil sampling activities, upwind and downwind parcels were selected based on the mean wind direction from 1984 to 1991 for the Detroit Metropolitan Area. A copy of the wind rose plot is provided in **Attachment C**. The wind rose plot showed a prominent northeast

wind direction in the City of Detroit Metropolitan Area. If smelting operations occurred, lead in soils resulting from aerial deposition would be detected downwind in the northeast direction from the Facility. Parcels/right-of-ways ranging from 720 ft to 1,100 ft west/southwest of the Facility were selected for upwind sampling locations. Right-of-way areas ranging from 1,200 ft to 1,600 ft east/northeast of the Facility were selected for downwind sampling. As discussed above, one upwind sample and one downwind sample exceeded Part 201 RCDCC.

#### **4.3 SPATIAL ANALYSIS**

Where air-transport of materials occurs, it is expected that the largest impacts on the soil will occur closest to the source, and the magnitude of the impact will tend to decrease as a function of distance from the source. In addition, it is expected that the spatial pattern of soil impacts will tend to be elongated in the predominant downwind direction. Thus, the Phase I investigation was designed to determine if an off-site airborne release had occurred by examining the spatial pattern of soil contaminant concentrations as a function of distance from the Facility in a downwind direction. As seen in **Table 2 (Attachment B)**, concentrations of lead greater than the screening level occurred within the primary downwind envelope.

To determine the distribution of the lead concentrations in soils as the distance from the Facility increases, WESTON evaluated the lead concentration of samples versus the distance from the Facility by graphing the data in relation to each other. Evaluation of this graph (see **Attachment E**) indicated consistently low concentrations of lead in the downwind direction and slightly elevated levels of lead in the upwind direction. The graph does not represent decreasing concentrations with increasing distance from the Facility. This condition would be expected if an aerial release of lead had occurred due to smelting operations.

#### **4.4 STATISTICAL ANALYSIS**

Analytical data was entered into a spreadsheet and differentiated as downwind and upwind samples, then processed using the MDEQ online statistical interface for Part 201 evaluations. As shown on the distribution analysis figures included in **Attachment F**, the downwind log mean is 4.79 mg/kg and the upwind log mean is 5.16 mg/kg indicating the concentrations downwind are lower than the upwind concentrations. In addition, the relative frequency histogram

(Attachment F) indicates that the highest frequency of occurrence occurs at 75 mg/kg in downwind areas and the highest frequency occurs at 150 mg/kg in the upwind area. Comparison of the upwind and downwind data sets indicates the mean lead concentrations upwind of the Facility are similar and slightly higher than the mean downwind concentrations to conclude that the data represent similar conditions.

#### **4.5 CONCLUSIONS**

The overall concentrations and pattern of analytical results for lead in soil samples collected from the Site do not suggest historic releases from smelting operations at the Facility have occurred. Further, samples collected at the Facility on behalf of the City of Detroit DEA did not contain lead concentrations that would be indicative of lead smelting operations. The analytical data was compared to a screening level consisting of the MDEQ RCDCC for soil (400 mg/kg), as established under Part 201, Environmental Response, of the Natural Resources and Environmental Protection Act 1994, as amended.

## **SECTION 5**

### **RECOMMENDATIONS**

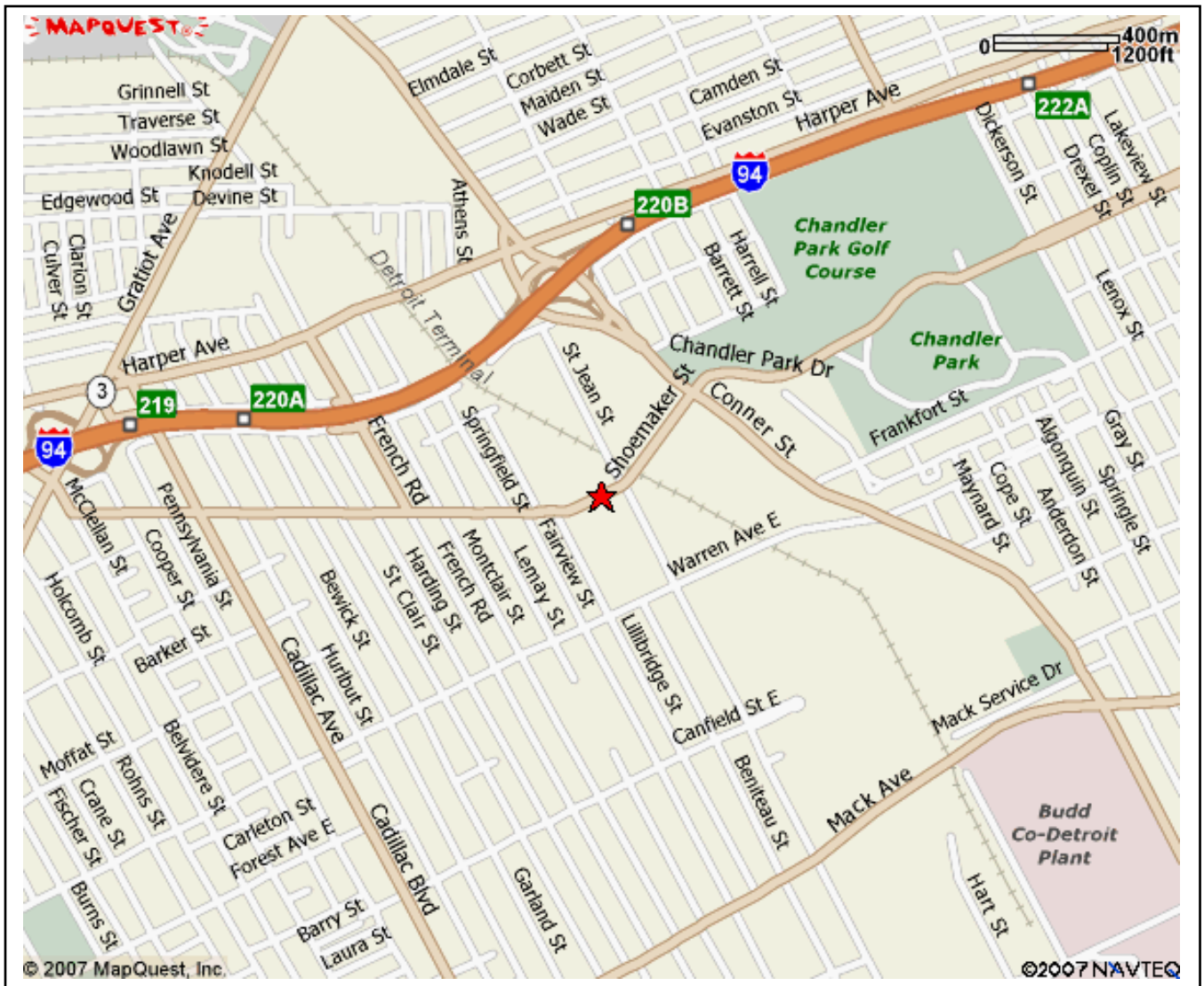
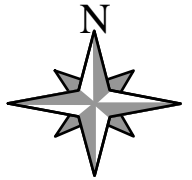
Based on the conclusions provided in **Section 4**, WESTON recommends that no further action be performed at the Site related to RCDCC exceedances for lead.

