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ENGINEERS, INC.

January 21, 1998

Mr. Eric L. Van Riper
Geologist
Michigan Department of Environmental Quality
Environmental Response Division
10650 S. Bennett Drive
Morrice, MI 48857

Re: Closure Report for Residential Properties in
the Windiate Park/Dixieland Subdivision
Flint, Michigan

File: 6009.013 #2

Dear Mr. Van Riper:

Enclosed for your review and approval are two copies of the Closure Report for Residential Properties (Closure Report) in the Windiate Park/Dixieland Subdivision located in Flint, Michigan.

This Closure Report documents the implementation of remedial actions performed as interim remedial measures at the twenty-two residential properties (Site). Based on the remedial actions completed at the residential properties, which provide for a Generic Residential (twenty properties) and Limited Residential (two properties) categorical cleanup, Site remediation is considered complete in accordance with PA 451, Part 201.

Please call either Bob Metcalf at (810) 236-0300 or me at (248) 426-8970 if you have any questions or comments.

Very truly yours,

O'BRIEN & GERE ENGINEERS, INC.

A handwritten signature in black ink, appearing to read 'SC', is written over the company name.

Scott L. Cormier, P.E.
Managing Engineer

SLC/clh

Enclosures

cc: Mr. Robert S. Metcalf, P.E. - General Motors WFG, Flint, MI
Mr. Edward E. Peterson - General Motors WFG, Detroit, MI
Mr. Swiatoslaw W. Kaczmar, PhD, CIH - O'Brien & Gere Engineers, Syracuse, NY
Mr. Scott J. Adamowski, P.E. - O'Brien & Gere Engineers, Novi, MI

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FINAL REPORT

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Closure Report for Residential Properties

Residential Properties in the Windiate Park/
Dixieland Subdivision
Flint, Michigan

January 1998

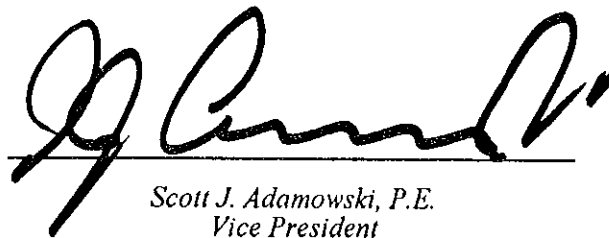


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Closure Report for Residential Properties

*Residential Properties in the Windgate Park/
Dixieland Subdivision
Flint, Michigan*

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Scott J. Adamowski, P.E.
Vice President

January 1998



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1. Introduction

This Report is the final Residential Remedial Closure Report (Closure Report) for twenty-two properties (Site) in the Windiate Park/Dixieland Subdivision area in Flint, Michigan. This Closure Report documents the implementation of remedial actions performed as interim remedial measures (IRMs) at the residential properties. The IRMs were performed in accordance with O'Brien & Gere Engineers, Inc. (O'Brien & Gere) February 1997 Residential Remedial Investigation/Feasibility Study (Residential RI/FS) and O'Brien & Gere's February 1997 Residential Remedial Action Plan (Residential RAP). The IRMs completed at each residential property consisted of one or more of the following elements:

- Excavation of surface soil and placement of clean backfill
- Excavation of subsurface waste fill and placement of clean backfill
- Soil cover (previously existing)
- Deed restrictions are proposed as the final implementation step for two residential properties, 4401 and 4537 Milton Drive.

The IRMs for the twenty-two residential properties were approved with contingencies by the Michigan Department of Environmental Quality (MDEQ) in a letter dated April 22, 1997. The contingent items were incorporated into the closure program as outlined in the July 17, 1997 response to comments letter.

A RAP for Windiate Park (Park RAP) involving a Limited Residential/Recreational closure with recreational deed restrictions has already been approved by the MDEQ, as expressed in a Notice of Intent to Approve from the MDEQ, dated July 19, 1996. IRM activities for the Park, which included placement of a soil cover supplemented with deed restrictions, are consistent with the Residential RAP IRM activities.

These IRM activities have been implemented in accordance with the requirements and regulatory authority of the 1995 amendments to Part 201 of Public Act 451 (PA 451, Part 201) of the Natural Resources and Environmental Protection Act (NREPA) administered by the Michigan Department of Environmental Quality (MDEQ).

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1.1. Objectives

The completion of the IRMs at the twenty-two residential properties, supplemented by deed restrictions (to be filed) and routine maintenance at two residential properties, serves as a final remedy for the Site. The objective of this Closure Report is to document that these final remedies, implemented as IRMs, have resulted in a "Generic (unrestricted) Residential" categorical closure at twenty residential properties and a "Limited Residential" categorical closure for two properties. The Limited Residential cleanup is supplemented with deed restrictions and routine maintenance as outlined in Section 3.2.3. of this Closure Report.

1.2. Changes to the remedial action plan (RAP)

Several changes to the Residential RAP were completed during remedial activities for the twenty-two residential properties as a result of conditions discovered during on site activities. These changes were discussed with MDEQ representatives at the time of implementation. Table 1 summarizes the proposed and final remedies for the properties included in the residential remediation. The following paragraphs summarize the changes to the February 1997 Residential RAP:

- Following excavation of waste fill at the 4537 Milton Drive property, it was discovered that waste fill extended across the Windiate Park access/utility easement, located at the southern end of the Park, and beneath the adjacent 4543 Milton Drive property. The waste fill material encountered on the 4543 Milton Drive property was removed and disposed in accordance with the procedures outlined in the February 1997 Residential RI/FS Report and the approved sampling and analysis work plan included as Appendix I to the Residential RI/FS Report
- GM elected to change the IRMs from soil cover installation to waste fill removal and disposal at three of the properties (4501, 4507, and 4513 Milton Drive). The Residential RAP indicated waste fill would need to be removed if it were desirable to eliminate the need for deed restrictions and future maintenance at these properties. This action also changes the proposed Land Use Cleanup Category to Generic (Unrestricted) Residential for these three properties. Table 1

summarizes the proposed and final remedies for the properties included in the residential remediation

- Subsurface waste fill was encountered at two additional properties (4605 and 4317 Milton Drive) during IRM excavation activities which was not anticipated based on the results of the Residential RI/FS Report. The subsurface waste fill material at these two properties was removed and disposed to qualify for the Generic (Unrestricted) Residential Land Use Cleanup Category
- As noted in Table 1, the 4407 Milton Drive property was purchased by GM, the house was demolished and the parcel will be donated to the City of Flint; becoming part of the Park. As this parcel will ultimately be Park property, closure will be requested under a Park RAP addendum including this parcel (the addendum to the Park RAP also includes the former 4413 Milton Drive parcel and the southern utility easement). Therefore, the 4407 Milton Drive parcel will not be included in this Closure Report.

In summary, the total number of properties included in the Residential RAP remains at twenty-two since one property was added (4543 Milton) and one property was removed (4407 Milton).

Of the six properties originally proposed for Limited Residential Closure, three of these properties (4501, 4507, and 4513 Milton) were remediated to Generic Residential criteria and one property (former 4407 Milton) is to be donated to the City of Flint; becoming part of the Park. Therefore, based on the foregoing, only two of the residential properties covered by the Residential RAP, 4537 and 4401 Milton Drive will be subject to Limited Residential Closure, due to the difficulty of removing the subsurface waste fill from these two properties, and will require deed restrictions and Land Use Agreements.

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2. Site specifics

2.1. Site description

For the purpose of this Closure Report, the "Site" is defined as twenty-two residential properties located within Sections 29 and 30 of Township 7 North, Range 7 East, in the City of Flint, Genesee County, Michigan. The Site Location Map, Figure 1, identifies the general location of these properties within Genesee County. The Site Plan, Figure 2, identifies the location of the twenty-two residential properties which were remediated as addressed in this Closure Report. The properties are located within Blocks 2 (southwest of Windiate Park) and 3 (adjacent to Windiate Park - south and west borders only) as defined in the Residential RI/FS Report.

The twenty-two residential properties are part of the Windiate Park/Dixieland Subdivision residential community. They are bordered to the north by Windiate Park (used for recreational purposes) to the south and east by private residential properties and to the west by commercial/residential properties. The residential properties contain houses and other typical residential structures, such as; garages, fences, pools, etc. They are covered with grass and may include trees, bushes, gardens, driveways (gravel, asphalt, concrete), and concrete sidewalks. The properties adjacent to Windiate Park (Block 3) are topographically higher than the Park with the backyards generally sloping towards the Park. The properties southwest of Windiate Park (Block 2) are generally flat.

Properties in Blocks 1 and 4, as shown on Figure 2, were not considered a concern based on the results of the Residential RI field activities and therefore were not included in the Residential RAP. The MDEQ recommended no further action under CERCLA for Blocks 1 and 4 in a December 19, 1996 letter to GM. Furthermore, in regard to the lateral extent of impact, the limits of the remedial investigations as identified in the Residential RI/FS and Residential RAP were approved by the MDEQ as expressed in a letter addressed to GM dated July 14, 1997. Therefore, in relation to historical filling activities in Windiate Park and the surrounding residential area, no further investigatory study is necessary.

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2.2. Site history

Residential uses of the land in the Windiate Park area date back to the early 1920s. Based on a review of historical aerial photographs, one house existed adjacent to Windiate Park in the 1920s near the former Shelley Lane. The Park area consisted of low lying wetland areas. Intermittent construction of additional residences occurred during the 1930s and 1940s along the west side of the Park, on Milton Drive. Construction of houses adjacent to the Park began in the early 1950s starting on the southwest side (4317 Milton Drive location) and proceeding around the perimeter of the Park. The Park was developed and used as a recreational Park since approximately 1954, according to the records at the City of Flint offices.

In the late 1940s and early 1950s, waste fill material (ostensibly from a number of sources) was deposited in the Park and extended to some areas later used for residential purposes. An additional area of waste filling was identified underneath the parking lot for the Pengelly Road Apartments and some adjacent vacant lots. This area is being addressed separately.

A RI/FS was performed for Windiate Park and identified waste fill material and substances of potential concern (SOPCs) related to the waste fill. The SOPCs in the waste fill material include lead, arsenic, benzo(a)anthracene, and benzo(a)pyrene. Perched ground water was not adversely impacted in the Park. Localized ground water impact was identified at one property (4407 Milton Drive); however, this property is separately addressed in an addendum to the Park RAP.

A blood lead level survey of area residents was performed by the Michigan and Genesee County Departments of Public Health, and a health survey was performed by the Michigan Department of Community Health utilizing the services of the Project for Urban Affairs (PURA) of the Flint Branch of the University of Michigan. These surveys did not identify health impacts attributable to SOPCs in the Park. Nevertheless, GM and the City of Flint implemented a remedial action for the Park which included the installation of a soil cover over the Park, deed restrictions, ground water monitoring for four quarters, and future soil cover maintenance.

The Park area also increased by annexing several residential properties to the Park and vacating the former Shelley Lane. These properties were addressed in an addendum to the Park RAP dated August 1996.

The property at 4413 Milton Drive, 4407 Milton Drive, and the South Utility Easement are proposed to be annexed to the Park in the future. These properties are being addressed separately in a second addendum to the Park RAP anticipated for submittal to the MDEQ later this year.

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2.3. Nature and extent of waste fill material

As described in the Residential RI/FS, subsurface waste fill material consisting of glass, vinyl, tin cans, rubber, cloth, slag material, wood, rebar, concrete, and general trash extended from Windiate Park onto eight of the residential properties adjacent to the Park (waste fill was also encountered at 4407 Milton Drive; however, this property is being separately addressed since it will be annexed to the Park). However, during IRM excavation activities, subsurface waste fill was also encountered extending onto two additional properties, 4605 Milton Drive and 4317 Milton Drive. The maximum depth of waste fill materials encountered during IRM excavation activities was 10 ft below grade (fig. Figure 3 depicts the approximate extent of waste fill material observed at the residential properties and the extent of waste fill removed during IRM activities.

2.4. Identification of Substances of Potential Concern (SOPCs)

As part of the Remedial Investigation (RI) activities performed at the twenty-two residential properties, several surface and subsurface environmental investigations have been conducted with numerous samples collected. As identified in the Residential RI/FS, SOPCs in soil were defined as substances for which the maximum detected concentrations exceeded the Generic Residential Direct Contact Value (DCV), per MDEQ Operational Memorandum 8, Revision 4, dated June 5, 1995, or in the case of arsenic, the background value. Based on the results of the numerous Residential RI investigations conducted at the twenty-two residential properties, lead was identified as the main SOPC in surface soil.

Eighteen properties with average surface soil lead concentrations above the MDEQ Generic Residential Direct Contact Value of 400 ppm were identified adjacent to and in the vicinity of the Park. Lead concentrations exceeded 400 ppm in the surface soil to depths of approximately 6 inches to 12 inches.

SOPCs were also identified in the subsurface waste fill material and consisted of: arsenic, lead, benzo(a)anthracene, and benzo(a)pyrene as outlined in the Windiate Park RI/FS Report, dated February 1996.

Although MDEQ criteria and background values were used as the basis for identifying the nature and extent of waste related substances, it must be recognized that exceedence of these criteria does not necessarily represent a threat to human health or the environment.

3. Site remediation

As identified on Figure 3, remedial activities (completed as IRMs) implemented at the twenty-two residential properties consisted of the following elements or a combination of these elements:

- Surface soil excavation with clean backfill at seventeen properties
- Subsurface waste fill excavation with clean backfill at nine properties
- Existing soil cover (4401 Milton Drive).

The scope of the IRM activities included various requirements during construction. An inspector was on site daily to document the activities implemented and compliance with General Motors Corporation's technical specifications. Some of the requirements outlined in the specifications included:

- Air monitoring during construction
- Safety issues and traffic control
- Soil cover compaction and final grading
- Equipment decontamination
- Resident coordination
- Surface restoration and landscaping
- Follow up maintenance for 2 months after restoration.

It should be noted that the soil cover in the backyard of 4401 Milton Drive was already existing before implementation of the remedial activities.

3.1. Health and safety plan

The 1994 Health and Safety Plan (HASP) developed for Windiate Park was used during construction activities to outline the responsibilities, training requirements, protective equipment, and standard operating procedures for on-site personnel.

Air monitoring was conducted daily as a standard operating procedure to document airborne levels of dust associated with the health and safety of on-site workers and the general public. Dust monitoring was performed with portable, Real-time Aerosol Monitors (RAMs) to assess the concentration of airborne particulates during on-site activities. The RAMs were calibrated according to manufacturers instructions prior to use. The RAMs were located at the perimeter of on-site activities, with at least one RAM in a location upwind of the construction activities and two located downwind. Readings were recorded hourly by the on-site inspector during construction activities. The readings for the dust monitoring did not exceed the action level of 150 ug/m³ above background.

Temporary access restrictions and security provisions including the placement of caution tape surrounding each excavation were implemented during construction activities. Water spray was used to reduce airborne dust particulates during construction activities when deemed necessary.

3.2. Interim remedial measures (IRMs)

In accordance with the procedures outlined in the Residential RI/FS and Residential RAP, including changes as described in Section 1.2 of this report, IRMs were performed at twenty-two residential properties. The IRMs were performed to mitigate potential exposure to SOPCs prior to the implementation of a final remedial action. These IRMs have been determined sufficient to serve as final remedial actions at each property. Table 1 of this report summarizes the final remedy (completed as an IRM) at each of the twenty-two residential properties.

Although implementation of IRMs at the residential properties was not required by the MDEQ, IRMs were voluntarily implemented prior to MDEQ approval of the Residential RAP. It was recognized that the results of the blood lead level survey and the health survey showed no public health impact related to exposure to SOPCs of the studied population in the area. The IRMs were implemented voluntarily by GM in accordance with various discussions with the MDEQ as described in a summary letter submitted to the MDEQ, dated January 21, 1997 for the purpose of expediting the remedial action process. Implementation of IRMs at privately owned properties were performed in accordance with agreements between GM and each individual property owner.

The IRMs performed at the twenty-two impacted residential properties consisted of one or more of the following:

- Excavation and disposal (waste fill and surface soil) with clean backfill
- Soil cover (previously existing)
- Deed restrictions (to be recorded).

A description of IRM activities performed at each of the of the twenty-two residential properties are provided in Appendix A of this report on a per property basis. Included in each property description is a summary of the construction activities, a site plan indicating the post-excavation sample locations, a table summarizing analytical results, and the respective laboratory report sheets. In addition, Table 1, included at the end of this report, summarizes the IRMs completed at each of the twenty-two residential properties.

The following sections generally describe the selected IRMs without respect to property specific issues.

3.2.1. Excavation and disposal IRM (waste fill and surface soil)

This IRM consisted of excavation and off-site disposal of impacted surface soil and waste fill material.

Prior to excavation activities, trees, fences, or other items were removed from properties as deemed necessary. Excavation of waste fill was conducted with conventional construction equipment such as a backhoe or a bulldozer. Waste fill was excavated to the depths necessary for removal, which ranged from 1 fbg to 10 fbg. If applicable, the excavation continued to the respective property borders. The excavations did not extend below the residential buildings. Excavation dewatering was not necessary during construction activities.

On properties in which the surface soil excavation IRM was implemented, surface soil excavation was conducted with construction equipment such as a backhoe at the properties with surface soil average lead concentrations exceeding 400 ppm. Excavation was to the depth of impact, identified as 6 inches or 1 fbg. Excavation occurred around permanent structures such as houses, sheds, pavement driveways, and sidewalks or in specific areas based on investigation results.

Table 3-1 below identifies the residential properties where the excavation and disposal IRM was conducted with the maximum depth of excavation for each property.

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Table 3-1. Excavation and disposal IRM summary.

Residential Property	Maximum Depth of Excavation	Comments
1. 4625 Milton Drive	1 fbg	impacted surface soil removed and backfilled with clean material
2. 4621 Milton Drive	1 fbg	impacted surface soil removed and backfilled with clean material
3. 4605 Milton Drive	4 fbg	impacted surface soil and waste fill removed and backfilled with clean material
4. 4543 Milton Drive	4 fbg	waste fill removed and backfilled with clean material
5. 4537 Milton Drive	6 fbg	waste fill removed (wfr) and backfilled with clean material
6. 4531 Milton Drive	7 fbg	waste fill removed and backfilled with clean material
7. 4525 Milton Drive	4.5 fbg	surface soil * and waste fill removed and backfilled with clean material
8. 4522 Milton Drive	0.5 fbg	impacted surface soil removed and backfilled with clean material
9. 4519 Milton Drive	4 fbg	impacted surface soil and waste fill removed and backfilled with clean material
10. 4518 Milton Drive	1 fbg	impacted surface soil removed and backfilled with clean material
11. 4513 Milton Drive	6 fbg	impacted surface soil and waste fill removed and backfilled with clean material
12. 4510 Milton Drive	1 fbg	impacted surface soil removed and backfilled with clean material
13. 4507 Milton Drive	4 fbg	surface soil* and waste fill removed and backfilled with clean material
14. 4502 Milton Drive	1 fbg	impacted surface soil removed and backfilled with clean material
15. 4501 Milton Drive	6 fbg	impacted surface soil and waste fill removed and backfilled with clean material
16. 4401 Milton Drive	1 fbg	impacted surface soil removed (wfr) and backfilled with clean material

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Table 3-1. Excavation and disposal IRM summary.

Residential Property	Maximum Depth of Excavation	Comments
17. 4317 Milton Drive	10 fbg	impacted surface soil and waste fill removed and backfilled with clean material
18. 4313 Milton Drive	1 fbg	impacted surface soil removed and backfilled with clean material
19. 4309 Milton Drive	1 fbg	impacted surface soil removed and backfilled with clean material
20. 4221 Milton Drive	1 fbg	impacted surface soil removed and backfilled with clean material
21. 4217 Milton Drive	1 fbg	impacted surface soil removed and backfilled with clean material
22. 201 Browning Avenue	0.5 fbg	impacted surface soil removed and backfilled with clean material

fbg = feet below grade

wfr = waste fill remains in subsurface

* = non impacted surface soil removed to remain consistent with adjacent properties

Source: O'Brien & Gere Engineers, Inc.

Also, waste characterization (TCLP analysis) was performed on a sample collected from the excavated waste fill material which indicated non-hazardous materials. Excavated materials were transported and disposed at Citizens Disposal Inc., a licensed Type II landfill facility located in Grand Blanc, Michigan.

3.2.2. Existing soil cover IRM

Soil cover was not installed in the backyard of 4401 Milton Drive since a 2 ft thick soil cover layer with a protective vegetative layer already exists over the waste fill material. As a condition of the purchase agreement and land use restrictions which will run with the land at 4401 Milton Drive, the homeowner will conduct normal and routine operation and maintenance of the soil cover to ensure its integrity and will not conduct excavation below a 2 ft. depth.

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3.2.3. Deed restrictions

A restrictive covenant for each of the two properties (recorded with the Genesee County Register of Deeds and approved by the MDEQ), 4401 Milton Drive and 4537 Milton Drive, will specify appropriate land use restrictions. The soil cover completed as an IRM enhances the protection of the exposure pathways, and the land use restrictions specified in the restrictive covenant will provide added assurance that no unusual exposure to subsurface soil will occur in the future.

The land use restrictions will be detailed in a restrictive covenant recorded by General Motors and approved by the MDEQ, and submitted under separate cover as outlined in O'Brien & Gere's July 17, 1997 response letter (addressed to the MDEQ). The land use restrictions will include the following:

- Restrictions on site activities which may potentially affect the integrity of the soil cover or other designated barriers or interfere with maintenance activities
- The prohibition of uncontrolled excavation or other activities which may potentially damage the soil cover or other designated barriers.

3.3. Excavation closure verification sampling and analysis

Post excavation soil samples were collected from the native soil remaining in the excavation following removal of impacted surface soil and/or waste fill. Sampling locations and frequency were established in accordance with the MDEQ Verification of Soil Remediation guidance document, Revision 1, April 1994 (VSR) for small (<0.25 acres) and medium ($0.25 < 3.0$ acres) sites. To document clean closure at the medium ($0.25 < 3.0$) sites, MDEQ VSR guidance states that statistical analysis, through the calculation of the upper confidence limit (UCL), can be used to show that closure is complete. The UCL was calculated from the total number of samples collected at medium sites. The UCL was then compared to the MDEQ Generic Residential Land Use criterion.

Sample collection was based on the protocols outlined in the O'Brien & Gere Clean Closure Verification Sampling and Analysis Work Plan, dated February 1997 (Closure Work Plan) and as amended in a letter dated July 17, 1997. Decontamination procedures were followed in accordance with protocols outlined in the November 1994 Work Plan prepared by O'Brien & Gere.

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Clean closure analyses of samples from soil remaining in the excavations were established based on the protocols outlined in the Closure Work Plan. This Work Plan incorporated the use of on site X-Ray fluorescence (XRF) analytical techniques for lead; including laboratory confirmation. A copy of this Work Plan was included as Appendix I in the Residential RI/FS. The use of the XRF machine was approved by the MDEQ in a letter addressed to GM dated April 22, 1997.

Excavations for lead impacted surface soil had a minimum 10% of closure samples submitted to the laboratory (O'Brien & Gere Laboratories Inc., Syracuse, New York) for confirmation analysis in addition to the XRF lead analysis. One sample per excavation of waste fill was also submitted to the laboratory and analyzed for lead, arsenic, benzo(a)pyrene, and benzo(a)anthracene. The XRF data results were compared to laboratory data results, and as identified on the chart in Table 2, a correlation of the XRF results to the laboratory confirmation results indicated that the XRF machine was operating within the appropriate parameters. Because waste fill excavation at 4531 Milton Drive was completed prior to MDEQ approval of the Closure Work Plan, the thirteen closure samples collected at 4531 Milton Drive were analyzed for the four SPCs identified in the Park RI/FS.

The XRF instrument was calibrated for lead concentrations in soil from 100 parts per million (ppm) to 700 ppm, and had an approximate tolerance of ± 75 ppm. If the XRF result identified a concentration of lead at or above 325 ppm, that sample was also submitted to the laboratory for lead analysis by Method 6010A. It should be noted that actual lead concentrations below 100 ppm were below the detection limit of the XRF instrument, and resulted in negative reported values. There was good correlation between the XRF results and laboratory results as shown on Table 2. A majority of the samples were determined by the laboratory to be below 100 ppm; a trend also represented in the XRF data.

It should be noted that between the dates of June 24, 1997 and July 9, 1997, excavation closure samples were submitted to the laboratory for confirmation due to the XRF instrument reporting suspect lower sample readings. A technician from the XRF instrument manufacturer identified that the low lead values were due to the half-life cycle of the radioactive source housed within the instrument thereby reducing the intensity of the source. The XRF manufacturer instructed the operator to raise the instrument counts per second (cps) from 100 cps to 200 cps to compensate for the reduced intensity of the radioactive source. This compensation began on July 9, 1997. After this date, the correlation between the XRF instrument and the laboratory data was within normal parameters.

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3.4. Site restoration

The areas where soil was removed were filled with compacted clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. The soil cover is a minimum of 24 inches thick in areas where remaining surface soil average lead concentrations exceed 400 ppm. The soil cover was graded to provide for proper drainage considering adjacent properties and Windiate Park.

Replacement of sidewalks, driveways, and additional landscaping was completed at various properties as referenced in the property specific packages included in Appendix A of this report. Sod placed at residences was maintained (watering and regular mowing) by GM for a period of 2 months, after which time the homeowner was responsible for lawn maintenance.

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4. Conclusions

The completion of the construction activities at the twenty-two residential properties, supplemented by deed restrictions and routine maintenance at two residential properties serves as the final remedy for the Site. These final remedies, implemented as IRMs, provide for a Generic (unrestricted) Residential categorical closure at twenty residential properties and a Limited Residential categorical closure at two residential properties. The properties are currently zoned for single family and two family residential use which is consistent with the categorical cleanups.

The remedial actions for the twenty-two residential properties consisted of the following elements or combinations of these elements:

- Excavation of surface soil and backfill with clean material at seventeen residential properties
- Excavation of subsurface waste fill material and backfill with clean material at nine residential properties
- Soil cover at one property left in place
- Deed restrictions are proposed as the final implementation step for two residential properties, 4401 Milton Drive and 4537 Milton Drive.

Based on the remedial actions completed at the twenty-two residential properties, which provide for a Generic Residential and Limited Residential categorical cleanup, Site remediation is considered complete in accordance with PA 451, Part 201.

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TABLES

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Table 1

Residential Remediation Final (Per Property) Remedy Summary

#	Property	Proposed Final Remedy	Former Proposed Land Use Cleanup Category	Actual Construction Activity performed as an Interim Remedial Measure (IRM)	New Proposed Land Use Cleanup Category
1.	4625 Milton	Excavate and replace surface soil in specific areas	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
2.	4621 Milton	Excavate and replace surface soil in specific areas	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
3.	4605 Milton	Excavate and replace surface soil in specific areas	Generic (Unrestricted) Residential	Excavate waste fill Excavate and replace surface soil in specific areas	Same as Previously Proposed
4.	4537 Milton	Install soil cover over waste fill, deed restrictions and maintenance	Limited Residential	Excavate waste fill and maintain soil cover over waste fill and deed restriction/maintenance*	Same as Previously Proposed
5.	4531 Milton	Excavate waste fill and backfill with clean material	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
6.	4525 Milton	Excavate waste fill and backfill with clean material	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
7.	4519 Milton	Excavate waste fill and backfill with clean material Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
8.	4513 Milton	Install soil cover over waste fill and surface soil, excavate some surface soil, deed restrictions and maintenance	Limited Residential	Excavate waste fill Excavate and replace surface soil	Generic (Unrestricted) Residential
9.	4507 Milton	Install soil cover over waste fill, excavate some surface soil to match grade of adjacent properties, deed restrictions and maintenance	Limited Residential	Excavate waste fill Excavate and replace surface soil	Generic (Unrestricted) Residential
10.	4501 Milton	Install soil cover over waste fill and surface soil, excavate some surface soil, deed restrictions and maintenance	Limited Residential	Excavate waste fill Excavate and replace surface soil	Generic (Unrestricted) Residential
11.	4407 Milton	Excavate waste fill, install soil cover over waste fill and surface soil, excavate some surface soil, pump and dispose limited impacted ground water, deed restrictions and maintenance	Limited Residential	No change from RAP	Same as Previously Proposed**
12.	4401 Milton	Excavate and replace surface soil (front yard), deed restrictions and	Limited Residential	No change from RAP	Same as Previously Proposed***
13.	4317 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	Excavate waste fill Excavate and replace surface soil	Same as Previously Proposed
14.	4313 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
15.	4309 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
16.	4221 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
17.	4217 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
18.	4522 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
19.	4518 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
20.	4510 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
21.	4502 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
22.	201 Browning	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
23.	4543 Milton	Not previously included in 297 RAP	NA	Excavate waste fill	Generic (Unrestricted) Residential

*Additional excavation scheduled for December 1997

**Structure at 4407 Milton Drive has been demolished. Parcel is planned to be donated to the City of Flint and will become Park property.

