REMEDIAL ACTION REPORT
RECOVERY OF BURIED DRUMS
FORMER GENERAL MOTORS
LEEDS ASSEMBLY PLANT
KANSAS CITY, MISSOURI

August 2000

96-620-3-005
GMLEEDS

Burns & McDonnell Engineering Company, Inc.
Engineers-Geologists-Scientists
Kansas City, Missouri

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1.0 INTRODUCTION

On May 18, 1999, several drums were unearthed at the former General Motors Leeds facility located at 6817 Stadium Drive in Kansas City, Missouri. The discovery was made during a sewer extension project conducted by Leeds Industrial (the facility's current owner). Based on available information, the drums are suspected of containing paint waste generated during the assembly of automobiles. General Motors has chosen to voluntarily investigate the extent of buried drums and implement corrective actions as necessary to protect human and ecological receptors. General Motors has completed the following activities and reports:

- Subsurface Investigation – May 25, 1999
- *Subsurface Investigation Report* – July 1999
- *Remedial Action Plan* – July 1999
- Recovery of Buried Drums – December 20, 1999 to December 30, 1999
- Geophysical Survey – January 26, 2000 to January 28, 2000
- Site Restoration – April 25, 2000 to April 28, 2000
- Land Survey – May 15, 2000 to May 18, 2000
- Disposal of Waste Materials – June 5, 2000 to July 27, 2000

This document provides details on activities completed in the vicinity of the drum discovery between December 1999 and July 2000.

1.1 FACILITY HISTORY

More than 8.2 million vehicles were manufactured at the Leeds facility from 1929 to 1988. Activities performed at the Leeds plant by General Motors included:

- Welding of car bodies and component parts
- Assembling automobiles
- Cleaning and preparation of automobiles for priming, painting, and finishing
- Priming, painting, and finishing automobiles

The Leeds facility was indefinitely idled by General Motors in April 1988. General Motors officially announced the plant's closing in October 1990 and offered it for sale. The facility was sold to a group of local investors in 1993. Leeds Industrial currently leases space to approximately 70 industrial tenants. A variety of business activities occur at the facility; however, storage appears to be the principle use of the property.

1.2 LOCATION

The legal description of the Leeds plant is as follows:

Jackson County, Missouri
Section 24, Township 49, Range 33
All South 1/2 of the Northeast 1/4 of Section 24-49-33
Lying South of 37th St., North of Blue River
East of present East line of Missouri Pacific R/W
West of present West line of Kansas City Southern R/W

The facility is located in a mixed industrial, commercial, and residential area. The plant faces north along Stadium Drive. An employee parking lot was located on the north side of the street. Northwest of the site is an industrial area. Railroads border the plant on the east and west sides. Beyond the railroad to the east are parking lots, residences, and commercial properties. West of the western rail line are residences, commercial properties, and industrial facilities. To the southeast of the plant across the Blue River is undeveloped open land with several residences and small businesses. The Blue River forms the southern property boundary.

The drums were discovered in the southwest portion of the facility (see Figure 1). An automobile auction company occupied the area when the drums were discovered; however, the tenant has since moved to an off-site location. The location of the drum discovery and existing infrastructure is presented on Figure 2.

1.3 ORIGIN OF DRUMS

There are no historical records documenting the disposal of drums at the Leeds facility. The drums unearthed were inspected for labels, but corrosion had removed all markings. Visual observations of the unearthed drums however, provided important clues on the drum contents and time of burial.

Based upon available information, the drums were used to store paint waste. Relatively homogeneous layers of red, blue, green, and purple material were observed in the drums. This observation indicates the possibility of paint waste generated during automobile finishing. Metal pigments and solvents contained within older paint are the primary environmental concern.

During the recovery of buried drums, debris was uncovered that included wire, metal banding, bottles, and concrete. Carbon paper and automobile license plates were also discovered with the buried drums. Both items were dated between 1954 and 1955. Records and aerial photographs indicate the asphalt pavement covering the southern portion of the facility was placed prior to 1964 to provide a vehicle staging area for shipping. The area was used continually for new car marshalling and shipping; it is unlikely that General Motors would have disturbed the pavement to bury waste on-site. Therefore, the

general conclusion was drawn that the buried drums and other debris were buried during the late 1950s or early 1960s.

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2.0 SITE CHARACTERISTICS

2.1 LAND USE

The former General Motors Leeds Assembly Plant is located on approximately 115 acres of land with approximately 2.3 million square feet of floor space in the manufacturing plant. The developed portion of the property consists of the main manufacturing building (where all manufacturing activities were conducted), a car shipping building, a wastewater treatment plant, a powerhouse, the caustic building, the paint mix building, and a drum storage area. A security fence encloses the facility and nearly all of the area is paved with concrete or asphalt.

The land surrounding and encompassing the facility is currently zoned M2, Heavy Industrial Use. Zoning is not expected to change significantly in the future; therefore, the industrial nature of the land use is likely to remain unchanged. Additionally, the former Leeds facility is located in the 100-yr floodplain, which limits potential future land uses. For these reasons, it is anticipated that the future land use will remain industrial.

2.2 GEOLOGY

The Leeds facility is located within the alluvial valley of the Blue River. Asphalt pavement, approximately 4-inches in depth, covers the southern portion of the facility. Artificial fill mixed with native materials is present from the pavement subbase to approximately 8 to 12 feet below grade. The native soil underlying the fill consists predominantly of fine-grained alluvial materials such as silty clay, clayey silt, and fine sand. The hydraulic conductivity of the alluvial materials generally ranges from 10^{-4} to 10^{-8} cm/sec. Geologic information on the Blue River valley indicates that alluvial soil extends to depths of 50 to 60 feet below grade. The fine-grained soils are generally underlain by a layer of course-grained clayey gravel and shale bedrock of the Pennsylvanian Pleasanton Group.

2.3 HYDROLOGY

The piezometric surface was not encountered during investigation or corrective action activities. Historic records and information on the Blue River Valley were used to estimate the site's hydrogeology. The piezometric surface is estimated to be approximately 15 feet below grade. The piezometric groundwater surface elevations are generally lowest during the winter and early spring and highest during the summer and fall. The seasonal groundwater fluctuations correspond positively with periods of low and high precipitation and river stages.

During normal to below normal river stage, groundwater flow is generally toward the Blue River. During periods of heavy precipitation and high water levels within the Blue River channel, the hydraulic gradient may be temporarily reversed causing groundwater to flow away from the Blue River. These periods of flow reversal are probably of short duration.

The Pennsylvanian Pleasanton Group bedrock is considered an aquitard throughout much of western Missouri. The facility lies within the bedrock groundwater province referred to as the Saline Groundwater Province. Paleozoic (Pennsylvanian to Cambrian) bedrock aquifers beneath the Kansas City area contain groundwater with total dissolved solid (TDS) levels that exceed 20,000 parts per million (ppm) and are not usable for potable supply. The potential for hydraulic interconnection occurring between the floodplain alluvial aquifer and the underlying Paleozoic aquifers is believed to be minimal.

* * * * *

3.0 DRUM RECOVERY ACTIVITIES

3.1 OBJECTIVE

General Motors is committed to protecting human and ecological receptors. The initial remedial action proposed by General Motors was to recover buried drums and contaminated materials near the May 1999 discovery. During drum recovery activities, it became obvious that the horizontal and vertical limits of buried drums were greater than originally estimated. In addition, analytical results indicate that most buried materials do not have toxicity levels exceeding those defined in 40 CFR 261.24. The discovery that buried drums occupy a much larger area than initially estimated and the low level of leachable contaminants made excavation less desirable and on-site management more attractive.

3.2 APPLICABLE REGULATIONS

General Motors voluntarily initiated corrective action to address the buried drum discovery. Neither CERCLA nor RCRA corrective action currently applies to the drum discovery. However, the Missouri Department of Natural Resources' (MDNR) Hazardous Waste Program has provided regulatory oversight during the project and corrective action cleanup goals were established using TCLP values from 40 CFR 261.24 and Missouri's Voluntary Cleanup Program (10 CAR 25-15.010).

3.3 LIMITS OF DRUM RECOVERY

Based upon the May 25, 1999 subsurface investigation, artificial fill containing debris was estimated to extend north and east of the drum discovery area. However, no drums or contamination were detected during the investigation. Therefore, the drums were assumed to be limited to a relatively small area. The area designated for corrective action was 40 feet square and 12 feet deep.