# **ATTACHMENT A**

## **FIGURES**



**FIGURE 1**  
**Site Location Map**  
**11031 Shoemaker Street Site**

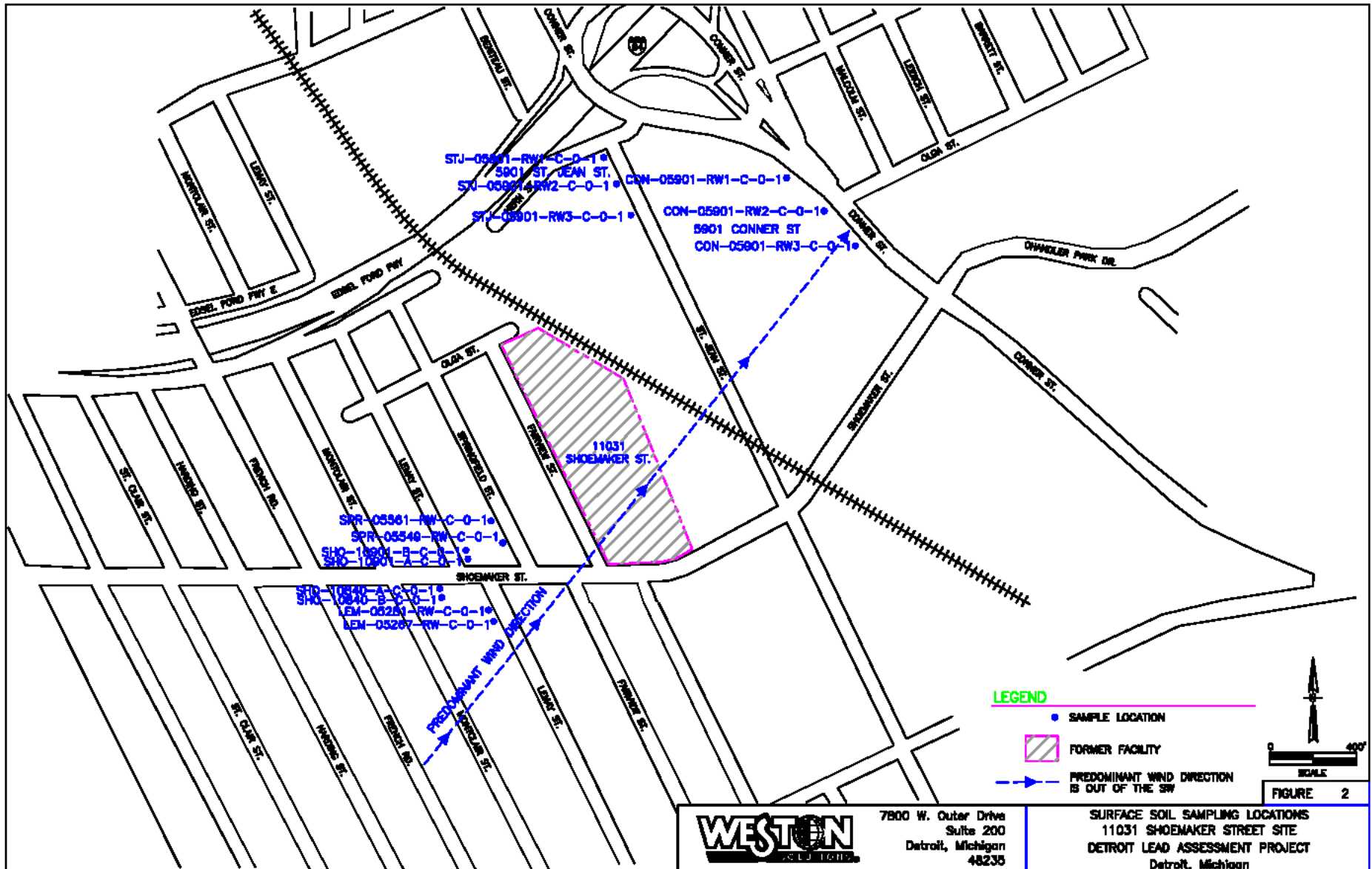


**WESTON SOLUTIONS OF MICHIGAN, INC.**



**7800 West Outer Drive, Suite 200**  
**Detroit, Michigan 48207**

**Detroit Lead Assessment Project**  
**Detroit, Wayne County, Michigan**  
**W.O. No. 20083.028.001**



CLIENT/SUBJECT Commodity Metals - Shoemaker W.O. NO. \_\_\_\_\_

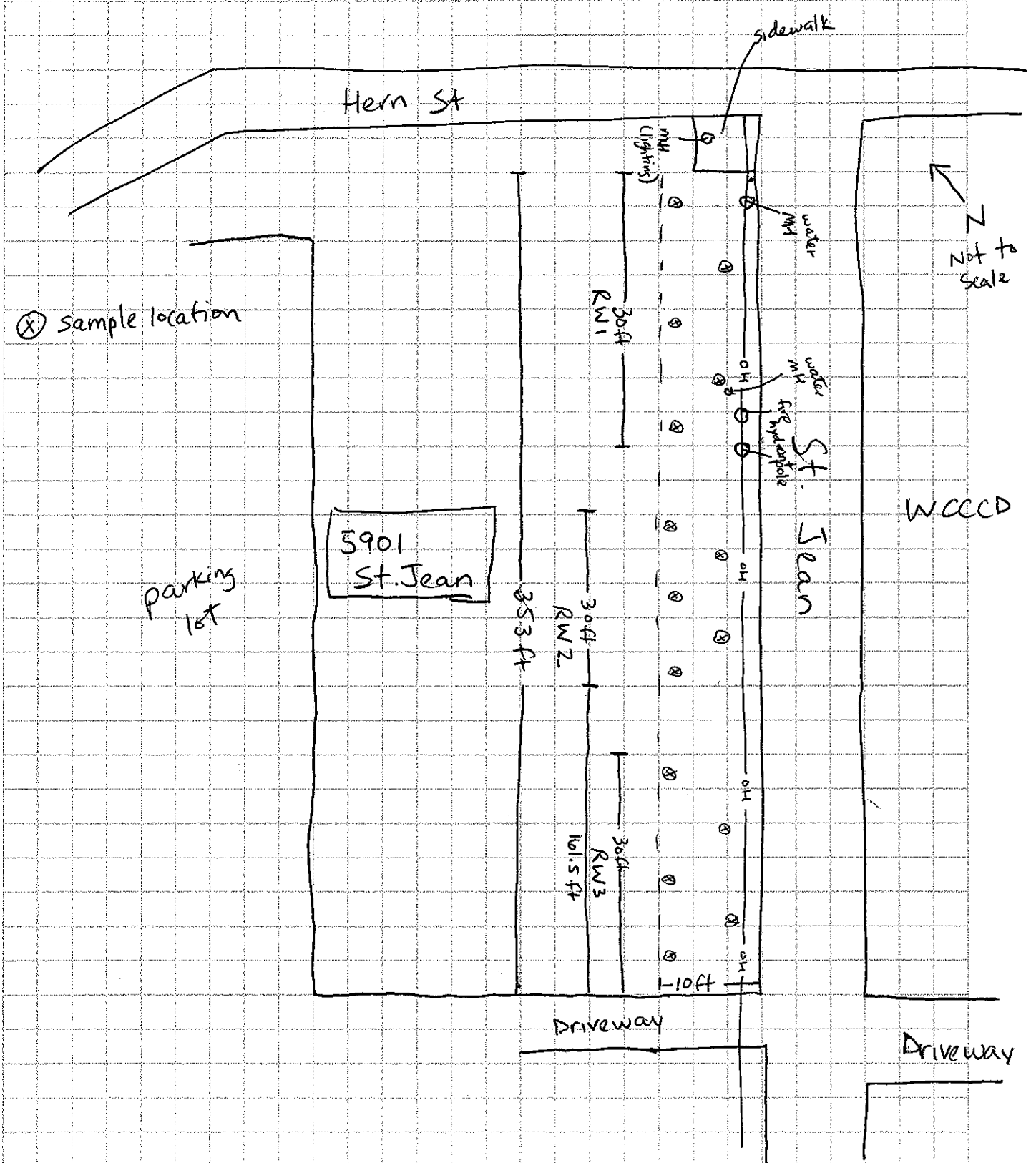
TASK DESCRIPTION 5901 St. Jean TASK NO. \_\_\_\_\_