***Structure at 4317 Milton Drive has been demolished. Parcel is planned to be split with the sections combined with adjacent parcels.

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Table 1

Residential Remediation Final (Per Property) Remedy Summary

#	Property	Proposed Final Remedy	Former Proposed Land Use Cleanup Category	Actual Construction Activity performed as an Interim Remedial Measure (IRM)	New Proposed Land Use Cleanup Category
1.	4625 Milton	Excavate and replace surface soil in specific areas	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
2.	4621 Milton	Excavate and replace surface soil in specific areas	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
3.	4605 Milton	Excavate and replace surface soil in specific areas	Generic (Unrestricted) Residential	Excavate waste fill Excavate and replace surface soil in specific areas	Same as Previously Proposed
4.	4537 Milton	Install soil cover over waste fill, deed restrictions and maintenance	Limited Residential	Excavate waste fill and maintain soil cover over waste fill and deed restriction/maintenance*	Same as Previously Proposed
5.	4531 Milton	Excavate waste fill and backfill with clean material	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
6.	4525 Milton	Excavate waste fill and backfill with clean material	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
7.	4519 Milton	Excavate waste fill and backfill with clean material Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
8.	4513 Milton	Install soil cover over waste fill and surface soil, excavate some surface soil, deed restrictions and maintenance	Limited Residential	Excavate waste fill Excavate and replace surface soil	Generic (Unrestricted) Residential
9.	4507 Milton	Install soil cover over waste fill, excavate some surface soil to match grade of adjacent properties, deed restrictions and maintenance	Limited Residential	Excavate waste fill Excavate and replace surface soil	Generic (Unrestricted) Residential
10.	4506 Milton	Install soil cover over waste fill and surface soil, excavate some surface soil, deed restrictions and maintenance	Limited Residential	Excavate waste fill Excavate and replace surface soil	Generic (Unrestricted) Residential
11.	4407 Milton	Excavate waste fill, install soil cover over waste fill and surface soil, excavate some surface soil, pump and dispose limited impacted ground water, deed restrictions and maintenance	Limited Residential	No change from RAP	Same as Previously Proposed***
12.	4400 Milton	Excavate and replace surface soil (front yard), deed restrictions and	Limited Residential	No change from RAP	Same as Previously Proposed***
13.	4317 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	Excavate waste fill Excavate and replace surface soil	Same as Previously Proposed
14.	4313 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
15.	4309 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
16.	4221 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
17.	4217 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
18.	4522 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
19.	4518 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
20.	4510 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
21.	4502 Milton	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
22.	201 Browning	Excavate and replace surface soil	Generic (Unrestricted) Residential	No change from RAP	Same as Previously Proposed
23.	4543 Milton	Not previously included in 2/97 RAP	NA	Excavate waste fill	Generic (Unrestricted) Residential

*Additional excavation scheduled for December 1997

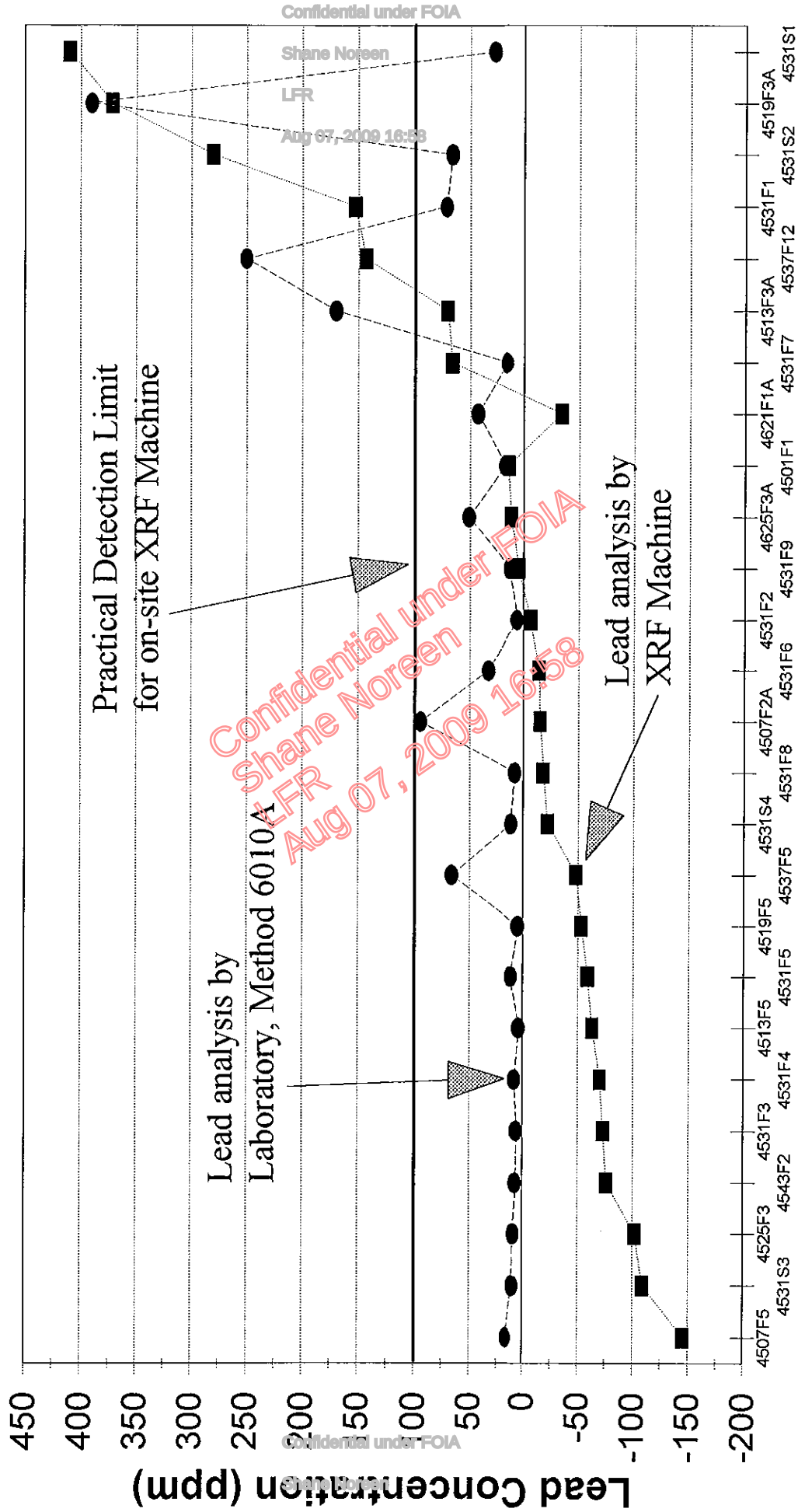
***Structure at 4407 Milton Drive has been demolished. Parcel is planned to be donated to the City of Flint and will become Park property.

***Structure at 4317 Milton Drive has been demolished. Parcel is planned to be split with the sections combined with adjacent parcels.

i:\nov\projects\600901514_notes\mapsum.wpd

Residential Remediation

XRF Data vs. Laboratory Data For Total Lead



Sample Designation

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FIGURES

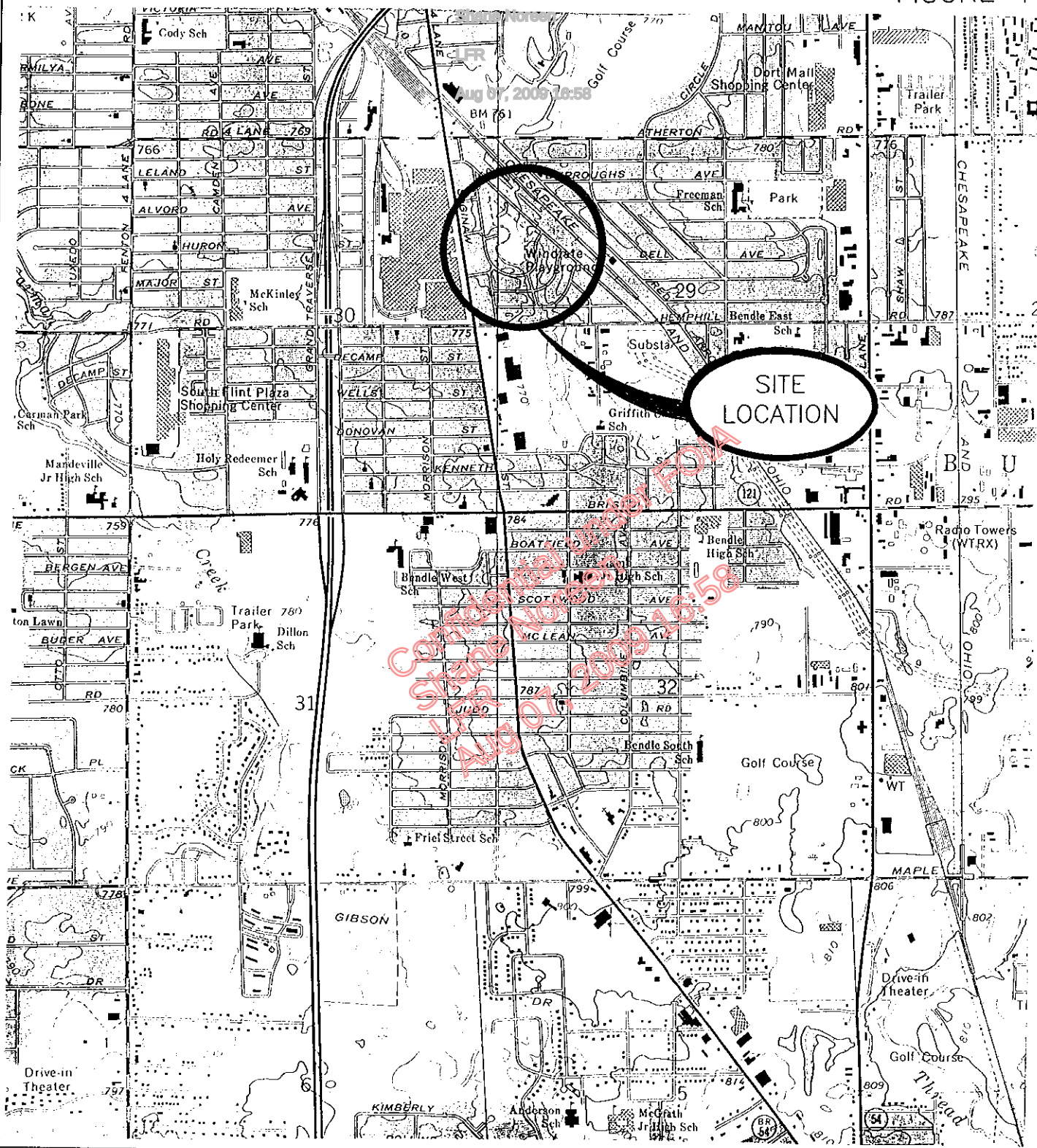
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FLINT SOUTH, MICH.
N4252.5—W8337.5/7.5

1969
PHOTOREVISED 1975
AMS 4269 I NW -SERIES V862

WINDIATE PARK AREA
FLINT, MICHIGAN

SITE LOCATION MAP

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QUADRANGLE LOCATION

0 1000 2000 3000 4000

SCALE IN FEET

FILE NO. 6009-011



OBIEN & GERE
ENGINEERS, INC.

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FIGURE 2

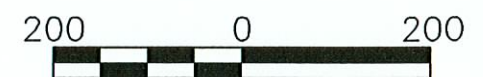


LEGEND

- BLOCK 1 OF SITE
- BLOCK 2 OF SITE
- BLOCK 3 OF SITE
- BLOCK 4 OF SITE
- 4102 PROPERTY ADDRESS

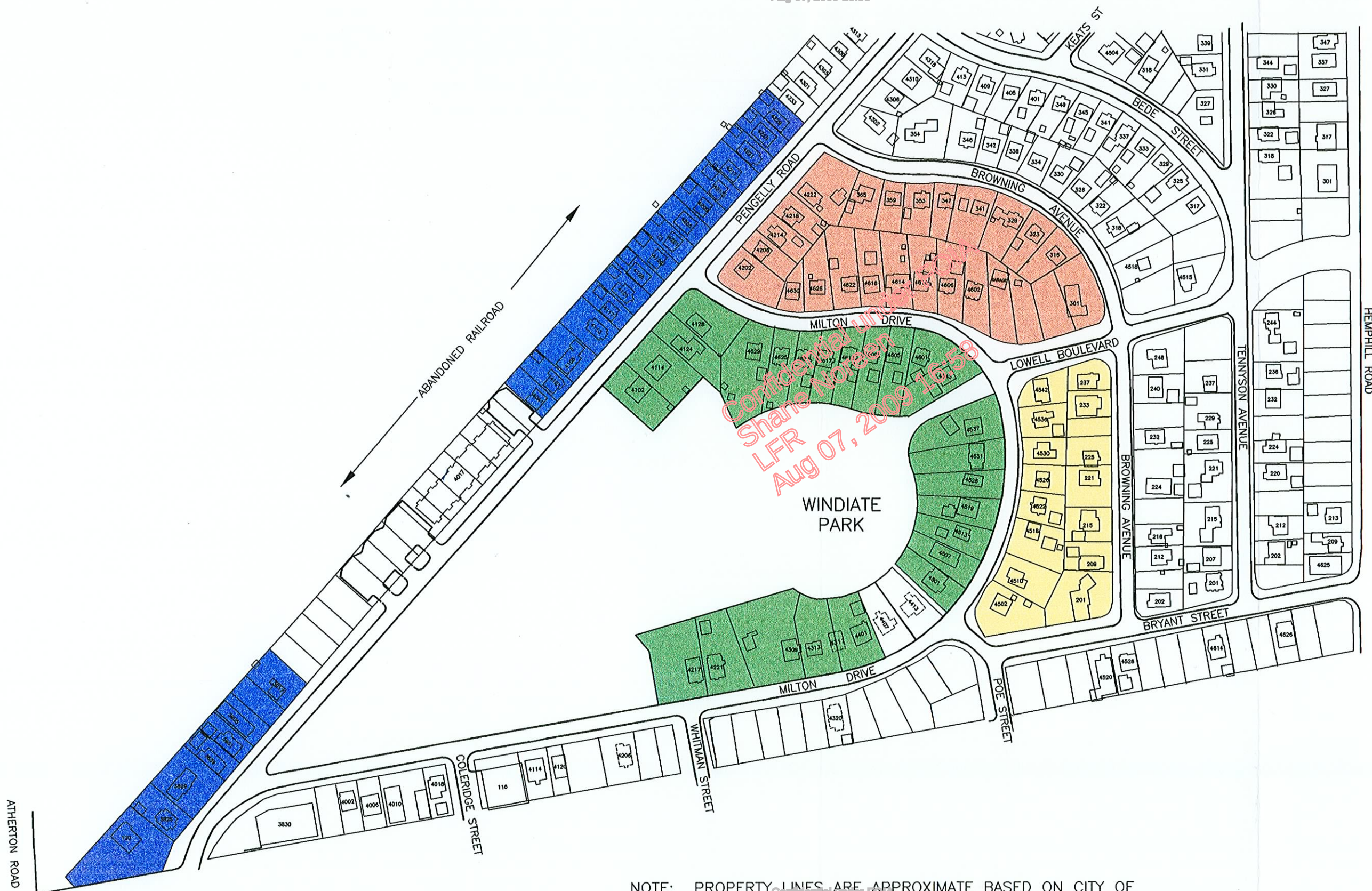
RESIDENTIAL REMEDIAL CLOSURE REPORT FLINT, MICHIGAN

SITE PLAN



APPROXIMATE SCALE IN FEET

FILE NO. 6009-015-024



NOTE: PROPERTY LINES ARE APPROXIMATE BASED ON CITY OF FLINT TAX ASSESSOR MAP 1966 COMPOSITE OF SECTION 29 & 30 T7N R7E BY GENESSEE COUNTY METROPOLITAN PLANNING COMMISSION.

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LEGEND

- AREA OF SURFACE SOIL EXCAVATION AND BACKFILL
- AREA OF SURFACE SOIL EXCAVATION AND PLACEMENT OF A MINIMUM OF TWO FOOT THICK SOIL COVER
- AREA OF WASTE FILL EXCAVATION AND BACKFILL
- PLACEMENT OF TWO FOOT THICK SOIL COVER
- TWO FOOT THICK SOIL COVER (EXISTING)
- PROPERTY LINE
- EXTENT OF SUBSURFACE WASTE FILL
- WFR SUBSURFACE WASTE FILL REMAINS

IN CHARGE OF _____
DESIGNED BY _____ CHECKED BY _____
DRAWN BY _____

1"=40'
40 0 40 80

NO.	DATE	REVISION	INIT.



GENERAL MOTORS CORPORATION
RESIDENTIAL REMEDIATION
FLINT, MICHIGAN

INTERIM REMEDIAL MEASURES

FILE NO.
6009.015-021
DATE
NOVEMBER, 1997

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APPENDICES

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201 Browning Avenue

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Remediation

Previous investigation and sampling by GM's environmental consultant identified surface soil at 201 Browning Avenue that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm). In July 1997, GM's environmental consultant excavated and removed the lead impacted surface soil material. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees and bushes were removed. Surface soil in the front yard, including the area between the road and the sidewalk, and the backyard was removed to a depth of 6 inches. The excavated surface soil was transported to a landfill for disposal.

The areas where surface soil was removed were filled in with a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed.

Post-Excavation Sampling

The lead content of the fifteen post-excavation samples from the area where surface soil was removed was below the MDEQ Generic Residential Land Use criterion, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

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Residential Remediation 201 Browning Avenue, Flint, Michigan

Closure Sampling Analytical Data

Surface Soil Excavation Samples

LOCATION	201F-1A		201F-2A		201F-3A		201F-4A		201F-5A		201F-6A		Clean-Up Criteria	
	07/24/97		07/25/97		07/24/97		07/24/97		07/24/97		07/24/97			
	Floor		Floor		Floor		Floor		Floor		Floor			
	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Analytical Parameter														
Lead	XRF		XRF		XRF		XRF		XRF		XRF		XRF	
	<100		<100		<100		<100		301		<100		400	

Surface Soil Excavation Samples

LOCATION	201F-7A		201F-8A		201F-9A		201F-10A		201F-11A		201F-12A		201F-13A		201F-14A		Clean-Up Criteria	
	07/25/97		07/25/97		07/28/97		07/25/97		07/28/97		07/28/97		07/25/97		07/25/97			
	Floor		Floor		Floor		Floor		Floor		Floor		Floor		Floor			
	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Analytical Parameter																		
Lead	XRF		XRF		XRF		XRF		XRF		XRF		XRF		XRF		XRF	
	<100		<100		<100		<100		3100		300		<100		122		400	

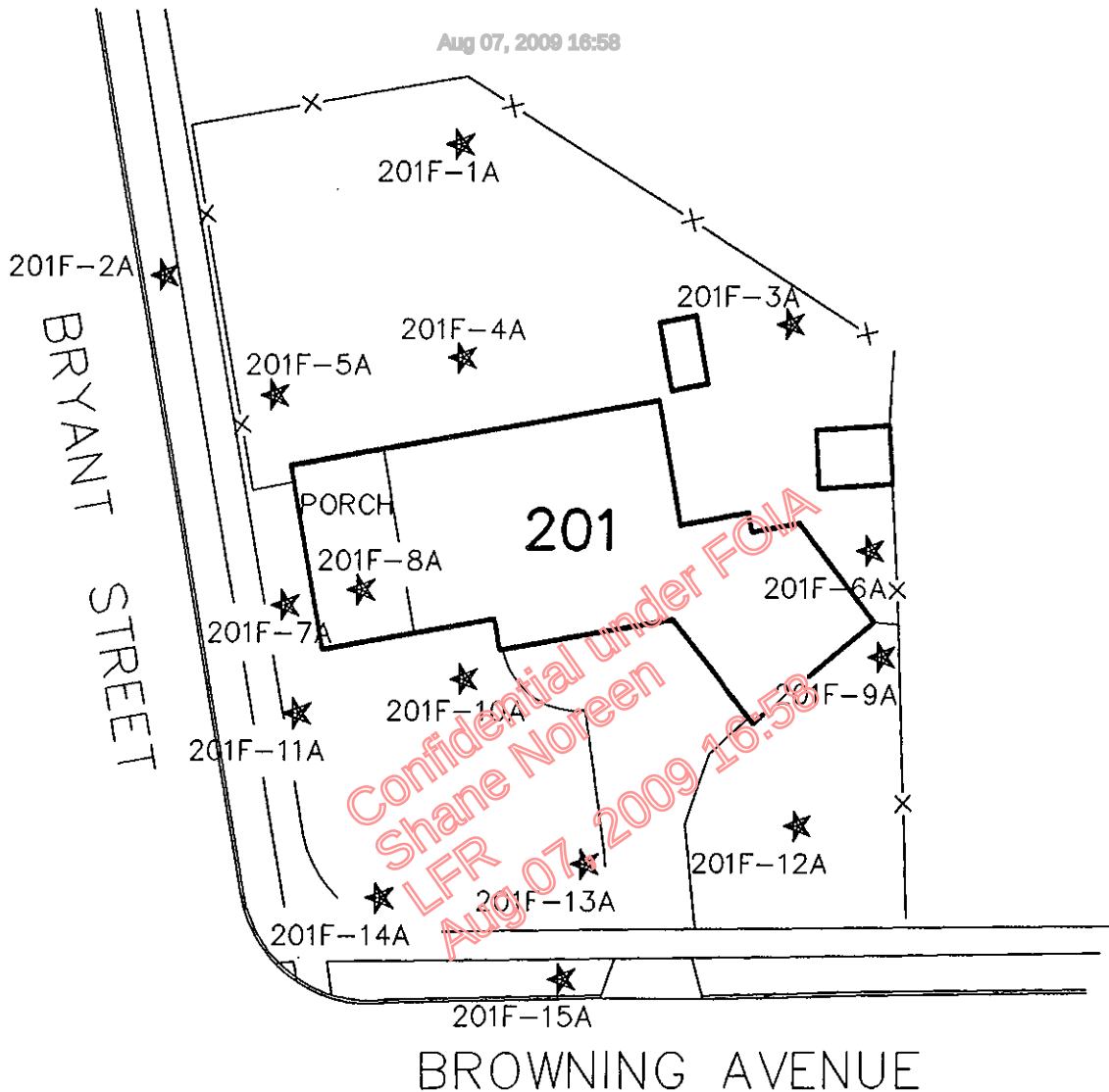
Laboratory Quality Assurance/Quality Control (QA/QC) Results

LOCATION	201F-1A		Clean-Up Criteria	
	07/24/97			
	Floor			
	mg/kg			
Analytical Parameter				
Lead	6010A			
	150		400	

Notes:

1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
3. Samples 201F-1A analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria for Lead is MDEQ Generic Residential Direct Contact Value.
5. "-" denotes analysis not performed.
6. "<" denotes result below detection limit.
7. mg/kg = parts per million.

POST-EXCAVATION SAMPLE LOCATIONS



NOTES:

"F" PREFIX DENOTES
FLOOR SAMPLE

"A" SUFFIX DENOTES
SURFACE SOIL
SAMPLE

201F-8A IS UNDERNEATH
SECOND STORY PORCH

★ CLOSURE SAMPLE
LOCATION

**201 BROWNING AVE
FLINT, MICHIGAN**

30 0 30

Shane Noreen

APPROX SCALE: 1" = 30'

Shane Noreen

LFR

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F6103
Samp. Description: 201F-1A (6")
Units: mg/Kg Dry weight

Collected: 07/24/97 Matrix: Solid
Received: 08/02/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	150.	6010A	08/04/97	08/04/97	080497S2	1

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: August 6, 1997

Monika Santucci

5000 Brittonfield Parkway / Suite 300, Box 4942 / Syracuse, NY 13221 / (315) 437-0200

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4217 Milton Drive

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Remediation

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4217 Milton Drive that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm). In June and July 1997, GM's environmental consultant excavated and removed the lead impacted surface soil material. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees, fences, concrete driveway, and the gravel parking area were removed. Surface soil in the front yard, including the area between the road and the sidewalk, and the backyard was removed to a depth of 1 ft. The excavated surface soil was transported to a landfill for disposal. The concrete driveway was not replaced.

The areas where surface soil was removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Crushed stone was placed in the area north of the house (depth of 1 ft) for the parking lot and ramp. Additional landscaping, consisting of installing flower beds and/or bushes was then completed. A chain link fence, with an access gate, was installed along the backyard and side yard bordering the Park.

Post-Excavation Sampling

The lead content of the sixteen post-excavation samples from the area where surface soil was removed was below the MDEQ Generic Residential Land Use criteria, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

Residential Remediation 4217 Milton Drive, Flint, Michigan

Closure Sampling Analytical Data

Surface Soil Excavation Samples

Laboratory Quality Assurance/Quality Control (QA/QC) Results

LOCATION		4217F-1A	4217F-2A	4217F-3A	4217F-4A	4217F-5A	4217F-6A	4217F-7A	4217F-8A	Clean-Up Criteria
Date Collected		06/27/97	06/26/97	06/26/97	06/26/97	06/27/97	06/26/97	06/27/97	06/27/97	
Depth		Floor	Floor	Floor	Floor	Floor	Floor	Floor	Floor	
Analytical Parameter		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Lead	XRF	<100	<100	<100	<100	<100	<100	<100	<100	400
Lead	6010A	36	120	26	170	98	7	11	15	400

Surface Soil Excavation Samples

Laboratory Quality Assurance/Quality Control (QA/QC) Results

LOCATION		4217F-9A	4217F-10A	4217F-11A	4217F-12A	4217F-13A	4217F-14A	4217F-15A	4217F-16A	Clean-Up Criteria
Date Collected		06/26/97	06/26/96	06/26/96	06/27/97	06/27/97	07/03/97	06/24/97	06/24/97	
Depth		Floor	Floor	Floor	Floor	Floor	Floor	Floor	Floor	
Analytical Parameter		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Lead	XRF	<100	<100	<100	340	274	<100	128	<100	400
Lead	6010A	72	15	7.6	240	220	180	-	96	400

Notes:

1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
3. All the samples at this property were analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria for Lead is MDEQ Generic Residential Direct Contact Value.
5. "-" denotes analysis not performed.
6. "<" denotes result below detection limit.
7. mg/kg = parts per million.

