PHASE I SUMMARY REPORT
FOR
DETROIT LEAD ASSESSMENT PROJECT
AETNA SMELTING – 1826 ILLINOIS STREET
DETROIT, WAYNE COUNTY, MICHIGAN

Prepared for:

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
REMEDIATION AND REDEVELOPMENT DIVISION
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Prepared by:

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March 2004

W.O. No. 20083.028.001

EXECUTIVE SUMMARY

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 former Aetna Smelting Company (the Facility), 1826 Illinois Street, Detroit, Wayne County, Michigan.

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

On 17 and 19 November 2003, WESTON collected 24 soil samples for lead analysis at locations upwind and downwind of the Facility. Review of the data concluded that the lead detected is consistent with deposition resulting from aerial releases and suggested that such releases occurred from the Facility during historic smelting operations. Therefore it is recommended that additional work be performed at the Facility including:

- Obtain access to the Facility for:
    - Review of existing information related to property transfer (Phase I, Phase II, and development planning):
    - Interview past employees regarding historical Facility operations;
    - Perform a Facility walk through to determine existing conditions;
    - Collect on-site soil samples to determine the presence, concentration, and extent of lead on the Facility (related to the location of former structures, if possible); and
- Collect soil samples from additional downwind properties to confirm and/or determine the extent of downwind contamination.

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LIST OF ATTACHMENTS

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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 former Aetna Smelting Company (the Facility), 1826 Illinois Street, Detroit, Wayne County, Michigan. The overall objectives, technical basis, and general sampling protocols for this work are described in the *Comprehensive Phase I Sampling Summary Report for the Detroit Lead Assessment Project* (Comprehensive Summary).

This Phase I Summary Report for Aetna Smelting Company has been organized in a format that is intended to facilitate and effectively meet the objectives of the Phase I investigation. 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.

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SECTION 2

SITE INFORMATION

2.1 SITE DESCRIPTION

The Facility, located at 1826 Illinois Street in Detroit, Wayne County Michigan (Detroit Metropolitan Area), was suspected of historical smelting operations and was chosen for investigation by the MDEQ based on its presence on a nationwide list of potential lead smelters. WESTON performed a preliminary records review including review of Bresser's city directory information, Sanborn fire insurance maps, aerial photographs, Fire Marshall inspection/permit records, and Baseline Environmental Assessments (BEAs). This review, presented in the "*Summary Report for Data Investigation, Detroit Lead Assessment Project*" dated September 2003, concluded that the facility required additional investigation. Facility location maps are included in **Attachment A**. The addresses of off-site properties sampled are presented in **Table 1** located in **Attachment B**.

2.1.1 Site Location

The Facility appears to be located at the site of the current Pepsi Bottling Distributor (PEPSI) parking lot. The area north and south of the Facility is industrial. The area east of the Facility is industrial for three blocks and residential for at least the next two blocks. A city scrap metal yard is located immediately east of the Facility. The area five blocks west of the Facility is industrial, primarily Pepsi and Interstate 75 (I-75). A senior living complex is located between Pepsi and I75.

2.1.2 Site History

A review of the Bresser's city directory indicated that Aetna Smelting and Refining Company owned the property from 1946 to1971. The address is not listed from 1981 to the present.

Review of the Sanborn maps for this address show the following chronology: 1921 National Smelter Refining Company present with two metal sheds; 1950 Aetna Smelter Company present with a warehouse and metal staging areas; 1968 Aetna Smelter Company present; 1977 Aetna

Smelter Company demolished; 1982 building demolished; 1986 property is cleared; 1996 to 2002 property under the Pepsi Distributing and Production Center.

The aerial photograph review indicated this area was industrialized from 1957 to the present with sparse residential use beginning approximately 1,500 feet (ft.) east of the address. Structures were not identified from the most recent aerial photograph (2003 GlobeXplorer™) with the historical address no longer in use, and the lot paved over for parking next to a large building just to the north. Review of the drive by information indicates that land use is consistent with the aerial photograph and Sanborn maps.

During the investigation of the fire records, an application for the installation of an Inflammable Liquid Storage Tank was located with its nature of business being described as melting of white metals (a classification which includes white lead, white lead ore, and cerussite). A permit was issued to repair fire damage and replace a defective steel stack in the junkyard and smelting plant.

BEAs for the property or surrounding properties were not found.

2.2 SITE CONCERNS

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

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. The general sampling protocol presented in **Section 2** of the Comprehensive Summary was followed during the Phase I evaluation of the Facility. Due to the development around the Facility, samples could not be collected within the 1,000 foot radius stated in the Quality Assurance Sampling Plan (QASP), so the radius was increased for this Facility.

Prior to sample collection, upwind and downwind sampling areas were established, 2,700 and 1,500 ft. from the Facility, respectively. 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, rights-of-way, utility corridors, and alleyways ('greenways') were used and have been identified on the figures 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 QASP to guide the sampling activities.

Sampling activities (sample collection, record keeping, and photo documentation) were conducted as described in the Comprehensive Summary. City and/or State owned parcels were available in the sample radius for the Facility so WESTON collected samples from 7 parcels near the Facility. Six City and/or State owned parcels were sampled in the downwind direction and one large parcel was sampled in the upwind direction due to size and availability of the properties. Two composite samples were collected from each of the 6 downwind parcels. Twelve composite samples were collected from the large upwind parcel (large parcel of land

encompassed approximately six average sized parcels). A total of 24 composite samples were collected from the area upwind and downwind of the Facility and are shown on the sample sketches included in **Attachment A**.

3.2 FIELD ACTIVITIES

WESTON personnel conducted field sampling on 17 and 19 November 2003. City and/or State owned parcels were sampled, and were noted in the logbook and can be viewed on the "Summary Table For Sample Properties" (**Attachment B**) and the sample sketches (**Attachment A**).

WESTON collected samples from one upwind parcel for a total of 12 composite samples. Additionally, two samples were collected from each of the six downwind parcels for a total of 12 downwind samples. Twenty four soil samples were submitted for analysis. Five samples were designated as a matrix spike/matrix spike duplicates (MS/MSD) 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 from the Facility project area:

- 12 composite soil samples in the upwind direction, and
- 12 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 24 samples were sent to the State Laboratory located in Lansing, Michigan for analysis via United States Environmental Protection Agency (U.S. EPA) Method 6010 for lead. Samples collected from properties upwind of the Facility did not contain concentrations of lead above the project screening level (400 milligrams per kilogram [mg/kg]) established in the Phase I QASP. Two samples collected from properties downwind of the former facility contained concentrations of lead above the project screening level (400 mg/kg) established in the Phase I QASP. A summary of the Phase I sample results is included in the table below.

Phase I Summary Of Results

Location	Number of Samples	Number equal or greater than 400 mg/kg	Range of Values (mg/kg)
Upwind	12	0	43-370
Downwind	12	2	170-470
Total	24	2	43-470

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 soil resulting from aerial deposition would be detected downwind in the northeast direction from the Facility. Parcels ranging from 2,300 ft. to 2,700 ft. were selected southwest in the upwind direction from the Facility. Parcels ranging from 900 ft. to 1,500 ft. were selected northeast, as close to the mean downwind direction from the Facility due to the presence of residential properties. Elevated lead concentrations were detected in the downwind direction of the Facility and low-level lead concentrations (less than the screening level) were detected in the upwind direction. A detailed analysis of upwind and downwind concentrations is contained in **Section 4.3 Spatial Analysis**.

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 **Figure 2 (Attachment A)**, concentrations of lead greater than the screening level occurs 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 (**Attachment E**) indicated consistently low concentrations of lead in the upwind direction and higher levels of lead in the downwind direction represented as decreasing concentrations with increasing distance from the Facility. Only two of the downwind samples contained lead above the screening level (400 mg/kg). However, the decreasing concentration trend is a condition that would be expected if an aerial release of lead had occurred due to smelting operations. These conclusions were confirmed by a linear regression of the concentrations versus distance data (**Attachment E**).

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 mean is 325 mg/kg and the upwind mean is 189 mg/kg indicating the concentrations downwind are greater than the upwind concentrations. In addition, the relative frequency for the downwind data shows a larger variation across the sample set than the upwind which contains a more even distribution. Comparison of the upwind and downwind data sets indicates the lead concentrations are sufficiently different from each other both in mean concentration and distribution to conclude that the data represent separate conditions.