Burns & McDonnell, on behalf of General Motors, initiated the excavation of buried drums on December 20, 1999. Approximately 1,400 cubic yards of soil and debris were excavated during the project. The footprint of the final excavation was approximately 300 square yards (see Figure 2). Depth of the excavation ranged from 15 to 20 feet below grade. The bulk of materials recovered during the project were excavated in 1999.

Drums and drum fragments were observed in a visually distinct lift of debris approximately 12 feet thick. Based upon field observations, the materials were compacted upon an incline (see Figure 2). In the western portion of the excavation, drums and debris were found directly under the pavement. The top of the lift was over fifteen feet below grade in the eastern portion of the excavation. The lift of debris and drums dipped to the east and the vertical limits were not defined within the excavation.

Recovery of buried drums was suspended when it became obvious that the drums were not limited to a relatively small area. The western limit of the debris was defined in the excavation; however, debris and drums extended for an unknown distance to the north, south, and east. In January 2000, Burns &

McDonnell conducted a geophysical survey to assess the horizontal limits of metal-containing debris. Results of the survey are presented in Section 7.0 and Appendix A.

3.4 MATERIALS RECOVERED

Drums recovered from the excavation were corroded, crushed, or broken apart. Most of the drums that were recovered intact were empty and crushed. Drums containing paint waste had been broken apart during placement making it impossible to segregate materials within the lift of debris. Based upon field observations, drums and their contents made up less than 10 percent of materials contained in the 12-foot lift of debris. Soil excavated above and below the lift was free of drums and debris except for occasional pieces of concrete.

Two horizontal layers of distinct green and red material were observed in the eastern portion of the excavation. The green layer was observed approximately 7 feet below grade and was 24 inches thick. The layer of red material was directly under the green layer and was approximately 24 inches thick. The layers were observed in the east wall of the excavation; however, they were not observed in the west wall.

The groundwater table was not encountered during drum recovery activities. This observation was anticipated because excavation activities were conducted when the groundwater surface is typically lowest (winter and early spring). However, perched groundwater was observed in portions of the excavation. The water was primarily found in voids created by pieces of debris. The free liquid accumulated in low spots of the excavation and was typically absorbed by surrounding soil within 24 hours.

3.5 SEGREGATION AND STOCKPILING OF MATERIALS

Excavated materials were segregated and placed into separate stockpiles based on the potential for contamination. Asphalt pavement and overburden were assumed to have a low probability of contamination. Soil and debris surrounding buried drums were assumed to be contaminated and were stockpiled accordingly.

Approximately 400 cubic yards of overburden were segregated as 'clean' based upon visual observations and photo-ionization detector (PID) readings. Contaminant concentrations in soil samples collected from the segregated stockpile did not exceed Cleanup Levels for Missouri (CALM); therefore the material was used to backfill the excavation. The first 400 cubic yards of backfill placed and compacted in the excavation during site restoration consisted of segregated materials. Approximately 84 tons of asphalt were segregated and transported off-site for recycling at Superior Asphalt Recycling of Kansas City, Missouri.

Materials suspected of containing contaminants of concern were temporarily stockpiled on-site until they were transported off-site for disposal. Plastic sheeting was placed under and over the stockpiles of

potentially contaminated materials to minimize wind and water erosion. In addition, orange barricade fence was placed around the stockpiles to minimize unauthorized access.

* * * * *

4.0 ENVIRONMENTAL SAMPLING

Burns & McDonnell collected thirteen soil samples during the project to evaluate the magnitude and extent of contamination at the drum discovery area. The soil samples were collected using a decontaminated sampling trowel. Field personnel wore new gloves and change them between sample locations. All samples from the excavation were collected from an excavator bucket because the excavation was unsafe for human entry.

Samples collected by Burns & McDonnell were analyzed by American Technical & Analytical Services (ATAS) of Maryland Heights, Missouri. In addition, MDNR collected five split samples for independent analysis. The analytical results provided by both ATAS and MDNR are evaluated in this section of the report and complete laboratory reports are provided in Appendix B and C.

4.1 RECOVERED MATERIALS

On December 30, 1999, samples were collected from three visually unique materials encountered during the excavation activities. These materials included paint, a green material, and a red layer of material. The objective of the sampling activity was to identify contaminants of concern.

The contents of a buried drum containing paint was sampled and submitted for laboratory analysis. The sample was analyzed for volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Method 8260; the Eight RCRA metals using USEPA Methods 6010 and 7471; and for semi-volatile organic compounds (SVOCs) using USEPA Method 8270. Barium, cadmium, and chromium were detected in the paint sample above TCLP values multiplied by twenty (20 X TCLP) but below CALM values. Lead concentrations exceeded both 20 X TCLP and CALM values. Volatile and semi-volatile compounds did not have concentrations above applicable clean-up standards.

Distinct layers of green and red material were observed in the excavation approximately 7 feet below grade. Volatile organic compounds were not detected in the field using a PID; therefore, the samples were only analyzed for metals. The green material is suspected to be a zinc phosphate undercoating for automobiles based upon visual observations and was analyzed for the Eight RCRA metals, manganese, and zinc using USEPA Methods 6010 and 7471. The red material underlying the green materials was of unknown origin and may be naturally occurring. A sample of the red material was collected for laboratory analysis for the Eight RCRA metals using USEPA Methods 6010 and 7471. Neither the red or green materials had metals concentrations exceeding 20 X TCLP or CALM values.

Analytical results for the three samples are summarized in Table 1.

4.2 STOCKPILE OF SEGRAGATED MATERIAL

Four soil samples were collected from the 400 cubic yard stockpile of segregated materials suspected of being "clean" to determine if the material was suitable for backfill. Sampling locations were selected by visibly examining the stockpile and taking PID readings. The outermost foot of soil was removed to expose selected sampling points.

The samples were analyzed for total petroleum hydrocarbons (TPH) using SW Method M8015; pH using USEPA Method 150.1; VOCs using USEPA Method 8260; the Eight RCRA metals using USEPA Methods 6010 and 7471; and SVOCs using USEPA Method 8270. Based upon analytical results the materials were not impacted with contaminants and the stockpile was used to backfill the excavation.

Analytical results for the four samples collected from the stockpile are summarized in Table 2.

4.3 SPLIT SAMPLES WITH MDNR

MDNR and Burns & McDonnell collected samples from the excavation on January 17, 2000. The objective of the sampling event was to document the magnitude of contamination left-in-place prior to backfilling the excavation. Burns & McDonnell and MDNR split five samples from the four corners of the excavation and the southern trench. The four samples collected from the excavation were primarily soil; the sample from the trench was a unique greenish material contained within a recovered drum. In addition, Burns & McDonnell collected a soil sample from the trench. All samples were collected from the bottom of the excavation; approximately 15 feet below grade.

The samples were analyzed for total petroleum hydrocarbons (TPH) using SW Method M8015; pH using USEPA Method 150.1; VOCs using USEPA Method 8260; the Eight RCRA metals using USEPA Methods 6010 and 7471; and SVOCs using USEPA Method 8270. Samples having contaminant concentrations exceeding 20 X TCLP values were also analyzed for leachable contaminants.

Contaminant concentrations did not exceed 20 X TCLP or CALM values in samples collected from the western corners of the excavation. In the eastern corners, benzo (a) pyrene was detected above CALM values but all other contaminant concentrations were below applicable cleanup levels.

Burns & McDonnell and MDNR collected samples from a unique greenish material contained within a drum recovered from the southern trench. The samples had metals and VOC concentrations that exceeded 20 X TCLP and CALM values; therefore, the samples were run through TCLP and reanalyzed for leachable contaminants. Leachable lead and benzene concentrations exceed values in 40 CFR 261.24; therefore, the material was classified as a characteristic hazardous waste. Total extractable hydrocarbons were also detected; however, the detections did not match referenced hydrocarbon standards and were classified as "miscellaneous." The hydrocarbon detections are suspected to be interferences from volatile

and semi-volatile compounds detected in the sample. The material was segregated and profiled for off-site disposal.

Burns & McDonnell collected a soil sample from the trench near where the drum of unique greenish material was encountered. The concentration of lead exceeded 20 X TCLP; however, leachable concentrations of lead did not exceed values in 40 CFR 261.24.

Analytical results for samples collected on January 17, 2000 are summarized in Tables 3, 4, and 5.

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5.0 SITE RESTORATION

The site was restored to the condition existing prior to the drum discovery. Soil and debris with contaminant concentrations not exceeding CALM levels were returned to the excavation as backfill. Additional backfill was imported from off-site and compacted to restore the site to its original grade. Contaminated materials were transported off-site for disposal. At the conclusion of the project, the asphalt pavement was replaced to match existing pavement. Site restoration activities are documented in the following paragraphs.