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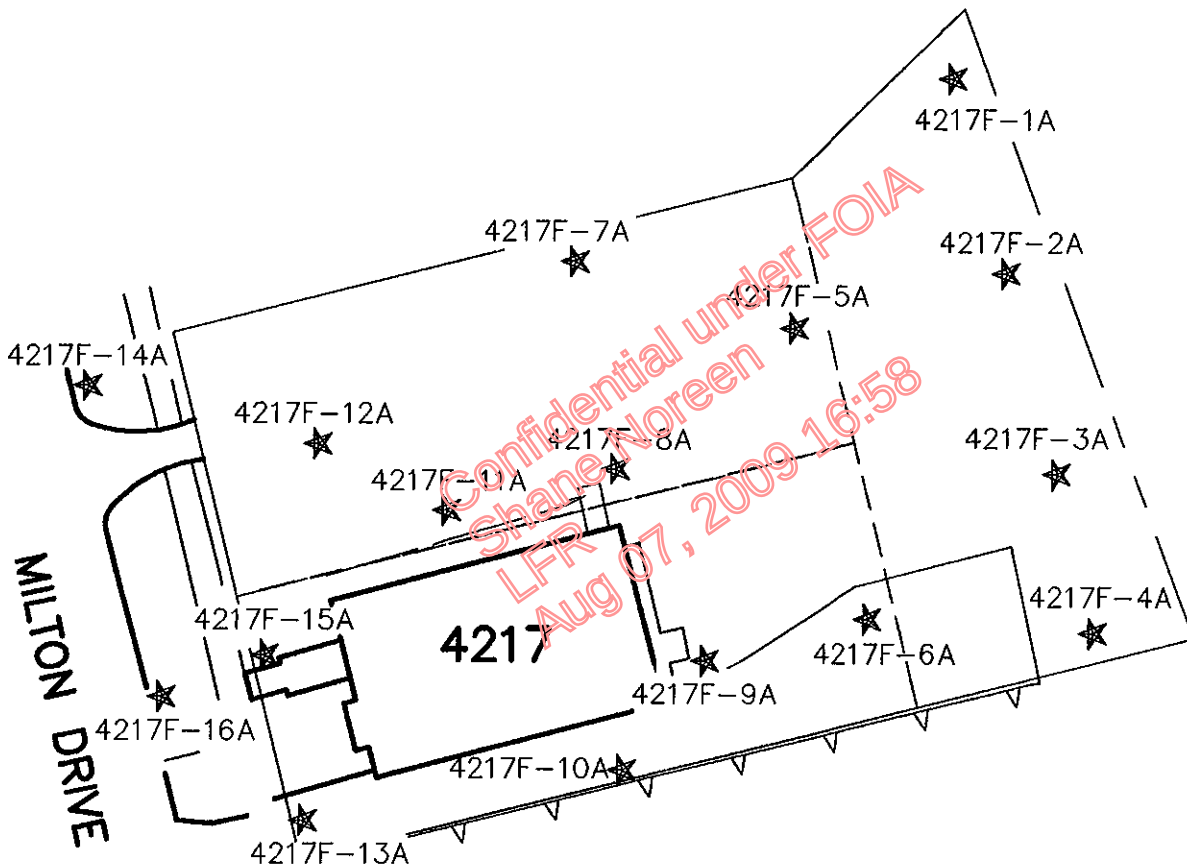
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POST-EXCAVATION SAMPLE LOCATIONS**NOTES:**

"F" PREFIX DENOTES
FLOOR SAMPLE

"A" SUFFIX DENOTES
SURFACE SOIL
SAMPLE

★ CLOSURE SAMPLE
LOCATION
4217F-4A

**4217 MILTON DRIVE
FLINT, MICHIGAN**



APPROX SCALE: 1"=30'

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0826
Samp. Description: 4217F-1A (6")
Units: mg/Kg Dry weight

Collected: 06/27/97 Matrix: Solid
Received: 06/30/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	36.	6010A	06/30/97	06/30/97	063097s1	1

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: July 1, 1997

Monika Santucci

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**Analytical Results
Trace Metals****O'Brien & Gere
Laboratories, Inc.**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0720
Samp. Description: 4217F-2A (6")
Units: mg/Kg Dry weight

Collected: 06/26/97 Matrix: Solid
Received: 06/27/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	120.	6010A	06/27/97	06/27/97	062797S1	1

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: June 30, 1997

Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0717
Samp. Description: 4217F-3A (6")
Units: mg/Kg Dry weight

Collected: 06/26/97 Matrix: Solid
Received: 06/27/97 %Solids: 99.8
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	26.	6010A	06/27/97	06/27/97	062797S1	1

Notes:

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Authorized: Monika Santucci

Date: June 30, 1997

Monika Santucci

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Aug 07, 2009 16:58

**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0718
Samp. Description: 4217F-4A (6")
Units: mg/Kg Dry weight

Collected: 06/26/97 Matrix: Solid
Received: 06/27/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	170.	6010A	06/27/97	06/27/97	062797s1	1	

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: June 30, 1997

Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0827
Samp. Description: 4217F-5A (6")
Units: mg/Kg Dry weight

Collected: 06/27/97 Matrix: Solid
Received: 06/30/97 %Solids: 99.9
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	98.	6010A	06/30/97	06/30/97	063097s1	1

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: July 1, 1997

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Aug 07, 2009 16:58

**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0716
Samp. Description: 4217F-6A (6")
Units: mg/Kg Dry weight

Collected: 06/26/97 Matrix: Solid
Received: 06/27/97 %Solids: 99.9
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	7.	6010A	06/27/97	06/27/97	062797S1	1	

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: June 30, 1997

Monika Santucci

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Aug 07, 2009 16:58

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0828
Samp. Description: 4217F-7A (6")
Units: mg/Kg Dry weight

Collected: 06/27/97 Matrix: Solid
Received: 06/30/97 %Solids: 99.9
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	11.	6010A	06/30/97	06/30/97	063097S1	1

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: July 1, 1997

Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0829
Samp. Description: 4217F-8A (6")
Units: mg/Kg Dry weight

Collected: 06/27/97 Matrix: Solid
Received: 06/30/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	15.	6010A	06/30/97	06/30/97	063097S1	1	

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Date: July 1, 1997

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0715
Samp. Description: 4217F-9A (6")
Units: mg/Kg Dry weight

Collected: 06/26/97 Matrix: Solid
Received: 06/27/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	72.	6010A	06/27/97	06/27/97	062797S1	1

Notes:

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Date: June 30, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0719
Samp. Description: 4217F-10A (6")
Units: mg/Kg Dry weight

Collected: 06/26/97 Matrix: Solid
Received: 06/27/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	15.	6010A	06/27/97	06/27/97	062797S1	1

Notes:

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0830
Samp. Description: 4217F-11A (6")
Units: mg/Kg Dry weight

Collected: 06/27/97 Matrix: Solid
Received: 06/30/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	8.	6010A	06/30/97	06/30/97	063097s1	1

Notes:

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Authorized: Monika Santucci

Date: July 1, 1997

Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0831
Samp. Description: 4217F-12A (6")
Units: mg/Kg Dry weight

Collected: 06/27/97 Matrix: Solid
Received: 06/30/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	240.	6010A	06/30/97	06/30/97	063097s1	1

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: July 1, 1997

Monika Santucci

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Aug 07, 2009 16:58

**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0458
Samp. Description: 4217F-13A (6")
Units: mg/Kg Dry weight

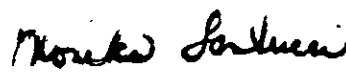
Collected: 06/24/97 Matrix: Solid
Received: 06/25/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	220.	6010A	06/25/97	06/25/97	062597S1	1

Notes:

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Authorized: 

Date: June 26, 1997

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F1813
Samp. Description: 4217F-14A (6")
Units: mg/Kg Dry weight

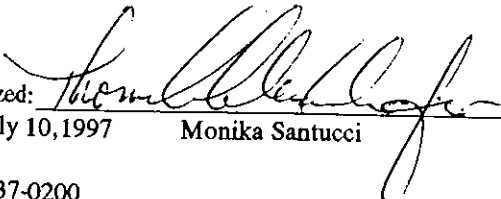
Collected: 07/07/97 Matrix: Solid
Received: 07/08/97 %Solids: 99.9
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	180.	6010A	07/08/97	07/08/97	070897S1	1	

Notes:

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Authorized: 
Date: July 10, 1997

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0542
Samp. Description: 4217F-16A (6")
Units: mg/Kg Dry weight

Collected: 06/25/97 Matrix: Solid
Received: 06/26/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	96.	6010A	06/26/97	06/27/97	062697S1	1

Notes:

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Authorized: Monika Santucci

Date: June 30, 1997

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4221 Milton Drive

Aug 07, 2009 16:58

Remediation

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4221 Milton Drive that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm). In June 1997, GM's environmental consultant excavated and removed the lead impacted surface soil material. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees, fences, concrete sidewalk, and a former garage concrete foundation were removed. Surface soil in the front yard, including the area between the road and the sidewalk, the backyard, and the former Shelly Lane area was removed to a depth of 1 ft. The excavated surface soil was transported to a landfill for disposal. The concrete sidewalk and pad were not replaced.

The areas where surface soil was removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed. Small trees were planted in the backyard where trees formerly existed and a chain link fence, with an access gate, was installed along the back yard bordering the Park. A new driveway and garage was installed in the area of the former Shelly Lane.

Post-Excavation Sampling

The lead content of the sixteen post-excavation samples from the area where surface soil was removed was below the MDEQ Generic Residential Land Use criteria, with the exception of one sampling location. The soil sample location 4221F-14A, collected from a depth of one foot exhibited lead at a concentration of 883 ppm. An additional one foot of soil was excavated in the vicinity of this sample location and a second sample, 4221F-14B was collected. The analytical data from the sample 4221F-14B was found to be less than 100 ppm for lead, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

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Residential Remediation 4221 Milton Drive, Flint, Michigan

Closure Sampling Analytical Data

Surface Soil Excavation Samples

LOCATION	4221F-1A			4221F-2A			4221F-3A			4221F-4A			4221F-5A			4221F-6A			4221F-7A			4221F-8A			4221F-9A			Clean-Up Criteria		
	06/19/97			06/19/97			06/19/97			06/19/97			06/19/97			06/19/97			06/19/97			06/19/97			06/19/97					
	Date Collected	Depth	Method	Date Collected	Depth	Method	Date Collected	Depth	Method	Date Collected	Depth	Method	Date Collected	Depth	Method	Date Collected	Depth	Method	Date Collected	Depth	Method	Date Collected	Depth	Method	Date Collected	Depth	Method			
Analytical Parameter	Floor			Floor			Floor			Floor			Floor			Floor			Floor			Floor			Floor					
Lead	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg					
	<100			<100			<100			<100			<100			<100			<100			<100			<100					

Surface Soil Excavation Samples

LOCATION	4221F-9A			4221F-10A			4221F-11A			4221F-12A			4221F-13A			4221F-14A			4221F-14b			4221F-15A			Clean-Up Criteria		
	06/19/97			06/23/97			06/23/97			06/23/97			06/24/97			06/24/97			06/24/97			06/24/97					
	Date Collected	Depth	Method	Date Collected	Depth	Method	Date Collected	Depth	Method	Date Collected	Depth	Method	Date Collected	Depth	Method	Date Collected	Depth	Method	Date Collected	Depth	Method	Date Collected	Depth	Method			
Analytical Parameter	Floor			Floor			Floor			Floor			Floor			Floor			Floor			Floor					
Lead	mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg			mg/kg					
	<100			<100			218			<100			264			883			<100			207					

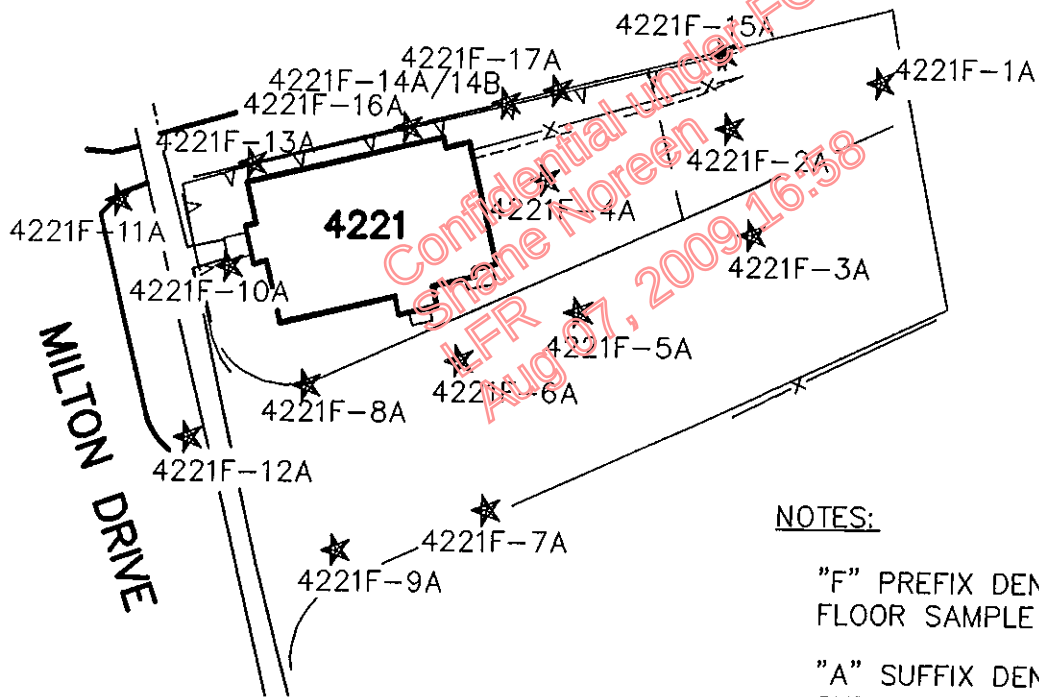
Laboratory Quality Assurance/Quality Control (QA/QC) Results

LOCATION	4221F-2A			4221F-14A			Clean-Up Criteria		
	06/19/97			06/24/97					
	Date Collected	Depth	Method	Date Collected	Depth	Method			
Analytical Parameter	Floor			Floor					
Lead	mg/kg			mg/kg					
	88			720					

Notes:

1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
3. Samples 4221F-2A and 4221F-14A analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria for Lead is MDEQ Generic Residential Direct Contact Value.
5. "-" denotes analysis not performed.
6. "<" denotes result below detection limit.
7. mg/kg = parts per million.
8. Sample designation with "b" suffix denotes an additional excavation beyond corresponding sample with "a" suffix (ie 4221F-14a and 4221F-14b).

POST-EXCAVATION SAMPLE LOCATIONS



NOTES:

"F" PREFIX DENOTES
FLOOR SAMPLE

"A" SUFFIX DENOTES
SURFACE SOIL
SAMPLE

"B" PREFIX DENOTES
SURFACE SOIL SAMPLE
SAMPLED AT LOWER DEPTH

★ CLOSURE SAMPLE
4221F-4A LOCATION

**4221 MILTON DRIVE
FLINT, MICHIGAN**



APPROX SCALE: 1" = 40'

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0459
Samp. Description: 4221F-2A (6")
Units: mg/Kg Dry weight

Collected: 06/24/97 Matrix: Solid
Received: 06/25/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	88.	6010A	06/25/97	06/25/97	062597S1	1

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: June 26, 1997

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0460
Samp. Description: 4221F-14A (6")
Units: mg/Kg Dry weight

Collected: 06/24/97 Matrix: Solid
Received: 06/25/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	720.	6010A	06/25/97	06/25/97	062597S1	1	

Notes:

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Authorized: Monika Santucci

Date: June 26, 1997

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4309 Milton Drive

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Remediation

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4309 Milton Drive that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm). In June 1997, GM's environmental consultant excavated and removed the lead impacted surface soil material. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees and bushes were removed along with the garage and the gravel parking area. Surface soil in the front yard, including the area between the road and the sidewalk, and the backyard was removed to a depth of 1 foot. The excavated surface soil was transported to a landfill for disposal.

The areas where surface soil was removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Crushed stone was placed in the area north of the house (depth of 1 ft) for the parking lot and ramp. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed and a chain link fence, with an access gate, was installed along the backyard bordering the Park.

Post-Excavation Sampling

The lead content of the sixteen post-excavation samples from the area where surface soil was removed was below the MDEQ Generic Residential Land Use criterion, with the exception of one sampling location. The soil sample collected at location 4309F-12A, at a depth of 1 foot, exhibited lead at a concentration of 500 ppm (laboratory analysis). MDEQ guidance states that statistical analysis, through the calculation of the upper confidence limit, can be used to show that closure is complete. The upper confidence limit of the sixteen lead results was calculated to be 177.13 ppm, which is below the MDEQ Generic Residential Land Use criterion. This indicates that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

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Residential Remediation 4309 Milton Drive, Flint, Michigan Closure Sampling Analytical Data

Surface Soil Excavation Samples

LOCATION	Date Collected		4309F-1A		4309F-2A		4309F-3A		4309F-4A		4309F-5A		4309F-6A		4309F-7A		4309F-8A		Clean-Up	
	Depth		06/04/97		06/16/97		06/18/97		06/16/97		06/13/97		06/17/97		06/17/97		06/04/97		Criteria	
	Method		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Lead	XRF		<100		<100		<100		<100		<100		<100		<100		<100		400	

Surface Soil Excavation Samples

LOCATION	Date Collected		4309F-9A		4309F-10A		4309F-11A		4309F-12A		4309F-13A		4309F-14A		4309F-15A		4309F-16A		Clean-Up	
	Depth		06/04/97		06/04/97		06/04/97		06/04/97		06/05/97		06/04/97		06/05/97		06/05/97		Criteria	
	Method		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Lead	XRF		149		<100		<100		330		<100		<100		301		<100		400	

Laboratory Quality Assurance/Quality Control (QA/QC) Results

LOCATION	Date Collected		4309F-8A		4309F-12A		4309F-13A		Clean-Up	
	Depth		06/04/97		06/04/97		06/05/97		Criteria	
	Method		mg/kg		mg/kg		mg/kg		mg/kg	
Lead	6010A		9		(500)		34		400	

Notes:

1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. () denotes sample exceeds direct contact value clean-up criteria.
3. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
4. Samples 4309F-8A, 4309F-12A and 4309F-13A analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
5. Clean-Up Criteria for Lead is MDEQ Generic Residential Direct Contact Value.
6. "-" denotes analysis not performed.
7. "<" denotes result below detection limit.
8. mg/kg = parts per million.

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Residential Remediation 4309 Milton Drive, Flint, Michigan

Closure Sampling Analytical Data UCL Calculation

Count	Sample	Lead*
1	4309F-1A	100
2	4309F-2A	100
3	4309F-3A	100
4	4309F-4A	0
5	4309F-5A	100
6	4309F-6A	100
7	4309F-7A	100
8	4309F-8A	9
9	4309F-9A	149
10	4309F-10A	100
11	4309F-11A	100
12	4309F-12A	500
13	4309F-13A	34
14	4309F-14A	100
15	4309F-15A	301
16	4309F-16A	100

Cleanup Criteria=	Lead
	400
X=	124.56
S=	119.94
Sx=	29.99
S^2=	14385.73
95% UCL=	177.13
Lambda=	2.296

Based on Attachment 2, Number of Observations for t Test of Mean, page 36 of MDNR's Guidance Document, verification of Soil Remediation, approximately 5 samples need to be taken. The lambda calculation indicates the appropriate number of samples have been collected.

Notes:

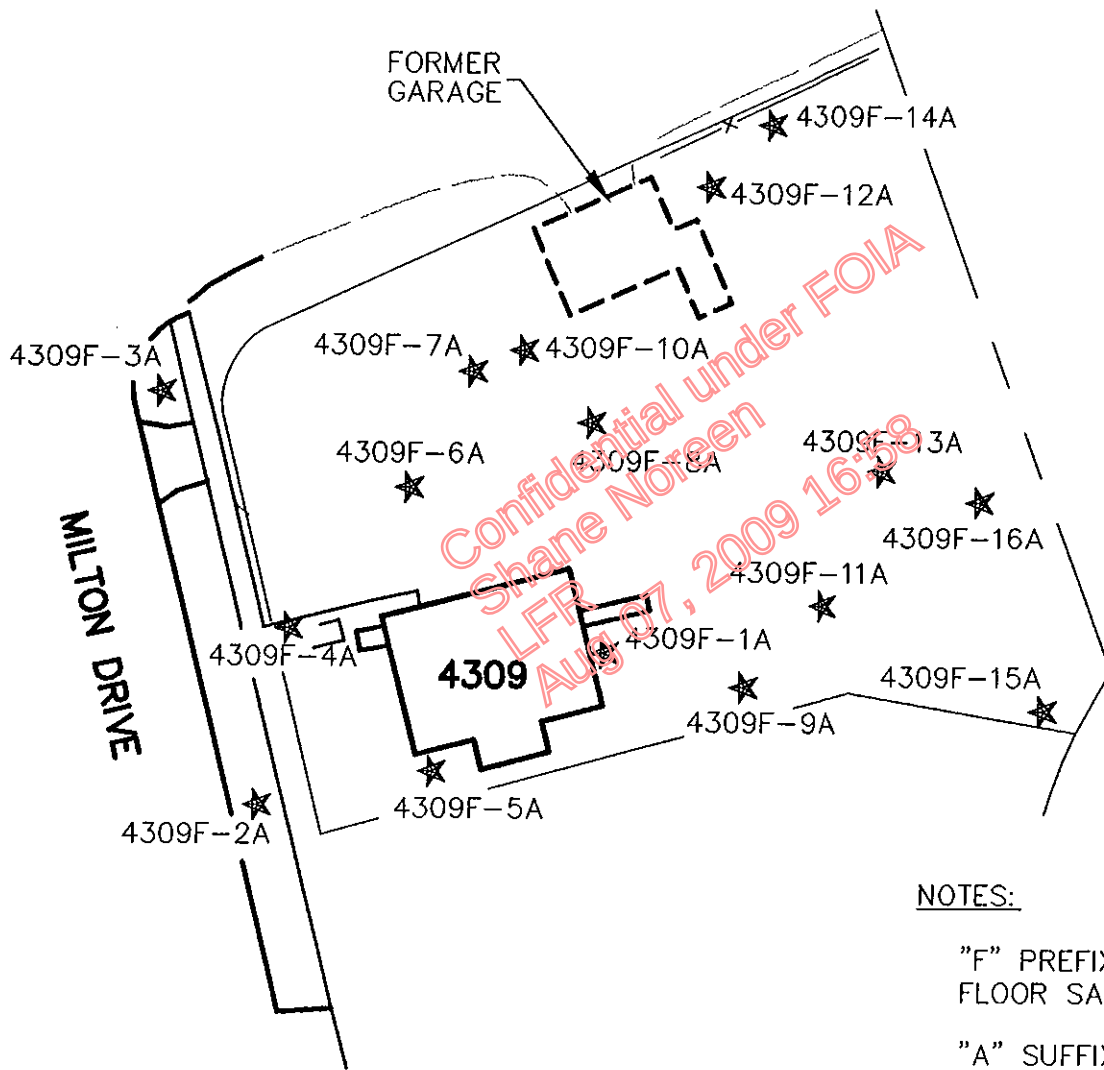
- * Lead data are XRF readings converted to 100 if readings were between 99 and -75 and readings were converted to 0 if less than -75. Lab analytical data, when available, was substituted for XRF data.
- Soil data and cleanup criteria measured in mg/kg (ppm).
- UCL= Upper Confidence Level
- Lambda= $(CC-X)/S$
- X = Mean
- S= Standard Deviation
- Sx= Standard Error of the Mean
- S^2= Standard Variance

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POST-EXCAVATION SAMPLE LOCATIONS



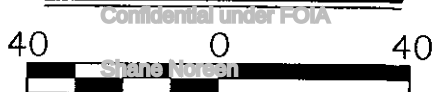
NOTES:

"F" PREFIX DENOTES FLOOR SAMPLE

"A" SUFFIX DENOTES SURFACE SOIL SAMPLE

★ CLOSURE SAMPLE LOCATION
4309F-4A

**4309 MILTON DRIVE
FLINT, MICHIGAN**



APPROX. SCALE: 1"=40'

Shane Noreen

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E9753
Samp. Description: 4309F-8A
Units: mg/Kg Dry weight

Collected: 06/04/97 Matrix: Solid
Received: 06/12/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	9.	6010A	06/12/97	06/12/97	061297S1	1	

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: June 16, 1997

Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F0461
Samp. Description: 4309F-12A (6")
Units: mg/Kg Dry weight

Collected: 06/24/97
Received: 06/25/97
Matrix: Solid
%Solids: 98.8
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	500.	6010A	06/25/97	06/25/97	062597S1	1

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: June 26, 1997

Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E9754
Samp. Description: 4309F-13A
Units: mg/Kg Dry weight

Collected: 06/05/97 Matrix: Solid
Received: 06/12/97 %Solids: 99.9
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	34.	6010A	06/12/97	06/12/97	061297S1	1	

Notes:

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Authorized: Monika Santucci

Date: June 16, 1997

Monika Santucci

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4313 Milton Drive

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Remediation

During the remediation of 4313 Milton Drive, an approximately 15 ft wide section of the adjoining parcel (4317 Milton Drive) was added to 4313 Milton Drive. The remainder of the 4317 Milton Drive property was added to the 4401 Milton Drive property. The following discussion summarizes the remedial activities that were undertaken at the 4313 Milton Drive property and the 15 ft wide section of the 4317 Milton Drive property (the adjoining parcel).

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4313 Milton Drive and the adjoining parcel that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm). In May and June 1997, GM's environmental consultant excavated and removed the lead impacted surface soil material. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees and bushes were removed. The house at 4317 Milton Drive was also demolished. Surface soil in the front yard, including the area between the road and the sidewalk, and the backyard was removed to a depth of 1 foot. Impacted surface soil was also removed from the adjoining parcel. The excavated surface soil from both properties was transported to a landfill for disposal.

The areas where surface soil was removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed and a chain-link fence, with an access gate, was installed in the backyard bordering the Park.

Post-Excavation Sampling

At the adjoining parcel, the testing results from four post-excavation samples from the areas where surface soil was removed were below the MDEQ Generic Residential Land Use criterion. At 4313 Milton Drive, the lead content of the ten post-excavation samples from the area where surface soil was removed was below the MDEQ Generic Residential Land Use criterion. The post-excavation samples from both parcels indicate that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

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Residential Remediation

4313 Milton Drive, Flint, Michigan

Closure Sampling Analytical Data

Surface Soil Excavation Samples

Laboratory Quality Assurance/ Quality Control (QA/QC) Results

Notes:

1. Sample designation with "A" suffix denotes closure sample from surface soil excavation

6. mg/kg = parts per million.

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Residential Remediation 4317 Milton Drive (adjoining parcel), Flint, Michigan

Closure Sampling Analytical Data

Surface Soil Excavation Samples

LOCATION	4317F-1A		4317F-3A		4317F-5A		4317F-6A		Clean-Up Criteria
	Date Collected		05/23/97		05/23/97		05/23/97		
	Depth		Floor		Floor		Floor		
	Method		mg/kg		mg/kg		mg/kg		
Analytical Parameter									
Lead	XRF		177		<100		308		<100
									400

Laboratory Quality Assurance/Quality Control (QA/QC) Results

LOCATION	4317F-3A		Clean-Up	
	Date Collected		05/23/97	Criteria
	Depth		Floor	
	Method		mg/kg	
Analytical Parameter				
Lead	6010A		61	400

Notes:

1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford
3. Samples 4317F-3A analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse,
4. Clean-Up Criteria for Lead is MDEQ Generic Residential Direct Contact Value.
5. "-" denotes analysis not performed.
6. "<" denotes result below detection limit.
7. mg/kg = parts per million.