4.5 CONCLUSIONS

The pattern of analytical results for lead in soil samples collected for the Facility suggests that lead contamination detected in downwind locations may be attributable to historic releases from historic smelting operations at the Facility. The analytical data was compared to a screening level consisting of the MDEQ Residential and Commercial I Direct Contact Criteria for soils (400 mg/kg), as established under Part 201 Environmental Response of the Natural Resources and Environmental Protection Act 1994, as amended.

None of the samples collected from upwind of the Facility contained concentrations of lead above the screening level. The downwind samples indicate a trend of decreasing concentration with increasing distance. However, only two samples (not those closest to the Facility) exceed the screening level. Lead concentrations upwind of the Facility are below the screening level and lead concentrations downwind exceed the screening levels and exhibit a decrease in concentration with increasing distance from the Facility. This pattern is consistent with deposition resulting from aerial releases and suggests that such releases occurred from the Facility during historic smelting operations.

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SECTION 5

RECOMMENDATIONS

Review of the data concluded that the lead detected is consistent with deposition resulting from aerial releases and suggested that such releases occurred from the Facility during historic smelting operations. Therefore, it is recommended that additional work be performed at the Facility. The determination that additional work is necessary is based on two factors:

- The presence of residential receptors located within approximately 600 ft. downwind of the Facility,
- The pattern of lead concentrations within the study area suggests a strong potential that soils at downwind properties have been impacted by aerial deposition from releases of lead from historic smelting operations at the Facility.

The additional work recommended at the Facility includes:

- Obtain access to the Facility for:
  - Review of existing information related to property transfer (Phase I, Phase II, and development planning):
  - Interview past employees regarding historical Facility operations;
  - Perform a Facility walk through to determine existing conditions;
  - Collect on-site soil samples to determine the presence, concentration, and extent of lead on the Facility (related to the location of former structures, if possible); and
- Collect soil samples from additional downwind properties to confirm and/or determine the extent of downwind contamination.

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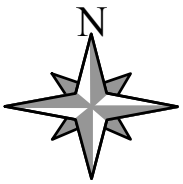
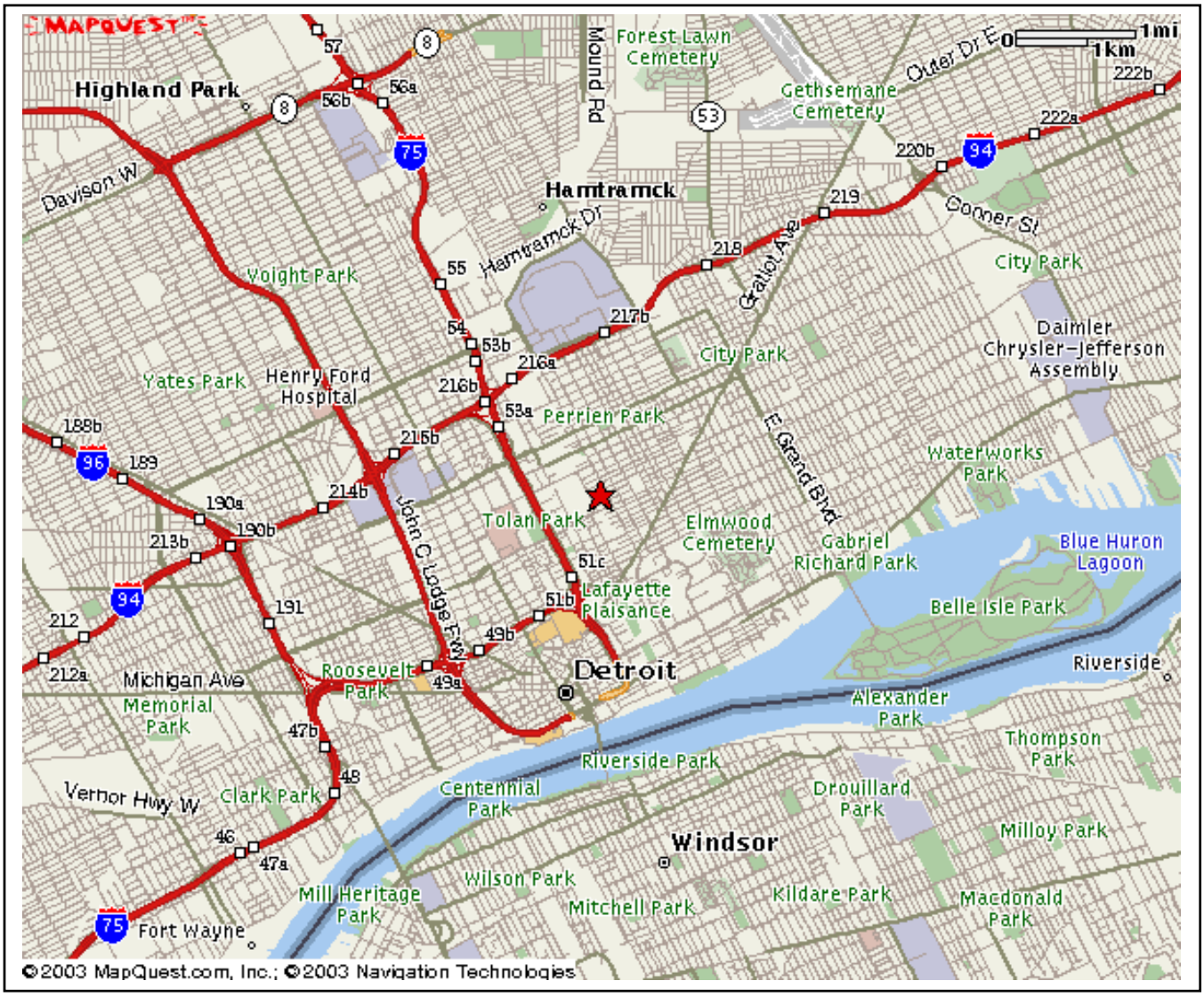
ATTACHMENT A