5.1 BACKFILLING

After MDNR and Burns & McDonnell collected samples from the excavation and trench, the excavation was backfilled with excavated materials having contaminant concentrations below CALM and loess imported from an off-site borrow pit. Materials were compacted with a vibrating sheeps-foot compactor within the excavation and trench. Density measurements by Terracon of Lenexa, Kansas and field observations indicate that compaction requirements were achieved (see Appendix D). However, some settlement may occur because failing sidewalls were not reconsolidated and the bottom of the excavation could not be safely compacted. Pavement was not replaced for approximately two months to allow for settlement of the backfill materials.

5.2 PAVEMENT REPLACEMENT

The drum recovery activities disturbed approximately 840 square yards of pavement. During the week of June 19, 2000, the asphalt pavement disturbed by the excavation activities was restored. The restored pavement profile consists of 24 inches of crushed aggregate and 4 inches of asphalt pavement. The pavement was installed by Wil-Pav of Independence, Missouri.

5.3 SITE CLEANING

During the project, Double Check collected soil and debris on a daily basis that was tracked outside the stockpile area or excavation. At the conclusion of the project, the entire area was cleaned with a street sweeper. Soil and debris collected during site cleaning activities were stockpiled and disposed of by Safety Kleen Services (SK Services). No residual soil or debris associated with the excavation was observed during a final inspection of the site.

5.4 EQUIPMENT DECONTAMINATION

Portions of equipment that came in contact with contaminated soil were decontaminated. Visible dirt was first removed from the equipment by hand and placed in appropriate stockpiles. The equipment was power washed to remove residual contaminants before exiting the barricaded area. The wash water was containerized in drums and sampled for disposal. Soil collected during equipment decontamination activities was stockpiled and disposed of by SK Services.

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6.0 WASTE DISPOSAL

General Motors retained SK Services to transport and dispose of impacted materials in compliance with applicable local, state, and federal regulations. Materials stored on-site and those excavated during remedial actions were characterized for off-site disposal. Materials having contaminant concentrations below CALM guidelines were used as backfill on-site. Contaminated materials were transported to SK Services's Lone Mountain Facility in Waynoka, Oklahoma or Aragonite Facility in Aragonite, Utah for disposal.

6.1 WASTE PROFILING

Waste materials were sampled to determine their hazard classification for disposal. Sample frequency and analytical parameters were specified by the Lone Mountain Facility. A sample of red paint waste was submitted to SK Services to profile the stockpile containing drum fragments, paint waste, debris, and soil. Based upon analytical results and the waste material characteristics, SK Services and General Motors determined that the stockpiled materials were acceptable for landfill disposal under a non-hazardous classification. The Notification of Waste Acceptance is provided in Appendix E.

The contents of the drum discussed in Section 4.3 was segregated, placed in a new drum, and profiled separately from the stockpiled soil and debris. The material was classified as a characteristic hazardous material based upon leachable lead and benzene concentrations. The Notification of Waste Acceptance is provided in Appendix E.

6.2 DISPOSAL OF NON-HAZARDOUS MATERIALS

SK Services loaded, transported, and disposed of approximately 1,520 tons of non-hazardous materials associated with this project. The materials were transported to the Lone Mountain Facility (RCRA Subtitle C facility) for disposal. Materials were transported off-site between June 5, 2000 and July 27, 2000. An example Bill of Lading used to transport the materials and a truck log are provided in Appendix E.

6.3 DISPOSAL OF HAZARDOUS MATERIALS

SK Services loaded, transported, and disposed of a drum of hazardous materials associated with this project. The drum was transported to the Aragonite Facility (RCRA Subtitle C facility) for incineration. The drum was transported off-site on July 27, 2000. A copy of the waste manifest is provided in Appendix E.

6.4 DISPOSAL OF FREE LIQUIDS

Six drums of free liquids were generated during the decontamination of sampling and construction equipment. No surface water or groundwater was collected or encountered during excavation activities. One composite sample was collected for analysis according to the City of Kansas City, Missouri (City)

guidelines. Analytical results of the testing were submitted to the City for review. If the groundwater meets the City's Publicly Owned Treatment Works (POTW) acceptance levels, it will be discharged to the POTW upon City approval. If the groundwater is contaminated above POTW acceptance levels, it will be transported and disposed of at an appropriate off-site disposal facility.

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7.0 SITE SURVEYS

7.1 GEOPHYSICAL SURVEY

MidWest Geomar Geophysics of Frankfort, Illinois completed a geophysical survey of the drum discovery area during the week of January 24, 2000. The objective of the survey was to define the horizontal limits of metal containing debris. Two pieces of equipment were utilized to increase the accuracy of the field screening. The equipment included a Geometrics 858-G Magnetometer-Gradiometer and electromagnetic Geonics EM-61. A detailed report of the survey is provided in Appendix A.

Buried metal debris appears to extend east and south of the drum discovery area (see Figure 3). The buried debris does not appear to extend north or west of the excavation, but it does appear to extend eastward beyond the Jack Cooper Marshalling Yard. The area east of the yard was not surveyed because parked vehicles would have interfered with geophysical equipment performance.

The geophysical survey is a field screening technique that can not definitively distinguish between drums and other metallic objects. Therefore, survey results presented in the report prepared by MidWest Geomar Geophysics should not be used to define the limits of buried drums. However, based upon field observations during excavation activities, it is probable that drums are associated with the anomalous readings obtained by the geophysical survey. The survey information is useful in focusing future investigations in areas that have the greatest potential of impact by waste materials associated with buried drums.

7.2 LAND SURVEY

At the request of MDNR, a land survey was completed to locate surface features and define topography within the Jack Cooper Marshalling Yard. Anderson Survey Company of Lee's Summit Missouri completed the survey in May 2000. Based upon surface features, the drum discovery area drains to a ravine located west of the site. There is approximately 30 feet of relief between the pavement surface at the drum discovery area and the bottom of the ravine. Surface water draining though the ravine flows southward to the Blue River. Surface features and site topography are shown on Figure 4.

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8.0 RECOMMENDATIONS

Based upon field observations and the geophysical survey, the horizontal limit of buried metallic debris is greater than initially anticipated. Excavation and off-site disposal of the debris is not economically desirable if the materials do not pose a risk to human and ecological receptors. Burns & McDonnell recommends that additional investigation be conducted to assess contaminant migration pathways and potential receptors. Based upon results of the investigation, the necessity and feasibility of final corrective actions can be assessed.

8.1 ADDITIONAL INVESTIGATION

Receptor contact with the metallic debris is not anticipated because the property is covered with pavement. In addition, institutional controls can be developed that would limit the future disturbance of pavement and specify methods for handling materials excavated during infrastructure development projects. Therefore, the initial investigation will focus on groundwater and not materials in the vadose zone. If groundwater contamination is detected and an active source of contaminants is suspected, a focused investigation of the vadose zone would be completed.

Burns & McDonnell recommends collecting groundwater samples between the metal containing debris detected by the geophysical survey and the Blue River. Samples collected would be analyzed for TPH, dissolved metals, VOCs, and SVOCs. If groundwater contamination is detected, additional samples would be collected using soil probes or wells to define the limits of impact. Specific details of the investigation will be provided in a Workplan. The Workplan will be submitted to General Motors and MDNR for approval before initiating the investigation.

8.2 ASSESSMENT OF RISK

Burns & McDonnell recommends conducting an assessment of risk if groundwater contamination is detected. The risk assessment would use investigation results to develop a Waste Management Plan that is protective of receptors, technically feasible, and economically justifiable. The objective would be to develop site-specific cleanup goals and implement corrective actions as necessary to protect both on-site and off-site human and ecological receptors. If necessary, corrective action could include institutional controls or remedial efforts that reduce the toxicity, mobility, or volume of wastes.