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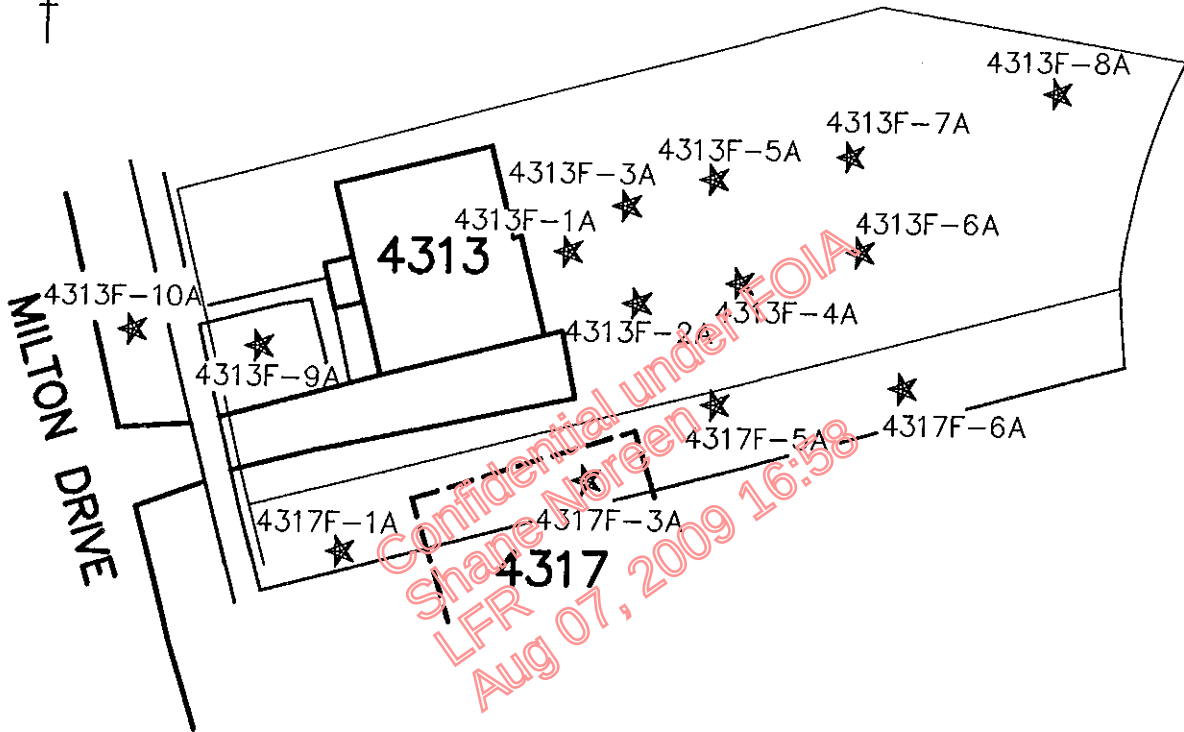
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POST-EXCAVATION SAMPLE LOCATIONS



NOTES:

"F" PREFIX DENOTES
FLOOR SAMPLE

"A" SUFFIX DENOTES
SURFACE SOIL SAMPLE

★ CLOSURE SAMPLE
LOCATION

**4313 MILTON DRIVE
FLINT, MICHIGAN**

30 0 30
Shane Noreen

APPROX SCALE: 1"=30'

O'BRIEN & GERE
ENGINEERS, INC.

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Shane Noreen

**O'Brien & Gere
Laboratories, Inc.**

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Aug 07, 2009 16:58

**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E9187
Samp. Description: 4313F-1A
Units: mg/Kg Dry weight

Collected: 05/30/97 Matrix: Solid
Received: 06/02/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	160.	6010A	06/02/97	06/02/97	060297S1	1	

Notes:

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J-Estimated value

Authorized: 

Date: June 3, 1997

Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E9186
Samp. Description: 4317F-3A
Units: mg/Kg Dry weight

Collected: 05/23/97
Received: 06/02/97
Matrix: Solid
%Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	61.	6010A	06/02/97	06/02/97	060297s1	1

Notes:

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Authorized: Monika Santucci
Date: June 3, 1997
Monika Santucci

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4401 Milton Drive

Aug 07, 2009 16:58

Remediation

During the investigation and remediation of 4401 Milton Drive, an approximately 35 ft wide section of the adjoining parcel (4317 Milton Drive) was added to 4401 Milton Drive. The remainder of the 4317 Milton Drive property was donated to the owner of the 4313 Milton Drive property. The following discussion summarizes the remedial activities that were undertaken at the 4401 Milton Drive property and the 35 ft wide section of the 4317 Milton Drive property (the adjoining parcel).

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4401 Milton Drive property and the adjoining parcel that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm) and waste fill material with concentrations of lead, arsenic and two semi-volatile organic compounds (SVOCs) (benzo(a)anthracene and benzo(a)pyrene) above respective MDEQ Generic Residential Land Use criteria. In May and June 1997, the impacted surface soil and subsurface waste fill material were excavated and removed from the adjoining parcel. Surface soil material was also excavated and removed from the front/side yard of the 4401 Milton Drive property. A description of the remediation activities at the properties is as follows:

Prior to excavation activities, trees, fences, and the concrete sidewalk were removed. The house at 4317 Milton Drive was also demolished. Impacted surface soil and subsurface waste fill material were then removed from the adjoining parcel. The maximum depth of excavation for the waste fill was approximately 10 ft below grade. Surface soil in the front/side yard at 4401 Milton Drive, including the area between the road and the sidewalk, was removed to a depth of 1 ft. The waste fill material beneath the soil cover in the backyard, garage, and house at the 4401 Milton Drive property was left in place. The excavated waste fill material from the adjoining parcel and impacted surface soil from both properties was transported to a landfill for disposal.

The areas where waste fill and surface soil were removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed. Small trees were planted in the backyard where trees formerly existed and a chain link fence, with an access gate, was installed along the backyard bordering the Park.

Post-Excavation Sampling

At the adjoining parcel, the testing results from twelve post-excavation samples from the areas where waste fill and surface soil were removed were below the MDEQ Generic Residential Land Use criterion. Surface soil and waste fill were removed from the adjoining parcel and no further investigation or remediation is necessary.

At 4401 Milton Drive, the lead content of the five post-excavation samples from the area where surface soil material was removed was below the MDEQ Generic Residential Land Use criterion. Surface soil material was removed from the front/side yard of 4401 Milton Drive and no further investigation or remediation of the surface soil is necessary. The waste fill remains in place beneath the 4401 Milton Drive property.

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Aug 07, 2009 16:58

4401 Milton Drive (Continued)

Aug 07, 2009 16:58

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

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Residential Remediation 4401 Milton Drive, Flint, Michigan Closure Sampling Analytical Data

Surface Soil Excavation Samples

LOCATION	4401F-1A			4401F-2A			4401F-3A			4401F-4A			4401F-5A			Clean-Up Criteria		
	Date Collected	Depth	Method	06/11/97	Floor	mg/kg	06/11/97	Floor	mg/kg	06/11/97	Floor	mg/kg	06/12/97	Floor	mg/kg	mg/kg		400
Analytical Parameter																		
Lead			XRF	296			<100			<100			<100					

Laboratory Quality Assurance/Quality Control (QA/QC) Results

LOCATION	4401F-1A			Clean-Up Criteria		
	Date Collected	Depth	Method	06/11/97	Floor	mg/kg
Analytical Parameter						
Lead	6010A			370		400

Notes:

1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
3. Sample 4401F-1A analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria for Lead is MDEQ Generic Residential Direct Contact Value.
5. "-" denotes analysis not performed.
6. "<" denotes result below detection limit.
7. mg/kg = parts per million.

Residential Remediation
4317 Milton Drive (adjoining parcel), Flint, Michigan

Closure Sampling Analytical Data

Surface Soil Excavation Samples

LOCATION	4317F-2A		4317F-4A		4317F-7A		Clean-Up Criteria
	05/23/97		05/23/97		06/12/97		
	Floor		Floor		Floor		
	mg/kg		mg/kg		mg/kg		
Analytical Parameter							
Lead	<100		<100		<100		400
	XRF						

Waste Fill Excavation Samples

LOCATION	4317F-1		4317F-2		4317F-3		4317F-4		4317F-5		4317S-1		4317S-2		4317S-3		4317S-4		Clean-Up Criteria
	06/03/97		06/03/97		06/03/97		06/03/97		06/03/97		06/03/97		06/03/97		06/03/97		06/03/97		
	Floor		Floor		Floor		Floor		Floor		Sidewall		Sidewall		Sidewall		Sidewall		
	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		
Analytical Parameter	<100		<100		<100		154		<100		<100		<100		<100		<100		mg/kg
	XRF																		
Lead	<100		<100		<100		154		<100		<100		<100		<100		<100		400

Laboratory Quality Assurance/Quality Control (QA/QC)

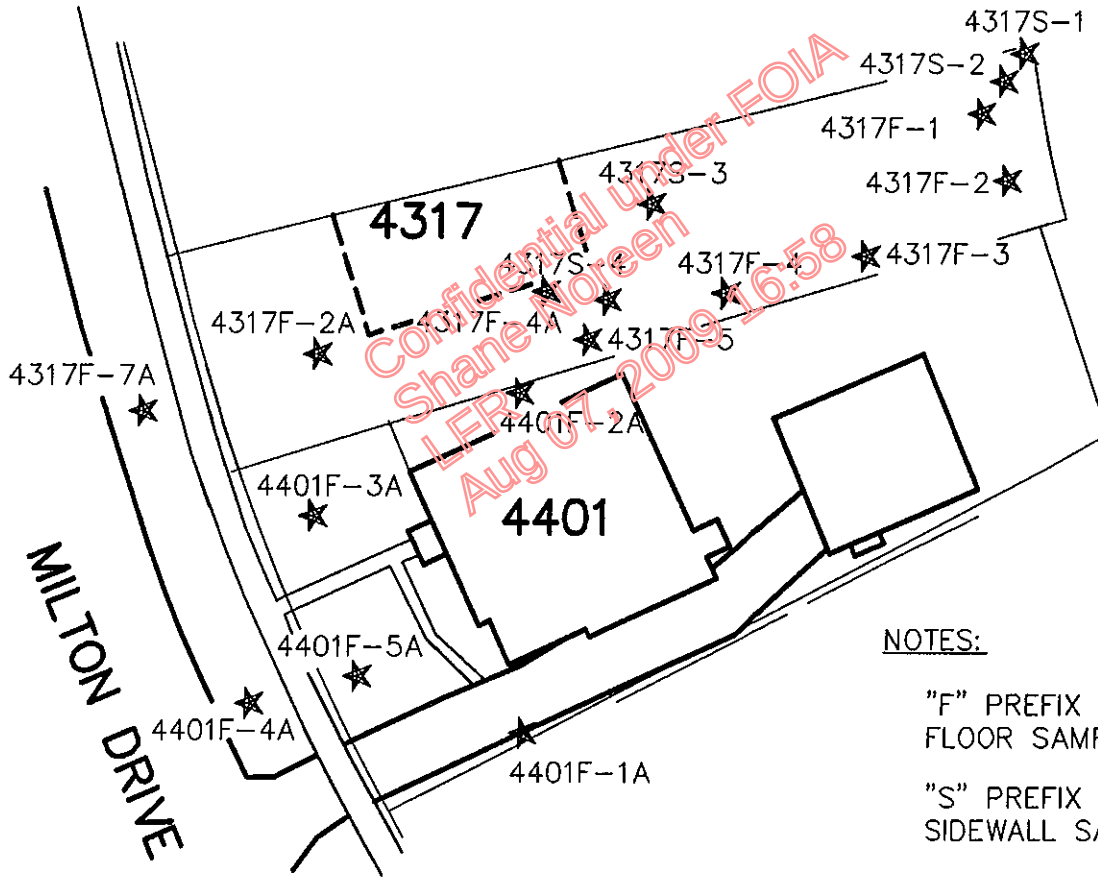
LOCATION	4317F-3		Clean-Up Criteria
	06/03/97		
	Floor		
	mg/kg		
Analytical Parameter	Date Collected		
	Depth		
	Method		
Lead	6010A	16	400
Arsenic	6010A	6.1	11
Benzo[a]anthracene	GC/MS	<0.19	14
Benzo[a]pyrene	GC/MS	<0.19	14

Notes:

1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
3. Samples 4317F-3 analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria is MDEQ Generic Residential Direct Contact Value, except Arsenic which is site specific background value for clay.
5. "-" denotes analysis not performed.
6. "<" denotes result below detection limit.
7. mg/kg = parts per million.

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POST-EXCAVATION SAMPLE LOCATIONS



NOTES:

"F" PREFIX DENOTES
FLOOR SAMPLE

"S" PREFIX DENOTES
SIDEWALL SAMPLE

"A" SUFFIX DENOTES
SURFACE SOIL
SAMPLE

★ CLOSURE SAMPLE
LOCATION

**4401 MILTON DRIVE
FLINT, MICHIGAN**



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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E9752
Samp. Description: 4401F-1A
Units: mg/Kg Dry weight

Collected: 06/11/97 Matrix: Solid
Received: 06/12/97 %Solids: 99.3
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	370.	6010A	06/12/97	06/12/97	061297S1	1	

Notes:

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Authorized: Monika Santucci

Date: June 16, 1997

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Analytical Results Trace Metals

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E9293
Samp. Description: 4317F-3
Units: mg/Kg Dry weight

Collected: 06/03/97
Received: 06/04/97
Matrix: Solid
%Solids: 84.5
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Arsenic	6.1	6010A	06/04/97	06/04/97	060497S1	1	
Lead	16.	6010A	06/04/97	06/04/97	060497S1	1	

Notes:

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Authorized: Monika Santucci

Date: June 5, 1997

Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E9293
Samp. Description: 4317F-3
Instrument: HP5972 GC/MS#6
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 06/03/97
Received: 06/04/97
Prepared: 06/04/97
Matrix: Solid
QC Batch: 060397S1
%Solids: 84.5
Sample Size: 30 g

<u>Parameter</u>	<u>Result</u>	<u>Surrog Limits</u>	<u>Dilution</u>	<u>Analyzed Notes</u>
Benzo[a]anthracene	<190.		1	06/04/97
Benzo[a]pyrene	<190.		1	06/04/97
Nitrobenzene-d5 (surrogate)	58.%	43-117	1	06/04/97
2-Fluorobiphenyl (surrogate)	83.%	42-121	1	06/04/97
Terphenyl-d14 (surrogate)	108.%	47-126	1	06/04/97

Notes:

- Outside control limits J-Estimated value

Authorized: Monika Santucci
Date: June 5, 1997

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4501 Milton Drive**Remediation**

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4501 Milton Drive property that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm) and waste fill material with concentrations of lead, arsenic and two semi-volatile organic compounds (SVOCs) (benzo(a)anthracene and benzo(a)pyrene) above respective MDEQ Generic Residential Land Use criteria. In May 1997, the waste fill material and impacted surface soil material were excavated and removed from the property. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees, fences or other items were removed if necessary. Subsurface waste fill material in the backyard and the sideyard, adjacent to the 4413 Milton Drive property, was then removed. The maximum depth of excavation was approximately 6 feet below grade. Surface soil in the front yard, including the area between the road and the sidewalk, and the remaining area in the backyard was removed to a depth of 1 ft. The excavated waste fill material and surface soil were transported to a landfill for disposal.

The areas where waste fill and surface soil were removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed. Small trees were planted in the backyard where trees formerly existed and a chain link fence, with an access gate, was installed along the backyard bordering the Park.

Post-Excavation Sampling

The lead content of the four post-excavation samples from the area where surface soil was removed was below 100 ppm, indicating successful removal of the surface soil containing excessive levels of lead. The results of the eleven post-excavation samples from the area where waste fill was removed also indicated successful removal of this material. The results of the post-excavation sampling were all below the MDEQ Generic Residential Land Use criteria, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

Shane Noreen

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Aug 07, 2009 16:58

**Residential Remediation
4501 Milton Drive, Flint, Michigan
Closure Sampling Analytical Data**

Surface Soil Excavation Samples						
LOCATION		4501F-1A	4501F-2A	4501F-3A	4501F-4A	Clean-Up Criteria
	Date Collected	05/06/97	05/20/97	05/20/97	05/21/97	
	Depth					
Analytical Parameter	Method	Floor	Floor	Floor	Floor	
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Lead	XRF	<100	<100	<100	<100	400

Waste Fill Excavation Samples	
LOCATION	
Date Collected	4501F-1 05/01/97 4501F-2 05/01/97 4501F-3 05/01/97 4501F-4 05/01/97 4501F-5 05/01/97
Depth	Floor Floor Floor Floor Floor
Analytical Parameter	mg/kg mg/kg mg/kg mg/kg mg/kg
Lead	<100 <100 <100 <100 <100

Laboratory Quality Assurance/Quality Control (QA/QC) Results				
LOCATION	4501F-3A		4501F-1	Clean-Up Criteria
	05/20/97	05/01/97	05/01/97	
	Date Collected			
	Depth			
	Method			
Analytical Parameter				
Lead	6010A	75	18	mg/kg
Arsenic	6010A	-	2.8	11
Benz[a]anthracene		-	<0.21	14
Benz[a]pyrene		-	<0.21	1.4

Notes:

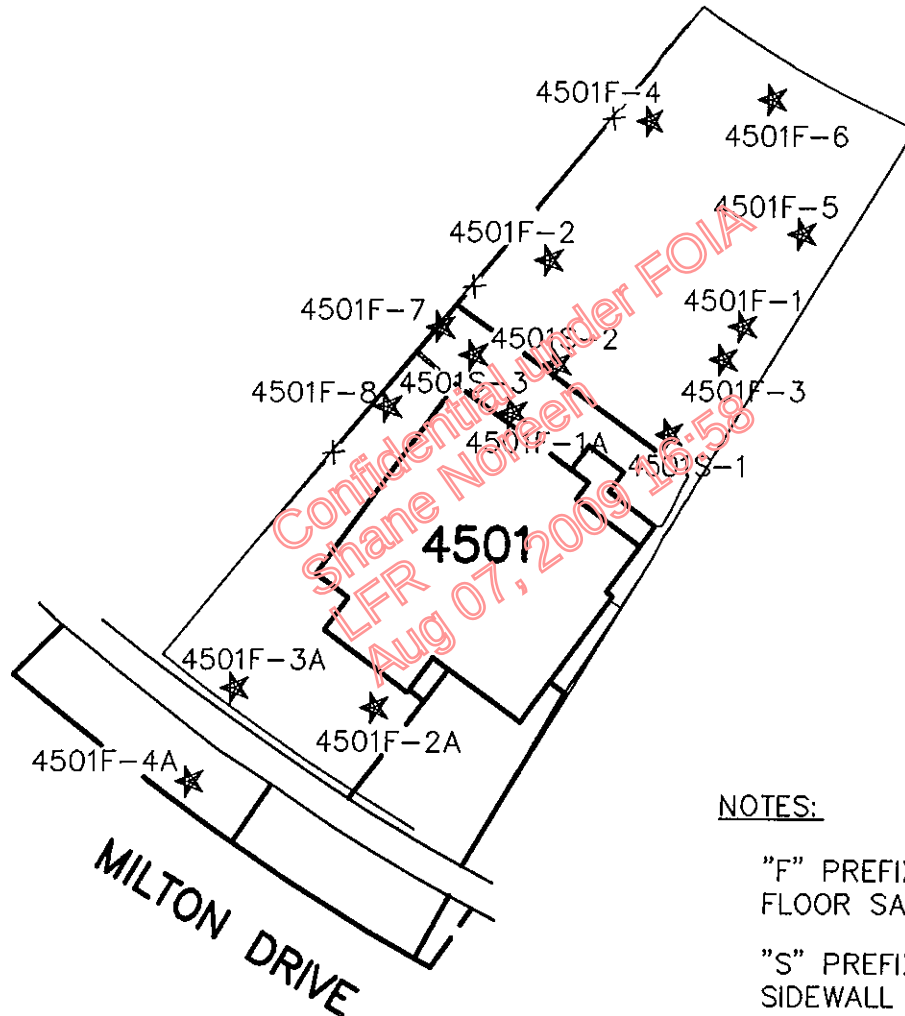
1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
3. Samples 4501F-3A and 4501F-1 analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria is MDEQ Generic Residential Direct Contact Value, except Arsenic which is site specific background value for clay.
5. "-" denotes analysis not performed.
6. "<" denotes result below detection limit.
7. mg/kg = parts per million.

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POST-EXCAVATION SAMPLE LOCATIONS



NOTES:

"F" PREFIX DENOTES
FLOOR SAMPLE

"S" PREFIX DENOTES
SIDEWALL SAMPLE

"A" SUFFIX DENOTES
SURFACE SOIL
SAMPLE

★ CLOSURE SAMPLE
LOCATION

**4501 MILTON DRIVE
FLINT, MICHIGAN**



Shane Noreen

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Aug 07, 2009 16:58

**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E7912
Samp. Description: 4501F-1
Units: mg/Kg Dry weight

Collected: 04/30/97 Matrix: Solid
Received: 05/01/97 %Solids: 81.2
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Arsenic	3.5	6010A	05/01/97	05/01/97	050197S1	1
Lead	23.	6010A	05/01/97	05/01/97	050197S1	1

Notes:

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J-Estimated value

Authorized: Monika Santucci
Date: May 2, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E7912
Samp. Description: 4501F-1
Instrument: HP5972 GC/MS#6
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/30/97
Received: 05/01/97
Prepared: 05/01/97
Matrix: Solid
QC Batch: 042997S2
%Solids: 81.2
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Benzo [a] anthracene	<200.		1	05/02/97	
Benzo [a] pyrene	<200.		1	05/02/97	
Nitrobenzene-d5 (surrogate)	79.%	43-117	1	05/02/97	
2-Fluorobiphenyl (surrogate)	81.%	42-121	1	05/02/97	
Terphenyl-d14 (surrogate)	86.%	47-126	1	05/02/97	

Notes:

- Outside control limits J-Estimated value

Authorized:

Date: May 2, 1997

Monika Santucci

Shane Noreen

LFR

Aug 07, 2009 16:58

**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E9185
Samp. Description: 4501F-3A
Units: mg/Kg Dry weight

Collected: 05/20/97 Matrix: Solid
Received: 06/02/97 %Solids: 99.3
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	75.	6010A	06/02/97	06/02/97	060297S1	1	

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: June 3, 1997 Monika Santucci

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4502 Milton Drive

Aug 07, 2009 16:58

Remediation

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4502 Milton Drive that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm). In July 1997, GM's environmental consultant excavated and removed the lead impacted surface soil material. A description of the remediation activities at the property is as follows:

Prior to excavation activities, a wood deck in the backyard was removed. Surface soil in the front yard, including the area between the road and the sidewalk, and the backyard was removed to a depth of 1 foot. The excavated surface soil was transported to a landfill for disposal.

The areas where surface soil was removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed along with installation of a new wood deck.

Post-Excavation Sampling

The lead content of the seventeen post-excavation samples from the area where surface soil was removed was below the MDEQ Generic Residential Land Use criterion, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

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**Residential Remediation
4502 Milton Drive, Flint, Michigan
Closure Sampling Analytical Data**

Surface Soil Excavation Samples

LOCATION	Clean-Up Criteria													
	Date Collected		4502F-1A	4502F-2A	4502F-3A	4502F-4A	4502F-5A	4502F-6A	4502F-7A	4502F-8A	4502F-9A			
	Depth		Floor	Floor	Floor	Floor	Floor	Floor	Floor	Floor	Floor	Floor		
	Method		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
Analytical Parameter	XRF		<100	<100	263	<100	<100	<100	<100	<100	<100	<100	400	
Lead														

Surface Soil Excavation Samples

LOCATION	Date Collected		Analytical Parameter	XRF	4502F-10A	4502F-11A	4502F-12A	4502F-13A	4502F-14A	4502F-15A	4502F-16A	4502F-17A	Clean-Up Criteria	
	Depth				07/22/97	07/17/97	07/16/97	07/15/97	07/15/97	07/16/97	07/23/97			
	Method				Floor	Floor	Floor	Floor	Floor	Floor	Floor			
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
Lead					324	118	<100	235	228	365	117	<100	400	

Laboratory Quality Assurance/Quality Control (QA/QC) Results

LOCATION	Date Collected		Analytical Parameter	4502F-7A	4502F-13A	4502F-15A	Clean-Up
				07/22/97	07/15/97	07/16/97	Criteria
	Depth			Floor	Floor	Floor	
	Method			mg/kg	mg/kg	mg/kg	mg/kg
Lead	6010A		160	100	210	400	

Notes:

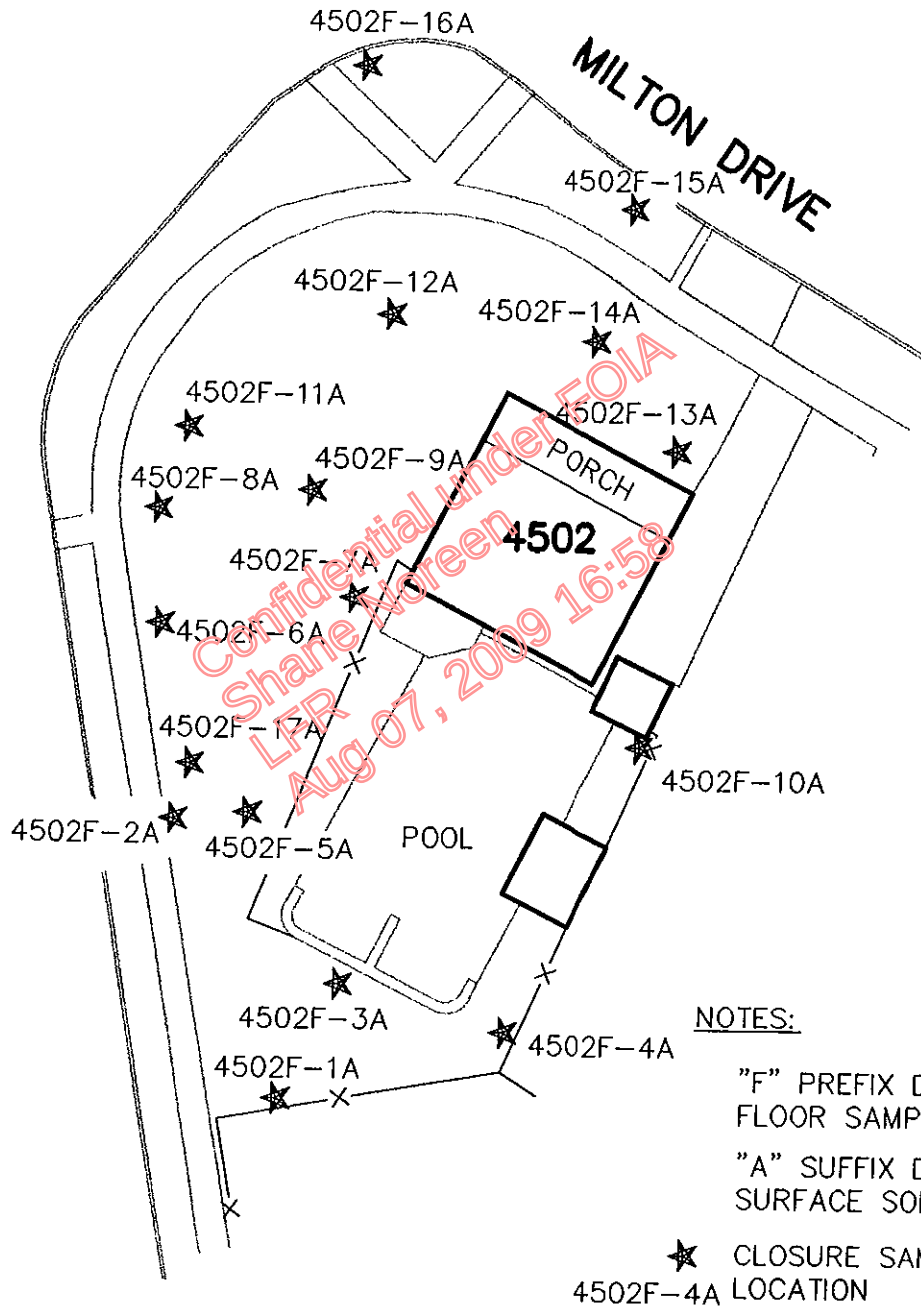
1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
3. Samples 4502F-7A, 4502F-13A and 4502F-15A analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria for Lead is MDEQ Generic Residential Direct Contact Value.
5. "<" denotes result below detection limit.
6. mg/kg = parts per million.

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POST-EXCAVATION SAMPLE LOCATIONS



4502 MILTON DRIVE
FLINT, MICHIGAN

30 0 30
APPROX. SCALE: 1"=30'

O'BRIEN & GERE
ENGINEERS, INC.

Aug 07, 2009 16:58

PLT SCALE: 30

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Aug 07, 2009 16:58

**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F6101
Samp. Description: 4502F-7A (6")
Units: mg/Kg Dry weight

Collected: 07/22/97 Matrix: Solid
Received: 08/02/97 %Solids: 99.7
Number of analytes: 1.