FIGURES

FIGURE 1
Site Location Map
1826 Illinois Street

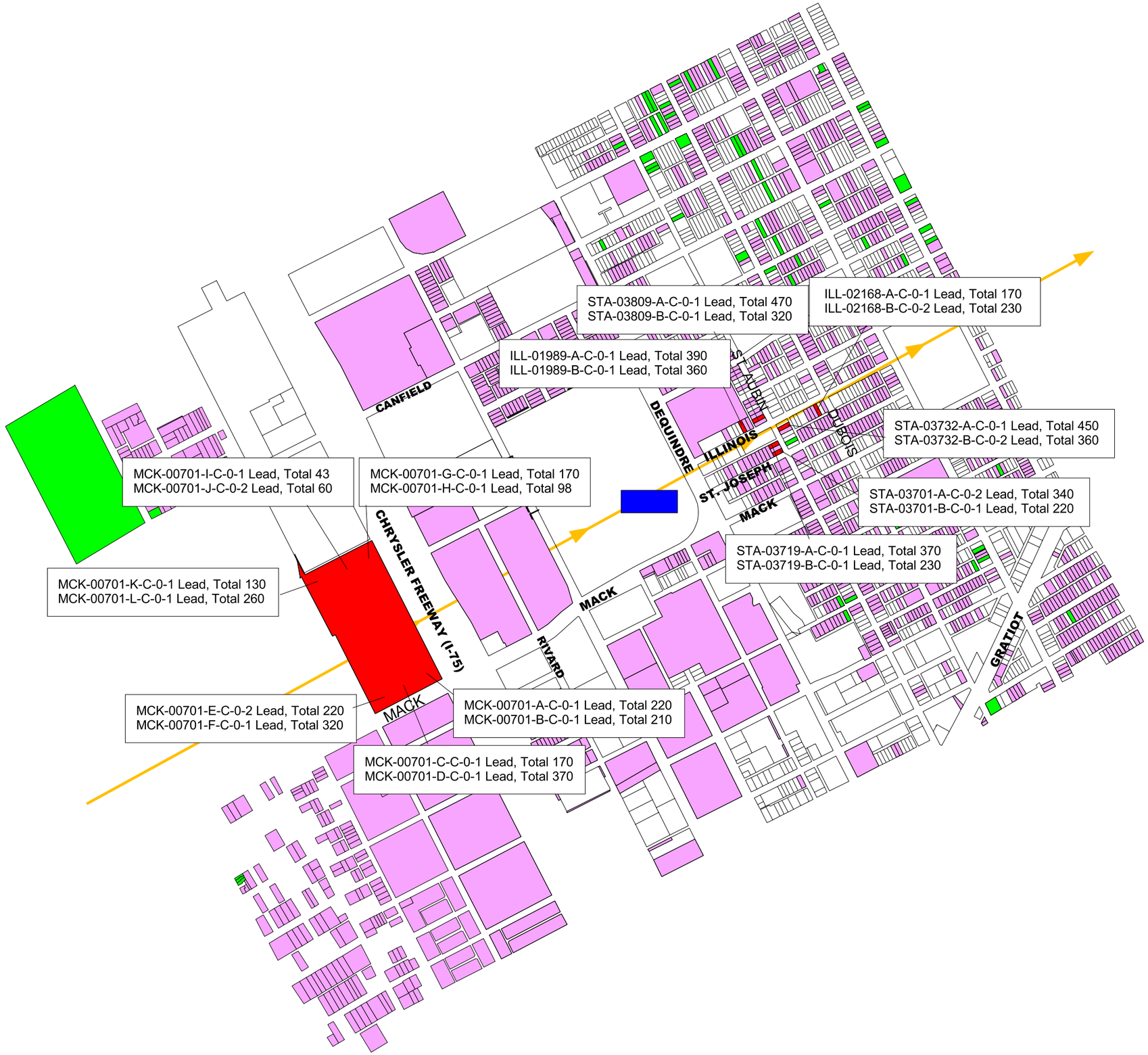




WESTON SOLUTIONS, INC. OF MICHIGAN

300 River Place, Suite 2800
Detroit, Michigan 48207

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



LEGEND:

EXAMPLE:

MWK-02525-A-C-0-1 Lead, Total 170

Sample ID Constituent Result

Parcel Boundaries
Sampled Properties
Facility of Concern
State Owned Property
City Owned Property
Wind Direction

Note: All Lead, Total analytical resutls are shown in mg/kg.

N

0 800 Feet

WESTON SOLUTIONS SM

PROJECT NAME:

Detroit Lead Assessment Project
Detroit, Wayne County, Michigan

Weston Soultions, Inc. of Michigan
300 River Place
Suite 2800
Detroit, Michigan 48207

DRAWING TITLE:

Analytical Results Map

Aetna Smelting
1826 Illinois Street

WORK ORDER No.: 20083.028.001	PROJECT MANAGER:		
DRAWN BY: JLT	CHECKED BY:		
DRAWING NAME:	DIRECTORY/ FOLDER: JLT://D:\DLAP\apr\09_09_03.apr		
CONTRACT No.:	DELIVERY ORDER No.:		
SCALE:	REPORT DATE:		
DATE: January 2004	REVISION No.:	FIGURE No.:	2

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT Illinois W.O. NO. ____

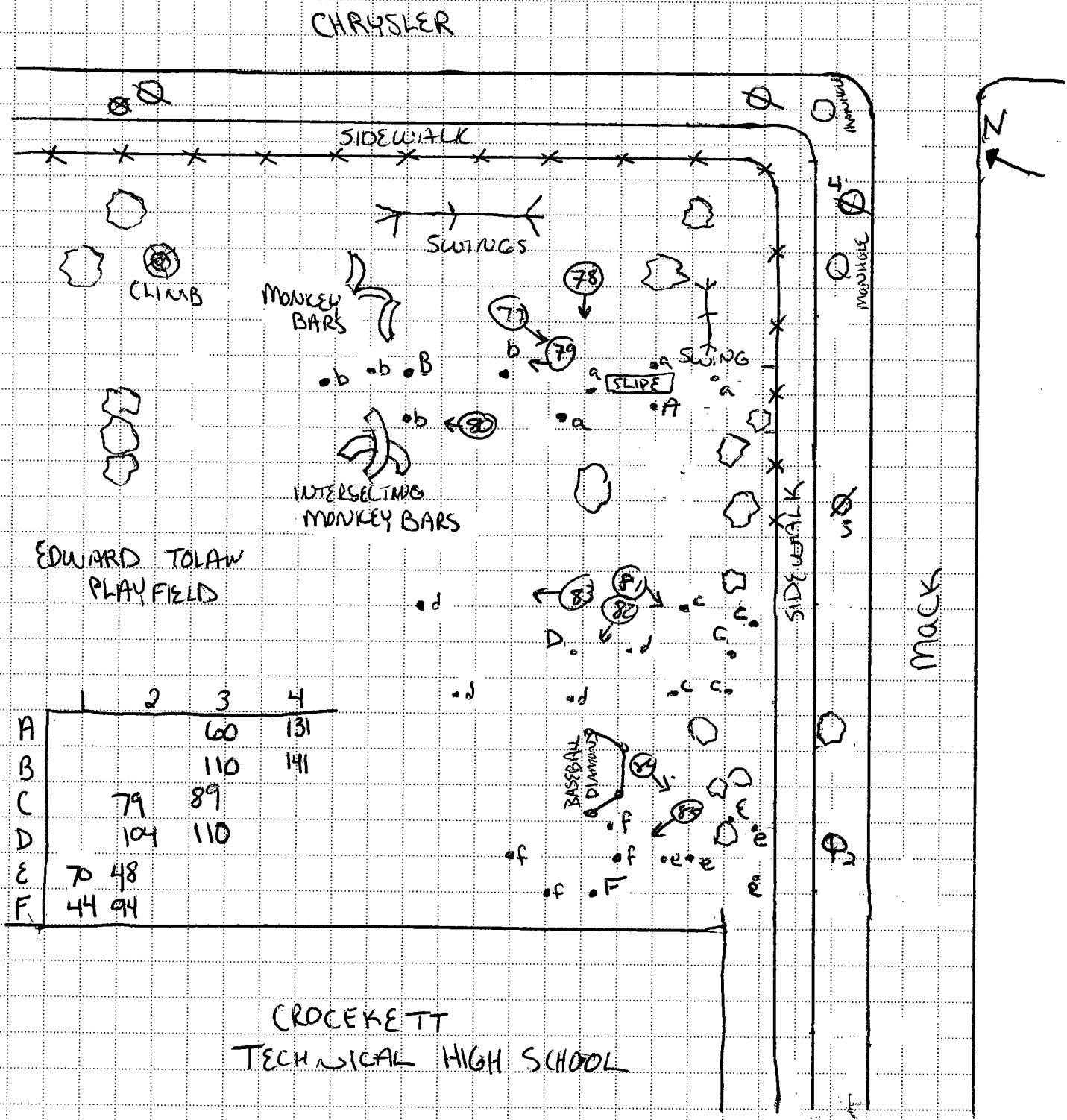
TASK DESCRIPTION MCK-00701 A,B,C,D,E,F TASK NO. ____

PREPARED BY A. Freeman DEPT ____ DATE 11-17-03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____