* * * * *

FIGURES

PLOT CONFIG: hpbsc for hp 1120c plotter

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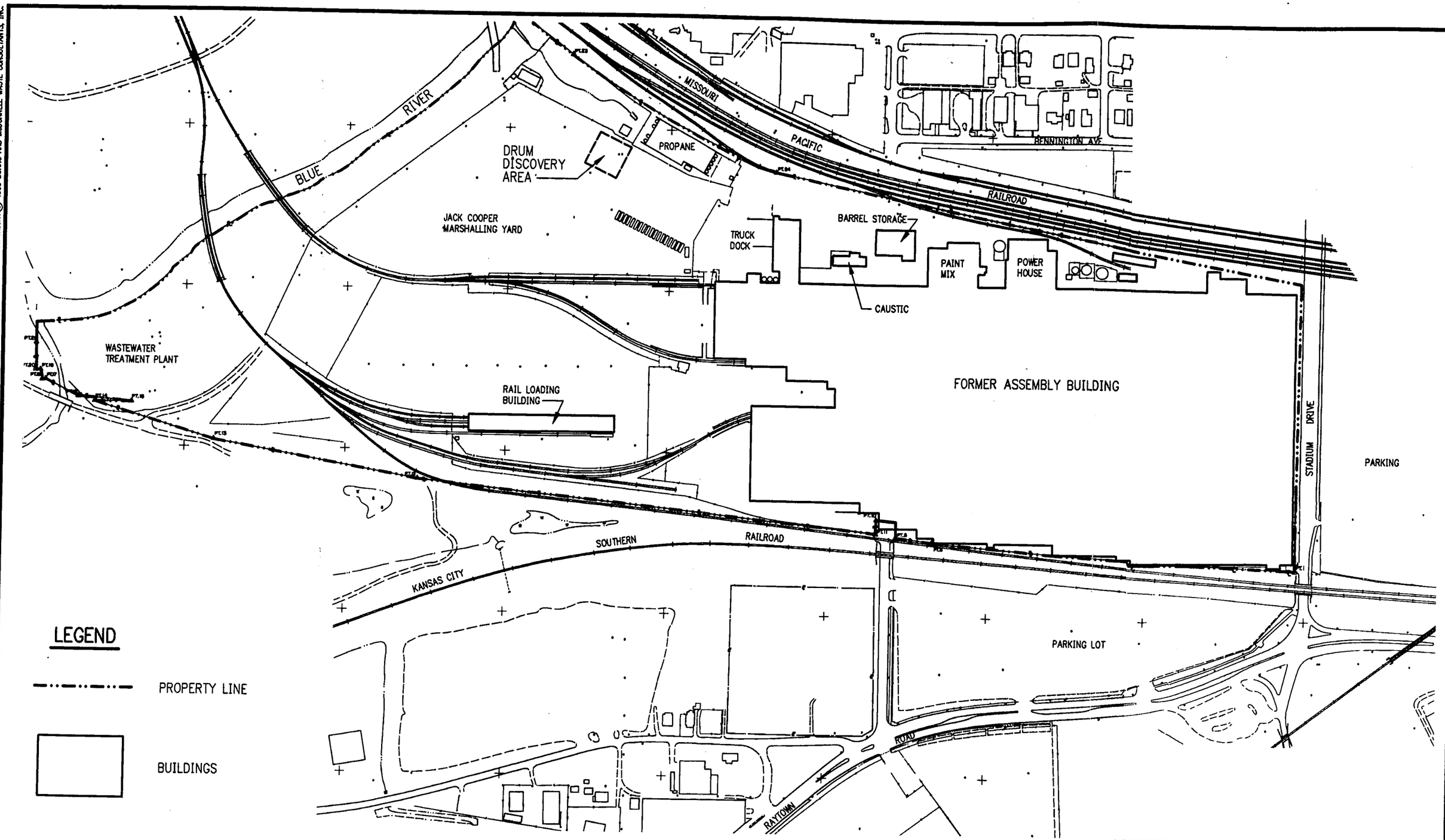


LEGEND

PROPERTY LINE

BUILDINGS

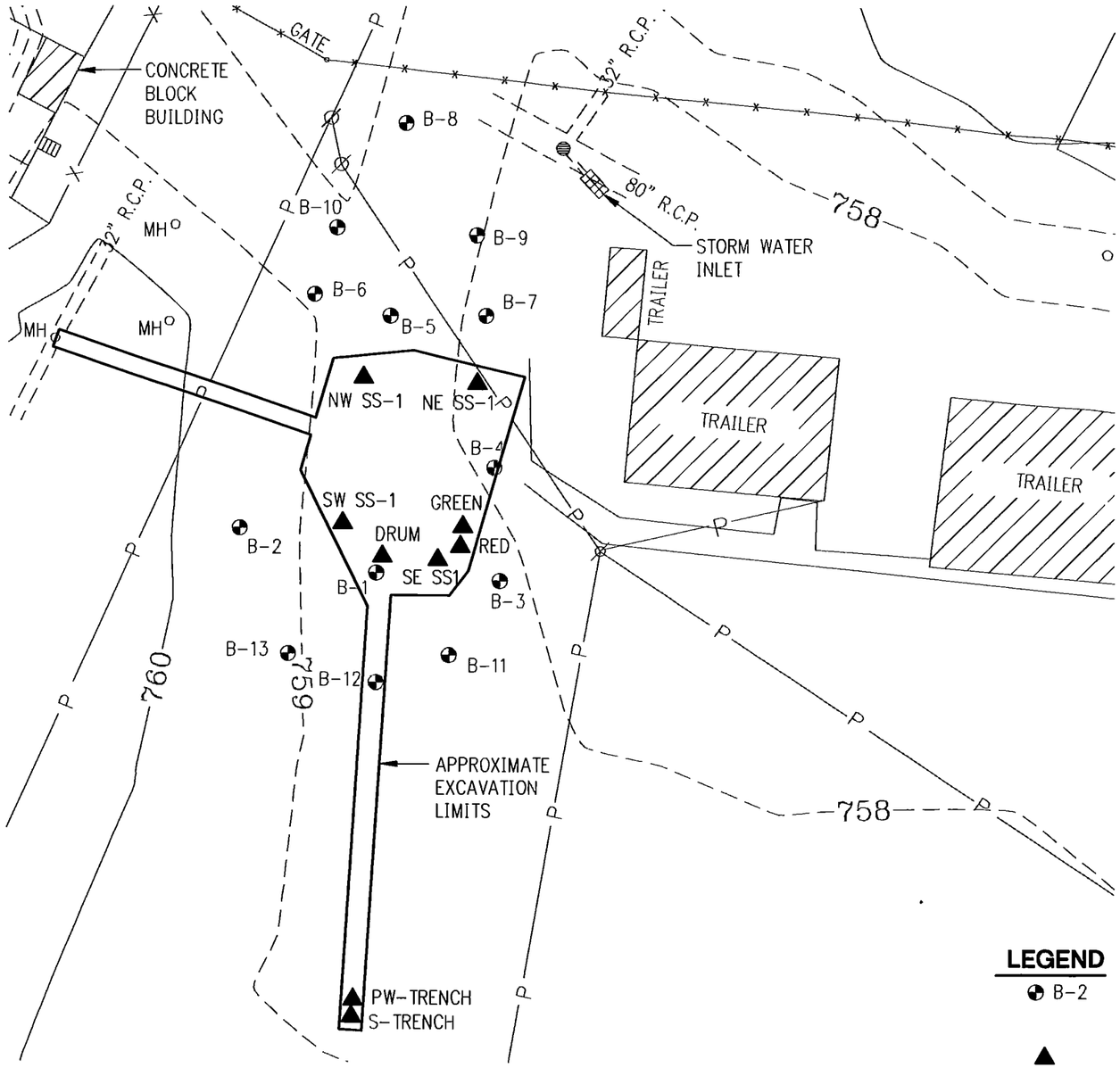
NORTH

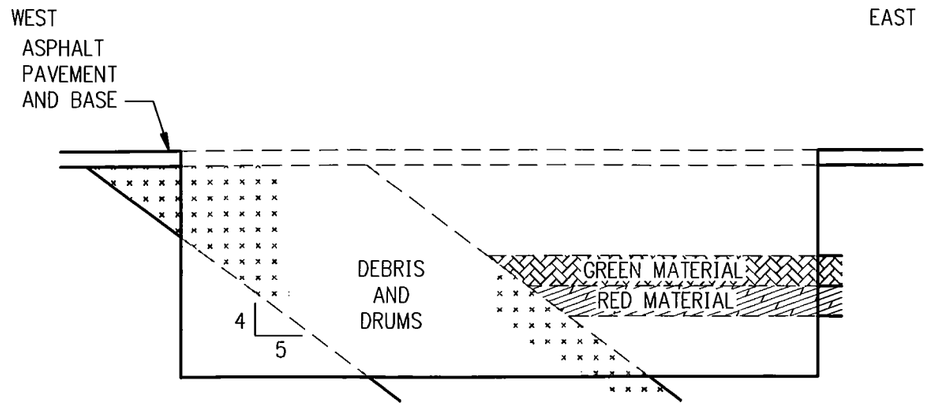
APPROXIMATE SCALE: 1" = 280'

Burns & McDonnell Waste Consultants, Inc.