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	160.	6010A	08/04/97	08/04/97	080497S2	1

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: August 6, 1997

Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.**

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**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F2415
Samp. Description: 4502F-13A
Units: mg/Kg Dry weight

Collected: 07/15/97 Matrix: Solid
Received: 07/16/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	100.	6010A	07/16/97	07/16/97	071697S1	1

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: July 21, 1997

Monika Santucci

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**Analytical Results
Trace Metals****O'Brien & Gere
Laboratories, Inc.**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F6100
Samp. Description: 4502F-15A (6")
Units: mg/Kg Dry weight

Collected: 07/16/97 Matrix: Solid
Received: 08/02/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	210.	6010A	08/04/97	08/04/97	080497S2	1	

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: August 6, 1997 Monika Santucci

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4507 Milton Drive

Aug 07, 2009 16:58

Remediation

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4507 Milton Drive property that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm) and waste fill material with concentrations of lead, arsenic and two semi-volatile organic compounds (SVOCs) (benzo(a)anthracene and benzo(a)pyrene) above respective MDEQ Generic Residential Land Use criteria. In April 1997, the waste fill material was excavated and removed from the property. Although the surface soil did not need remediation, the surface soil was also removed so that the landscaping would be consistent with the adjacent properties. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees, fences and the concrete driveway were removed. Subsurface waste fill material in the backyard was then removed. The maximum depth of excavation was approximately 4 feet below grade. The structural supports on the back side of the house were removed during waste fill excavation and new foundations and supports were installed. Surface soil in the front yard, including the area between the road and the sidewalk, and the remaining area in the backyard was removed to a depth of 1 ft. The excavated waste fill material and surface soil was transported to a landfill for disposal.

The areas where waste fill and surface soil were removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Crushed stone was placed in the driveway area to a depth of one foot below grade. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed. Small trees were planted in the backyard where trees formerly existed and a chain link fence, with an access gate, was installed along the backyard bordering the Park.

Post-Excavation Sampling

Although not necessary, post-excavation samples were taken from the areas where surface soil was removed. The lead content of the seven post-excavation samples from the area where surface soil was removed was below 100 ppm. The results of the seven post-excavation samples from the area where waste fill was removed indicated successful removal of this material to levels below MDEQ Generic Residential Land Use criteria. The results of the post-excavation sampling were all below the MDEQ Generic Residential Land Use criteria, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

Shane Noreen

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Aug 07, 2009 16:58

**Residential Remediation
4507 Milton Drive, Flint, Michigan
Closure Sampling Analytical Data**

Surface Soil Excavation Samples

LOCATION	4507F-1A		4507F-2A		4507F-3A		4507F-4A		4507F-5A		4507F-6A		4507F-7A		Clean-Up Criteria
	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	
Analytical Parameter	Floor		Floor		Floor		Floor		Floor		Floor		Floor		mg/kg
Lead	mg/kg	<100	mg/kg	<100	mg/kg	<100	mg/kg	<100	mg/kg	<100	mg/kg	<100	mg/kg	<100	400

Waste Fill Excavation Samples

LOCATION	4507F-1		4507F-2		4507F-3		4507F-4		4507F-5		4507S-1		4507S-2		Clean-Up Criteria
	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	
Analytical Parameter	Floor		Floor		Floor		Floor		Floor		Sidewall		Sidewall		mg/kg
Lead	mg/kg	<100	mg/kg	<100	mg/kg	<100	mg/kg	<100	mg/kg	<100	mg/kg	<100	mg/kg	<100	400

Laboratory Quality Assurance/Quality Control (QA/QC) Results

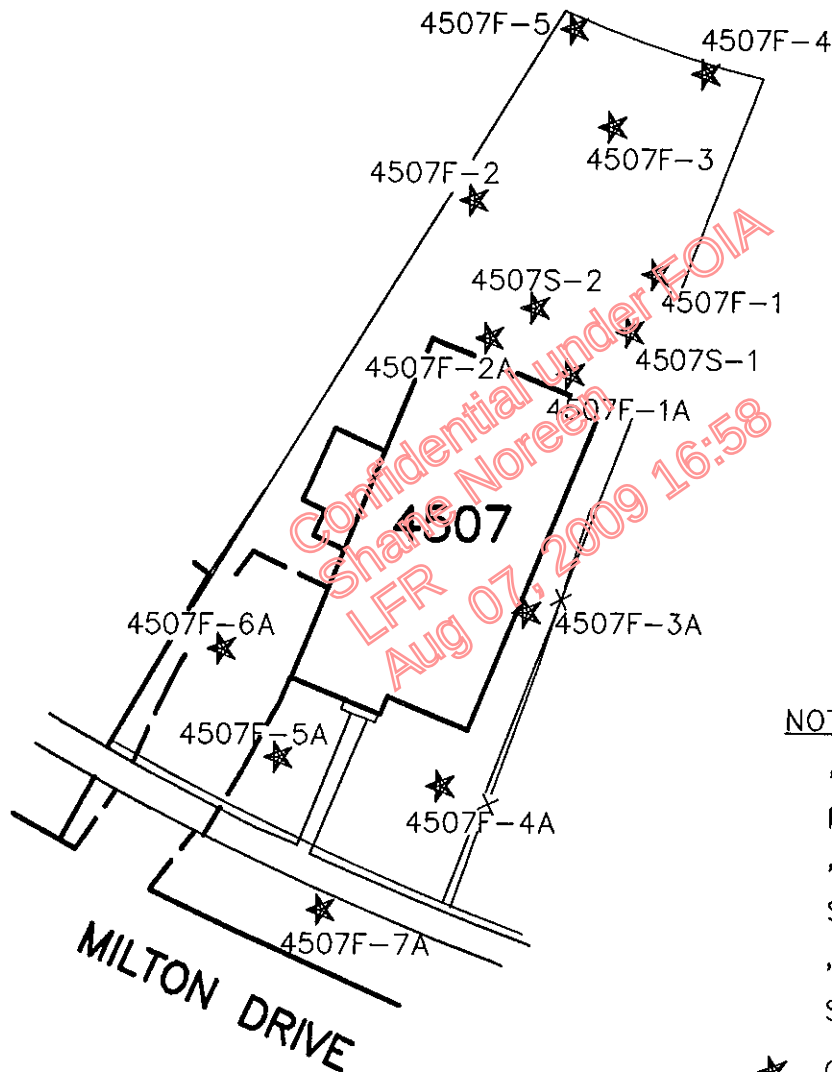
LOCATION	4507F-2A		4507F-5		Clean-Up Criteria
	Date Collected	Depth	Date Collected	Depth	
Analytical Parameter	Floor		Floor		mg/kg
Lead	mg/kg	94	mg/kg	13	400
Arsenic	-	-	mg/kg	2.9	11
Benzo[a]anthracene	-	-	mg/kg	<0.21	14
Benzo[a]pyrene	-	-	mg/kg	<0.21	1.4

Notes:

1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
3. Samples 4507F-2A and 4507F-5 analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria is MDEQ Generic Residential Direct Contact Value, except Arsenic which is site specific background value for clay.
5. "-" denotes analysis not performed.
6. "<" denotes result below detection limit.
7. mg/kg = parts per million.

POST-EXCAVATION SAMPLE LOCATIONS

Aug 07, 2009 16:58



NOTES:

"F" PREFIX DENOTES
FLOOR SAMPLE

"S" PREFIX DENOTES
SIDEWALL SAMPLE

"A" SUFFIX DENOTES
SURFACE SOIL SAMPLE

★ CLOSURE SAMPLE
LOCATION
4507F-2A

**4507 MILTON DRIVE
FLINT, MICHIGAN**

30 0 30

APPROX. SCALE: 1"=30'

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Aug 07, 2009 16:58

**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E7913
Samp. Description: 4507F-2A
Units: mg/Kg Dry weight

Collected: 04/30/97
Received: 05/01/97
Matrix: Solid
%Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	94.	6010A	05/01/97	05/01/97	050197S1	1	

Notes:

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J-Estimated value

Authorized: Monika Santucci
Date: May 2, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E7911
Samp. Description: 4507F-5
Units: mg/Kg Dry weight

Collected: 04/30/97
Received: 05/01/97
Matrix: Solid
%Solids: 82.2
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Arsenic	3.5	6010A	05/01/97	05/01/97	050197S1	1
Lead	16.	6010A	05/01/97	05/01/97	050197S1	1

Notes:

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J-Estimated value

Authorized: Monika Santucci
Date: May 2, 1997

Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E7911
Samp. Description: 4507F-5
Instrument: HP5972 GC/MS#6
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/30/97
Received: 05/01/97
Prepared: 05/01/97
Matrix: Solid
QC Batch: 042997S2
%Solids: 82.2
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed Notes
Benzo[a]anthracene	<190.		1	05/02/97
Benzo[a]pyrene	<190.		1	05/02/97
Nitrobenzene-d5 (surrogate)	76.%	43-117	1	05/02/97
2-Fluorobiphenyl (surrogate)	79.%	42-121	1	05/02/97
Terphenyl-d14 (surrogate)	75.%	47-126	1	05/02/97

Notes:

- Outside control limits J-Estimated value

Authorized: Monika Santucci
Date: May 2, 1997
Monika Santucci

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4510 Milton Drive**Remediation**

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4510 Milton Drive that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm). In July 1997, the lead impacted surface soil material was excavated and removed from the property. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees and bushes were removed. Surface soil in the front yard, including the area between the road and the sidewalk, and the backyard was removed to a depth of 6 inches, with the exception of one sampling location discussed below, where surface soil was removed to a depth of 1 foot. The excavated surface soil was transported to a landfill for disposal.

The areas where surface soil was removed were filled in with a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed.

Post-Excavation Sampling

The lead content of the nine post-excavation samples from the area where surface soil was removed was below the MDEQ Generic Residential Land Use criterion, with the exception of one sampling location. The soil sample collected at location 4510F-3A, at a depth of 6 inches, exhibited lead at a concentration of 470 ppm. An additional 6 inches of soil was excavated in the vicinity of this sample location and a second sample, 4510F-3B, was collected. The analytical data from the sample 4510F-3B was found to be less than 100 ppm for lead, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

Shane Noreen

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Closure Sampling Analytical Data

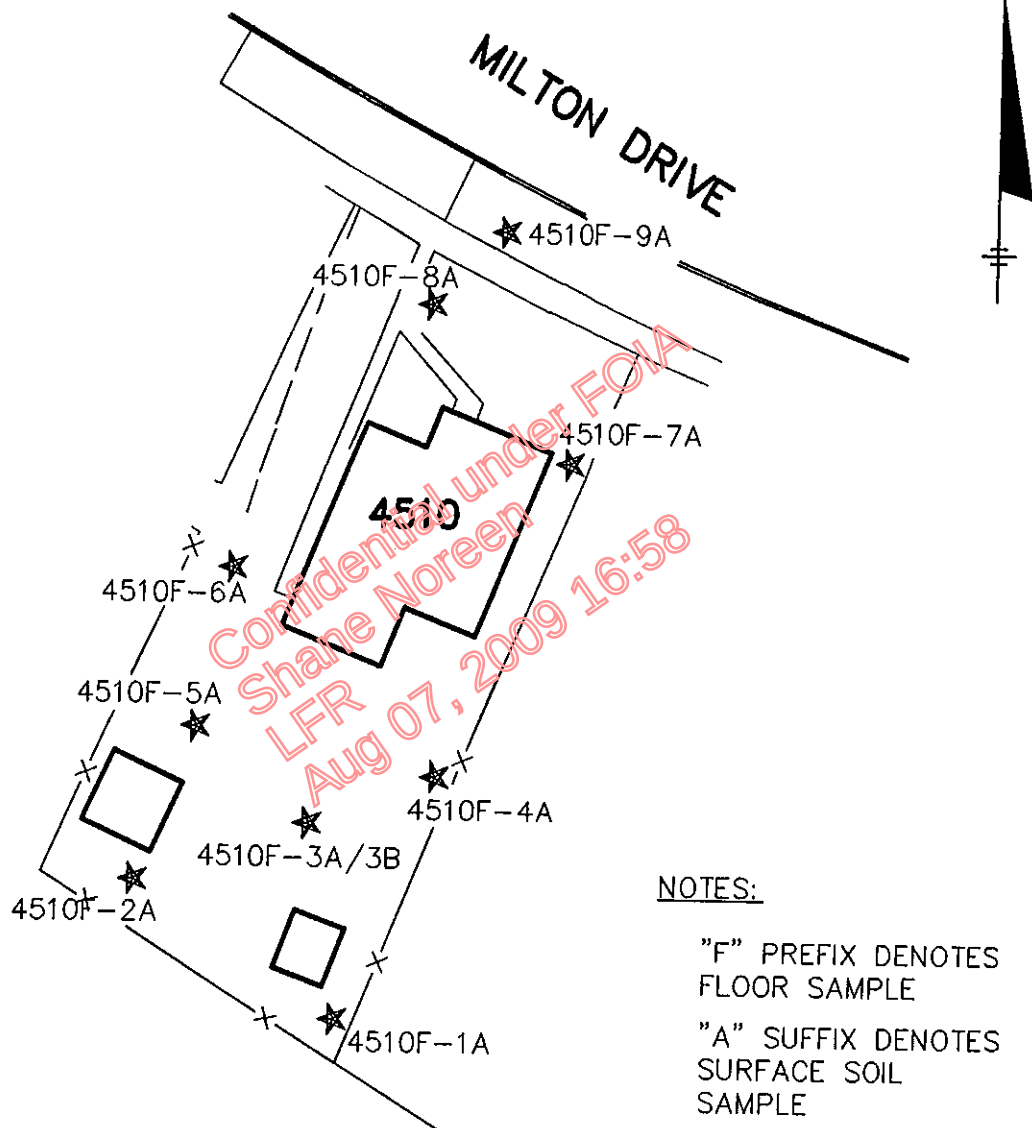
Surface Soil Excavation Samples

Laboratory Quality Assurance/Quality Control (QA/QC) Results

1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence Instrument Oxford Model Lab X-1000.
3. Samples 4510F-3A analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria for Lead is MDEQ Generic Residential Direct Contact Value.

5. "—" denotes analysis not performed.
6. "<" denotes result below detection limit.
7. mg/kg = parts per million.
8. Sample designation with "B" suffix denotes

POST-EXCAVATION SAMPLE LOCATIONS



**4510 MILTON DRIVE
FLINT, MICHIGAN**

30 0 30

APPROX. SCALE: 1" = 30'

**O'Brien & Gere
Laboratories, Inc.**

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**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F2414
Samp. Description: 4510F-3A
Units: mg/Kg Dry weight

Collected: 07/14/97 Matrix: Solid
Received: 07/16/97 %Solids: 97.7
Number of analytes: 1

<u>Parameter</u>	<u>Result</u>	<u>Method</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>QC Batch</u>	<u>Dilut.</u>	<u>Note</u>
Lead	440.	6010A	07/16/97	07/16/97	071697S1	1	

Notes:

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J-Estimated value

Authorized: Monika Santucci
Date: July 21, 1997 Monika Santucci

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4513 Milton Drive**Remediation**

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4513 Milton Drive property that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm) and waste fill material with concentrations of lead, arsenic and two semi-volatile organic compounds (SVOCs) (benzo(a)anthracene and benzo(a)pyrene) above respective MDEQ Generic Residential Land Use criteria. In April 1997, the waste fill material and impacted surface soil material were excavated and removed from the property. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees, fences or other items were removed if necessary. Subsurface waste fill material in the backyard was then removed. The maximum depth of excavation was approximately 6 feet below grade. Surface soil in the front yard, including the area between the road and the sidewalk, and the remaining area in the backyard was removed to a depth of 1 ft. The excavated waste fill material and surface soil were transported to a landfill for disposal.

The areas where waste fill and surface soil were removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed. Small trees were planted in the backyard where trees formerly existed and a chain link fence, with an access gate, was installed along the backyard bordering the Park.

Post-Excavation Sampling

The lead content of the eight post-excavation samples from the area where surface soil was removed was below 100 ppm, indicating successful removal of the surface soil containing excessive levels of lead. The results of the eight post-excavation samples from the area where waste fill was removed also indicated successful removal of this material. The results of the post-excavation sampling were all below the MDEQ Generic Residential Land Use criteria, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

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Closure Sampling Analytical Data

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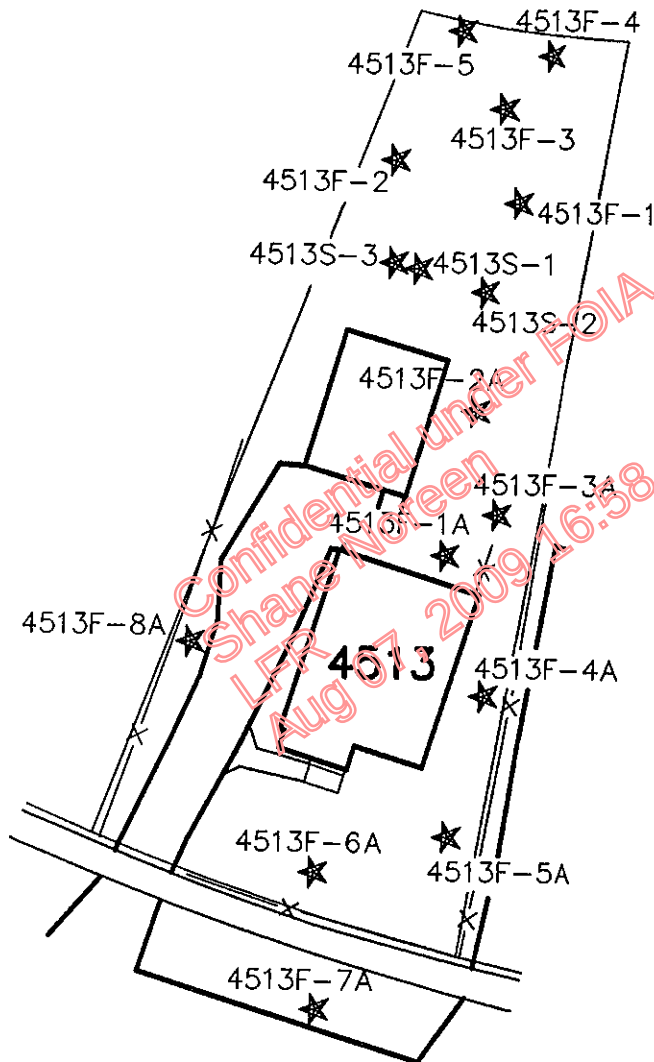
LOCATION	4513F-3A			4513F-5	Clean-Up
	Date Collected	04/24/97	04/24/97	Criteria	
	Depth	Floor	Floor		
Analytical Parameter	Method	mg/kg	mg/kg	mg/kg	
Lead	6010A	170	4.3	400	
Arsenic	6010A	-	2.7	11	
Benzofluranthracene		-	<0.21	14	
Benzoflapyrene		-	<0.21	14	

7. mg/kg = parts per million.

Shane Noreen

POST-EXCAVATION SAMPLE LOCATIONS

Aug 07, 2009 16:58



NOTES:

"F" PREFIX DENOTES
FLOOR SAMPLE

"S" PREFIX DENOTES
SIDEWALL SAMPLE

"A" SUFFIX DENOTES
SURFACE SOIL SAMPLE

★ CLOSURE SAMPLE
LOCATION
4513F-2A

4513 MILTON DRIVE
FLINT, MICHIGAN



APPROX. SCALE: 1"=30'

**O'Brien & Gere
Laboratories, Inc.**

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**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E7285
Samp. Description: 4513F-3A
Units: mg/Kg Dry weight

Collected: 04/24/97
Received: 04/25/97
Matrix: Solid
%Solids: 98.9
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	170.	6010A	04/25/97	04/25/97	042597S1	1

Notes:

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Aug 07, 2009 16:58

J-Estimated value

Authorized: Monika Santucci
Date: April 28, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.**

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Aug 07, 2009 16:58

**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E7284
Samp. Description: 4513F-5
Units: mg/Kg Dry weight

Collected: 04/24/97 Matrix: Solid
Received: 04/25/97 %Solids: 75.6
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Arsenic	2.7	6010A	04/25/97	04/25/97	042597S1	1
Lead	6.	6010A	04/25/97	04/25/97	042597S1	1

Notes:

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Authorized: Monika Santucci
Date: April 28, 1997 Monika Santucci

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Analytical Results Method: 8270

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E7284
Samp. Description: 4513F-5
Instrument: HP5972 GC/MS#6
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/24/97
Received: 04/25/97
Prepared: 04/25/97
Matrix: Solid
QC Batch: 042597S1
%Solids: 75.6
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Benzo[a]anthracene	<210.		1	04/28/97	
Benzo[a]pyrene	<210.		1	04/28/97	
Nitrobenzene-d5 (surrogate)	87.5%	43-117	1	04/28/97	
2-Fluorobiphenyl (surrogate)	85.5%	42-121	1	04/28/97	
Terphenyl-d14 (surrogate)	93.5%	47-126	1	04/28/97	

Notes:

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- Outside control limits J-Estimated value

Authorized: Monika Santucci

Date: May 6, 1997

Monika Santucci

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4518 Milton Drive**Remediation**

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4518 Milton Drive that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm). In July 1997, the lead impacted surface soil material was excavated and removed from the property. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees and bushes were removed. Surface soil in the front yard, including the area between the road and the sidewalk, and the backyard was removed to a depth of 6 inches, with the exception of the two sampling locations discussed below, where surface soil was removed to a depth of 1 foot. The excavated surface soil was transported to a landfill for disposal.

The areas where surface soil were removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed.

Post-Excavation Sampling

The lead content of the fourteen post-excavation samples from the area where surface soil was removed was below the MDEQ Generic Residential Land Use criterion, with the exception of one sampling location. The soil sample collected at location 4518F-2A, at a depth of 6 inches, exhibited lead at a concentration of 412 ppm. An additional 6 inches of soil was excavated in the vicinity of this sample location and a second soil sample, 4518F-2B, was collected. In addition, an additional 6 inches of soil was excavated in the vicinity of sample 4518F-1A (second sample 4518F-1B) as the initial result was 381 ppm, just below the MDEQ Generic Residential Land Use criterion. The analytical data from samples 4518F-1B and 4518F-2B were found to be less than 100 ppm for lead, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

Shane Noreen

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Residential Remediation 4518 Milton Drive, Flint, Michigan

Closure Sampling Analytical Data

Surface Soil Excavation Samples

LOCATION	4518F-1A		4518F-1B		4518F-2A		4518F-2B		4518F-3A		4518F-4A		4518F-5A		4518F-6A		4518F-7A		Clean-Up Criteria
	07/10/97		07/10/97		07/10/97		07/10/97		07/07/97		07/10/97		07/07/97		07/10/97		07/10/97		
	Floor		Floor		Floor		Floor		Floor		Floor		Floor		Floor		Floor		
	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		
Lead	381		<100		412		<100		<100		223		<100		161		<100		400
Analytical Parameter	XRF																		

Surface Soil Excavation Samples

LOCATION	4518F-8A		4518F-9A		4518F-10A		4518F-11A		4518F-12A		4518F-13A		4518F-14A		Clean-Up Criteria mg/kg	
	07/09/97		07/10/97		07/10/97		07/09/97		07/10/97		07/09/97		07/10/97		mg/kg	
	Floor		Floor		Floor		Floor		Floor		Floor		Floor		mg/kg	
	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Lead	<100		<100		<100		<100		<100		<100		<100		400	
Analytical Parameter	XRF															

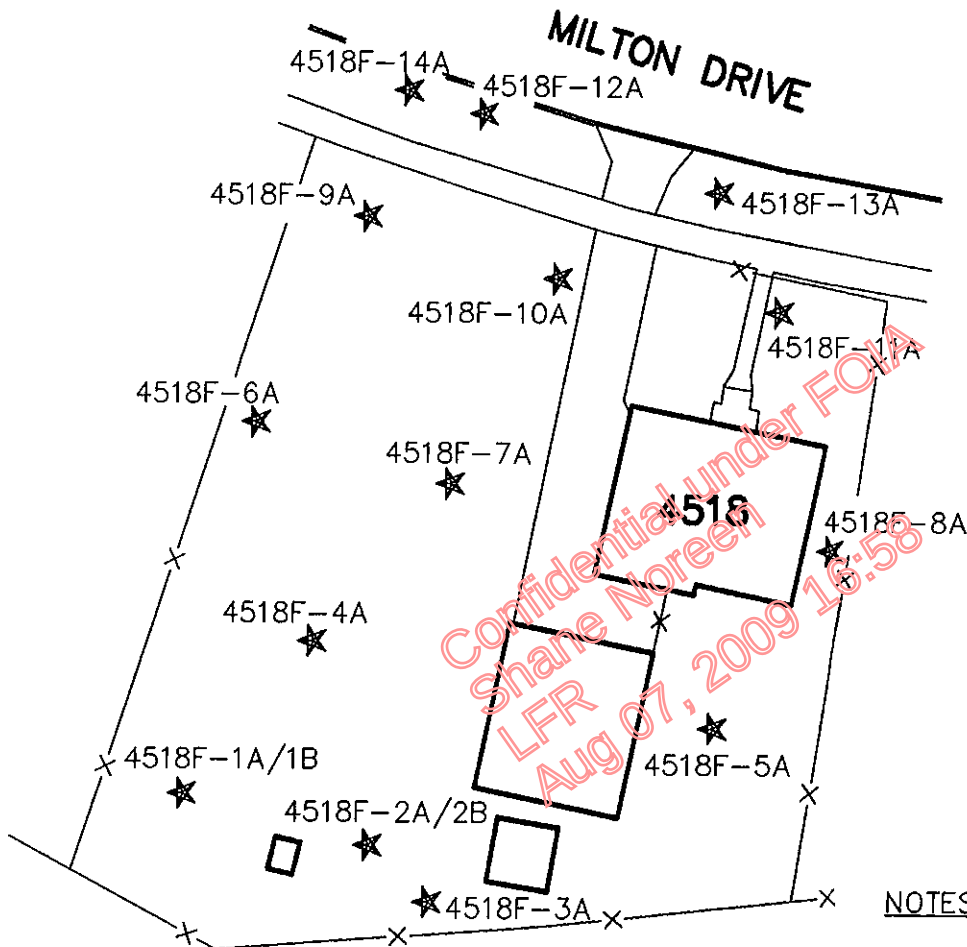
Laboratory Quality Assurance/Quality Control (QA/QC) Results

LOCATION	4518F-1A		4518F-1B		4518F-2A		4518F-3A		Clean-Up Criteria mg/kg	
	07/10/97		07/10/97		07/10/97		07/07/97		mg/kg	
	Floor		Floor		Floor		Floor		mg/kg	
	mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
Lead	380		11		410		74		400	
Analytical Parameter	6010A									

Notes:

1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
3. Samples 4518F-1A, 4518F-1B analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria for Lead is MDEQ Generic Residential Direct Contact Value.
5. "-" denotes analysis not performed.
6. "<" denotes result below detection limit.
7. mg/kg = parts per million.
8. Sample designation with "B" suffix denotes an additional 6 in -1 ft excavation beyond corresponding sample with "A" suffix (ie 4518F-1A and 4518F-1B).