PREPARED BY KBH DEPT \_\_\_\_\_ DATE 12/28/06

MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY	
DEPT _____	DATE _____



CLIENT/SUBJECT Commodity Metals - Shoemaker W.O. NO. \_\_\_\_\_

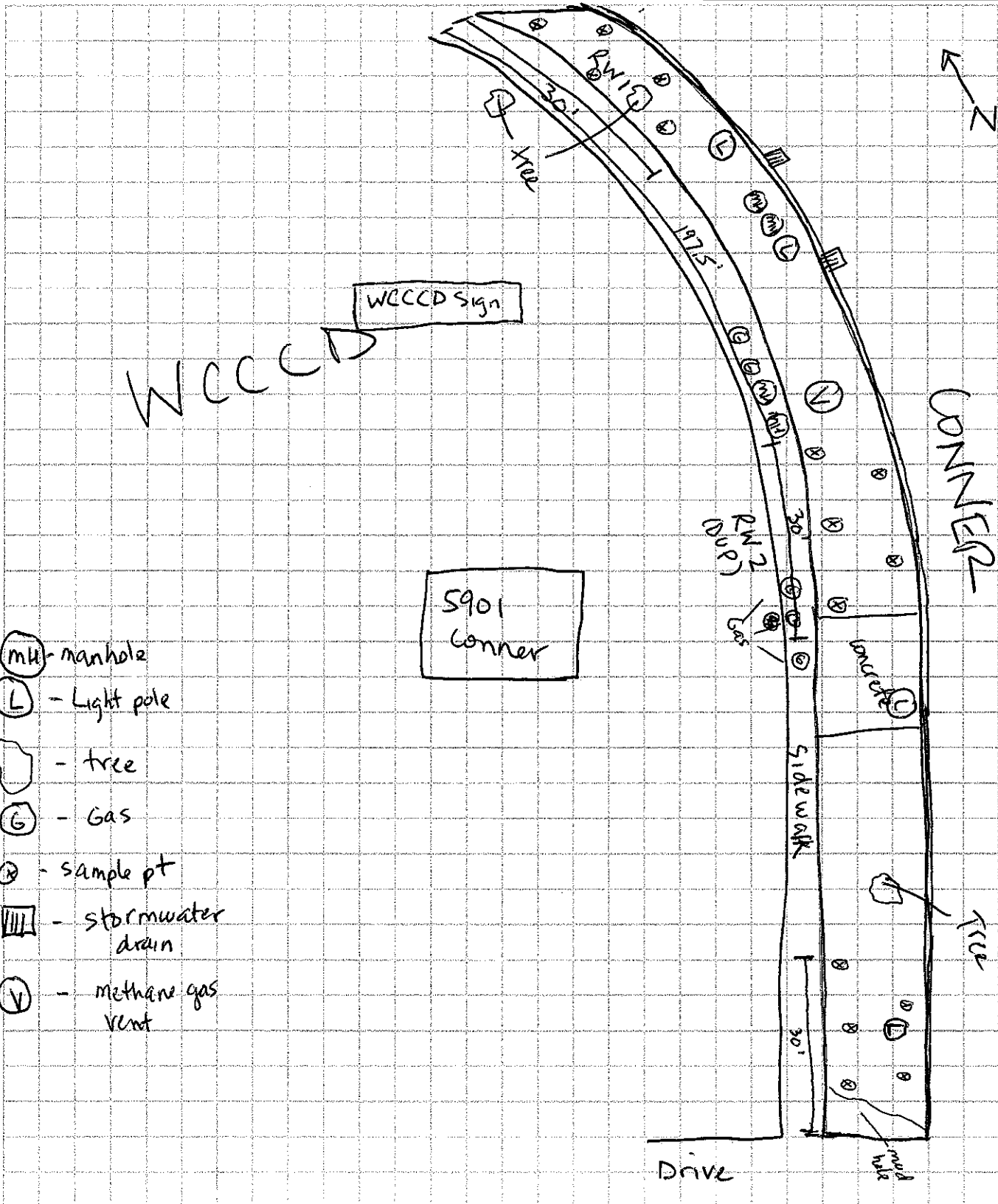
TASK DESCRIPTION 5901 Conner TASK NO. \_\_\_\_\_

PREPARED BY KBH DEPT \_\_\_\_\_ DATE 12/28/06

MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY	
DEPT _____	DATE _____



- MH - manhole
- L - Light pole
- T - tree
- G - Gas
- X - sample pt
- SD - stormwater drain
- V - methane gas vent



SHEET \_\_\_ of \_\_\_

CLIENT/SUBJECT MDEQ-RCD: DLAP-SHOEMAKER W.O. NO. 20083

TASK DESCRIPTION Sampling: 10890 SHOEMAKER TASK NO. \_\_\_\_\_

PREPARED BY S. Lewis DEPT \_\_\_\_\_ DATE 12/21/06

MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY	
_____	
DEPT _____	DATE _____

N

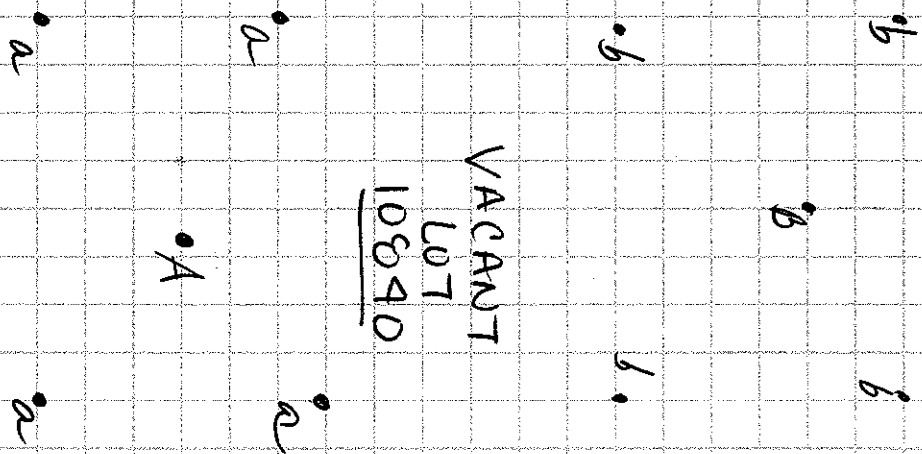
LEMAY

10870  
Trinity Memorial  
MBC

SHOEMAKER

PARKING LOT

VACANT LOT  
10890





SHEET \_\_\_\_ of \_\_\_\_

CLIENT/SUBJECT \_\_\_\_\_

W.O. NO. 2083.