Figure 1

SITE LOCATION MAP
FORMER GM LEEDS PLANT
KANSAS CITY, MISSOURI





VERTICAL PLACEMENT OF DEBRIS IN EXCAVATION

DRUM RECOVERY EXCAVATION

30 0 30 60

SCALE IN FEET

NORTH

LEGEND

B-2	SOIL BORING ADVANCED IN MAY, 1999 INVESTIGATION
▲	GRAB SAMPLE (COLLECTED APPROXIMATELY 15' BELOW GRADE)
MH	MANHOLE
⌀	POWER POLE
P	OVERHEAD POWER LINE
× × ×	FENCE
760	EXISTING GRADE 10 FOOT CONTOUR
758	EXISTING GRADE 1 FOOT CONTOUR

Burns & McDonnell SINCE 1898

Figure 2

DRUM DISCOVERY AREA
FORMER GM LEEDS PLANT
KANSAS CITY, MISSOURI

K:\GMLEEDS\ACAD\2000\gm120sam.dwg 05-28-2000 08:18 TDC

TABLES

Table 1
Material Analytical Summary
Drum Excavation
Former GM Leeds Assembly Plant
Kansas City, Missouri

Sample ID:		GREEN	RED	DRUM	20 X TCLP	Cleanup Levels for Missouri (CALM)**
Sample Date:		12/30/99	12/30/99	12/30/99		
Laboratory Number:		28625.01	28625.02	28625.03		
Parameter	Units					
Total Extractable Hydrocarbons (SW Method M8015)						
Gasoline	mg/kg	NA	NA	NA	NA	500 (TPH)
Mineral Spirits	mg/kg	NA	NA	NA	NA	500 (TPH)
Kerosene	mg/kg	NA	NA	NA	NA	500 (TPH)
Diesel	mg/kg	NA	NA	NA	NA	500 (TPH)
#6 Fuel Oil	mg/kg	NA	NA	NA	NA	500 (TPH)
Hydraulic Fluid	mg/kg	NA	NA	NA	NA	500 (TPH)
Motor Oil	mg/kg	NA	NA	NA	NA	500 (TPH)
Miscellaneous	mg/kg	NA	NA	NA	NA	500 (TPH)
pH (USEPA Method 150.1)						
pH	S.U	NA	NA	NA	NA	NA
Metals (SW Method 6010/7471)						
Arsenic	mg/kg	3.13	2.8	8.36	100	11
Barium	mg/kg	236	251	3090	2,000	3,930
Cadmium	mg/kg	0.3 *U*	0.3 *U*	21.9	20	120
Chromium	mg/kg	24.2	29.2	566	100	1,800
Lead	mg/kg	12.8* *U*	14.1* *U*	682	100	660
Silver	mg/kg	0.3 *U*	0.3 *U*	0.3 *U*	100	490
Selenium	mg/kg	2.6 *U*	2.8 *U*	3.19	20	420
Mercury	mg/kg	0.3 *U*	0.3 *U*	0.3 *U*	4	96
Manganese	mg/kg	151	NA	NA	NA	7,160
Zinc	mg/kg	45.6	NA	NA	NA	53,000
Volatile Organic Compounds (USEPA Method 8060)						
Xylene (Total)	mg/kg	NA	NA	4.500 *J*	NA	1,510
Acetone	mg/kg	NA	NA	10.000 *U*	NA	3,780
Methylene Chloride	mg/kg	NA	NA	2.500 *J*	NA	71
2-Butanone	mg/kg	NA	NA	10.000 *U*	4000	NA
Benzene	mg/kg	NA	NA	5.000 *U*	10	11
4-Methyl-2-Pentanone	mg/kg	NA	NA	10.000 *U*	NA	NA
Toluene	mg/kg	NA	NA	5.000 *U*	NA	890
Ethylbenzene	mg/kg	NA	NA	2.300 *J*	NA	1,460
Isopropylbenzene	mg/kg	NA	NA	9.000	NA	NA
n-Propylbenzene	mg/kg	NA	NA	58.000	NA	NA
1,3,5-Trimethylbenzene	mg/kg	NA	NA	6.800 *J*	NA	NA
1,2,4-Trimethylbenzene	mg/kg	NA	NA	23.000	NA	NA
sec-Butylbenzene	mg/kg	NA	NA	16.000	NA	NA
p-Isopropyltoluene	mg/kg	NA	NA	5.000 *U*	NA	NA
n-Butylbenzene	mg/kg	NA	NA	32.000	NA	NA
Naphthalene	mg/kg	NA	NA	2.600 *J*	NA	1,350
Semi-Volatile Organic Compounds (USEPA Method 8270)						
Benzoic Acid	mg/kg	NA	NA	12.000 *U*	NA	NA
Naphthalene	mg/kg	NA	NA	5.000 *U*	NA	1,350
2-Methylnaphthalene	mg/kg	NA	NA	55.100	NA	NA
Acenaphthylene	mg/kg	NA	NA	3.200 *J*	NA	NA
Acenaphthene	mg/kg	NA	NA	5.000 *U*	NA	5,900
Dibenzofuran	mg/kg	NA	NA	5.000 *U*	NA	NA
Fluorene	mg/kg	NA	NA	4.300 *J*	NA	3,900
Phenanthrene	mg/kg	NA	NA	9.700	NA	NA
Anthracene	mg/kg	NA	NA	1.600 *J*	NA	29,500
Di-n-butylphthalate	mg/kg	NA	NA	11.000	NA	NA
Fluoranthene	mg/kg	NA	NA	2.600 *J*	NA	830
Pyrene	mg/kg	NA	NA	2.500 *J*	NA	2,950
Butylbenzylphthalate	mg/kg	NA	NA	5.000 *U*	NA	930
Bis (2-ethylhexyl) phthalate	mg/kg	NA	NA	28.000	NA	200
Benzo (a) anthracene	mg/kg	NA	NA	0.800 *J*	NA	NA
Chrysene	mg/kg	NA	NA	1.300 *J*	NA	52
Di-n-octylphthalate	mg/kg	NA	NA	1.100 *J*	NA	NA
Benzo (b) fluoranthene	mg/kg	NA	NA	0.720 *J*	NA	1.4
Benzo (k) fluoranthene	mg/kg	NA	NA	0.610 *J*	NA	11.5
Benzo (a) pyrene	mg/kg	NA	NA	0.850 *J*	NA	0.23
Dibenzo(a,h)anthracene	mg/kg	NA	NA	5.000 *U*	NA	0.21
Indeno(1,2,3-cd)pyrene	mg/kg	NA	NA	5.000 *U*	NA	4.20
Benzo(g,h,i)Perylene	mg/kg	NA	NA	5.000 *U*	NA	NA

mg/kg - Milligrams per kilogram
U - Not detected at or above method detection limit
NA - Not analyzed or applicable
B - Analyte detected in method blank
J - Estimated value; below reporting limit
* - Diluted due to interference
Exceeds 20 X TCLP levels and/or CALM levels

** Using Tier 1 Standards, Exposure Scenario B

Note: Only those Volatile Organic Compounds and Semi-Volatile Organic Compounds with detections were included in table.