POST-EXCAVATION SAMPLE LOCATIONS



NOTES:

"F" PREFIX DENOTES FLOOR SAMPLE

"A" SUFFIX DENOTES SURFACE SOIL SAMPLE

"B" SUFFIX DENOTES SURFACE SOIL SAMPLE AT LOWER DEPTH

★ CLOSURE SAMPLE LOCATION
4518F-4A

**4518 MILTON DRIVE
FLINT, MICHIGAN**

30 0 30
APPROX. SCALE: 1"=30'
LFR

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Laboratories, Inc.**

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**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F2038
Samp. Description: 4518F-1A
Units: mg/Kg Dry weight

Collected: 07/10/97 Matrix: Solid
Received: 07/11/97 %Solids: 99.9
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	380.	6010A	07/11/97	07/11/97	071197S1	1	

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: July 22, 1997

Monika Santucci

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**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F2039
Samp. Description: 4518F-1B
Units: mg/Kg Dry weight

Collected: 07/10/97 Matrix: Solid
Received: 07/11/97 %Solids: 99.8
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	11.	6010A	07/11/97	07/11/97	071197S1	1	

Notes:

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Authorized: 

Date: July 15, 1997

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**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F2040
Samp. Description: 4518F-2A
Units: mg/Kg Dry weight

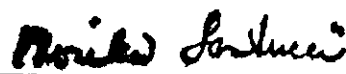
Collected: 07/10/97 Matrix: Solid
Received: 07/11/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	410.	6010A	07/11/97	07/11/97	071197s1	1

Notes:

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Authorized: 

Date: July 15, 1997

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F2041
Samp. Description: 4518F-3A
Units: mg/Kg Dry weight

Collected: 07/10/97 Matrix: Solid
Received: 07/11/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	74.	6010A	07/11/97	07/11/97	071197S1		1

Notes:

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Authorized: Monika Santucci
Date: July 15, 1997 Monika Santucci

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4519 Milton Drive**Remediation**

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4519 Milton Drive that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm). In addition, waste fill was identified with concentrations of lead, arsenic and two semi-volatile organic compounds (SVOCs) (benzo(a)anthracene and benzo(a)pyrene) above respective MDEQ Generic Residential Land Use criteria. In April and May 1997, GM's environmental consultant excavated and removed the lead impacted soil material and waste fill. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees, bushes and a wood deck were removed. Surface soil in the front yard, including the area between the road and the sidewalk, was removed to a depth of 1 foot. In the back yard, waste fill was removed to a maximum depth of 4 feet below grade. The excavated surface soil and waste fill were transported to a landfill for disposal.

The areas where surface soil and waste fill were removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Additional landscaping, consisting of installing flower beds, bushes, and trees was then completed along with installation of a new wood deck. A chain link fence, with an access gate, was installed along the backyard bordering the Park.

Post-Excavation Sampling

The testing results from seventeen post-excavation samples from the areas where waste fill and surface soil were removed were below the respective MDEQ Generic Residential Land Use criteria indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

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Residential Remediation 4519 Milton Drive, Flint, Michigan Closure Sampling Analytical Data

Surface Soil Excavation Samples

LOCATION	Date Collected		Analytical Parameter	Method	XRF	4519F-1A	4519F-2A	4519F-3A	4519F-4A	4519F-5A	4519F-6A	4519F-7A	4519F-8A	Clean-Up
	04/17/97	04/21/97				Floor	Floor	Floor	Floor	Floor	Floor	Floor	Floor	Criteria
Lead	<100	<100	mg/kg		372	<100	<100	<100	<100	<100	<100	<100	<100	mg/kg
														400

Waste Fill Excavation Samples

LOCATION	Date Collected		Analytical Parameter	Method	XRF	4519F-1	4519F-2	4519F-3	4519F-4	4519F-5	4519S-1	4519S-2	4519S-3	4519S-4	Clean-Up
	04/21/97	04/21/97				Floor	Floor	Floor	Floor	Floor	Sidewall	Sidewall	Sidewall	Sidewall	Criteria
Lead	<100	<100	mg/kg		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	mg/kg
															400

Laboratory Quality Assurance/ Quality Control (QA/QC) Results

LOCATION	Date Collected		Analytical Parameter	Method	XRF	4519F-3A	4519F-5	Clean-Up
	04/21/97	04/22/97				Floor	Floor	Criteria
Lead	390	5	mg/kg			5	400	
Arsenic	-	3.3	mg/kg			3.3	11	
Benzol[a]anthracene	-	<0.19	mg/kg			<0.19	14	
Benzol[a]pyrene	-	<0.19	mg/kg			<0.19	1.4	

Notes:

1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
3. Samples 4519F-3A and 4519F-5 analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria for Lead is MDEQ Generic Residential Direct Contact Value.
5. "-" denotes analysis not performed.
6. "<" denotes result below detection limit.
7. mg/kg = parts per million.

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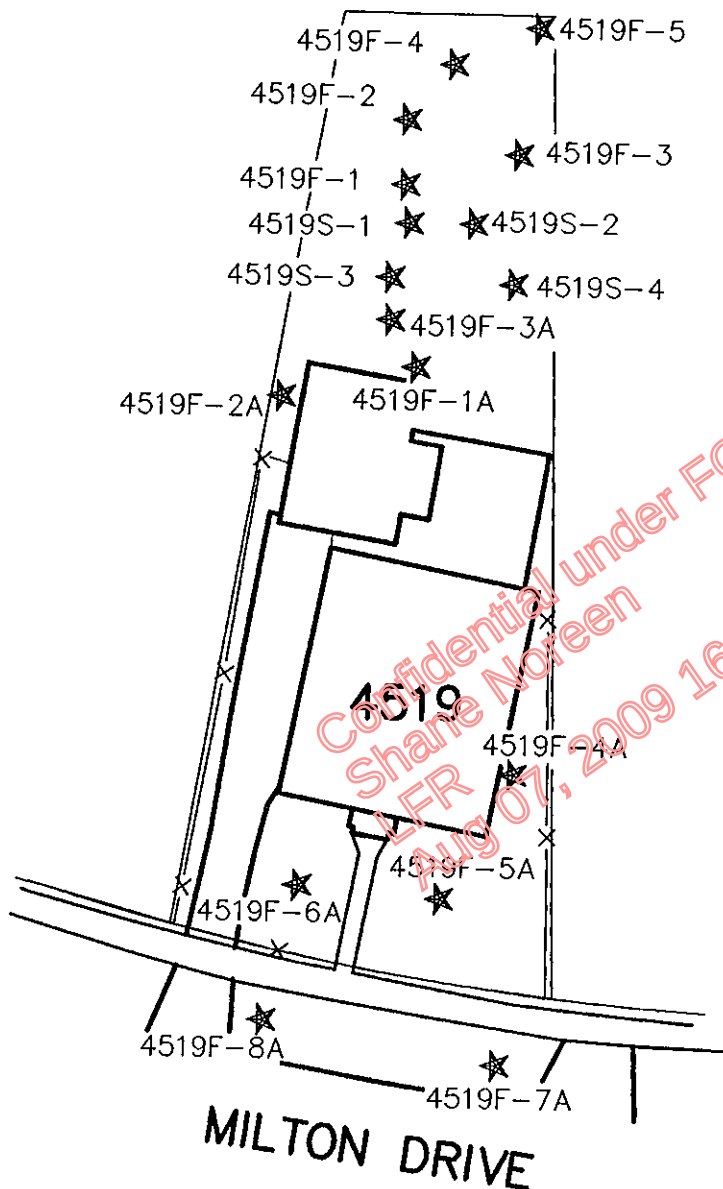
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POST-EXCAVATION SAMPLE LOCATIONS

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NOTES:

"F" PREFIX DENOTES
FLOOR SAMPLE

"S" PREFIX DENOTES
SIDEWALL SAMPLE

"A" SUFFIX DENOTES
SURFACE SOIL SAMPLE

★ CLOSURE SAMPLE
LOCATION

4519 MILTON DRIVE
FLINT, MICHIGAN



APPROXIMATE SCALE 1"=30'

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PLT SCALE: 30

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**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6930
Samp. Description: 4519F-3A (6")
Units: mg/Kg Dry weight

Collected: 04/21/97 Matrix: Solid
Received: 04/22/97 %Solids: 98.8
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	390.	6010A	04/22/97	04/22/97	042297S1	1	

Notes:

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J-Estimated value

Authorized: Monika Santucci
Date: April 24, 1997 Monika Santucci

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**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6931
Samp. Description: 4519F-5 (6")
Units: mg/Kg Dry weight

Collected: 04/21/97 Matrix: Solid
Received: 04/22/97 %Solids: 84.1
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Arsenic	3.3	6010A	04/22/97	04/22/97	042297S1	1
Lead	5.	6010A	04/22/97	04/22/97	042297S1	1

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: April 24, 1997

Monika Santucci

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**Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6931
Samp. Description: 4519F-5 (6")
Instrument: HP5970 GC/MS#1
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/21/97
Received: 04/22/97
Prepared: 04/22/97
Matrix: Solid
QC Batch: 042197S2
%Solids: 84.1
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Benzo[a]anthracene	<190.		1	04/22/97	
Benzo[a]pyrene	<190.		1	04/22/97	
Nitrobenzene-d5 (surrogate)	75.3%	43-117	1	04/22/97	
2-Fluorobiphenyl (surrogate)	92.3%	42-121	1	04/22/97	
Terphenyl-d14 (surrogate)	83.3%	47-126	1	04/22/97	

Notes:

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- Outside control limits J-Estimated value

Authorized: Monika Santucci

Date: May 6, 1997

Monika Santucci

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4522 Milton Drive

Remediation

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4522 Milton Drive that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm). In July 1997, the lead impacted surface soil material was excavated and removed from the property. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees and bushes were removed. Surface soil in the front yard, including the area between the road and the sidewalk, and the backyard was removed to a depth of 6 inches. The excavated surface soil was transported to a landfill for disposal.

The areas where surface soil was removed were filled in with a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed.

Post-Excavation Sampling

The lead content of the seven post-excavation samples from the area where surface soil was removed was below the MDEQ Generic Residential Land Use criterion, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

Shane Noreen

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Residential Remediation 4522 Milton Drive, Flint, Michigan Closure Sampling Analytical Data

Surface Soil Excavation Samples

LOCATION	Date Collected			Analytical Parameter	Method	Lead	4522F-1A 07/07/97 Floor mg/kg 114	4522F-2A 07/07/97 Floor mg/kg <100	4522F-3A 07/07/97 Floor mg/kg 275	4522F-4A 07/07/97 Floor mg/kg <100	4522F-5A 07/07/97 Floor mg/kg <100	4221F-6A 06/19/97 Floor mg/kg <100	4221F-7A 06/19/97 Floor mg/kg <100	Clean-Up Criteria mg/kg 400
	Depth													
	XRF													

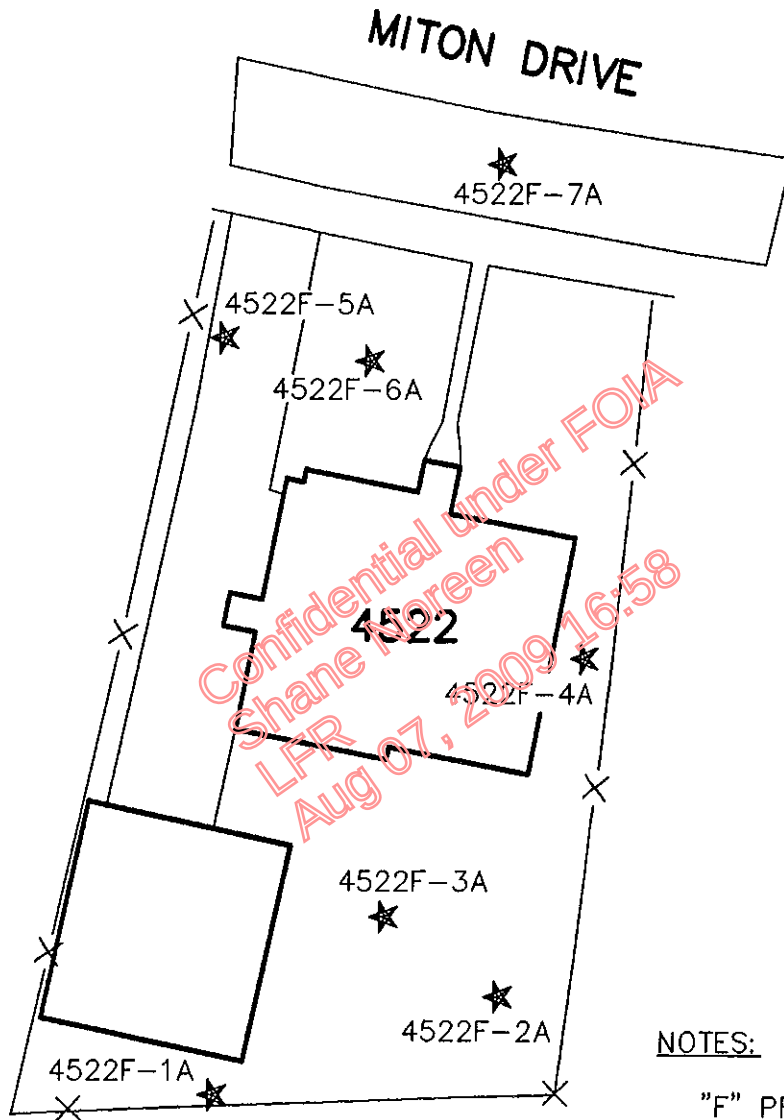
Laboratory Quality Assurance/Quality Control (QA/QC) Results

LOCATION	Date Collected			Analytical Parameter	Method	Lead	4522F-1A 07/07/97 Floor mg/kg 180	4522F-2A 07/07/97 Floor mg/kg 120	4522F-3A 07/07/97 Floor mg/kg 350	4522F-4A 07/07/97 Floor mg/kg 50	Clean-Up Criteria mg/kg 400
	Depth										
	6010A										

Notes:

1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence Instrument Oxford Model Lab X-1000.
3. Samples 4522F-1A, 4522F-2A, 4522F-3A, and 4522F-4A analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria for Lead is MDEQ Generic Residential Direct Contact Value.
5. "-" denotes analysis not performed.
6. "<" denotes result below detection limit.
7. mg/kg = parts per million.

POST-EXCAVATION SAMPLE LOCATIONS



NOTES:

"F" PREFIX DENOTES FLOOR SAMPLE

"A" SUFFIX DENOTES SURFACE SOIL SAMPLE

★ CLOSURE SAMPLE LOCATION
4522F-4A

**4522 MILTON DRIVE
FLINT, MICHIGAN**

20 20
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APPROX. SCALE: 1" = 20'

Shane Noreen

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F1817
Samp. Description: 4522F-1A (6")
Units: mg/Kg Dry weight

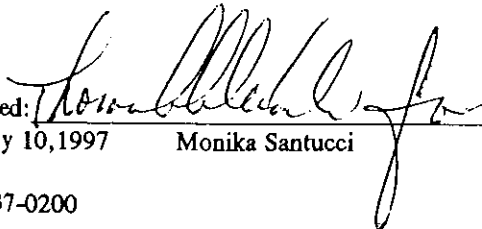
Collected: 07/07/97 Matrix: Solid
Received: 07/08/97 %Solids: 99.6
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	180.	6010A	07/08/97	07/08/97	070897S1	1	

Notes:

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Aug 07, 2009 16:58

J-Estimated value

Authorized: 
Date: July 10, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F1816
Samp. Description: 4522F-2A (6")
Units: mg/Kg Dry weight

Collected: 07/07/97
Received: 07/08/97
Matrix: Solid
% Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	120.	6010A	07/08/97	07/08/97	070897S1	1	

Notes:

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Authorized: 

Date: July 10, 1997

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Laboratories, Inc.**

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**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F1815
Samp. Description: 4522F-3A (6")
Units: mg/Kg Dry weight

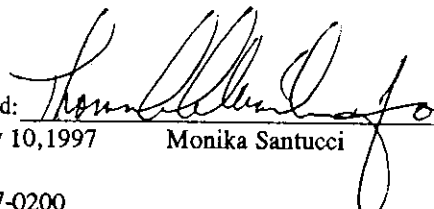
Collected: 07/07/97 Matrix: Solid
Received: 07/08/97 %Solids: 99.8
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	350.	6010A	07/08/97	07/08/97	070897s1		1

Notes:

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Authorized: 
Date: July 10, 1997 Monika Santucci

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Laboratories, Inc.**

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**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: F1814
Samp. Description: 4522F-4A (6")
Units: mg/Kg Dry weight

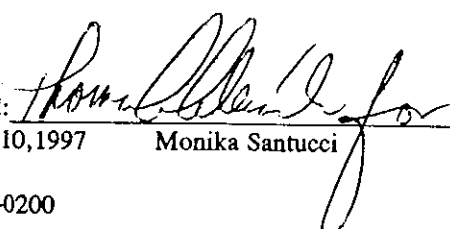
Collected: 07/07/97 Matrix: Solid
Received: 07/08/97 %Solids: 99.4
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	50.	6010A	07/08/97	07/08/97	070897S1	1	

Notes:

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Date: July 10, 1997 Monika Santucci

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4525 Milton Drive

Remediation

Previous investigation and sampling by GM's environmental consultant identified waste fill material at 4525 Milton Drive that contained lead, arsenic and two semi-volatile organic compounds (SVOCs) (benzo(a)anthracene and benzo(a)pyrene) above respective Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criteria. In April 1997, GM's environmental consultant excavated and removed the waste fill material. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees and bushes were removed. In the back yard, waste fill material was removed to a maximum depth of 4.5 feet below grade. At the request of the property owner, a limited quantity of unimpacted surface soil along the boundary with 4519 Milton Drive was also removed to a depth of 1 foot. The excavated waste fill material and surface soil were transported to a landfill for disposal.

The areas where soil was removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. A chain link fence, with an access gate, was installed along the backyard bordering the Park.

Post-Excavation Sampling

The testing results from eight post-excavation samples from the areas where waste fill was removed were below the respective MDEQ Generic Residential Land Use criteria indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

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Residential Remediation 4525 Milton Drive, Flint, Michigan Closure Sampling Analytical Data

Waste Fill Excavation Samples

LOCATION	Date Collected		Analytical Parameter	Method	XRF	4525F-1 04/17/97 Floor mg/kg ≤100	4525F-2 04/17/97 Floor mg/kg ≤100	4525F-3 04/17/97 Floor mg/kg ≤100	4525F-4 04/17/97 Floor mg/kg ≤100	4525S-1 04/17/97 Sidewall mg/kg ≤100	4525S-2 04/17/97 Sidewall mg/kg ≤100	4525S-3 04/17/97 Sidewall mg/kg ≤100	4525S-4 04/17/97 Sidewall mg/kg 168	Clean-Up Criteria mg/kg 400	
Lead															

Laboratory Quality Assurance/Quality Control (QA/QC) Results

LOCATION	4525F-3		Clean-Up Criteria
	04/17/97		
	Floor		
	mg/kg		
Analytical Parameter	Date Collected		
Lead	Depth		
	Method		
Arsenic	6010A	9	400
Benzo[a]anthracene	6010A	3.1	11
Benzo[a]pyrene	8270	<0.22	14
	8270	<0.22	14

Notes:

1. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
2. Sample 4525F-3 analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
3. Clean-Up Criteria is MDEQ Generic Residential Direct Contact Value, except Arsenic which is site specific background value for clay.
4. "-" denotes analysis not performed.
5. "<" denotes result below detection limit.
6. mg/kg = parts per million.

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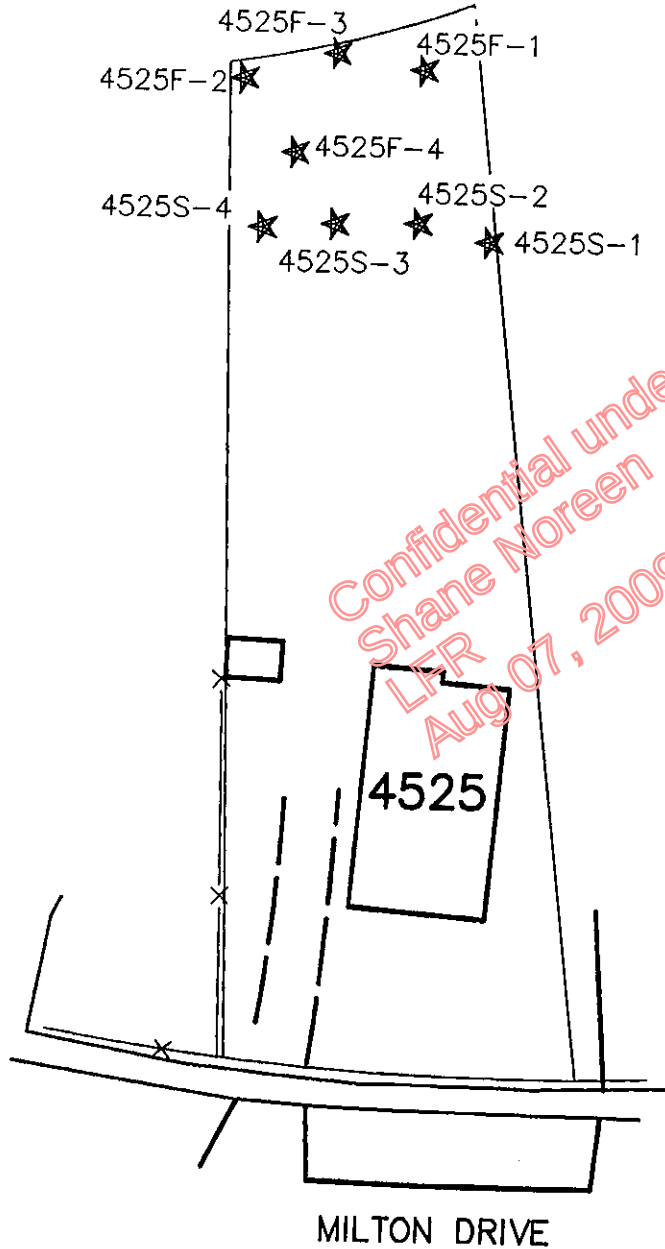
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POST-EXCAVATION SAMPLE LOCATIONS



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NOTES:

"F" PREFIX DENOTES
FLOOR SAMPLE

"S" PREFIX DENOTES
SIDEWALL SAMPLE

★ CLOSURE SAMPLE
LOCATION
4525F-4

4525 MILTON DRIVE
FLINT, MICHIGAN

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APPROX. SCALE: 1" = 30'

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ENGINEERS, INC.

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PLT SCALE: 30

**O'Brien & Gere
Laboratories, Inc.**

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**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6618
Samp. Description: 4525F-3 (6")
Units: mg/Kg Dry weight

Collected: 04/17/97
Received: 04/18/97
Matrix: Solid
%Solids: 73.1
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Arsenic	3.1	6010A	04/18/97	04/18/97	041897S1	1
Lead	9.	6010A	04/18/97	04/18/97	041897S1	1

Notes:

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J-Estimated value

Authorized:

Date: April 23, 1997

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Laboratories, Inc.**

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**Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6618
Samp. Description: 4525F-3 (6")
Instrument: HP5970 GC/MS#1
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/17/97
Received: 04/18/97
Prepared: 04/18/97
Matrix: Solid
QC Batch: 041897S2
%Solids: 73.1
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Benzo[a]anthracene	<220.		1	04/21/97	
Benzo[a]pyrene	<220.		1	04/21/97	
Nitrobenzene-d5 (surrogate)	73.3	43-117	1	04/21/97	
2-Fluorobiphenyl (surrogate)	75.8	42-121	1	04/21/97	
Terphenyl-d14 (surrogate)	72.8	47-126	1	04/21/97	

Notes:

- Outside control limits J-Estimated value

Authorized: Monika Santucci
Date: May 6, 1997
Monika Santucci

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4531 Milton Drive**Remediation**

Previous investigation and sampling by GM's environmental consultant identified waste fill material at 4531 Milton Drive with concentrations of lead, arsenic and two semi-volatile organic compounds (SVOCs) (benzo(a)anthracene and benzo(a)pyrene) above respective Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criteria. In April 1997, GM's environmental consultant excavated and removed the waste fill material. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees and bushes were removed. Waste fill was removed from the backyard to a maximum depth of 7 feet below grade. The excavated soil was transported to a landfill for disposal.

The areas where soil was removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed.

Post-Excavation Sampling

The testing results of the thirteen post-excavation samples from the area where waste fill material was removed were below the MDEQ Generic Residential Land Use criteria, with the exception of two sampling locations. The soil sample location 4531S-1, collected along the sidewall of the excavation, exhibited arsenic at a concentration of 20 parts per million (ppm) and lead at 412 ppm (the lead result was measured by an x-ray fluorescence instrument, however, the laboratory analytical result for the same sample was 28 ppm). The soil sample location 4531S-2, collected along the sidewall of the excavation, exhibited arsenic at a concentration of 54 ppm. Additional soil was removed from the excavation in the vicinity of these sample locations and a second round of samples, 4531S-1B and 4531S-2B, was collected. The analytical data from the samples 4531S-1B and 4531S-2B were found to be less than the MDEQ Generic Residential Land Use criteria, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

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Residential Remediation
4531 Milton Drive, Flint, Michigan
Closure Sampling Analytical Data

Waste Fill Excavation Samples

Laboratory Quality Assurance/Quality Control (QA/QC) Results

LOCATION	4531F-1		4531F-2		4531F-3		4531F-4		4531F-5		4531F-6		4531F-7		4531F-8		Clean-Up Criteria	
	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	mg/kg	mg/kg
Analytical Parameter	XRF		XRF		XRF		XRF		XRF		XRF		XRF		XRF			
Lead																		
Lead																		
Arsenic																		
Benzoflanthracene																		
Benzoflanthracene																		

Waste Fill Excavation Samples

Laboratory Quality Assurance/Quality Control (QA/QC) Results

LOCATION	4531F-9		4531S-1		4531S-2		4531S-2B*		Clean-Up Criteria	
	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth
Analytical Parameter	XRF		XRF		XRF		XRF		XRF	
Lead										
Lead										
Arsenic										
Benzoflanthracene										
Benzoflanthracene										

Notes:

1. Concentrations of semivolatiles may be under-reported due to microwave preparation prior to analysis.
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
3. All Samples analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria is MDEQ Generic Residential Direct Contact Value, except Arsenic which is site specific background value for clay.
5. "u" denotes analysis not performed.
6. "<" denotes result below detection limit.
7. "()" denotes results that exceed Direct Contact Value Criteria.
8. Sample designation with "B" suffix denotes additional excavation beyond original sample location (ie 4531S-1 and 4531S-1B).
9. * Sample 4531S-1B was originally labeled 4531S-3 and 4531S-2B was originally labeled 4531S-4.
10. mg/kg = parts per million.