	1	2	3	4
A			60	131
B			110	141
C		79	89	
D		104	110	
E	70	48		
F	44	94		

RFW 10-05-003/A-5/85

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT Illinois W.O. NO. ____

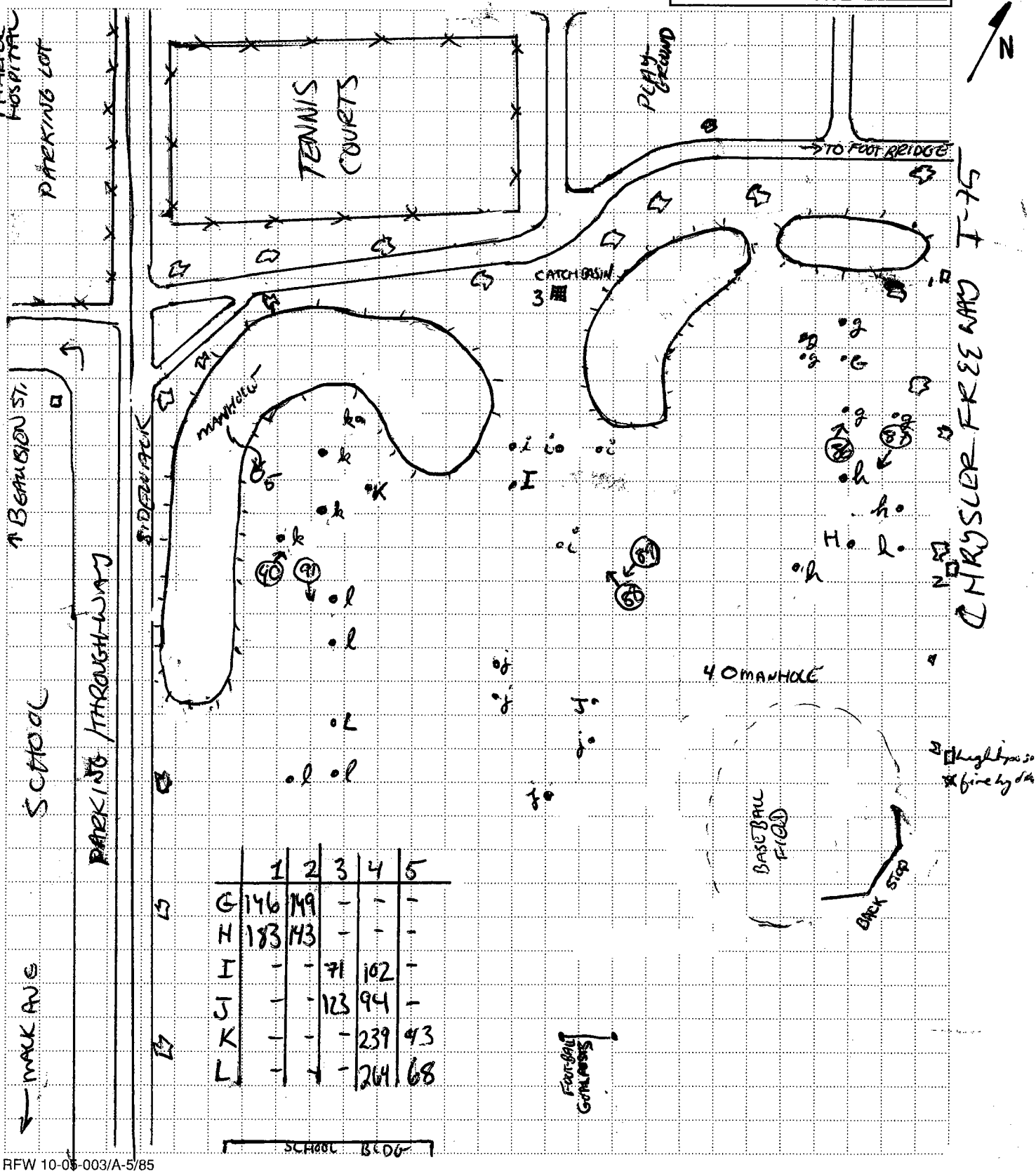
TASK DESCRIPTION 701 Mack Ave G, H, I, J, K, L TASK NO. ____

PREPARED BY R. Nemirovsky DEPT North Side DATE 11/19/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____



	1	2	3	4	5
G	146	149	-	-	-
H	183	143	-	-	-
I	-	-	71	102	-
J	-	-	123	94	-
K	-	-	-	239	43
L	-	-	-	264	68

RFW 10-05-003/A-5/85

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT Illinois W.O. NO. ____

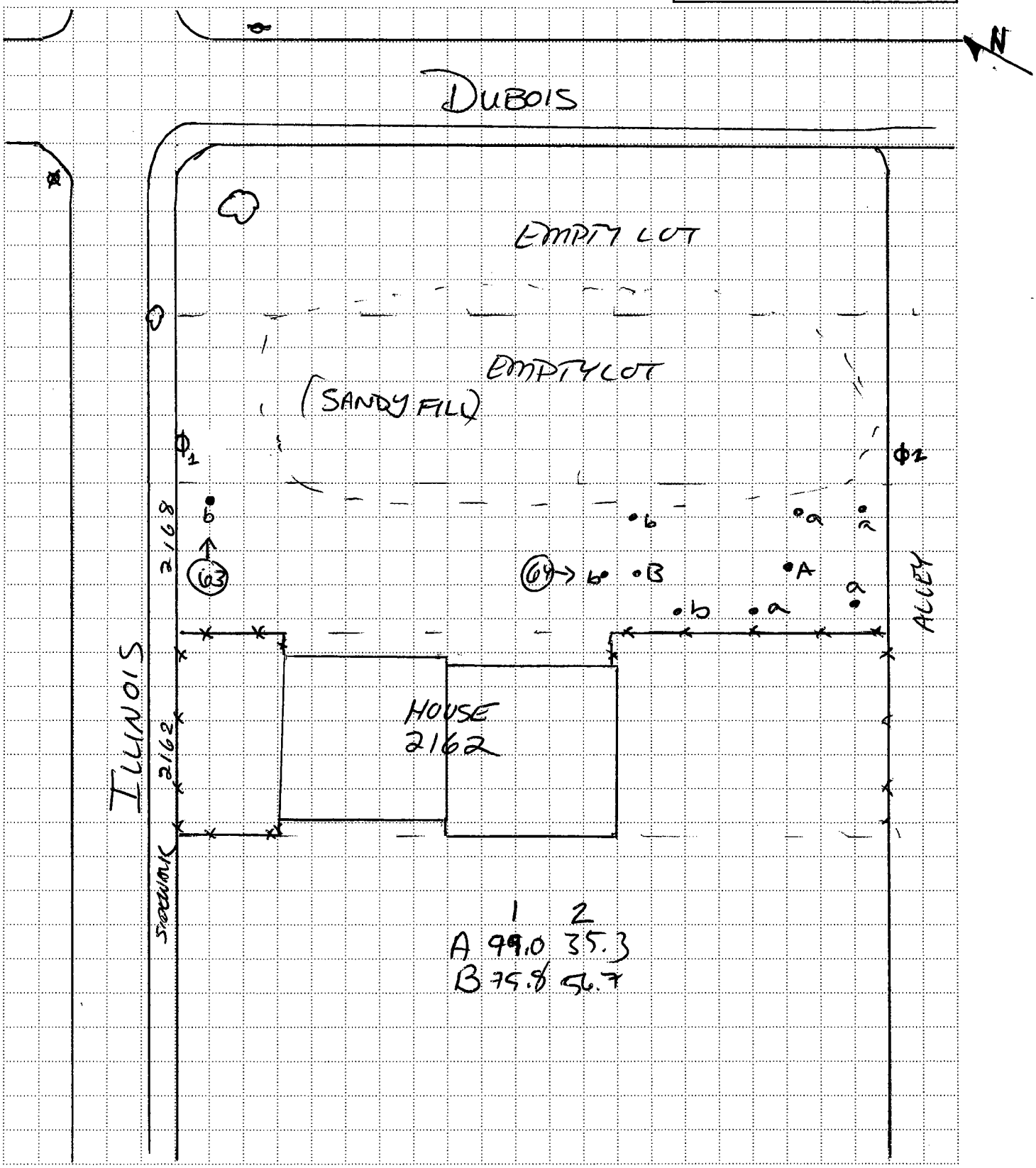
TASK DESCRIPTION Ill-02168 A+B TASK NO. ____

PREPARED BY R. Nemirovsky DEPT ____ DATE 11/17/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____