Table 2
Soil Stockpile Analytical Summary
Drum Excavation
Former GM Leeds Assembly Plant
Kansas City, Missouri

Sample ID:		SP-1/STOCKPILE	SP-2/STOCKPILE	SP-3/STOCKPILE	SP-4/STOCKPILE	20 X TCLP	Cleanup Levels for Missouri (CALM)**
Sample Date:		01/11/00	01/11/00	01/11/00	01/11/00		
Laboratory Number:		28688.01	28688.02	28688.03	28688.04		
Parameter	Units						
Total Extractable Hydrocarbons (SW Method M8015)							
Gasoline	mg/kg	3.8 *U*	3.9 *U*	4.4 *U*	3.8 *U*	NA	500 (TPH)
Mineral Spirits	mg/kg	3.8 *U*	3.9 *U*	4.4 *U*	3.8 *U*	NA	500 (TPH)
Kerosene	mg/kg	3.8 *U*	3.9 *U*	4.4 *U*	3.8 *U*	NA	500 (TPH)
Diesel	mg/kg	3.8 *U*	3.9 *U*	4.4 *U*	3.8 *U*	NA	500 (TPH)
#6 Fuel Oil	mg/kg	3.8 *U*	3.9 *U*	4.4 *U*	3.8 *U*	NA	500 (TPH)
Hydraulic Fluid	mg/kg	3.8 *U*	3.9 *U*	4.4 *U*	3.8 *U*	NA	500 (TPH)
Motor Oil	mg/kg	3.8 *U*	3.9 *U*	4.4 *U*	3.8 *U*	NA	500 (TPH)
Miscellaneous	mg/kg	49.3	NA	33.1	NA	NA	500 (TPH)
pH (USEPA Method 150.1)							
pH	S.U.	8.1	7.8	8	7.9	NA	NA
Metals (SW Method 6010/7471)							
Arsenic	mg/kg	9.03	1.32 *U*	2.76	4.41	100	11
Barium	mg/kg	109	220	240	145	2,000	3,930
Cadmium	mg/kg	0.75	0.132	0.265	0.205	20	120
Chromium	mg/kg	24	20.1	26.8	23.6	100	1,800
Lead	mg/kg	18.4	20	18.1	12.8	100	660
Silver	mg/kg	0.5 *U*	0.53 *U*	0.59 *U*	0.51 *U*	100	490
Selenium	mg/kg	2.5 *U*	2.63 *U*	2.94 *U*	2.56 *U*	20	420
Mercury	mg/kg	0.25 *U*	0.26 *U*	0.29 *U*	0.26 *U*	4	96
Manganese	mg/kg	NA	NA	NA	NA	NA	7,160
Zinc	mg/kg	NA	NA	NA	NA	NA	53,000
Volatile Organic Compounds (USEPA Method 8060)							
Xylene (Total)	mg/kg	0.006 *U*	0.001 *J*	0.007 *U*	0.006 *U*	NA	1,510
Acetone	mg/kg	0.012 *U*	0.047	0.060	0.039	NA	3,780
Methylene Chloride	mg/kg	0.013 *B*	0.011 *B*	0.016 *B*	0.009 *B*	NA	71
2-Butanone	mg/kg	0.012 *U*	0.013 *U*	0.015 *U*	0.013 *U*	4000	NA
Benzene	mg/kg	0.002 *J*	0.004 *J*	0.007 *U*	0.002 *J*	10	11
4-Methyl-2-Pentanone	mg/kg	0.012 *U*	0.013 *U*	0.015 *U*	0.013 *U*	NA	NA
Toluene	mg/kg	0.002 *J*	0.004 *J*	0.007 *U*	0.001 *J*	NA	890
Ethylbenzene	mg/kg	0.006 *U*	0.001 *J*	0.007 *U*	0.006 *U*	NA	1,460
Isopropylbenzene	mg/kg	0.006 *U*	0.006 *U*	0.007 *U*	0.006 *U*	NA	NA
n-Propylbenzene	mg/kg	0.006 *U*	0.006 *U*	0.007 *U*	0.006 *U*	NA	NA
1,3,5-Trimethylbenzene	mg/kg	0.006 *U*	0.001 *J*	0.007 *U*	0.006 *U*	NA	NA
1,2,4-Trimethylbenzene	mg/kg	0.006 *U*	0.006 *U*	0.007 *U*	0.006 *U*	NA	NA
sec-Butylbenzene	mg/kg	0.006 *U*	0.006 *U*	0.007 *U*	0.006 *U*	NA	NA
p-Isopropyltoluene	mg/kg	0.006 *U*	0.006 *U*	0.007 *U*	0.006 *U*	NA	NA
n-Butylbenzene	mg/kg	0.006 *U*	0.006 *U*	0.007 *U*	0.006 *U*	NA	NA
Naphthalene	mg/kg	0.006 *U*	0.006 *U*	0.007 *U*	0.006 *U*	NA	1,350
Semi-Volatile Organic Compounds (USEPA Method 8270)							
Benzoic Acid	mg/kg	0.028 *JB*	0.035 *JB*	0.058 *JB*	0.026 *JB*	NA	NA
Naphthalene	mg/kg	0.420 *U*	0.440 *U*	0.490 *U*	0.430 *U*	NA	1,350
2-Methylnaphthalene	mg/kg	0.420 *U*	0.440 *U*	0.490 *U*	0.430 *U*	NA	NA
Acenaphthylene	mg/kg	0.420 *U*	0.440 *U*	0.490 *U*	0.430 *U*	NA	NA
Acenaphthene	mg/kg	0.420 *U*	0.440 *U*	0.490 *U*	0.430 *U*	NA	5,900
Dibenzofuran	mg/kg	0.420 *U*	0.440 *U*	0.490 *U*	0.430 *U*	NA	NA
Fluorene	mg/kg	0.420 *U*	0.440 *U*	0.490 *U*	0.430 *U*	NA	3,900
Phenanthrene	mg/kg	0.060 *J*	0.440 *U*	0.041 *J*	0.430 *U*	NA	NA
Anthracene	mg/kg	0.420 *U*	0.440 *U*	0.490 *U*	0.430 *U*	NA	29,500
Di-n-butylphthalate	mg/kg	0.061 *J*	0.034 *J*	0.032 *J*	0.034 *J*	NA	NA
Fluoranthene	mg/kg	0.100 *J*	0.440 *U*	0.085 *J*	0.031 *J*	NA	830
Pyrene	mg/kg	0.086 *J*	0.440 *U*	0.190 *J*	0.037 *J*	NA	2,950
Butylbenzylphthalate	mg/kg	0.420 *U*	0.440 *U*	0.048 *J*	0.045 *J*	NA	930
Bis (2-ethylhexyl) phthalate	mg/kg	0.089 *J*	0.053 *J*	0.310 *J*	0.046 *J*	NA	200
Benzo (a) anthracene	mg/kg	0.043 *J*	0.440 *U*	0.054 *J*	0.430 *U*	NA	NA
Chrysene	mg/kg	0.044 *J*	0.440 *U*	0.067 *J*	0.022 *J*	NA	52
Di-n-octylphthalate	mg/kg	0.130 *JB*	0.110 *JB*	0.072 *JB*	0.110 *JB*	NA	NA
Benzo (b) fluoranthene	mg/kg	0.035 *J*	0.440 *U*	0.054 *J*	0.430 *U*	NA	1.4
Benzo (k) fluoranthene	mg/kg	0.026 *J*	0.440 *U*	0.042 *J*	0.430 *U*	NA	11.5
Benzo (a) pyrene	mg/kg	0.030 *J*	0.440 *U*	0.056 *J*	0.430 *U*	NA	0.23
Dibenzo(a,h)anthracene	mg/kg	0.420 *U*	0.440 *U*	0.490 *U*	0.430 *U*	NA	0.21
Indeno(1,2,3-cd)pyrene	mg/kg	0.420 *U*	0.440 *U*	0.490 *U*	0.430 *U*	NA	4.20
Benzo(g,h,i)Perylene	mg/kg	0.420 *U*	0.440 *U*	0.490 *U*	0.430 *U*	NA	NA

mg/kg - Milligrams per kilogram
U - Not detected at or above method detection limit
NA - Not applicable
B - Analyte detected in method blank
J - Estimated value; below reporting limit
* - Diluted due to interference
Exceeds 20 X TCLP levels and/or CALM levels

** Using Tier 1 Standards, Exposure Scenario B

Note: Only those Volatile Organic Compounds and Semi-Volatile Organic Compounds with detections were included in table.