TASK DESCRIPTION SAMPLING - 5549 SPRINGFIELD

TASK NO. \_\_\_\_\_

PREPARED BY S. Lewis DEPT \_\_\_\_\_ DATE 12/21/06

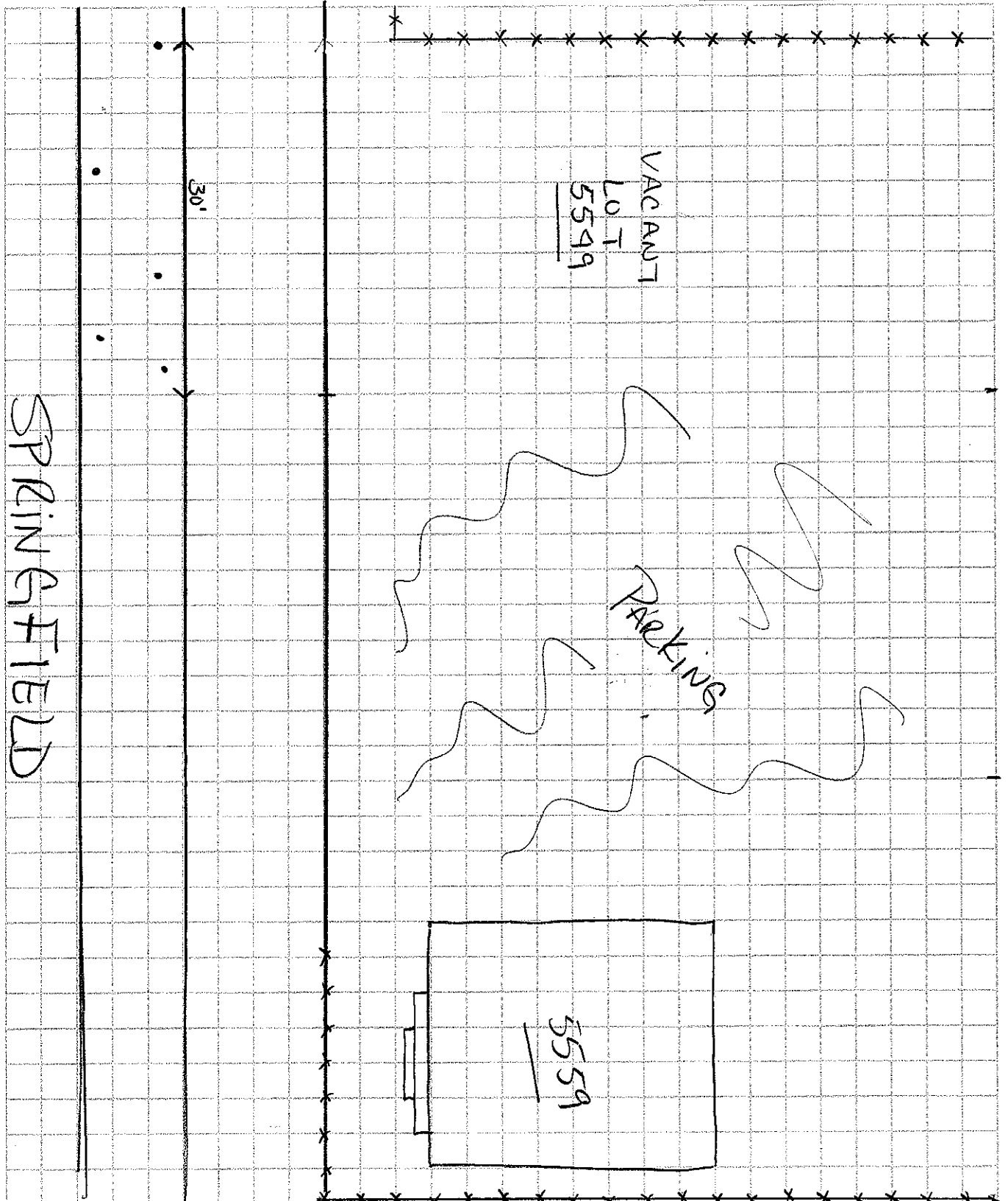
APPROVED BY \_\_\_\_\_

MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

DEPT \_\_\_\_\_ DATE \_\_\_\_\_

↓N



CLIENT/SUBJECT MIDEX-RRID; DLAP-SHOEMAKER

W.O. NO. 20083

TASK DESCRIPTION SAMPLING - 5567 Springfield

TASK NO. \_\_\_\_\_

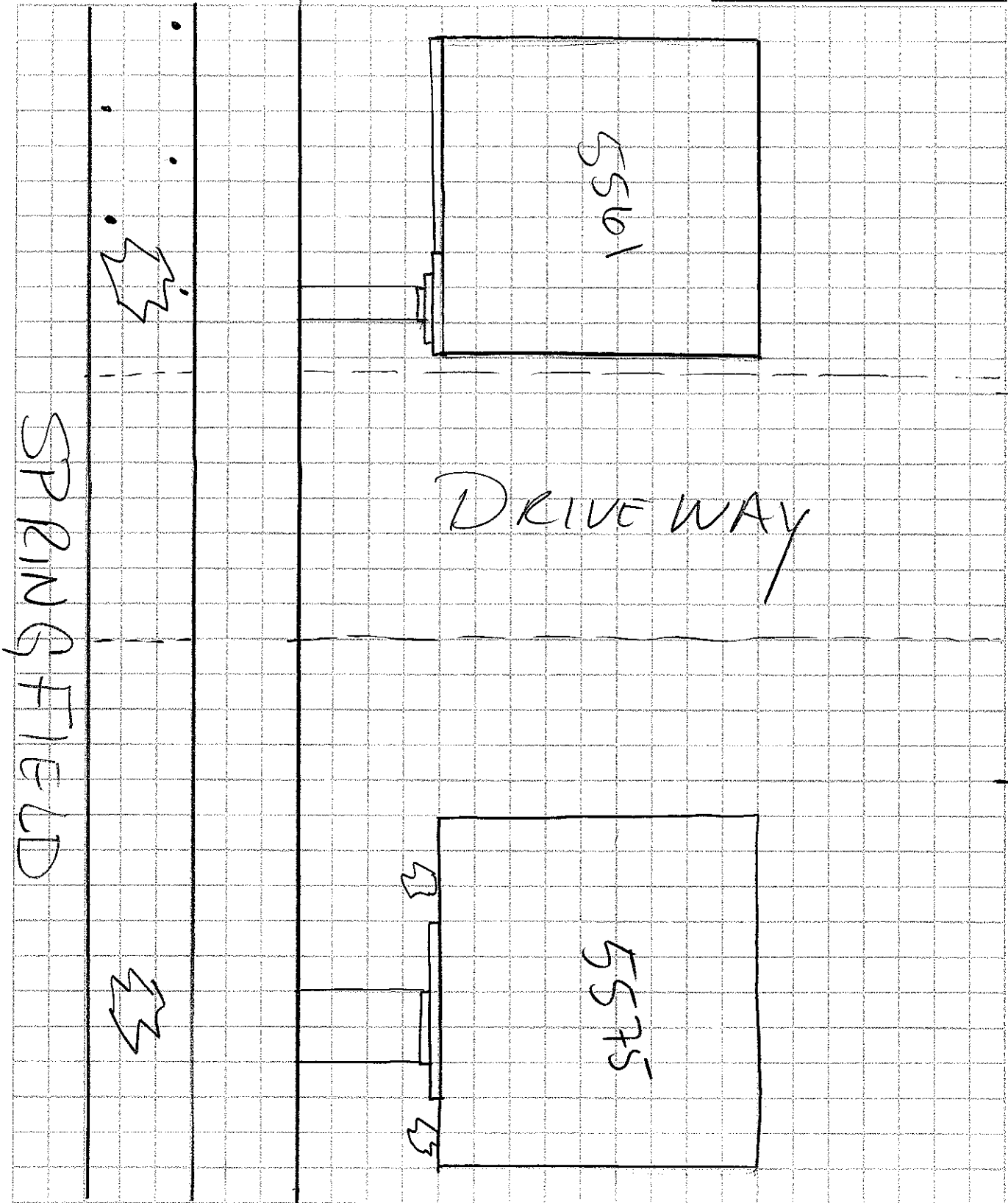
PREPARED BY S. Lewis DEPT \_\_\_\_\_ DATE 12/21/06

MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY
DEPT _____ DATE _____

↓ N



CLIENT/SUBJECT MDEQ-RRD: DLAP - SHOEMAKER

W.O. NO. 20083

TASK DESCRIPTION SAMPLING - 10901 SHOEMAKER

TASK NO. \_\_\_\_\_

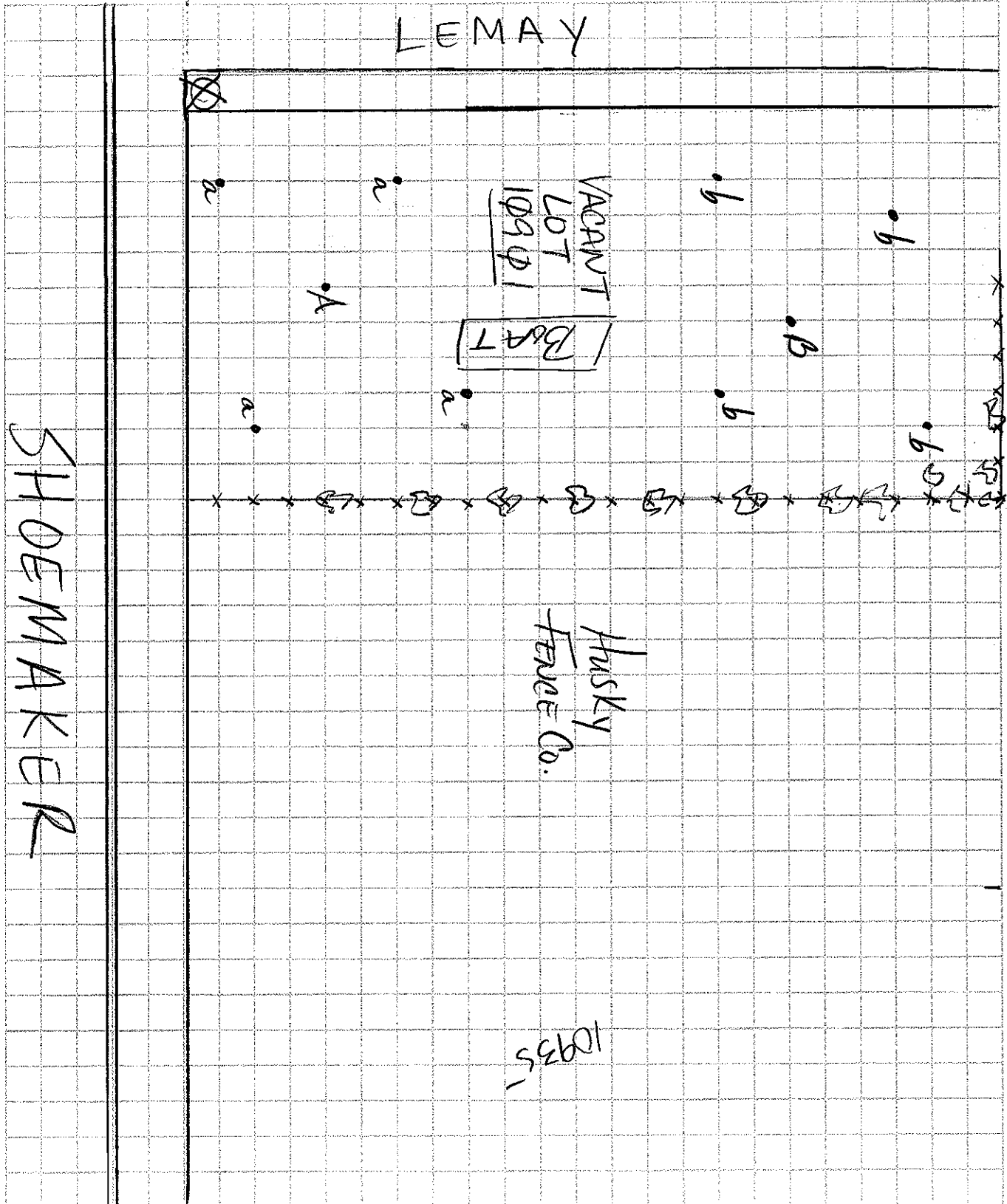
PREPARED BY S. LEWIS DEPT \_\_\_\_\_ DATE 12/21/06