RFW 10-05-003/A-5/85

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT ILLINOIS W.O. NO. ____

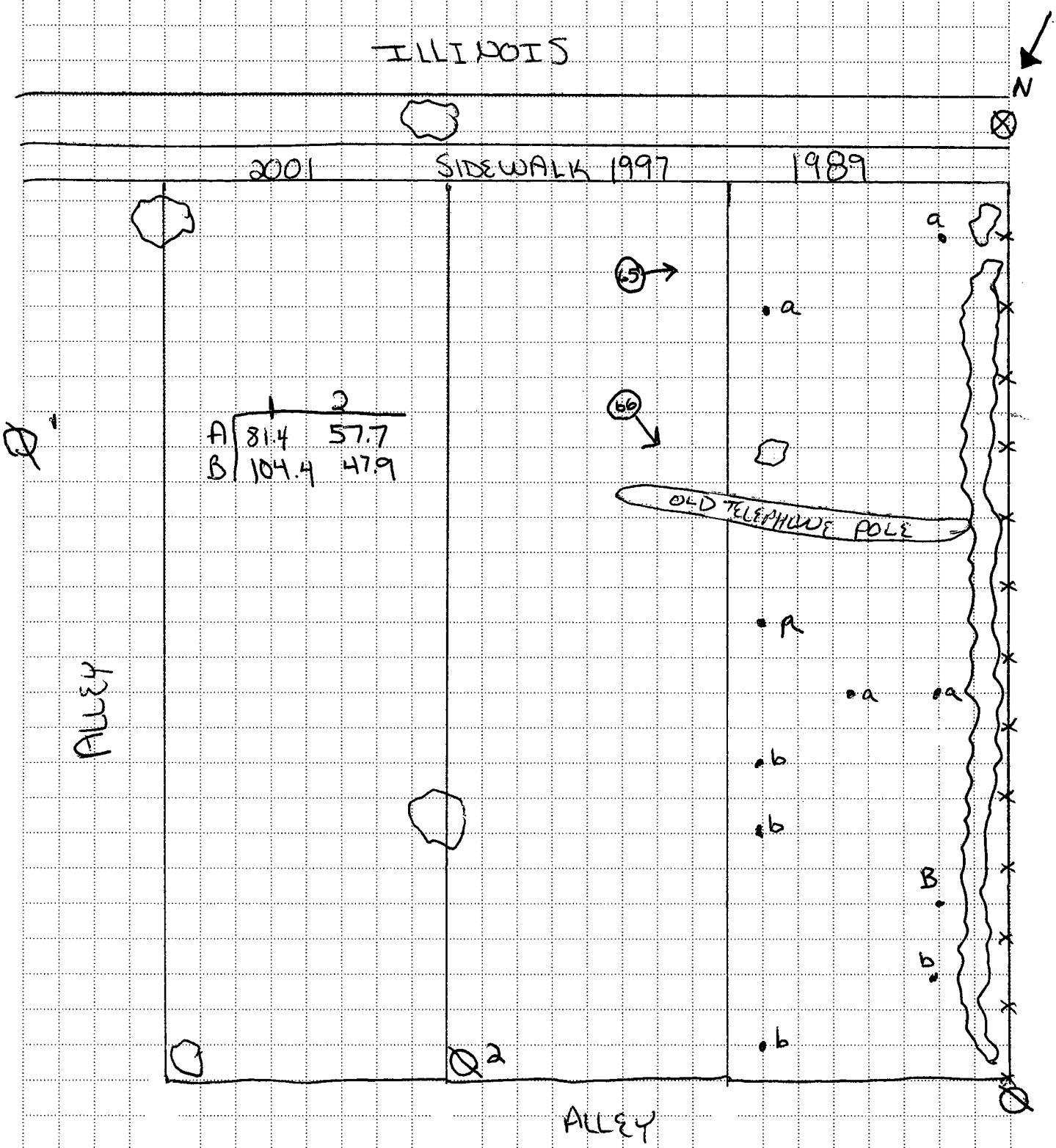
TASK DESCRIPTION ILL-01989 A+B TASK NO. ____

PREPARED BY A. Freeman DEPT ____ DATE 11-17-03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____



RFW 10-05-003/A-5/85

WESTON MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT ILLINOIS W.O. NO. ____

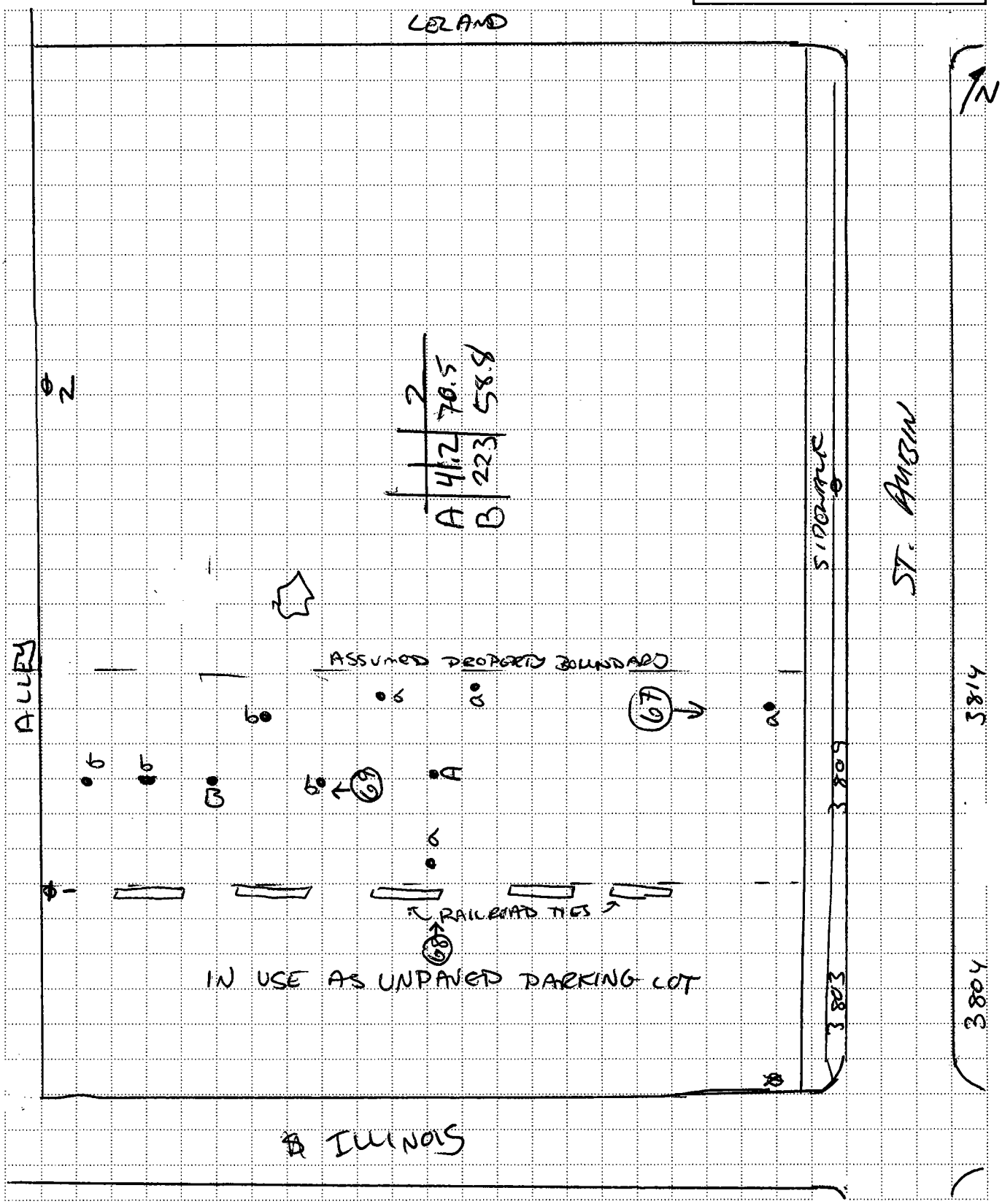
TASK DESCRIPTION STA-03809 A&B TASK NO. ____

PREPARED BY R NEMIROVSKY DEPT ____ DATE 11/17/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____



RFW 10-05-003/A-5/85

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT Illinois W.O. NO. ____

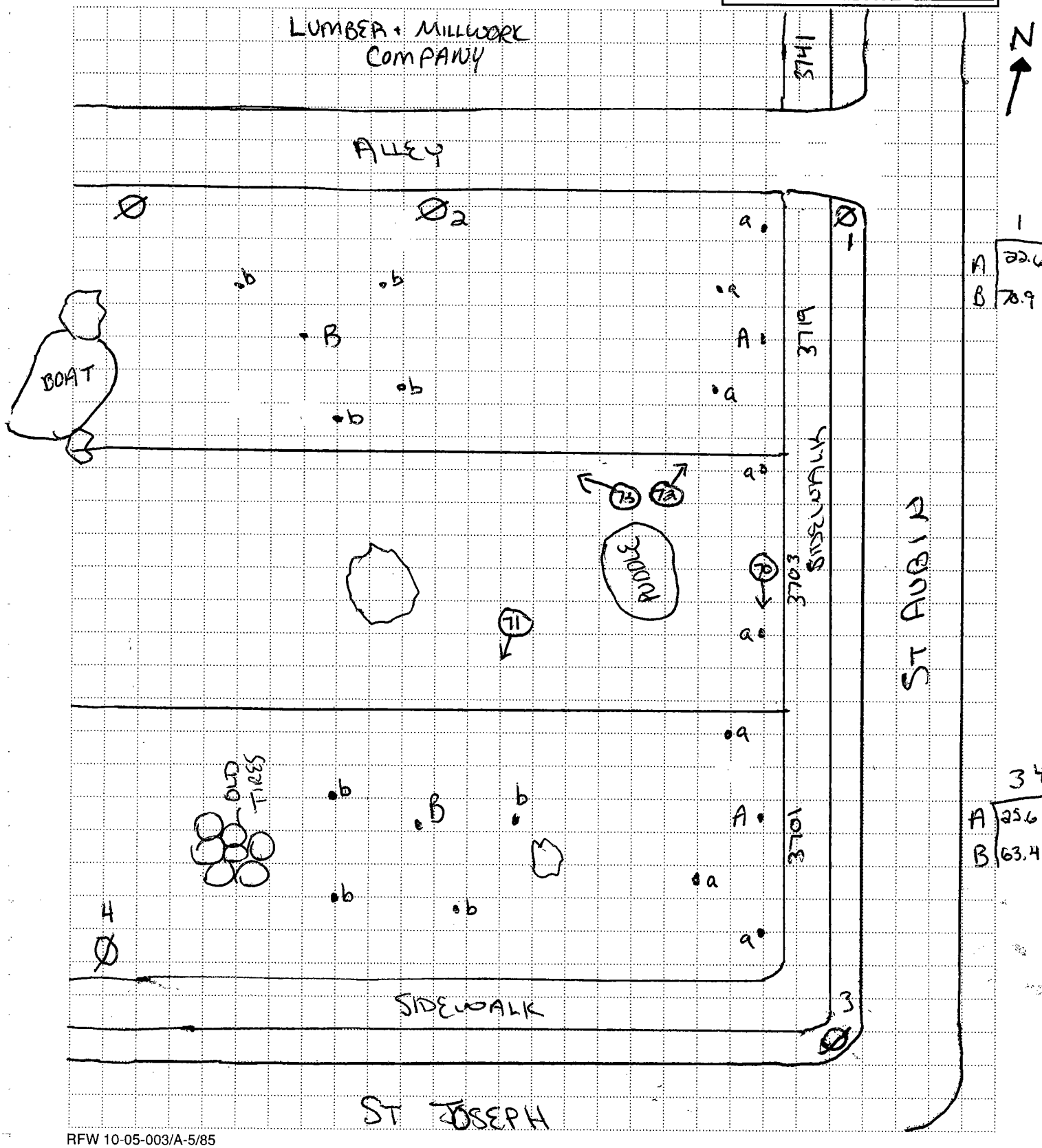
TASK DESCRIPTION STA-03701 A+B STA-03719 A+B TASK NO. ____