Table 3
Excavation Analytical Summary
Drum Excavation
Former GM Leeds Assembly Plant
Kansas City, Missouri

Sample ID:		NW SS-1	NW Corner-MDNR	NE SS-1	NE Corner-MDNR	20 X TCLP	Cleanup Levels for Missouri (CALM)**
Sample Date:		01/17/00	01/17/00	01/17/00	01/17/00		
Laboratory Number:		28731.01	2004	28731.02	2007		
Parameter	Units						
Total Extractable Hydrocarbons (SW Method M8015)							
Gasoline	mg/kg	3 U	NA	3 U	NA	NA	500 (TPH)
Mineral Spirits	mg/kg	3 U	NA	3 U	NA	NA	500 (TPH)
Kerosene	mg/kg	3 U	NA	3 U	NA	NA	500 (TPH)
Diesel	mg/kg	3 U	NA	3 U	NA	NA	500 (TPH)
#6 Fuel Oil	mg/kg	3 U	NA	3 U	NA	NA	500 (TPH)
Hydraulic Fluid	mg/kg	3 U	NA	3 U	NA	NA	500 (TPH)
Motor Oil	mg/kg	3 U	NA	3 U	NA	NA	500 (TPH)
Miscellaneous (1)	mg/kg	NA	NA	10.5	NA	NA	500 (TPH)
Miscellaneous (2)	mg/kg	NA	NA	22.3	NA	NA	500 (TPH)
pH (USEPA Method 150.1)							
pH	S.U.	6.7	NA	7.7	NA	NA	NA
Metals ATAS (SW Method 6010/7471) - MDNR (Method 200.7/206.2/239.2/245.1/270.2)							
Arsenic	mg/kg	4	8.91	5.2	7.73	100	11
Barium	mg/kg	135	315	149	355	2,000	3,930
Cadmium	mg/kg	0.35	1.43	1	1.83	20	120
Chromium	mg/kg	13.1	51.9	19.7	55.4	100	1,800
Lead	mg/kg	15.4	35.8	24.8	56.3	100	660
Silver	mg/kg	0.4 U	2.23	0.4 U	2.24	100	490
Selenium	mg/kg	2 U	2 U	2 U	2 U	20	420
Mercury	mg/kg	0.2 U	0.04 U	0.2 U	0.0474	4	96
Manganese	g/kg	NA	NA	NA	NA	NA	7,160
Zinc	mg/kg	NA	NA	NA	NA	NA	53,000
Volatile Organic Compounds (USEPA Method 8060)							
Xylene (Total)	mg/kg	0.005 U	0.002 U	0.005 U	0.002 U	NA	1,510
Acetone	mg/kg	0.042	0.100 U	0.420	0.100 U	NA	3,760
Methylene Chloride	mg/kg	0.016 B	0.100 U	0.070 B	0.100 U	NA	71
2-Butanone	mg/kg	0.010 U	0.025 U	0.010 U	0.041	4000	NA
Benzene	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	10	11
4-Methyl-2-Pentanone	mg/kg	0.010 U	0.005 U	0.010 U	0.007	NA	NA
Toluene	mg/kg	0.005 U	0.005 U	0.005	0.005 U	NA	890
Ethylbenzene	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	NA	1,460
Isopropylbenzene	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	NA	NA
n-Propylbenzene	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	NA	NA
1,3,5-Trimethylbenzene	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	NA	NA
1,2,4-Trimethylbenzene	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	NA	NA
sec-Butylbenzene	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	NA	NA
p-Isopropyltoluene	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	NA	NA
n-Butylbenzene	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	NA	NA
Naphthalene	mg/kg	0.005 U	0.015	0.005 U	0.006	NA	1,350
Semi-Volatile Organic Compounds (USEPA Method 8270)							
Benzoic Acid	mg/kg	0.830 U	0.250 U	0.830 U	0.250 U	NA	NA
Naphthalene	mg/kg	0.330 U	NA	0.330 U	NA	NA	1,350
2-Methylnaphthalene	mg/kg	0.330 U	0.250 U	0.330 U	0.670	NA	NA
Acenaphthylene	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	NA
Acenaphthene	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	5,900
Dibenzofuran	mg/kg	0.330 U	0.250 U	0.330 U	0.270	NA	NA
Fluorene	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	3,900
Phenanthrene	mg/kg	0.330 U	0.250 U	0.330 U	0.460	NA	NA
Anthracene	mg/kg	0.330 U	0.250 U	0.330 U	0.350	NA	29,500
Di-n-butylphthalate	mg/kg	0.330 U	0.500 U	0.330 U	0.500 U	NA	NA
Fluoranthene	mg/kg	0.330 U	0.250 U	0.330 U	0.440	NA	830
Pyrene	mg/kg	0.330 U	0.500 U	0.330 U	0.630	NA	2,950
Butylbenzylphthalate	mg/kg	0.330 U	0.250 U	0.330 U	1.100	NA	930
Bis (2-ethylhexyl) phthalate	mg/kg	0.330 U	0.500 U	0.330 U	0.530	NA	200
Benzo (a) anthracene	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	NA
Chrysene	mg/kg	0.330 U	0.250 U	0.330 U	0.460	NA	52
Di-n-octylphthalate	mg/kg	0.330 U	1.000 U	0.330 U	1.000 U	NA	NA
Benzo (b) fluoranthene	mg/kg	0.330 U	0.250 U	0.330 U	0.400	NA	1.4
Benzo (k) fluoranthene	mg/kg	0.330 U	0.250 U	0.330 U	0.380	NA	11.5
Benzo (a) pyrene	mg/kg	0.330 U	0.250 U	0.330 U	0.660	NA	0.23
Dibenzo(a,h)anthracene	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	0.21
Indeno(1,2,3-cd)pyrene	mg/kg	0.330 U	0.250 U	0.330 U	0.270	NA	4.20
Benzo(g,h,i)Perylene	mg/kg	0.330 U	0.250 U	0.330 U	0.290	NA	NA

mg/kg - Milligrams per kilogram
U - Not detected at or above method detection limit
NA - Not applicable
B - Analyte detected in method blank
J - Estimated value; below reporting limit
* - Diluted due to interference
Exceeds 20 X TCLP levels and/or CALM levels

** Using Tier 1 Standards, Exposure Scenario B

Note: Only those Volatile Organic Compounds and Semi-Volatile Organic Compounds with detections were included in table.

Table 3
Excavation Analytical Summary
Drum Excavation
Former GM Leeds Assembly Plant
Kansas City, Missouri

Sample ID:		SW SS-1	SW Corner-MDNR	SE SS-1	SE Corner-MDNR	20 X TCLP	Cleanup Levels for Missouri (CALM)**
Sample Date:		01/17/00	01/17/00	01/17/00	01/17/00		
Laboratory Number:		28731.03	2005	28731.06	2008		
Parameter	Units						
Total Extractable Hydrocarbons (SW Method M8015)							
Gasoline	mg/kg	3 U	NA	3 U	NA	NA	500 (TPH)
Mineral Spirits	mg/kg	3 U	NA	3 U	NA	NA	500 (TPH)
Kerosene	mg/kg	3 U	NA	3 U	NA	NA	500 (TPH)
Diesel	mg/kg	3 U	NA	3 U	NA	NA	500 (TPH)
#6 Fuel Oil	mg/kg	3 U	NA	3 U	NA	NA	500 (TPH)
Hydraulic Fluid	mg/kg	3 U	NA	3 U	NA	NA	500 (TPH)
Motor Oil	mg/kg	3 U	NA	3 U	NA	NA	500 (TPH)
Miscellaneous (1)	mg/kg	3.35	NA	5.39	NA	NA	500 (TPH)
Miscellaneous (2)	mg/kg	15.1	NA	82.5	NA	NA	500 (TPH)
pH (USEPA Method 150.1)							
pH	S.U.	7.1	NA	7.4	NA	NA	NA
Metals ATAS (SW Method 6010/7471) - MDNR (Method 200.7/206.2/239.2/245.1/270.2)							
Arsenic	mg/kg	7.8	9.84	4	9.14	100	11
Barium	mg/kg	278	446	221	290	2,000	3,930
Cadmium	mg/kg	1.8	1.54	1.1	1.22	20	120
Chromium	mg/kg	19.2	50.3	20.4	55.1	100	1,800
Lead	mg/kg	31.9	14.3	16.6	12.8	100	660
Silver	mg/kg	0.4 U	2 U	0.4 U	2 U	100	490
Selenium	mg/kg	2 U	2 U	2 U	2 U	20	420
Mercury	mg/kg	0.2 U	0.0453	0.2 U	0.0664	4	96
Manganese	mg/kg	NA	NA	NA	NA	NA	7,160
Zinc	mg/kg	NA	NA	NA	NA	NA	53,000
Volatile Organic Compounds (USEPA Method 8060)							
Xylene (Total)	mg/kg	0.009	0.002 U	0.005 U	0.002 U	NA	1,510
Acetone	mg/kg	0.220	0.1 U	0.077	0.100 U	NA	3,780
Methylene Chloride	mg/kg	0.015 B	0.1 U	0.010 B	0.100 U	NA	71
2-Butanone	mg/kg	0.010 U	0.025 U	0.010 U	0.025 U	4000	NA
Benzene	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	10	11
4-Methyl-2-Pentanone	mg/kg	0.010 U	0.005 U	0.010 U	0.005 U	NA	NA
Toluene	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	NA	890
Ethylbenzene	mg/kg	0.005	0.005 U	0.005 U	0.005 U	NA	1,460
Isopropylbenzene	mg/kg	0.005 U	0.0061	0.005 U	0.005 U	NA	NA
n-Propylbenzene	mg/kg	0.027	0.026	0.005 U	0.005 U	NA	NA
1,3,5-Trimethylbenzene	mg/kg	0.014	0.0072	0.005 U	0.005 U	NA	NA
1,2,4-Trimethylbenzene	mg/kg	0.005 U	0.0595	0.005 U	0.0098	NA	NA
sec-Butylbenzene	mg/kg	0.012	0.0137	0.005 U	0.005 U	NA	NA
p-Isopropyltoluene	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	NA	NA
n-Butylbenzene	mg/kg	0.020	0.0248	0.005 U	0.005 U	NA	NA
Naphthalene	mg/kg	0.005 B	0.0114	0.005 U	0.0082	NA	1,350
Semi-Volatile Organic Compounds (USEPA Method 8270)							
Benzoic Acid	mg/kg	0.830 U	0.250 U	0.830 U	0.250 U	NA	NA
Naphthalene	mg/kg	0.330 U	NA	0.330 U	NA	NA	1,350
2-Methylnaphthalene	mg/kg	0.330 U	0.280	0.330 U	0.250 U	NA	NA
Acenaphthylene	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	NA
Acenaphthene	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	5,900
Dibenzofuran	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	NA
Fluorene	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	3,900
Phenanthrene	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	NA
Anthracene	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	29,500
Di-n-butylphthalate	mg/kg	0.330 U	0.940	0.340	0.500 U	NA	NA
Fluoranthene	mg/kg	0.330 U	0.250 U	0.330 U	0.380	NA	830
Pyrene	mg/kg	0.330 U	0.500 U	0.330 U	0.850	NA	2,950
Butylbenzylphthalate	mg/kg	0.330 U	0.400	0.330 U	0.630	NA	930
Bis (2-ethylhexyl) phthalat	mg/kg	1.100 B	1.100	0.330 U	0.970	NA	200
Benzo (a) anthracene	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	NA
Chrysene	mg/kg	0.330 U	0.250 U	0.330 U	0.350	NA	52
Di-n-octylphthalate	mg/kg	0.330 U	1.000 U	0.330 U	1.000 U	NA	NA
Benzo (b) fluoranthene	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	1.4
Benzo (k) fluoranthene	mg/kg	0.330 U	0.250 U	0.330 U	0.320	NA	11.5
Benzo (a) pyrene	mg/kg	0.330 U	0.250 U	0.330 U	0.620	NA	0.23
Dibenzo(a,h)anthracene	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	0.21
Indeno(1,2,3-cd)pyrene	mg/kg	0.330 U	0.250 U	0.330 U	0.250 U	NA	4.20
Benzo(g,h,i)Perylene	mg/kg	0.330 U	0.250 U	0.330	0.250 U	NA	NA