APPROVED BY \_\_\_\_\_

MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

DEPT \_\_\_\_\_ DATE \_\_\_\_\_





CLIENT/SUBJECT MDEQ-RRD / DLAP-SHOEMAKER W.O. NO. 20083

TASK DESCRIPTION INVESTIGATIVE SAMPLING EVENT TASK NO. \_\_\_\_\_

PREPARED BY S. LEWIS DEPT \_\_\_\_\_ DATE 12/21/06

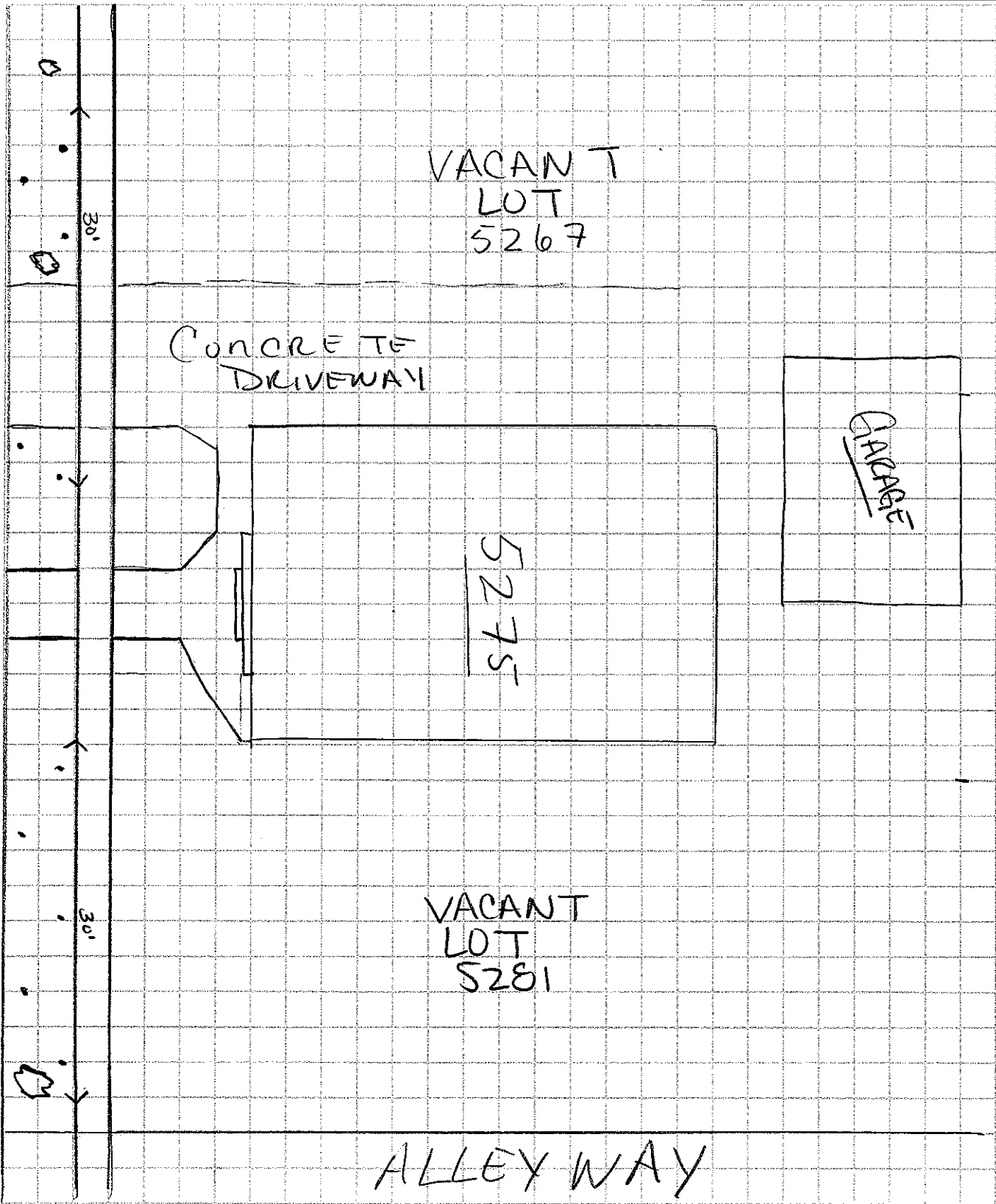
MATH CHECK BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

METHOD REV. BY \_\_\_\_\_ DEPT \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY _____
DEPT _____ DATE _____

↓N

LEMAY



**ATTACHMENT B**

**TABLES**

**Table 1**  
**Summary of Sampled Properties**  
**11031 Shoemaker Street Site**  
**Detroit Lead Assessment Project**  
**Detroit, Wayne County, Michigan**

<b>Upwind Properties</b>		
<b>Address</b>	<b>Description</b>	<b>Sample Identification</b>
5267 Lemay	Right-of-way located on the west side of Lemay Street, approximately 30 ft north to south from the fence line of 5267 Lemay Street.	LEM-05267-RW-C-0-1
5281 Lemay	Right-of-way located on the west side of Lemay Street in front of the vacant property known as 5281 Lemay Street.	LEM-05281-RW-C-0-1
10840 Shoemaker	Vacant property located on the south side of Shoemaker Street and west of the church parking lot.	SHO-10840-A-C-0-1
		SHO-10840-B-C-0-1
(Duplicate sample)		SHO-10840-B-C-0-3
10901 Shoemaker	Vacant gated property located on the north side of Shoemaker Street and west of a small business.	SHO-10901-A-C-0-1
(MS/MSD sample)		SHO-10901-B-C-0-2
5549 Springfield	Right-of-way located east of the vacant lot of 5549 Springfield. 5549 Springfield is located on the west side of Springfield and south of 5561 Springfield.	SPR-05549-RW-C-0-1
5561 Springfield	Right-of-way located east of the 5561 Springfield. 5561 Springfield is located on the west side of Springfield.	SPR-05561-RW-C-0-1
<b>Downwind Properties</b>		
<b>Address</b>	<b>Description</b>	<b>Sample Identification</b>
5901 Conner	Right-of-way located on the west side of Conner, east of Wayne County Community College Campus	CON-05901-RW1-C-0-1
		CON-05901-RW2-C-0-1
(Duplicate sample)		CON-05901-RW2-C-0-3
		CON-05901-RW3-C-0-1
5901 St. Jean	Right-of-way located on the west side of Conner Road, west of Dialysis health center on the east side of Conner.	STJ-05901-RW1-C-0-1
		STJ-05901-RW2-C-0-1
		STJ-05901-RW3-C-0-1

**Table 2**  
**Summary of Analytical Results**  
**11031 Shoemaker Street Site**  
**Detroit Lead Assessment Project**  
**Detroit, Wayne County, Michigan**