PREPARED BY A. Freeman DEPT ____ DATE 11-17-03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____



	1	2
A	22.6	21.
B	70.9	32.

	3	4
A	25.6	12.
B	63.4	66.

RFW 10-05-003/A-5/85

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET ____ of ____

CLIENT/SUBJECT Illinois W.O. NO. ____

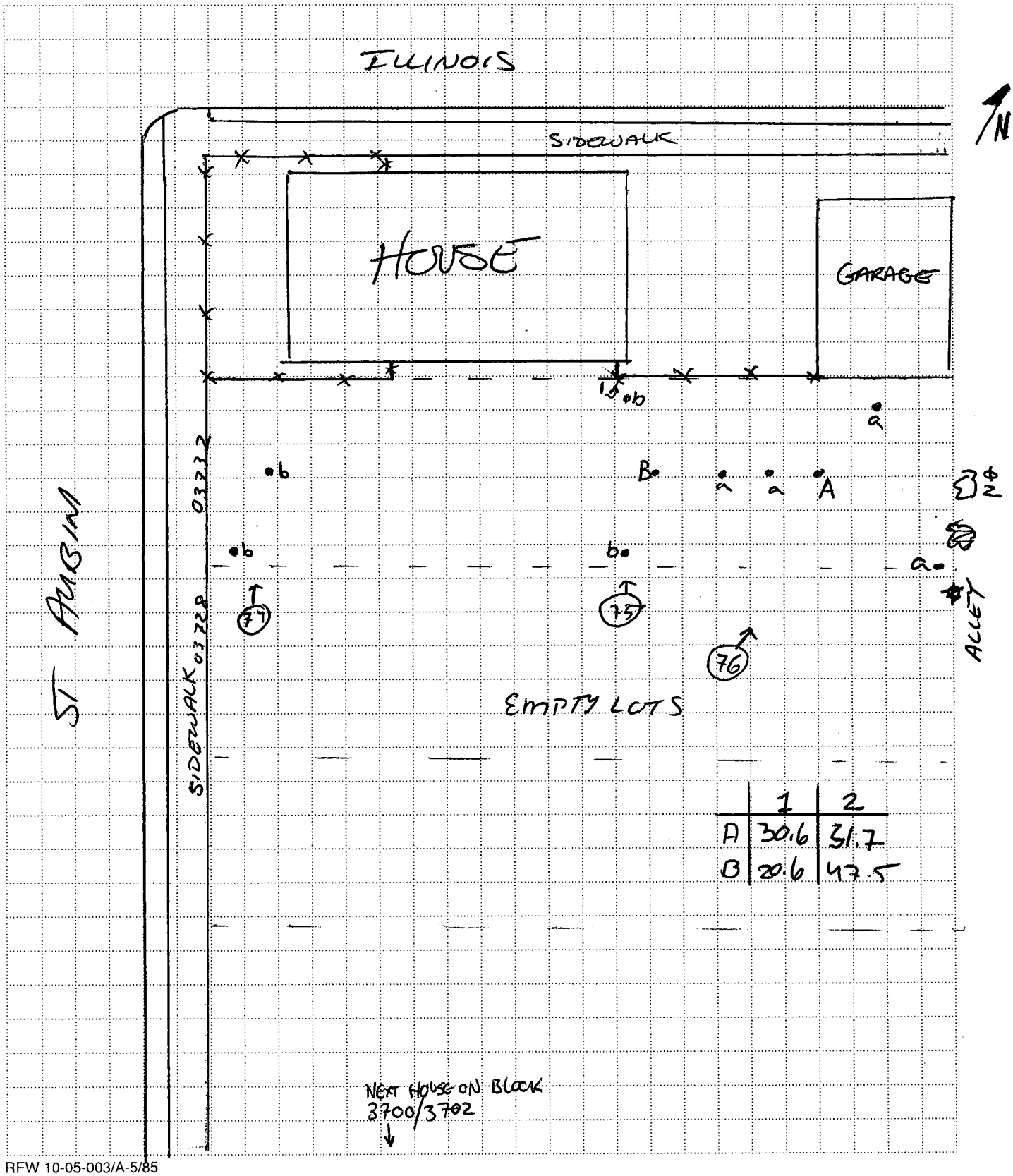
TASK DESCRIPTION STA-03732 A+B TASK NO. ____

PREPARED BY R. Nemirovsky DEPT ____ DATE 11/17/03

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____



	1	2
A	30.6	31.7
B	20.6	47.5

RFW 10-05-003/A-5/85

ATTACHMENT B

TABLES

TABLE 1

SUMMARY OF SAMPLED PROPERTIES

Upwind Properties		
Address	**Description**	**Sample Identification**
701 Mack (Southeast end of Edward Tolan Playfield & directly northeast of Crocekett Technical High School)	Property located on the corner of Chrysler Dr and Mack. Area surrounding the slide and between the monkey bars were used.	MCK-00701-A-C-0-1
		MCK-00701-B-C-0-1
701 Mack	Property located on the corner of Chrysler Dr and Mack. Area to the northeast of the baseball diamond was used.	MCK-00701-C-C-0-1
		MCK-00701-D-C-0-1
701 Mack	Property located on the corner of Chrysler Dr and Mack. Area to the south west of the baseball diamond was used.	MCK-00701-E-C-0-2
		MCK-00701-F-C-0-1
701 Mack (Northwest end of Edward Tolan Playfield)	Property located on the southwest side of Chrysler Dr. Area farthest to the east was used.	MCK-00701-G-C-0-1
		MCK-00701-H-C-0-1
701 Mack	Property located on the southwest side of Chrysler Dr. Area directly between the east and west sampling areas were used.	MCK-00701-I-C-0-1
		MCK-00701-J-C-0-2
701 Mack	Property located on the southwest side of Chrysler Dr. Area farthest to the west was used.	MCK-00701-K-C-0-1
		MCK-00701-L-C-0-1
Downwind Properties		
Address	**Description**	**Sample Identification**
2168 Illinois	Vacant property located on the southeast side of Illinois St and to the northeast of a house at 2162 Illinois.	ILL-02168-A-C-0-1
		ILL-02168-B-C-0-2
1989 Illinois	Vacant property located on the northwest side of Illinois St and on the northeast side of a fence lined with scrubs/trees.	ILL-01989-A-C-0-1
		ILL-01989-B-C-0-1
3809 St Aubin	Vacant property located on the southwest side of St Aubin and directly northwest of an unpaved parking lot on the corner of St Aubin & Illinois.	STA-03809-A-C-0-1
		STA-03809-B-C-0-1
3701 St Aubin	Vacant property located on the corner of St Aubin and St Joseph.	STA-03701-A-C-0-2
		STA-03701-B-C-0-1
3719 St Aubin	Vacant property located on the southwest/west side of St Aubin and to the south of the Lumber & Millwork Company at 3741 St Aubin.	STA-03719-A-C-0-1
		STA-03719-B-C-0-1
3732 St Aubin	Vacant property located on the northeast side of St Aubin and directly southeast of a house.	STA-03732-A-C-0-1
		STA-03732-B-C-0-2