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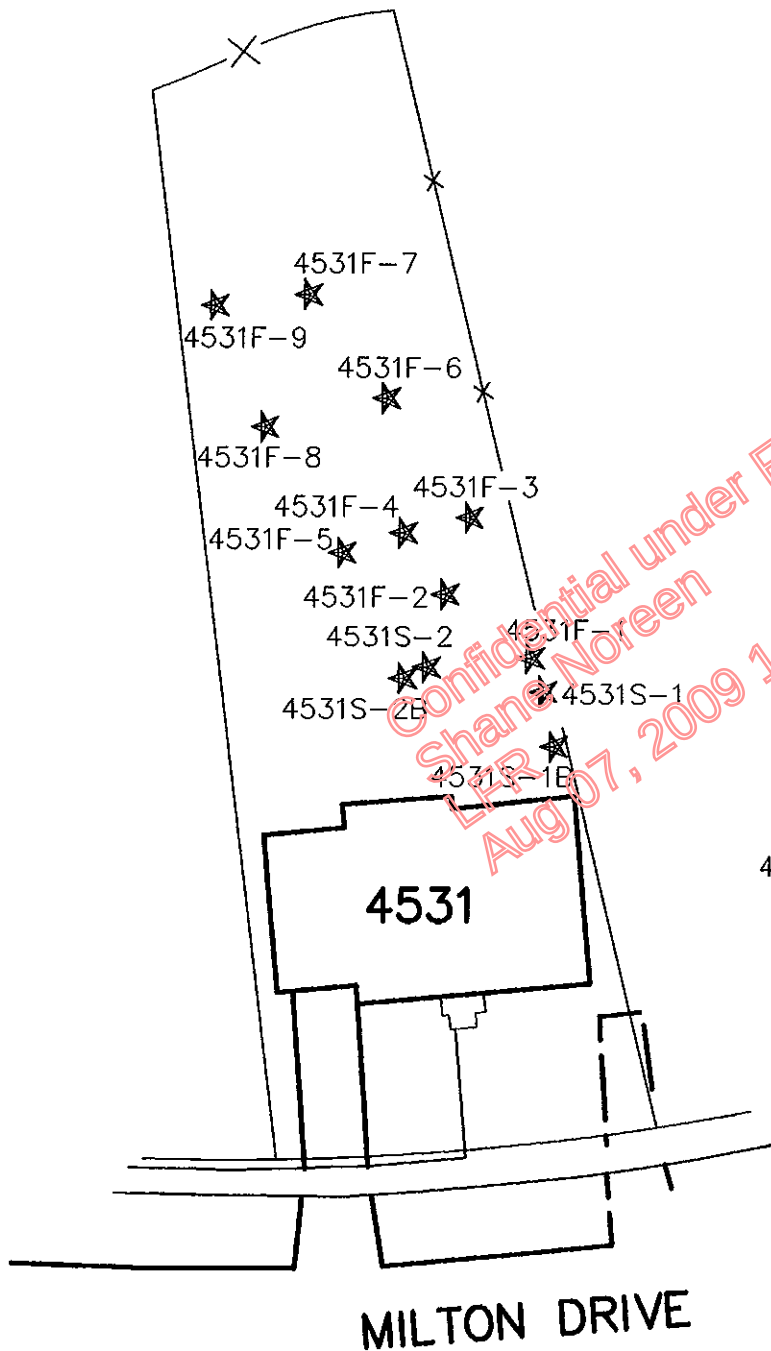
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POST-EXCAVATION SAMPLE LOCATIONS

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NOTES:

"F" PREFIX DENOTES FLOOR SAMPLE

"S" PREFIX DENOTES SIDEWALL SAMPLE

"B" PREFIX DENOTES SOIL SAMPLE AFTER EXCAVATION WAS WIDENED

★ CLOSURE SAMPLE LOCATION

**4531 MILTON DRIVE
FLINT, MICHIGAN**

30 0 30

APPROX. SCALE: 1"=30'



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PLT SCALE: 30

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6054
Samp. Description: 4531F-1 (6")
Units: mg/Kg Dry weight

Collected: 04/08/97 Matrix: Solid
Received: 04/09/97 %Solids: 95.3
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Arsenic	7.6	6010A	04/09/97	04/09/97	040997S1	1	
Lead	71.	6010A	04/09/97	04/09/97	040997S1	1	

Notes:

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J-Estimated value

Authorized: Monika Santucci
Date: April 28, 1997 Monika Santucci

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**Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6054
Samp. Description: 4531F-1 (6")
Instrument: HP5972 GC/MS#6
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/08/97
Received: 04/09/97
Prepared: 04/09/97
Matrix: Solid
QC Batch: 040997S1
%Solids: 95.3
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Benzo[a]anthracene	320.		1	04/09/97	
Benzo[a]pyrene	300.		1	04/09/97	
Nitrobenzene-d5 (surrogate)	79.0%	43-117	1	04/09/97	
2-Fluorobiphenyl (surrogate)	80.0%	42-121	1	04/09/97	
Terphenyl-d14 (surrogate)	170.0%	# 47-126	1	04/09/97	

Notes:

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- Outside control limits J-Estimated value

Authorized: Monika Santucci
Date: April 28, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6055
Samp. Description: 4531F-2 (6")
Units: mg/Kg Dry weight

Collected: 04/08/97 Matrix: Solid
Received: 04/09/97 %Solids: 97.3
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Arsenic	1.8	6010A	04/09/97	04/09/97	040997S1		1
Lead	6.	6010A	04/09/97	04/09/97	040997S1		1

Notes:

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Date: April 28, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6055
Samp. Description: 4531F-2 (6")
Instrument: HP5972 GC/MS#6
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/08/97
Received: 04/09/97
Prepared: 04/09/97
Matrix: Solid
QC Batch: 040997S1
%Solids: 97.3
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Benzo [a] anthracene	<160.		1	04/09/97	
Benzo [a] pyrene	<160.		1	04/09/97	
Nitrobenzene-d5 (surrogate)	80.%	43-117	1	04/09/97	
2-Fluorobiphenyl (surrogate)	79.%	42-121	1	04/09/97	
Terphenyl-d14 (surrogate)	133.%	# 47-126	1	04/09/97	

Notes:

- Outside control limits J-Estimated value

Authorized: Monika Santucci

Date: April 28, 1997

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6203
Samp. Description: 4531F-3 (6")
Units: mg/Kg Dry weight

Collected: 04/09/97 Matrix: Solid
Received: 04/10/97 %Solids: 98.3
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Arsenic	3.6	6010A	04/10/97	04/10/97	041097S1	1
Lead	6.	6010A	04/10/97	04/10/97	041097S1	1

Notes:

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Date: April 28, 1997

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6203
Samp. Description: 4531F-3 (6")
Instrument: HP5970 GC/MS#1
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/09/97
Received: 04/10/97
Prepared: 04/10/97
Matrix: Solid
QC Batch: 041097S1
%Solids: 98.3
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Benzo[a]anthracene	<160		1	04/10/97	
Benzo[a]pyrene	<160		1	04/10/97	
Nitrobenzene-d5 (surrogate)	83.3%	43-117	1	04/10/97	
2-Fluorobiphenyl (surrogate)	97.3%	42-121	1	04/10/97	
Terphenyl-d14 (surrogate)	124.3%	47-126	1	04/10/97	

Notes:

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Authorized: Monika Santucci

Date: April 28, 1997

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6204
Samp. Description: 4531F-4 (6")
Units: mg/Kg Dry weight

Collected: 04/09/97 Matrix: Solid
Received: 04/10/97 %Solids: 95.2
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Arsenic	4.7	6010A	04/10/97	04/10/97	041097S1	1	
Lead	8.	6010A	04/10/97	04/10/97	041097S1	1	

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J-Estimated value

Authorized: Monika Santucci

Date: April 28, 1997

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Laboratories, Inc.**

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**Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: B6204
Samp. Description: 4531F-4 (6")
Instrument: HP5972 GC/MS#6
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/09/97
Received: 04/10/97
Prepared: 04/10/97
Matrix: Solid
QC Batch: 041097S1
%Solids: 95.2
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Benzo[a]anthracene	<170.		1	04/17/97	
Benzo[a]pyrene	<170.		1	04/17/97	
Nitrobenzene-d5 (surrogate)	94.%	43-117	1	04/17/97	
2-Fluorobiphenyl (surrogate)	97.%	42-121	1	04/17/97	
Terphenyl-d14 (surrogate)	132.%	# 47-126	1	04/17/97	

Notes:

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- Outside control limits J-Estimated value

Authorized: Monika Santucci

Date: April 28, 1997

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6205
Samp. Description: 4531F-5 (6")
Units: mg/Kg Dry weight

Collected: 04/09/97
Received: 04/10/97
Matrix: Solid
%Solids: 99.7
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Arsenic	4.5	6010A	04/10/97	04/10/97	041097S1	1	
Lead	12.	6010A	04/10/97	04/10/97	041097S1	1	

Notes:

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Authorized: Monika Santucci

Date: April 28, 1997

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: B6205
Samp. Description: 4531F-5 (6")
Instrument: HP5970 GC/MS#1
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/09/97
Received: 04/10/97
Prepared: 04/10/97
Matrix: Solid
QC Batch: 041097S1
%Solids: 99.7
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed Notes
Benzo [a] anthracene	<160		1	04/11/97
Benzo [a] pyrene	<160		1	04/11/97
Nitrobenzene-d5 (surrogate)	78. %	43-117	1	04/11/97
2-Fluorobiphenyl (surrogate)	88. %	42-121	1	04/11/97
Terphenyl-d14 (surrogate)	94. %	42-126	1	04/11/97

Notes:

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6206
Samp. Description: 4531F-6 (6")
Units: mg/Kg Dry weight

Collected: 04/09/97 Matrix: Solid
Received: 04/10/97 %Solids: 95.2
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Arsenic	5.4	6010A	04/10/97	04/10/97	041097S1	1	
Lead	33.	6010A	04/10/97	04/10/97	041097S1	1	

Notes:

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6206
Samp. Description: 4531F-6 (6")
Instrument: HP5970 GC/MS#1
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/09/97
Received: 04/10/97
Prepared: 04/10/97
Matrix: Solid
QC Batch: 041097S1
%Solids: 95.2
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Benzo[a]anthracene	<170		1	04/11/97	
Benzo[a]pyrene	<170		1	04/11/97	
Nitrobenzene-d5 (surrogate)	84.1%	43-117	1	04/11/97	
2-Fluorobiphenyl (surrogate)	89.1%	42-121	1	04/11/97	
Terphenyl-d14 (surrogate)	131.1% #	42-126	1	04/11/97	

Notes:

- Outside control limits J-Estimated value

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Date: April 28, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6282
Samp. Description: 4531F-7 (6")
Units: mg/Kg Dry weight

Collected: 04/10/97
Received: 04/11/97
Matrix: Solid
%Solids: 95.2
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Arsenic	1.9	6010A	04/11/97	04/11/97	041197S1	1	
Lead	16.	6010A	04/11/97	04/11/97	041197S1	1	

Notes:

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6283
Samp. Description: 4531F-8 (6")
Units: mg/Kg Dry weight

Collected: 04/10/97
Received: 04/11/97
Matrix: Solid
%Solids: 99.3
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Arsenic	4.8	6010A	04/11/97	04/11/97	041197S1	1
Lead	8.	6010A	04/11/97	04/11/97	041197S1	1

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6284
Samp. Description: 4531F-9 (6")
Units: mg/Kg Dry weight

Collected: 04/10/97 Matrix: Solid
Received: 04/11/97 %Solids: 95.5
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Arsenic	3.6	6010A	04/11/97	04/11/97	041197S1	1
Lead	13.	6010A	04/11/97	04/11/97	041197S1	1

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Authorized: Monika Santucci

Date: April 28, 1997

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: B6056
Samp. Description: 4531S-1 (6")
Units: mg/Kg Dry weight

Collected: 04/08/97
Received: 04/09/97
Matrix: Solid
%Solids: 99.4
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Arsenic	20.	6010A	04/09/97	04/09/97	040997S1	1
Lead	28.	6010A	04/09/97	04/09/97	040997S1	1

Notes:

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Authorized: Monika Santucci

Date: April 28, 1997

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6056
Samp. Description: 4531S-1 (6")
Instrument: HP5972 GC/MS#6
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/08/97
Received: 04/09/97
Prepared: 04/09/97
Matrix: Solid
QC Batch: 040997S1
%Solids: 99.4
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Benzo [a] anthracene	<160		1	04/09/97	
Benzo [a] pyrene	<160		1	04/09/97	
Nitrobenzene-d5 (surrogate)	81.1%	43-117	1	04/09/97	
2-Fluorobiphenyl (surrogate)	81.1%	42-121	1	04/09/97	
Terphenyl-d14 (surrogate)	60.1%	42-126	1	04/09/97	

Notes:

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- Outside control limits J-Estimated value

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Date: April 28, 1997

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6057
Samp. Description: 4531S-2 (6")
Units: mg/Kg Dry weight

Collected: 04/08/97 Matrix: Solid
Received: 04/09/97 %Solids: 96.7
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Arsenic	54.	6010A	04/09/97	04/09/97	040997S1	1	
Lead	66.	6010A	04/09/97	04/09/97	040997S1	1	

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6057
Samp. Description: 4531S-2 (6")
Instrument: HP5972 GC/MS#6
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/08/97
Received: 04/09/97
Prepared: 04/09/97
Matrix: Solid
QC Batch: 040997S1
%Solids: 96.7
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Benzo[a]anthracene	<170			1	04/09/97
Benzo[a]pyrene	<170			1	04/09/97
Nitrobenzene-d5 (surrogate)	73.%	43-117		1	04/09/97
2-Fluorobiphenyl (surrogate)	66.%	42-121		1	04/09/97
Terphenyl-d14 (surrogate)	63.%	47-126		1	04/09/97

Notes:

- Outside control limits J-Estimated value

Authorized: Monika Santucci
Date: April 28, 1997
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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: B6202
Samp. Description: 4531S-3 (6")
Units: mg/Kg Dry weight

Collected: 04/09/97 Matrix: Solid
Received: 04/10/97 %Solids: 94.5
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Arsenic	2.8	6010A	04/10/97	04/10/97	041097S1	1	
Lead	10.	6010A	04/10/97	04/10/97	041097S1	1	

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: B6202
Samp. Description: 4531S-3 (6")
Instrument: HP5970 GC/MS#1
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/09/97
Received: 04/10/97
Prepared: 04/10/97

Matrix: Solid
QC Batch: 041097S1
%Solids: 94.5
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Benzo [a] anthracene	<170		1	04/10/97	
Benzo [a] pyrene	<170		1	04/10/97	
Nitrobenzene-d5 (surrogate)	91.1%	43-117	1	04/10/97	
2-Fluorobiphenyl (surrogate)	101.1%	42-121	1	04/10/97	
Terphenyl-d14 (surrogate)	130.1%	# 47-126	1	04/10/97	

Notes:

- Outside control limits J-Estimated value

Authorized: Monika Santucci
Date: April 28, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6285
Samp. Description: 4531S-4 (6")
Units: mg/Kg Dry weight

Collected: 04/10/97
Received: 04/11/97
Matrix: Solid
%Solids: 85.8
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Arsenic	2.9	6010A	04/11/97	04/11/97	041197S1	1
Lead	12.	6010A	04/11/97	04/11/97	041197S1	1

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Authorized: Monika Santucci

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**O'Brien & Gere
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**Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6285
Samp. Description: 4531S-4 (6")
Instrument: HP5970 GC/MS#1
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/10/97
Received: 04/11/97
Prepared: 04/14/97

Matrix: Solid
QC Batch: 041497S2
%Solids: 85.8
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Benzo[a]anthracene	<190.		1	04/15/97	
Benzo[a]pyrene	<190.		1	04/15/97	
Nitrobenzene-d5 (surrogate)	82.%	43-117	1	04/15/97	
2-Fluorobiphenyl (surrogate)	91.%	42-121	1	04/15/97	
Terphenyl-d14 (surrogate)	97.%	47-126	1	04/15/97	

Notes:

- Outside control limits J-Estimated value

Authorized: Monika Santucci

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4537 Milton Drive**Remediation**

Previous investigation and sampling by GM's environmental consultant identified waste fill material at 4537 Milton Drive with concentrations of lead, arsenic and two semi-volatile organic compounds (SVOCs) (benzo(a)anthracene and benzo(a)pyrene) above respective Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criteria. In April 1997, the waste fill material was excavated and removed from the property. A description of the remediation activities at the property is as follows:

Prior to excavation activities, trees, fences, and the concrete driveway were removed. The garage and pool were also demolished and removed. Subsurface waste fill material in the backyard, underneath the driveway in the backyard to the front of the house, and in the flower bed located east of the house was then removed. The maximum depth of excavation was approximately 7 feet below grade (fbg). The extent of waste fill material appeared to extend underneath the driveway and the house. Any waste fill material underneath the house was left in place. The waste fill material underneath the driveway was partially removed; however, some waste fill material underneath the driveway was also left in place. The excavated waste fill material was transported to a landfill for disposal.

The areas where waste fill material was removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the top soil. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed. Small trees were planted in the backyard where trees formerly existed and a chain link fence, with an access gate, was installed along the side and backyard bordering the Park and a new garage was installed.

Post-Excavation Sampling

The results of the twelve post-excavation samples for lead, arsenic, benzo(a)anthracene and benzo(a)pyrene from the area where waste fill was removed were below the MDEQ Generic Residential Land Use criteria with the exception of any waste fill material remaining underneath the house and south of the front of the house underneath the driveway.

Flower Bed (Post)-Excavation Sampling

In October 1997, subsurface waste fill material was excavated and removed from two of the three flower beds located adjacent to the house at 4537 Milton Drive (subsurface waste fill material in the flower bed located east of the house was previously excavated and removed). The two flower bed areas were excavated to a maximum depth of 2 fbg. Trees, shrubs, and bushes were removed in the two flower bed areas prior to the excavation activities. The excavated material was transported to a landfill for disposal.

The areas where waste fill material was removed were filled in with clean sand material and a minimum of 6 inches of top soil.

The results of the five lead samples collected at 2 fbg in the flower beds were below the MDEQ Generic Residential Land Use criterion except for one sample, 4537B-4, located in the backyard flower bed.

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West and Front Yard (Post)-Excavation Sampling

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In December 1997, subsurface waste fill material was excavated and removed from the west yard and front yard at 4537 Milton Drive to a maximum depth of 2 fbg. Although waste fill material was not identified between the road and the sidewalk, soil in this area was also excavated to a maximum depth of 2 fbg, to maintain a consistent lawn for the property. Trees and shrubs were removed in the west and front yards prior to soil excavation activities. The excavated material was transported to a landfill for disposal.

The areas where waste fill material was removed were filled in with clean sand material and a minimum of 6 inches of top soil. The west and front yards were then hydro-seeded over the topsoil. Crushed stone was placed along the southwestern property line for a driveway for the homeowner at 4531 Milton Drive.

As a result of excavation activities, but not part of the remediation, a new concrete approach was placed at 4537 Milton Drive and new concrete sidewalk was placed at 4531 Milton Drive (soil underneath the approach and sidewalk was not removed).

The results of the seven lead samples collected at 2 fbg in the west and front yards were below the MDEQ Generic Residential Land Use criterion.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

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**Residential Remediation
4537 Milton Drive, Flint, Michigan**

Closure Sampling Analytical Data

Waste Fill Excavation Samples

LOCATION		4537F-1	4537F-2	4537F-3	4537F-4	4537F-5	4537F-6	4537F-7	4537F-8	Clean-Up
Analytical Parameter	Date Collected	04/15/97	04/15/97	04/15/97	04/15/97	04/15/97	04/15/97	04/15/97	04/22/97	Criteria
	Depth	Floor	Floor	Floor	Floor	Floor	Floor	Floor	Floor	
	Method	XRF								
Lead		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		<100	<100	<100	304	<100	<100	<100	<100	400

Waste Fill Excavation Samples

LOCATION		4537F-9	4537F-10	4537F-11	4537F-12	Clean-Up
Analytical Parameter	Date Collected	04/22/97	04/22/97	04/22/97	04/23/97	Criteria
	Depth	Floor	Floor	Floor	Floor	
	Method	XRF				
Lead		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		<100	<100	<100	113	400

Flower Bed Excavation Samples

LOCATION		4537B-1	4537B-2	4537B-3	4537B-4	4537B-5	Clean-Up
Analytical Parameter	Date Collected	10/09/97	10/09/97	10/09/97	10/09/97	10/09/97	Criteria
	Depth	Floor	Floor	Floor	Floor	Floor	
	Method	6010A					
Lead		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		130	120	330	(1000)	240	400

Laboratory Quality Assurance/Quality Control (QA/QC) Results

LOCATION		4537F-5	4537F-12	Clean-Up
Analytical Parameter	Date Collected	04/15/97	04/23/97	Criteria
	Depth	Floor	Floor	
	Method			
Lead		mg/kg	mg/kg	mg/kg
		65.86	250	400
Arsenic		mg/kg		
		3.36	-	11
Benzofluranthracene				
		<220	-	14
Benzoflapyrene				
		<220	-	1.4

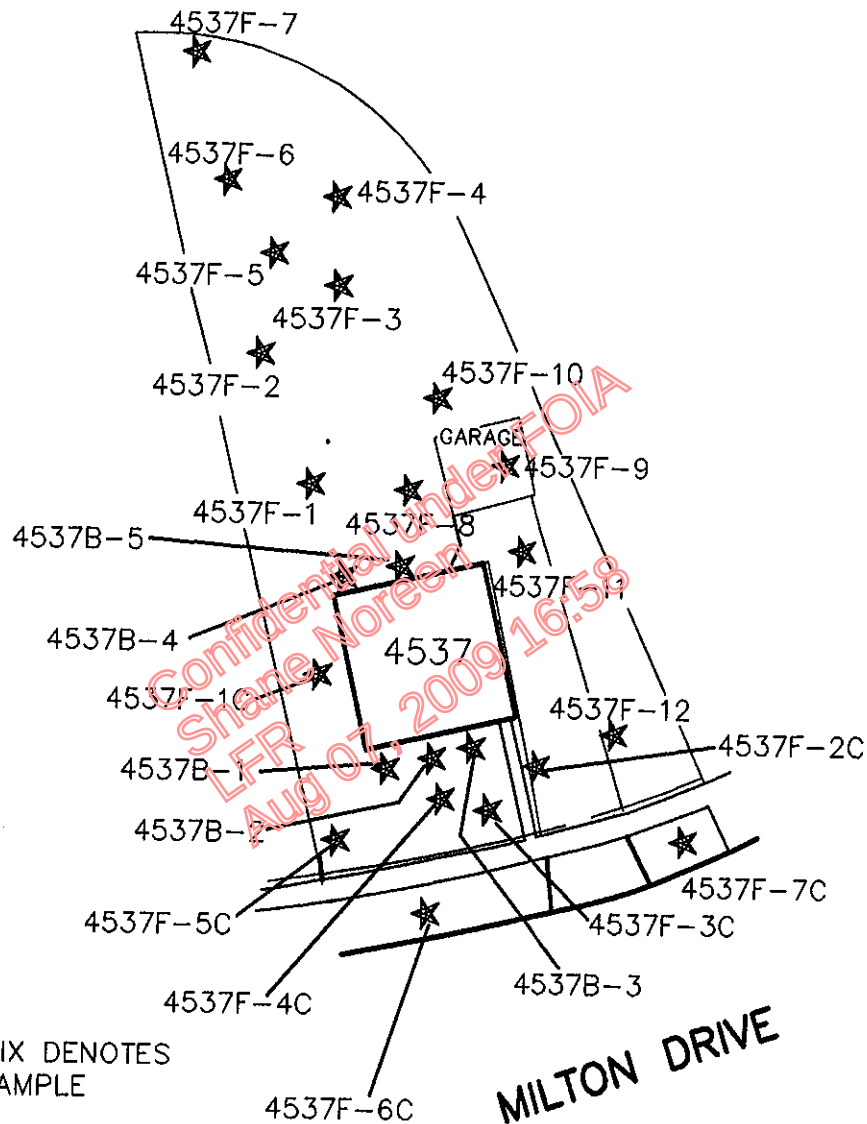
Notes:

1. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
2. Sample 4537F-5 and 4537F-12 analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
3. Clean-Up Criteria is MDEQ Generic Residential Direct Contact Value, except Arsenic which is site specific background value for clay.
4. "-" denotes analysis not performed.
5. "<" denotes result below detection limit.
6. mg/kg = parts per million.
7. Flower Bed Excavation Samples collected on October 9, 1997. Analysis performed at O'Brien & Gere Laboratories, Syracuse, NY.
8. () denotes sample exceeds direct contact value clean up criteria.

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POST-EXCAVATION SAMPLE LOCATIONS



NOTES:

"F" PREFIX DENOTES
FLOOR SAMPLE

★ CLOSURE SAMPLE
4537F-4 LOCATION

★ "B" PREFIX DENOTES BOTTOM
4537B-5 OF FLOWER BED SAMPLE

★ "C" SUFFIX DENOTES FLOOR SAMPLE
4537F-1C COLLECTED AT 2 FT. BELOW GRADE

**4537 MILTON DRIVE
FLINT, MICHIGAN**

40 0 40
Shane Noreen

APPROX. SCALE: 1" = 40'

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PLT SCALE: 40

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Laboratories, Inc.**

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**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6487
Samp. Description: 4537F-5 (6")
Units: mg/Kg Dry weight

Collected: 04/15/97 Matrix: Solid
Received: 04/16/97 %Solids: 74.4
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Arsenic	3.4	6010A	04/16/97	04/16/97	041697S1	1
Lead	66.	6010A	04/16/97	04/16/97	041697S1	1

Notes:

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J-Estimated value

Authorized: *Monika Santucci*

Date: April 21, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E6487
Samp. Description: 4537F-5 (6")
Instrument: HP5972 GC/MS#6
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 04/15/97
Received: 04/16/97
Prepared: 04/16/97
Matrix: Solid
QC Batch: 041497S2
%Solids: 74.4
Sample Size: 30 g

Parameter	Result	Surrog		Analyzed	Notes
		Limits	Dilution		
Benzo[a]anthracene	<220.		1	04/17/97	
Benzo[a]pyrene	<220.		1	04/17/97	
Nitrobenzene-d5 (surrogate)	83.%	43-117	1	04/17/97	
2-Fluorobiphenyl (surrogate)	93.%	42-121	1	04/17/97	
Terphenyl-d14 (surrogate)	156.%	# 47-126	1	04/17/97	

Notes:

- Outside control limits J-Estimated value

Authorized: Monika Santucci
Date: May 5, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E7046
Samp. Description: 4537F-12 (6")
Units: mg/Kg Dry weight

Collected: 04/23/97 Matrix: Solid
Received: 04/24/97 %Solids: 99.9
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	260.	6010A	04/24/97	04/24/97	042497s1	1	

Notes:

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Windiate Park - Flint, MI
Proj. Desc: 4537 Milton Investigation

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: G2559
Samp. Description: 4537B-1 (2FBG)
Units: mg/Kg Dry weight

Collected: Matrix: Solid
Received: 10/10/97 %Solids: 93.5
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut, Note
Lead	130.	6010A	10/15/97	10/16/97	101597s1	1

Notes:

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Authorized: Monika Santucci
Date: October 17, 1997 Monika Santucci

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**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Windiate Park - Flint, MI
Proj. Desc: 4537 Milton Investigation

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: G2560
Samp. Description: 4537B-2 (2FBG)
Units: mg/Kg Dry weight

Collected: Matrix: Solid
Received: 10/10/97 %Solids: 90.6
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	120.	6010A	10/15/97	10/16/97	101597S1	1	

Notes:

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Authorized: Monika Santucci

Date: October 17, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Windiate Park - Flint, MI
Proj. Desc: 4537 Milton Investigation

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: G2561
Samp. Description: 4537B-3 (2FBG)
Units: mg/Kg Dry weight

Collected: Matrix: Solid
Received: 10/10/97 %Solids: 85.6
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	330.	6010A	10/15/97	10/16/97	101597S1	1	

Notes:

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Authorized: Monika Santucci
Date: October 17, 1997 Monika Santucci

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**Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Windiate Park - Flint, MI
Proj. Desc: 4537 Milton Investigation

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: G2562
Samp. Description: 4537B-4 (2FBG)
Units: mg/Kg Dry weight

Collected: Matrix: Solid
Received: 10/10/97 %Solids: 87.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	1000.	6010A	10/15/97	10/16/97	101597S1	1

Notes:

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Authorized: Monika Santucci

Date: October 17, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Windiate Park - Flint, MI
Proj. Desc: 4537 Milton Investigation

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: G2563
Samp. Description: 4537B-5 (2FBG)
Units: mg/Kg Dry weight

Collected: Matrix: Solid
Received: 10/10/97 %Solids: 88.2
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	240.	6010A	10/15/97	10/16/97	101597S1	1	

Notes:

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: G5860
Samp. Description: 4537F-1C (2')
Units: mg/Kg Dry weight

Collected: 12/04/97 Matrix: Solid
Received: 12/05/97 %Solids: 86.1
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut. Note
Lead	23.	6010A	12/08/97	12/09/97	120897S1	1

Notes:

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: G5861
Samp. Description: 4537F-2C (2')
Units: mg/Kg Dry weight

Collected: 12/04/97 Matrix: Solid
Received: 12/05/97 %Solids: 91.3
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	15.	6010A	12/08/97	12/09/97	120897S1		1

Notes:

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Authorized: Monika Santucci
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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: G5862
Samp. Description: 4537F-3C (2')
Units: mg/Kg Dry weight

Collected: 12/04/97 Matrix: Solid
Received: 12/05/97 %Solids: 89.7
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	50.	6010A	12/08/97	12/09/97	120897S1		1

Notes:

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Authorized: Monika Santucci
Date: December 11, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: G5863
Samp. Description: 4537F-4C (2')
Units: mg/Kg Dry weight

Collected: 12/04/97 Matrix: Solid
Received: 12/05/97 %Solids: 85.7
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	5.	6010A	12/08/97	12/09/97	120897S1	1	

Notes:

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Date: December 11, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: G5864
Samp. Description: 4537F-5C (2')
Units: mg/Kg Dry weight

Collected: 12/04/97 Matrix: Solid
Received: 12/05/97 %Solids: 84.7
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	7.	6010A	12/08/97	12/09/97	120897s1		1

Notes:

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Authorized: Monika Santucci

Date: December 11, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: G5865
Samp. Description: 4537F-6C (2')
Units: mg/Kg Dry weight

Collected: 12/04/97
Received: 12/05/97
Matrix: Solid
%Solids: 90.7
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	60.	6010A	12/08/97	12/09/97	120897s1		1

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: December 11, 1997 Monika Santucci

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: G5866
Samp. Description: 4537F-7C (2')
Units: mg/Kg Dry weight

Collected: 12/04/97
Received: 12/05/97
Matrix: Solid
%Solids: 87.3
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	42.	6010A	12/09/97	12/10/97	120997S1	1	

Notes:

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Authorized: Monika Santucci

Date: December 11, 1997 Monika Santucci

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4543 Milton Drive

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Remediation

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4543 Milton Drive property that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm) and waste fill material with concentrations of lead, arsenic and two semi-volatile organic compounds (SVOCs) (benzo(a)anthracene and benzo(a)pyrene) above respective MDEQ Generic Residential Land Use criteria. In May 1997, the waste fill material identified on the west side of the property which extended from the adjacent easement, was excavated and removed from the property. A description of the remediation activities at the property is as follows:

Prior to excavation activities, the garage, a portion of the concrete driveway, and the fence were removed. Subsurface waste fill material along the west side of the property was then removed. The maximum depth of excavation was approximately 4 feet below grade. The excavated waste fill material was transported to a landfill for disposal.