Sample Address	Sample ID	Total Concentration (mg/Kg)	Fine Concentration (mg/Kg)	Coarse Concentration (mg/Kg)
<b>Upwind Properties</b>				
5267 Lemay	LEM-05267-RW-C-0-1	250	350	190
5281 Lemay	LEM-05281-RW-C-0-1	270	250	290
10840 Shoemaker	SHO-10840-A-C-0-1	120	130	120
	SHO-10840-B-C-0-1	140	180	140
(Duplicate sample)	SHO-10840-B-C-0-3	170	180	170
10901 Shoemaker	SHO-10901-A-C-0-1	160	160	160
(MS/MSD sample)	SHO-10901-B-C-0-2	92	150	87
5549 Springfield	SPR-05549-RW-C-0-1	300	<b>410</b>	270
5561 Springfield	SPR-05561-RW-C-0-1	180	220	170
<b>Downwind Properties</b>				
5901 Conner	CON-05901-RW1-C-0-1	190	310	140
	CON-05901-RW2-C-0-1	91	160	62
(Duplicate sample)	CON-05901-RW2-C-0-3	110	150	100
	CON-05901-RW3-C-0-1	66	110	40
5901 St. Jean	STJ-05901-RW1-C-0-1	81	93	78
	STJ-05901-RW2-C-0-1	<b>590</b>	190	<b>640</b>
	STJ-05901-RW3-C-0-1	61	78	58

Entered by: KBH  
QC by: ALC

**\*Notes**

- 1) RW indicates sample was collected in right-of-way near road.
- 2) Duplicate and Matrix spike / Matrix spike duplicate (MS/MSD) samples collected from sample listed just previously.
- 3) Residential and Commercial I Direct Contact Criteria is 400 milligrams per kilogram (mg/kg).  
**Bold indicates results equal to or greater than 400 mg/kg.**

**Table 3**  
**Total Concentration of Lead vs. Distance**  
**11031 Shoemaker Street Site**  
**Detroit Lead Assessment Project**  
**Detroit, Wayne County, Michigan**

Sample ID	Distance (ft)	Concentration (mg/kg)
<b>Upwind Properties</b>		
LEM-05267-RW-C-0-1	1,000	250
LEM-05281-RW-C-0-1	1,000	270
SHO-10840-A-C-0-1	1,080	120
SHO-10840-B-C-0-1	1,090	140
SHO-10840-B-C-0-3	1,090	170
SHO-10901-A-C-0-1	800	160
SHO-10901-B-C-0-2	800	92
SPR-05549-RW-C-0-1	680	300
SPR-05561-RW-C-0-1	720	180
<b>Downwind Properties</b>		
CON-05901-RW1-C-0-1	1,600	190
CON-05901-RW2-C-0-1	1,600	91
CON-05901-RW2-C-0-3	1,600	110
CON-05901-RW3-C-0-1	1,560	66
STJ-05901-RW1-C-0-1	1,480	81
STJ-05901-RW2-C-0-1	1,320	<b>590</b>
STJ-05901-RW3-C-0-1	1,200	61

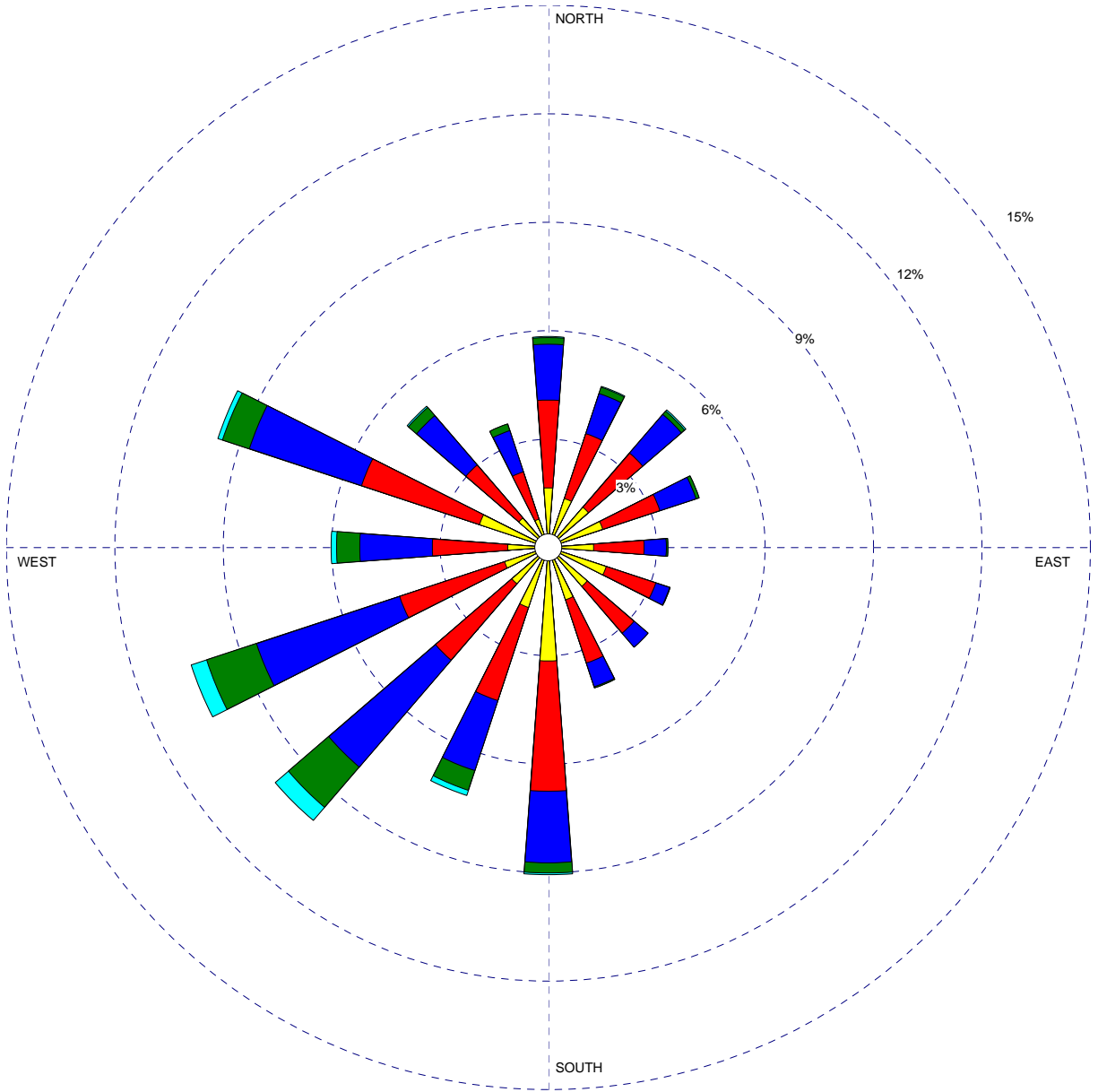
\*Notes:

- 1) Bold indicates results equal to or greater than 400 mg/kg.

**ATTACHMENT C**  
**WIND ROSE PLOT**

WIND ROSE PLOT

STATION #94847 - DETROIT/METROPOLITAN ARPT, MI



<p>Wind Speed (m/s)</p>		DATE <b>2/3/2003</b>	<b>Weston Solutions, Inc.</b>
	DISPLAY <b>Wind Speed</b>	UNIT <b>m/s</b>	<b>Years 1984-1991</b>
	AVG. WIND SPEED <b>5.06 m/s</b>	CALM WINDS <b>3.67%</b>	
	ORIENTATION <b>Direction (blowing from)</b>	PLOT YEAR-DATE-TIME <b>84 85 86 87 88 89 90 91 January 1 - December 31 Midnight - 11 PM</b>	<b>ATTACHMENT C</b>

**ATTACHMENT D**  
**PHOTOGRAPHS OF SAMPLING LOCATIONS**



**PHOTOGRAPHIC LOG**  
Detroit Lead Assessment Project  
11031 Shoemaker Street Site



**Photograph 01** Photographer: S. Lewis. Date: 12/18/06. View: West.  
Description: 5281 Lemay Street – Right-of-Way, with Lemay Street in foreground.



**Photograph 02** Photographer: S. Lewis. Date: 12/21/06. View: West.  
Description: 5267 Lemay Street – Right-of-Way, with Lemay Street in foreground.