TABLE 2

ANALYTICAL RESULTS

Sample Address	Sample ID	Concentration (mg/Kg)
Upwind		
701 Mack	MCK-00701-A-C-0-1	220
701 Mack	MCK-00701-B-C-0-1	210
701 Mack	MCK-00701-C-C-0-1	170
701 Mack	MCK-00701-D-C-0-1	370
701 Mack	MCK-00701-E-C-0-2	220
701 Mack	MCK-00701-F-C-0-1	320
701 Mack	MCK-00701-G-C-0-1	170
701 Mack	MCK-00701-H-C-0-1	98
701 Mack	MCK-00701-I-C-0-1	43
701 Mack	MCK-00701-J-C-0-2	60
701 Mack	MCK-00701-K-C-0-1	130
701 Mack	MCK-00701-L-C-0-1	260
Downwind		
2168 Illinois	ILL-02168-A-C-0-1	170
2168 Illinois	ILL-02168-B-C-0-2	230
1989 Illinois	ILL-01989-A-C-0-1	390
1989 Illinois	ILL-01989-B-C-0-1	360
3809 St Aubin	STA-03809-A-C-0-1	**470**
3809 St Aubin	STA-03809-B-C-0-1	320
3701 St Aubin	STA-03701-A-C-0-2	340
3701 St Aubin	STA-03701-B-C-0-1	220
3719 St Aubin	STA-03719-A-C-0-1	370
3719 St Aubin	STA-03719-B-C-0-1	230
3732 St Aubin	STA-03732-A-C-0-1	**450**
3732 St Aubin	STA-03732-B-C-0-2	360

*Notes

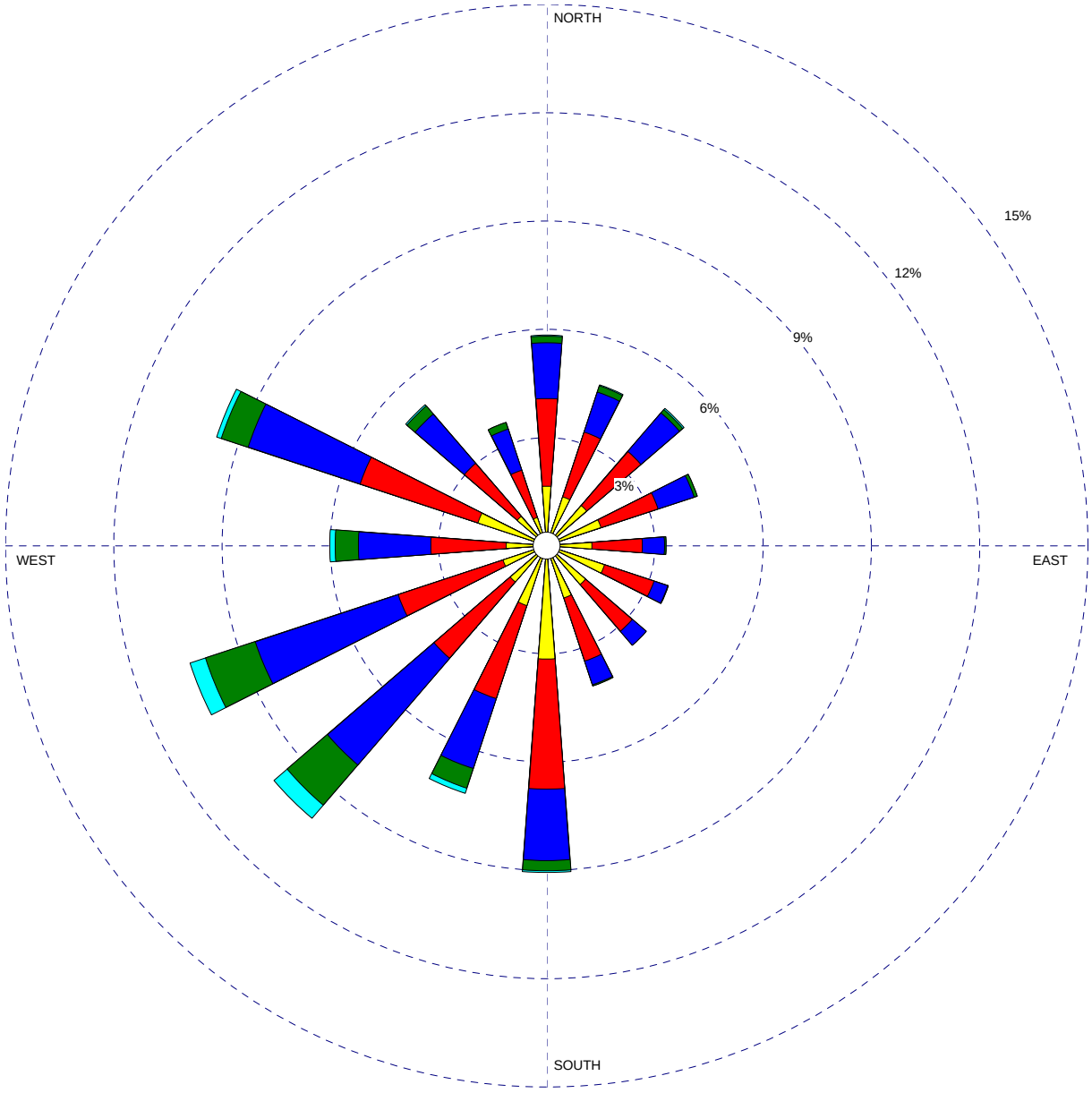
1) Bold indicates results equal to or greater than 400 mg/kg.

ATTACHMENT C

WIND ROSE PLOT

WIND ROSE PLOT

STATION #94847 - DETROIT/METROPOLITAN ARPT, MI



Wind Speed (m/s) > 10.8 8.8-10.8 5.7- 8.8 3.6- 5.7 2.1- 3.6 0.5- 2.1		DATE **2/3/2003**	**Weston Solutions, Inc.**
	DISPLAY **Wind Speed**	UNIT **m/s**	**Years 1984-1991**
	AVG. WIND SPEED **5.06 m/s**	CALM WINDS **3.67%**	
	ORIENTATION **Direction (blowing from)**	PLOT YEAR-DATE-TIME **84 85 86 87 88 89 90 91 January 1 - December 31 Midnight - 11 PM**	**ATTACHMENT C**

WRPLOT View 2.22 by Lakes Environmental Software - www.lakes-environmental.com

ATTACHMENT D

PHOTOGRAPHS OF SAMPLING LOCATIONS

Former Aetna Smelting – 1826 Illinois

701 Mack – Property located on the corner of Chrysler Dr and Mack. This is the southeast end of the Edward Tolan Playfield and it is directly northeast of Crocekett Technical High School. The area between the slide and monkey bars, the area northeast of the baseball diamond, and the area southwest of the baseball diamond were used for the sampling areas.

Looking south and west, respectively, along the property at 5 total discrete sample A locations.

Looking northwest along the property at 5 total discrete sample B locations.

Illinois (cont'd)

701 Mack (cont'd)

Looking south along the property at 5 discrete sample C locations.

Looking west and northwest, respectively, along the property at 5 total discrete sample D locations.

Illinois (cont'd)

701 Mack (cont'd)

Looking south along the property at 5 discrete sample E locations.

Looking west along the property at 5 discrete sample F locations.

Illinois (cont'd)

701 Mack – Property located on the southwest side of Chrysler Dr. This is the area furthest to the northwest end of the Edward Tolan Playfield. The property was broken into the east, between east and west, and west ends for the sampling areas.

Looking north along the property at 5 discrete sample G locations.

Looking south along the property at 5 discrete sample H locations.

Illinois (cont'd)

701 Mack (cont'd)

Looking west along the property at 5 discrete sample I locations.

Looking south along the property at 5 discrete sample J locations.

Illinois (cont'd)

701 Mack (cont'd)

Looking north along the property at 5 discrete sample K locations.

Looking southeast along the property at 5 discrete sample L locations.

Illinois (cont'd)

2168 Illinois – Vacant property located on the southeast side of Illinois St and to the northeast of a house at 2162 Illinois.