The areas where waste fill was removed were filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. A new garage was installed, the concrete driveway was repaired and a chain link fence, with an access gate, was installed along the backyard and west side of the property bordering the Park.

Post-Excavation Sampling

The results of the twelve post-excavation samples from the area where waste fill was removed indicated successful removal of this material. The results of the post-excavation sampling were below the MDEQ Generic Residential Land Use criteria, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

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Residential Remediation 4543 Milton Drive, Flint, Michigan Closure Sampling Analytical Data

Waste Fill Excavation Samples

LOCATION	Date Collected		Analytical Parameter	Method	XRF	4543F-1 05/07/97 Floor mg/kg <100	4543F-2 05/07/97 Floor mg/kg <100	4543F-3 05/12/97 Floor mg/kg <100	4543F-4 05/12/97 Floor mg/kg <100	4543F-5 05/12/97 Floor mg/kg <100	4543S-1 05/07/97 Sidewall mg/kg <100	4543S-2 05/07/97 Sidewall mg/kg <100	4543S-3 05/12/97 Sidewall mg/kg <100	4543S-4 05/12/97 Sidewall mg/kg <100	4543S-5 05/12/97 Sidewall mg/kg <100	4543S-6 05/12/97 Sidewall mg/kg <100	4543S-7 05/12/97 Sidewall mg/kg <100	Clean-Up Criteria mg/kg 400
Lead																		

Laboratory Quality Assurance/ Quality Control (QA/QC) Results

LOCATION	Date Collected		Analytical Parameter	Method	4543F-2 05/07/97 Floor mg/kg 7	4543F-5 05/12/97 Floor mg/kg 93	Clean-Up Criteria mg/kg 400
Lead							
Arsenic							
Benzofuran							
Benzofluorene							

Notes:

1. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
2. Sample 4543F-2 and 4543F-5 analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
3. Clean-Up Criteria is MDEQ Generic Residential Direct Contact Value, except Arsenic which is site specific background value for clay.
4. "-" denotes analysis not performed.
5. "<" denotes result below detection limit.
6. mg/kg = parts per million.

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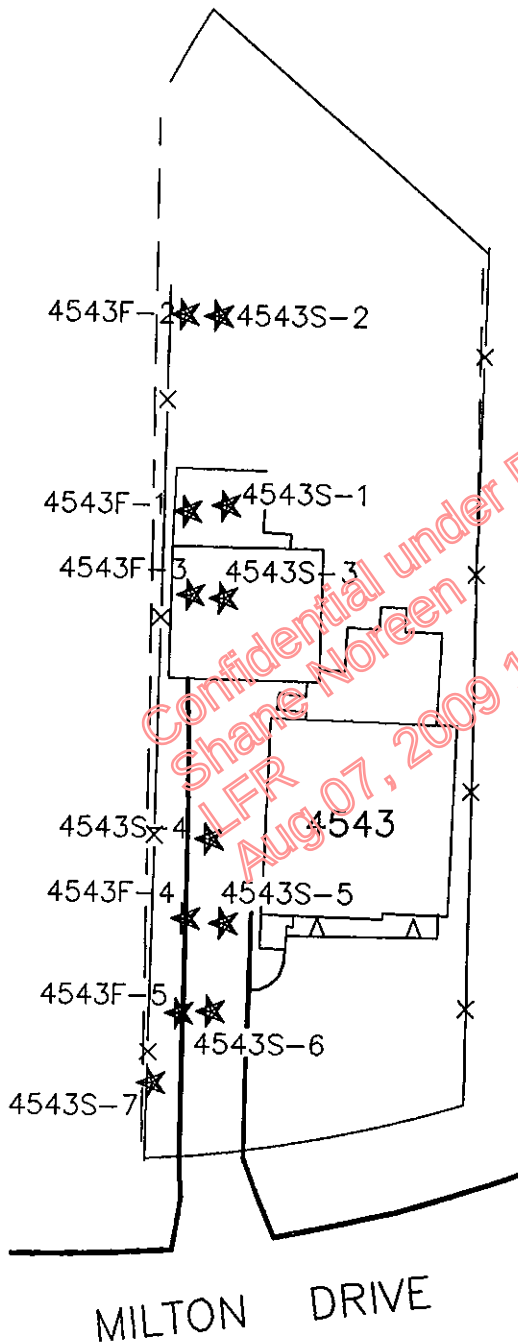
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POST-EXCAVATION SAMPLE LOCATIONS

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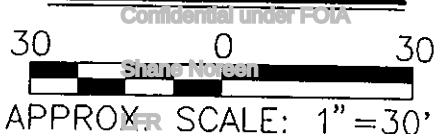
NOTES:

"F" PREFIX DENOTES
FLOOR SAMPLE

"S" PREFIX DENOTES
SIDEWALL SAMPLE

★ CLOSURE SAMPLE
4543F-2 LOCATION

4543 MILTON DRIVE
FLINT, MICHIGAN



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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E8202
Samp. Description: 4543F-2
Units: mg/Kg Dry weight

Collected: 05/07/97
Received: 05/08/97
Matrix: Solid
%Solids: 89.6
Number of analytes: 2

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Arsenic	6.1	6010A	05/08/97	05/08/97	050897S1	1	
Lead	7.	6010A	05/08/97	05/08/97	050897S1	1	

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: May 12, 1997

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**Analytical Results
Method: 8270**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E8202
Samp. Description: 4543F-2
Instrument: HP5970 GC/MS#1
Units: ug/Kg Dry weight
Number of analytes: 5

Collected: 05/07/97
Received: 05/08/97
Prepared: 05/08/97
Matrix: Solid
QC Batch: 050897S2
%Solids: 89.6
Sample Size: 30 g

Parameter	Result	Surrog Limits	Dilution	Analyzed	Notes
Benzo [a] anthracene	<180		1	05/09/97	
Benzo [a] pyrene	<180		1	05/09/97	
Nitrobenzene-d5 (surrogate)	86.6%	43-117	1	05/09/97	
2-Fluorobiphenyl (surrogate)	76.6%	42-121	1	05/09/97	
Terphenyl-d14 (surrogate)	89.6%	47-126	1	05/09/97	

Notes:

- Outside control limits J-Estimated value

Authorized: Monika Santucci
Date: May 9, 1997

Monika Santucci

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**O'Brien & Gere
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**Analytical Results
Wet Chemistry**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E8202
Samp. Description: 4543F-2

Collected: 05/07/97
Received: 05/08/97 07:30

Matrix: Solid

Parameter	Result Units	Method	Prepared	Analyzed	QC Batch	Note
% Total Solids	89.6 %	2540-G		05/08/97	050897S11	

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: May 11, 1997

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan - Windiate Park
Proj. Desc: Residential

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E9184
Samp. Description: 4543F-5
Units: mg/Kg Dry weight

Collected: 05/12/97
Received: 06/02/97
Matrix: Solid
%Solids: 96.4
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	93.	6010A	06/02/97	06/02/97	060297S1	1	

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: June 3, 1997

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4605 Milton Drive**Surface Soil Remediation**

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4605 Milton Drive that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm), in a specific area. In September 1996, GM's environmental contractor excavated and removed the lead impacted surface soil material. A description of the remediation activities at the property is as follows:

A limited area of surface soil impact in the back yard was removed to a depth of 1 foot. The excavated surface soil was transported to a landfill for disposal.

The area where surface soil was removed was filled in with top soil. Sod was then placed over the topsoil.

Surface Soil Post-Excavation Sampling

The results of the analyses were compared to the MDEQ Generic Residential Land Use criterion. In addition, the results of the analyses were statistically evaluated. Each closure sample has a lead concentration below the direct contact value and the 95% Upper Confidence Limit (95% UCL) of the results is also below 400 ppm, indicating that further investigation or remediation is not necessary.

Waste Fill Remediation

In May 1997, during remediation of the adjacent 4543 Milton Drive property, a limited amount of waste fill material was found to extend onto the 4605 Milton Drive property. The waste fill material may contain levels of lead, arsenic and two semivolatile organic compounds (SVOCs) (benzo(a)anthracene and benzo(a) pyrene) above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criteria. The waste fill was removed from 4605 Milton Drive along with the waste fill from 4543 Milton Drive to a depth of approximately 4 feet below grade. A new chain link fence, with an access gate, was installed in the backyard bordering the Park.

Waste Fill Post-Excavation Sampling

The post-excavation samples, located on the 4543 Milton Drive property, were collected in the area where waste fill material was removed. Waste fill material was removed until visually clean, therefore no sidewall samples were collected. However, the post-excavation samples were representative of the entire waste fill excavation across both properties. The results of the post-excavation samples from the area where waste fill was removed indicated successful removal of this material. The results of the post-excavation sampling were below the MDEQ Generic Residential Land Use criteria, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- Figure 1, showing the extent of surface soil excavation and post-excavation sample locations;
- Figure 2, showing the extent of the waste fill excavation;
- A table summarizing analytical results for surface soil, and
- Laboratory analytical data sheets.

Attachments

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**Residential Remediation
4605 Milton Drive, Flint, Michigan
Closure Sampling Analytical Data**

Surface Soil Excavation Sample Laboratory Results														
LOCATION		Date Collected		4605F-1A	4605F-2A	4605F-3A	4605F-4A	4605F-5A	4605F-6A	Clean-Up Criteria				
		Depth		09/27/96	09/27/96	09/27/96	09/27/96	09/27/96	09/27/96					
		Analytical Parameter	Method	Floor	Floor	Floor	Floor	Floor	Floor					
Lead		6010A		150	180	110	39	92	49	mg/kg	400			

Notes:

1. Sample designation with "A" suffix denotes closure sample from surface soil excavation.
2. Sample were analyzed at O'Brien & Gere Laboratories, Syracuse, NY.
3. Clean-Up Criteria for Lead is MDEQ Generic Residential Direct Contact Value.
4. mg/kg = parts per million.

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SURFACE SOIL EXCAVATION LOCATION AND POST-EXCAVATION SAMPLE LOCATIONS

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4605F-2A 4605F-6A
4605F-5A 4605F-3A
4605F-1A 4605F-4A



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NOTES:

"F" PREFIX DENOTES
FLOOR SAMPLE

"A" SUFFIX DENOTES
SURFACE SOIL SAMPLE

★ CLOSURE SAMPLE
LOCATION

4605F-4A

4605

MILTON DRIVE

**4605 MILTON DRIVE
FLINT, MICHIGAN**

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APPROX. SCALE: 1"=30'

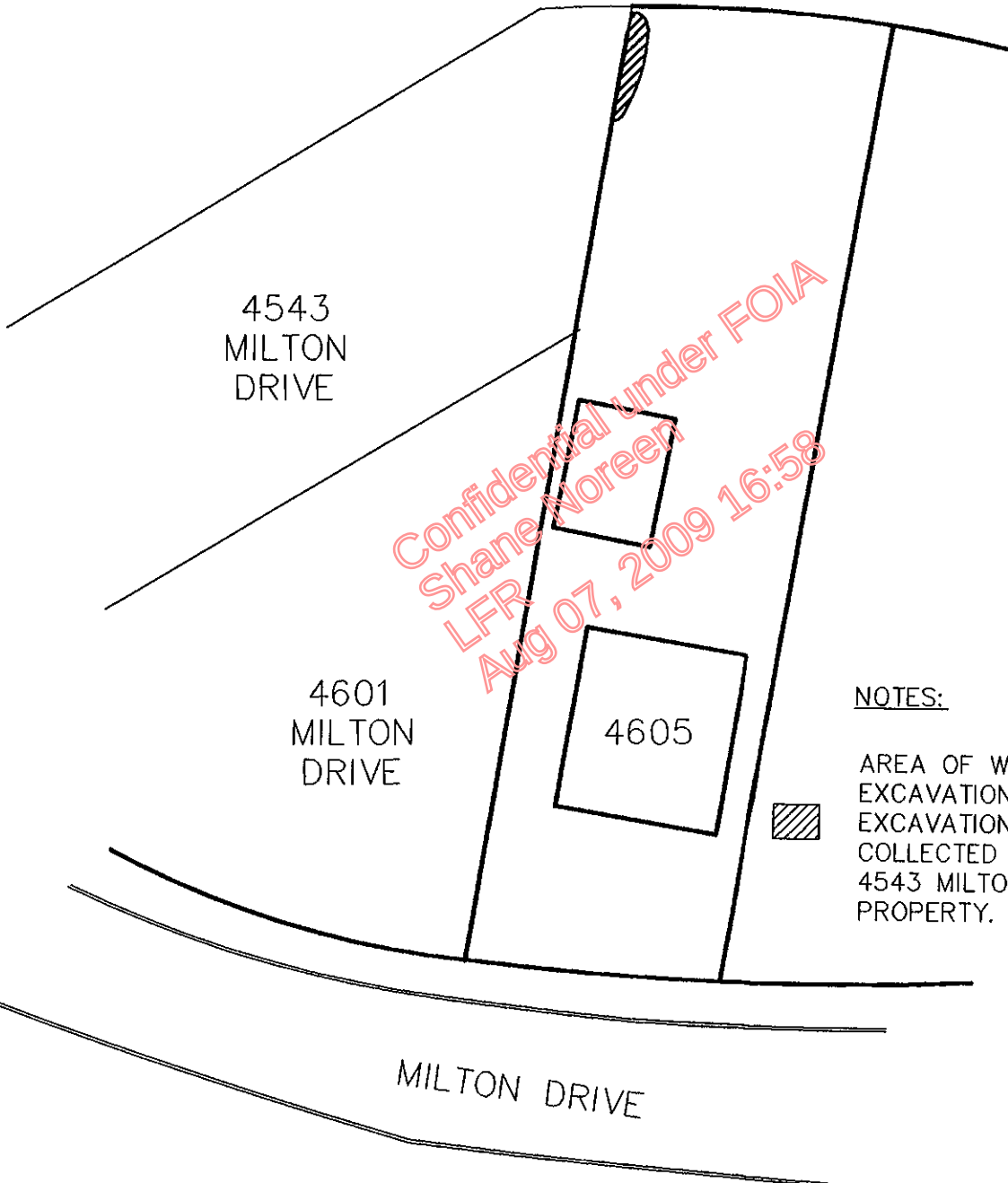
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WASTE FILL EXCAVATION LOCATION

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NOTES:

AREA OF WASTE FILL EXCAVATION. POST-EXCAVATION SAMPLES COLLECTED ON ADJACENT 4543 MILTON DRIVE PROPERTY.

**4605 MILTON DRIVE
FLINT, MICHIGAN**

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APPROX. SCALE: 1"=30'

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Analytical Results Trace Metals

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification No.: 10155R

Sample: B4607
Samp. Description: CS4605-5
Units: mg/Kg

Collected: 09/27/96 Matrix: Solid
Received: 09/28/96

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Note
Lead	92.	6010A	09/28/96	09/29/96	092896S1	

Sample: B4608
Samp. Description: CS4605-6
Units: mg/Kg

Collected: 09/27/96 Matrix: Solid
Received: 09/28/96

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Note
Lead	49.	6010A	09/28/96	09/29/96	092896S1	

Sample: B4609
Samp. Description: CS4605-DUP-1
Units: mg/Kg

Collected: 09/27/96 Matrix: Solid
Received: 09/28/96

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Note
Lead	67.	6010A	09/28/96	09/29/96	091096S1	

Sample: B4610
Samp. Description: CS4605-EB-1
Units: mg/L

Collected: 09/27/96 Matrix: Water
Received: 09/28/96

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Note
Lead	<0.003	6010A	10/02/96	10/03/96	100296W1	

Notes:

Revision of report dated: October 7, 1996.

J-estimated value

Authorized: Monika Santucci

Date: January 10, 1997

Monika Santucci

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O'Brien & Gere Laboratories, Inc.

Analytical Results Trace Metals

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc: Windiate Park Area

Job No.: 6009.004.517
Certification No.: 10155R

Sample: B4603
Samp. Description: CS4605-1
Units: mg/Kg

Collected: 09/27/96 Matrix: Solid
Received: 09/28/96

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Note
Lead	150.	6010A	09/28/96	09/29/96	092896S1	

Sample: B4604
Samp. Description: CS4605-2
Units: mg/Kg

Collected: 09/27/96 Matrix: Solid
Received: 09/28/96

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Note
Lead	180.	6010A	09/28/96	09/29/96	092896S1	

Sample: B4605
Samp. Description: CS4605-3
Units: mg/Kg

Collected: 09/27/96 Matrix: Solid
Received: 09/28/96

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Note
Lead	110.	6010A	09/28/96	09/29/96	091096S1	

Sample: B4606
Samp. Description: CS4605-4
Units: mg/Kg

Collected: 09/27/96 Matrix: Solid
Received: 09/28/96

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Note
Lead	39.	6010A	09/28/96	09/29/96	091096S1	

Notes:

Revision of report dated: October 7, 1996.

J-estimated value

Authorized: Monika Santucci

Date: January 10, 1997

Monika Santucci

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4621 Milton Drive

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Remediation

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4621 Milton Drive that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm), in specific areas. In April 1997, GM's environmental consultant excavated and removed the lead impacted surface soil material. A description of the remediation activities at the property is as follows:

Surface soil in the backyard, northern side yard and front yard, including the area between the road and the sidewalk, in the area of surface soil impact was removed to a depth of 1 foot. The excavated surface soil was transported to a landfill for disposal.

The area where surface soil was removed was filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. Additional landscaping, consisting of installing flower beds and/or bushes, was then completed. A new chain link fence, with an access gate, was installed in the backyard bordering the Park.

Post-Excavation Sampling

The lead content of the eight post-excavation samples from the area where surface soil was removed was below the MDEQ Generic Residential Land Use criterion, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

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Residential Remediation

4621 Milton Drive, Flint, Michigan

Closure Sampling Analytical Data

Surface Soil Excavation Samples

LOCATION	4621F-1A		4621F-2A		4621F-3A		4621F-4A		4621S-1		4621S-2		4621S-3		4621S-4		Clean-Up Criteria	
	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	mg/kg	mg/kg
Analytical Parameter																		
Lead																		

Laboratory Quality Assurance/ Quality Control (QA/QC) Results

LOCATION	4621F-1A		Clean-Up Criteria	
	Date Collected	Depth	Date Collected	Depth
Analytical Parameter				
Lead				

Notes:

1. Sample designation with "A" suffix denotes initial round of closure sample from surface soil excavation (No subsequent rounds were required).
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-1000.
3. Sample 4621F-1A analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria for Lead is MDEQ Generic Residential Direct Contact Value.
5. "z" denotes result below detection limit.
6. mg/kg = parts per million.

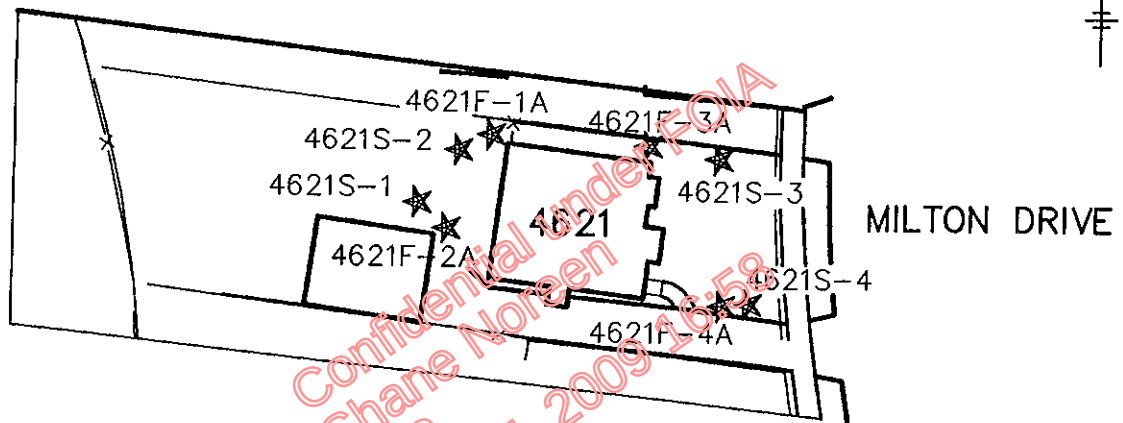
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POST-EXCAVATION SAMPLE LOCATIONS



NOTES:

"F" PREFIX DENOTES
FLOOR SAMPLE

"S" PREFIX DENOTES
SIDEWALL SAMPLE

"A" SUFFIX DENOTES
SURFACE SOIL SAMPLE

★ CLOSURE SAMPLE
4621F-4A LOCATION

**4621 MILTON DRIVE
FLINT, MICHIGAN**

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APPROX. SCALE: 1"=40'
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ENGINEERS, INC.

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E7496
Samp. Description: 4621F-1A
Units: mg/Kg Dry weight

Collected: 04/28/97 Matrix: Solid
Received: 04/29/97 %Solids: 99.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	43.	6010A	04/29/97	04/29/97	042997S1		1

Notes:

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Authorized: Monika Santucci
Date: May 1, 1997 Monika Santucci

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4625 Milton Drive

Remediation

Previous investigation and sampling by GM's environmental consultant identified surface soil at 4625 Milton Drive that contained lead levels above the Michigan Department of Environmental Quality (MDEQ) Generic Residential Land Use criterion, 400 parts per million (ppm), in a specific area. In July 1997, GM's environmental consultant excavated and removed the lead impacted surface soil material. A description of the remediation activities at the property is as follows:

Surface soil in the front yard, including the area between the road and the sidewalk, in the area of surface soil impact was removed to a depth of 1 foot. The excavated surface soil was transported to a landfill for disposal.

The area where surface soil was removed was filled in with clean sand material and a minimum of 6 inches of top soil. Sod was then placed over the topsoil. A new chain link fence, with an access gate, was installed in the backyard bordering the Park.

Post-Excavation Sampling

The lead content of the six post-excavation samples from the area where surface soil was removed was below the MDEQ Generic Residential Land Use criterion, indicating that further investigation or remediation is not necessary.

The following supporting documentation is attached:

- A site plan showing the post-excavation sample locations;
- A table summarizing analytical results, and
- laboratory analytical data sheets.

Attachments

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Residential Remediation

4625 Milton Drive, Flint, Michigan

Closure Sampling Analytical Data

Surface Soil Excavation Samples

LOCATION	4625F-1A		4625F-2A		4625F-3A		4625S-1		4625S-2		4625S-3		Clean-Up Criteria
	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	Date Collected	Depth	
Analytical Parameter													
Lead													

Laboratory Quality Assurance/ Quality Control (QA/QC) Results

LOCATION	4625F-3A		Clean-Up Criteria	
	Date Collected	Depth	Date Collected	Depth
Analytical Parameter				
Lead				

Notes:

1. Sample designation with "A" suffix denotes initial round of closure sample from surface soil excavation (No subsequent rounds were required).
2. Analytical method "XRF" denotes on-site analysis with X-Ray Fluorescence instrument Oxford Model Lab X-100
3. Sample 4625F-3A analyzed for QA/QC purposes at O'Brien & Gere Laboratories, Syracuse, NY.
4. Clean-Up Criteria for Lead is MDEQ Generic Residential Direct Contact Value.
5. "-" denotes analysis not performed.
6. "<" denotes result below detection limit.
7. mg/kg = parts per million.

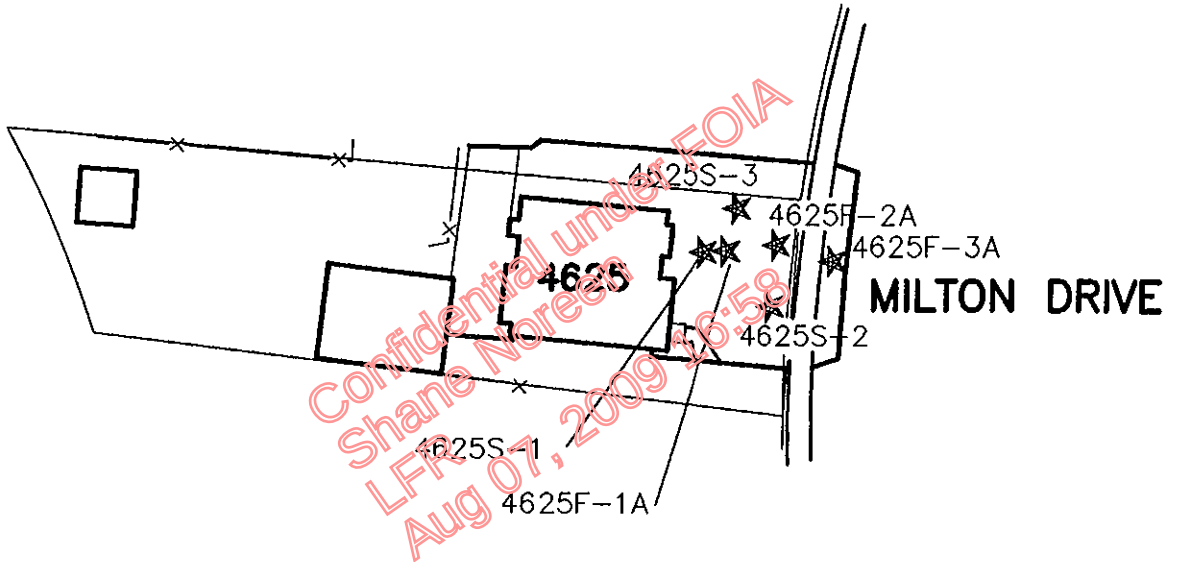
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POST-EXCAVATION SAMPLE LOCATIONS

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NOTES:

"F" PREFIX DENOTES
FLOOR SAMPLE

"S" PREFIX DENOTES
SIDEWALL SAMPLE

"A" SUFFIX DENOTES
SURFACE SOIL SAMPLE

★ CLOSURE SAMPLE
4625F-1A LOCATION

**4625 MILTON DRIVE
FLINT, MICHIGAN**



APPROX. SCALE: 1"=40'

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**O'Brien & Gere
Laboratories, Inc.****Analytical Results
Trace Metals**

Client: General Motors Corporation
Project: Flint, Michigan
Proj. Desc:

Job No.: 6009.004.517
Certification NY No.: 10155R

Sample: E7495
Samp. Description: 4625F-3A
Units: mg/Kg Dry weight

Collected: 04/28/97 Matrix: Solid
Received: 04/29/97 %Solids: 100.0
Number of analytes: 1

Parameter	Result	Method	Prepared	Analyzed	QC Batch	Dilut.	Note
Lead	51.	6010A	04/29/97	04/29/97	042997s1	1	

Notes:

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J-Estimated value

Authorized: Monika Santucci

Date: May 1, 1997

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