**PHOTOGRAPHIC LOG**  
Detroit Lead Assessment Project  
11031 Shoemaker Street Site



**Photograph 03** Photographer: S. Lewis. Date: 12/21/06. View: East.  
Description: 5549 Springfield Street – Right-of-Way, with Springfield Street in foreground.



**Photograph 04** Photographer: S. Lewis. Date: 12/21/06. View: East.  
Description: 5561 / 5567 Springfield Street – Right-of-Way, with Springfield Street in foreground.

**PHOTOGRAPHIC LOG**  
Detroit Lead Assessment Project  
11031 Shoemaker Street Site



**Photograph 05** Photographer: S. Lewis. Date: 12/21/06. View: South.  
Description: 10840 Shoemaker Street sample location, with composite soil samples collected on north and south portion of parcel.



**Photograph 06** Photographer: S. Lewis. Date: 12/21/06. View: North.  
Description: 10901 Shoemaker Street sample location, with view of south portion of parcel (front yard).

**PHOTOGRAPHIC LOG**  
Detroit Lead Assessment Project  
11031 Shoemaker Street Site



**Photograph 07** Photographer: S. Lewis. Date: 12/21/06. View: South.  
Description: 10901 Shoemaker Street sample location, with view of north portion of parcel (back yard).



**Photograph 08** Photographer: K. Hudson. Date: 12/28/06. View: West-Southwest.  
Description: 5901 St. Jean Street – Right-of-Way #1, with St. Jean Street in foreground.

**PHOTOGRAPHIC LOG**  
Detroit Lead Assessment Project  
11031 Shoemaker Street Site



**Photograph 09** Photographer: K. Hudson. Date: 12/28/06. View: West-Southwest.  
Description: 5901 St. Jean Street – Right-of-Way #2, with St. Jean Street in foreground.



**Photograph 10** Photographer: K. Hudson. Date: 12/28/06. View: West-Southwest.  
Description: 5901 St. Jean Street – Right-of-Way #3, with St. Jean Street in foreground.

**PHOTOGRAPHIC LOG**  
Detroit Lead Assessment Project  
11031 Shoemaker Street Site



**Photograph 11** Photographer: K. Hudson. Date: 12/28/06. View: North-Northeast.  
Description: 5901 Conner Road – Right-of-Way #1, with Conner Road in background.



**Photograph 12** Photographer: K. Hudson. Date: 12/28/06. View: North-Northeast.  
Description: 5901 Conner Road – Right-of-Way #2, with Conner Road in background.

**PHOTOGRAPHIC LOG**  
Detroit Lead Assessment Project  
11031 Shoemaker Street Site

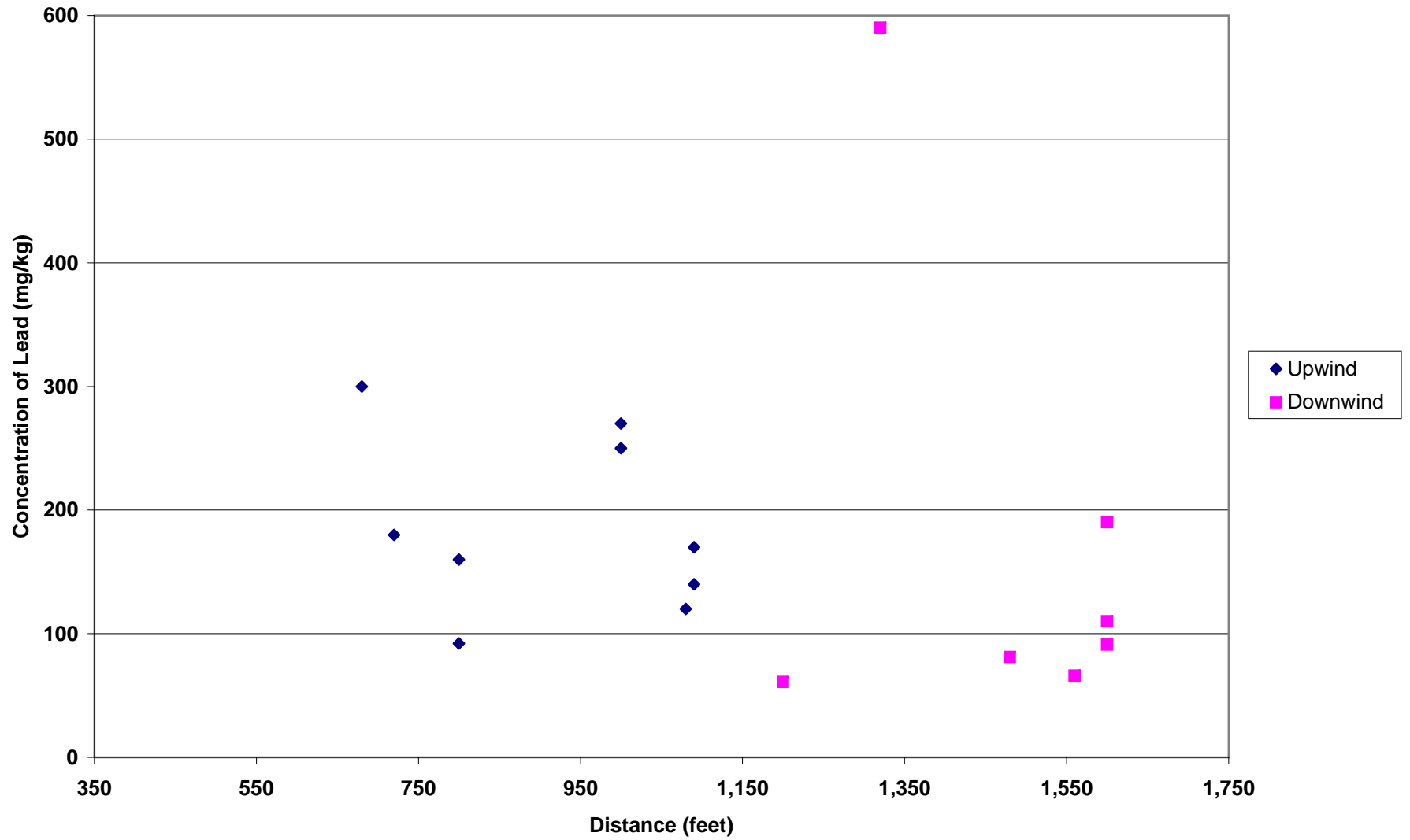


**Photograph 13** Photographer: K. Hudson. Date: 12/28/06. View: North-Northeast.  
Description: 5901 Conner Road – Right-of-Way #3, with Conner Road in background.

**ATTACHMENT E**  
**CONCENTRATION GRAPH**



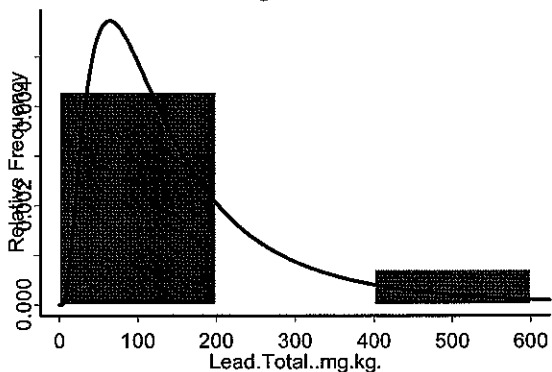
# 11031 Shoemaker Street Site



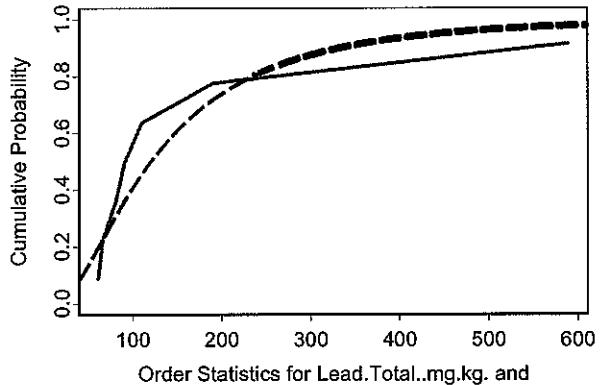
**ATTACHMENT F**  
**STATISTICAL DISTRIBUTION**

Results of Shapiro-Wilk GOF Test for Lead.Total..mg.kg. in X11031.Shoemaker.Street.Site.Samples..2.