Looking southeast along the vacant property at 5 discrete sample A locations, and 4 of 5 sample B locations further to the southeast in the back of the photo.

Looking northeast along the vacant property at 1 of 5 discrete sample B locations.

Illinois (cont'd)

1989 Illinois – Vacant property located on the northwest side of Illinois St and on the northeast side of a fence lined with scrubs and trees.

Looking southwest along the vacant property at 2 of 5 discrete sample A locations.

Looking west along the vacant property at 3 of 5 discrete sample A locations, and 5 discrete sample B locations located further west and to the back of the photo.

Illinois (cont'd)

3809 St Aubin – Vacant property located on the southwest side of St Aubin and directly northwest of an unpaved parking lot on the corner of St Aubin and Illinois.

Looking northeast and northwest, respectively, along the vacant property at 5 total discrete sample A locations.

Looking southwest along the vacant property at 5 discrete sample B locations.

Illinois (cont'd)

3701 St Aubin – Vacant property located on the corner of St Aubin and St Joseph.

Looking southeast along the vacant property at 5 discrete sample A locations.

Looking south along the vacant property at 5 discrete sample B locations.

Illinois (cont'd)

3719 St Aubin – Vacant property located on the southwest/west side of St Aubin and to the south of the Lumber & Millwork Company at 3741 St Aubin.

Looking north along the vacant property at 5 discrete sample A locations.

Looking west along the vacant property at 5 discrete sample B locations.

Illinois (cont'd)

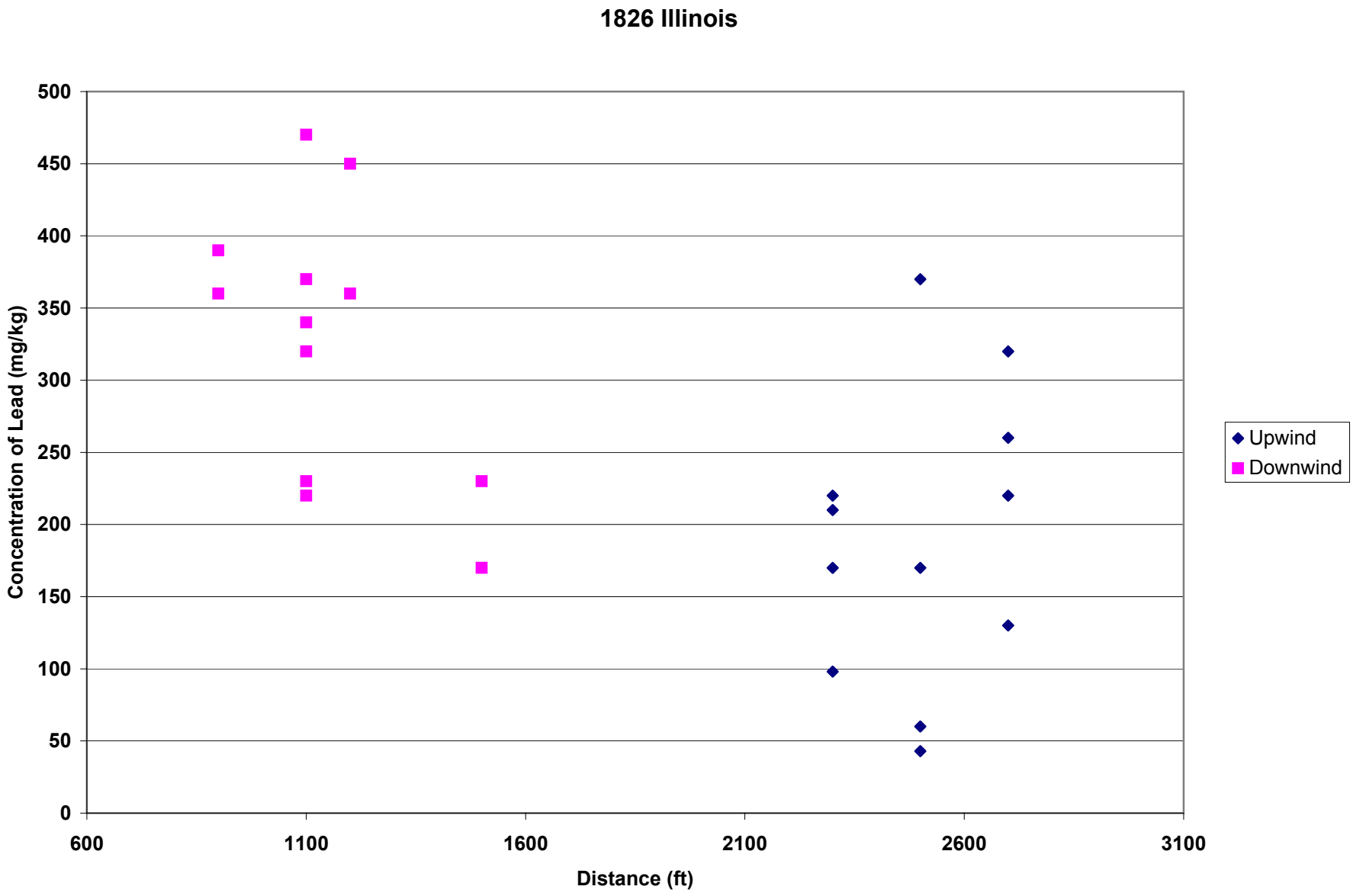
3732 St Aubin – Vacant property located on the northeast side of St Aubin and directly southeast of a house.

Looking north along the vacant property at 5 discrete sample A locations.

Looking northwest along the vacant property at 5 total sample B locations.

ATTACHMENT E

CONCENTRATION GRAPH


1826 Illinois
Concentration of Lead (mg/kg)
500
450
400
350
300
250
200
150
100
50
0
600
1100
1600
2100
2600
3100
Distance (ft)
Upwind
Downwind

Aetna

```
*** Linear Model ***

Call: lm(formula = Lead.ppm ~ Location + Distance.ft + Distance.ft:Location, data = Aetna, na.action = na.exclude)
Residuals:
   Min    1Q Median    3Q   Max
 -146.3 -62.1 -0.641 48.11 180.8

Coefficients:
                    Value Std. Error   t value  Pr(>|t|)
       (Intercept) -173.2500  410.3899    -0.4222    0.6774
          Location  807.2244  445.2554     1.8129    0.0849
       Distance.ft    0.1450    0.1638     0.8852    0.3866
Distance.ft:Location   -0.4129    0.2210    -1.8684    0.0764

Residual standard error: 92.66 on 20 degrees of freedom
Multiple R-Squared: 0.4606
F-statistic: 5.693 on 3 and 20 degrees of freedom, the p-value is 0.0055

Analysis of Variance Table

Response: Lead.ppm

Terms added sequentially (first to last)
                 Df Sum of Sq  Mean Sq  F Value     Pr(F)
          Location  1  111930.0 111930.0 13.03564 0.0017453
       Distance.ft  1    4754.4   4754.4  0.55371 0.4654607
Distance.ft:Location  1   29974.3  29974.3  3.49087 0.0764284
         Residuals 20  171729.3   8586.5

*** Linear Model ***

Call: lm(formula = Log.Lead ~ Location + Distance.ft + Distance.ft:Location, data = Aetna, na.action = na.exclude)
Residuals:
   Min      1Q Median     3Q    Max
 -1.319 -0.2831 0.0493 0.3449 0.8338

Coefficients:
                   Value Std. Error t value Pr(>|t|)
       (Intercept)  3.3162  2.2665     1.4632  0.1590
          Location  3.5686  2.4590     1.4512  0.1622
       Distance.ft  0.0007  0.0009     0.7798  0.4447
Distance.ft:Location -0.0017  0.0012    -1.3913  0.1794

Residual standard error: 0.5117 on 20 degrees of freedom
Multiple R-Squared: 0.3781
F-statistic: 4.052 on 3 and 20 degrees of freedom, the p-value is 0.02109

Analysis of Variance Table

Response: Log.Lead

Terms added sequentially (first to last)
                 Df Sum of Sq  Mean Sq  F Value     Pr(F)
          Location  1  2.640184 2.640184 10.08139 0.0047587
       Distance.ft  1  0.036720 0.036720  0.14021 0.7120102
Distance.ft:Location  1  0.506932 0.506932  1.93569 0.1794214
         Residuals 20  5.237739 0.261887
```

ATTACHMENT F

STATISTICAL DISTRIBUTION

Aetna Smelting
Statistical Distribution