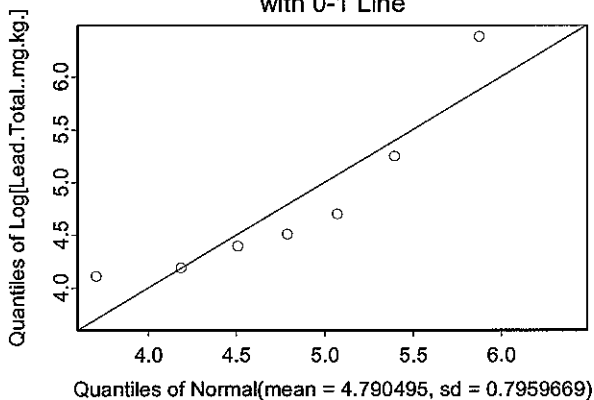
Histogram of Observed Data with Fitted Lognormal Distribution



Empirical CDF for Lead.Total..mg.kg. (solid line) with Fitted Lognormal CDF (dashed line)



Quantile-Quantile Plot with 0-1 Line

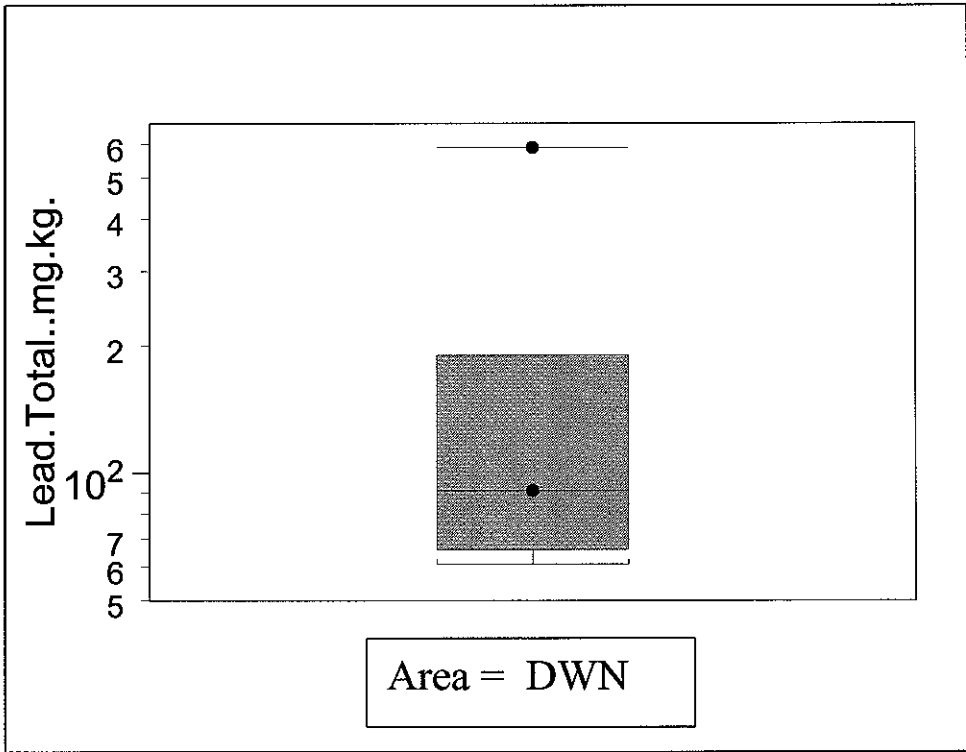


Lognormal(meanlog=4.790495, sdlog=0.7959669) Distribution

Results of Shapiro-Wilk GOF

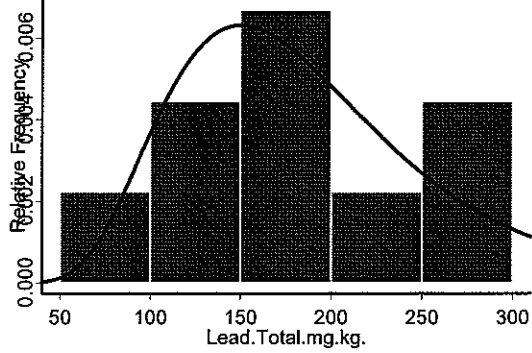
Hypothesized Distribution: Lognormal  
 Estimated Parameters: meanlog = 4.790495, sdlog = 0.7959669  
 Data: Lead.Total..mg.kg.Shoemaker.St.Site.Samples..2.  
 Sample Size: 7  
 Test Statistic: W = 0.8312327  
 Test Statistic Parameter: n = 7  
 P-value: 0.08219902

Area = DWN

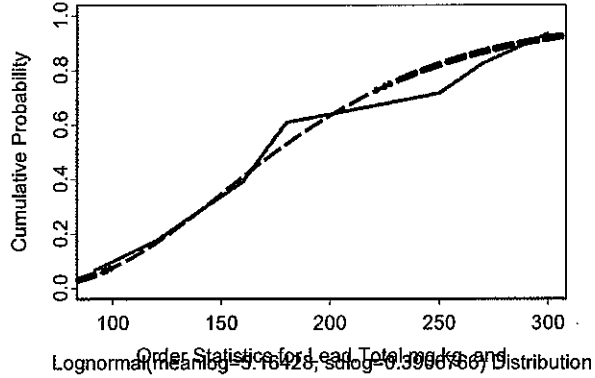


Results of Shapiro-Wilk GOF Test for Lead.Total.mg.kg. in X11031.Shoemaker.Street.Site.Samples..2.

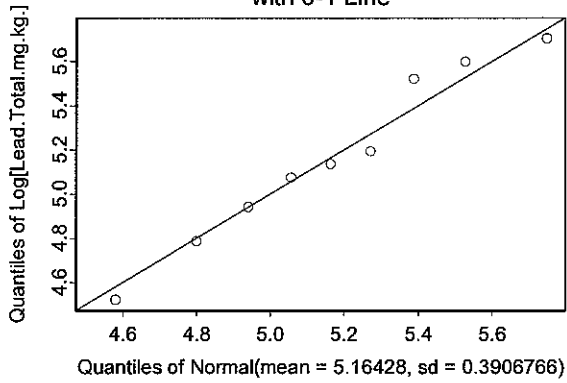
Histogram of Observed Data with Fitted Lognormal Distribution



Empirical CDF for Lead.Total.mg.kg. (solid line) with Fitted Lognormal CDF (dashed line)



Quantile-Quantile Plot with 0-1 Line

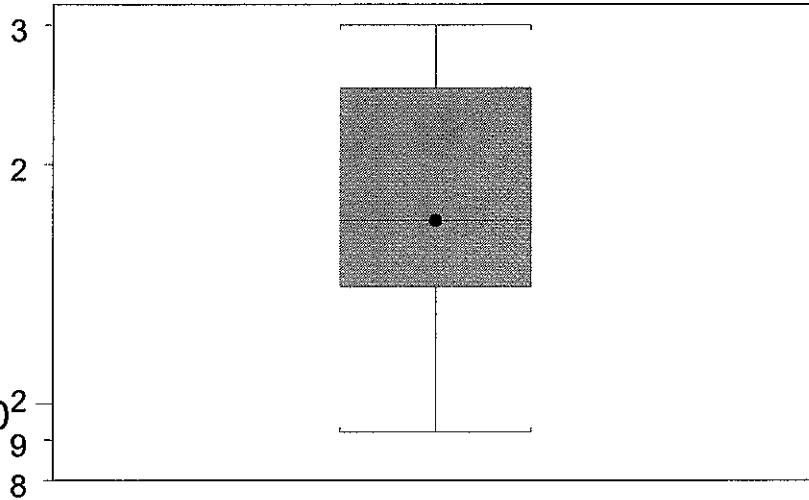


Results of Shapiro-Wilk GOF

Hypothesized Distribution:	Lognormal
Estimated Parameters:	meanlog = 5.16428 sdlog = 0.3906766
Data:	Lead.Total.mg.kg. .Shoemaker.St.Site.Samples..2.
Sample Size:	9
Test Statistic:	W = 0.9639173
Test Statistic Parameter:	n = 9
P-value:	0.8382973

Area = UP

Lead.Total.mg.kg.



Area = UP