mg/kg - Milligrams per kilogram
U - Not detected at or above method detection limit
NA - Not applicable
B - Analyte detected in method blank
J - Estimated value; below reporting limit
* - Diluted due to interference
Exceeds 20 X TCLP levels and/or CALM levels

** Using Tier 1 Standards, Exposure Scenario B

Note: Only those Volatile Organic Compounds and Semi-Volatile Organic Compounds with detections were included in table.

Table 4
Trench Analytical Summary
Drum Excavation
Former GM Leeds Assembly Plant
Kansas City, Missouri

Sample ID:		S-TRENCH	PW-TRENCH	PW-MDNR		20 X TCLP	Cleanup Levels for Missouri (CALM)**
Sample Date:		01/17/00	01/17/00	01/17/00			
Laboratory Number:		28731.04	28731.05	2006			
Parameter	Units						
Total Extractable Hydrocarbons (SW Method M8015)							
Gasoline	mg/kg	3 U	4500 U	NA		NA	500 (TPH)
Mineral Spirits	mg/kg	3 U	4500 U	NA		NA	500 (TPH)
Kerosene	mg/kg	3 U	4500 U	NA		NA	500 (TPH)
Diesel	mg/kg	3 U	4500 U	NA		NA	500 (TPH)
#6 Fuel Oil	mg/kg	3 U	4500 U	NA		NA	500 (TPH)
Hydraulic Fluid	mg/kg	3 U	4500 U	NA		NA	500 (TPH)
Motor Oil	mg/kg	3 U	4500 U	NA		NA	500 (TPH)
Miscellaneous (1)	mg/kg	20.2	25500	NA		NA	500 (TPH)
Miscellaneous (2)	mg/kg	95.6	NA	NA		NA	500 (TPH)
pH (USEPA Method 150.1)							
pH	S.U.	8	7.3	NA		NA	NA
Metals ATAS (SW Method 6010/7471) - MDNR (Method 200.7/206.2/239.2/245.1/270.2)							
Arsenic	mg/kg	4	10 U	6.14		100	11
Barium	mg/kg	186	604	777		2,000	3,930
Cadmium	mg/kg	17.1	56.5	189		20	120
Chromium	mg/kg	73.6	314	2430		100	1,800
Lead	mg/kg	365	14200	14500		100	650
Silver	mg/kg	0.4 U	0.57	2.29		100	490
Selenium	mg/kg	7	14.6	42.4		20	420
Mercury	mg/kg	0.2 U	0.2 U	0.0555		4	96
Manganese	g/kg	NA	NA	NA		NA	7,160
Zinc	mg/kg	NA	NA	NA		NA	53,000
Volatile Organic Compounds (USEPA Method 8060)							
Xylene (Total)	mg/kg	0.250 J	170.000	167.000		NA	1,510
Acetone	mg/kg	1.000 U	100.000 U	100.000 U		NA	3,780
Methylene Chloride	mg/kg	0.770 B	82.000 B	100.000 U		NA	71
2-Butanone	mg/kg	1.000 U	100.000 U	38.500		4000	NA
Benzene	mg/kg	0.500 U	50.000 U	8.250		10	11
4-Methyl-2-Pentanone	mg/kg	1.000 U	100.000 U	5.000 U		NA	NA
Toluene	mg/kg	0.500 U	68.000	154.000		NA	890
Ethylbenzene	mg/kg	1.100	48.000 J	77.900		NA	1,460
Isopropylbenzene	mg/kg	0.2 J	17.000 J	22.600		NA	NA
n-Propylbenzene	mg/kg	1.1	100.000	125.000		NA	NA
1,3,5-Trimethylbenzene	mg/kg	0.400 J	250.000	245.000		NA	NA
1,2,4-Trimethylbenzene	mg/kg	1.300	980.000	1320.000		NA	NA
sec-Butylbenzene	mg/kg	0.490 J	59.000	53.500		NA	NA
p-Isopropyltoluene	mg/kg	0.500 U	88.000	67.100		NA	NA
n-Butylbenzene	mg/kg	0.980	50.000 U	247.000		NA	NA
Naphthalene	mg/kg	0.880 B	160.000 B	NA		NA	1,350
Semi-Volatile Organic Compounds (USEPA Method 8270)							
Benzoic Acid	mg/kg	0.830 U	0.830 U	3.750 U		NA	NA
Naphthalene	mg/kg	0.330 U	20.000	430.000		NA	1,350
2-Methylnaphthalene	mg/kg	0.330 U	6.900	73.000		NA	NA
Acenaphthylene	mg/kg	0.330 U	5.000 U	3.750 U		NA	NA
Acenaphthene	mg/kg	0.330 U	2.000 J	29.000		NA	5,900
Dibenzofuran	mg/kg	0.330 U	1.600 J	24.000		NA	NA
Fluorene	mg/kg	0.330 U	2.300 J	41.000		NA	3,900
Phenanthrene	mg/kg	0.330 U	9.800	150.000		NA	NA
Anthracene	mg/kg	0.330 U	1.700 J	31.000		NA	29,500
Di-n-butylphthalate	mg/kg	0.330 U	41.000	630.000		NA	NA
Fluoranthene	mg/kg	0.330 U	6.800	48.000		NA	830
Pyrene	mg/kg	0.330 U	8.400	160.000		NA	2,950
Butylbenzylphthalate	mg/kg	0.330 U	21.000	3.750 U		NA	930
Bis (2-ethylhexyl) phthalate	mg/kg	0.330 U	4.400 JB	43.000		NA	200
Benzo (a) anthracene	mg/kg	0.330 U	3.400 J	23.000		NA	NA
Chrysene	mg/kg	0.330 U	3.800 J	20.000		NA	52
Di-n-octylphthalate	mg/kg	0.330 U	0.960 JB	15.000 U		NA	NA
Benzo (b) fluoranthene	mg/kg	0.330 U	3.100 J	15.000		NA	1.4
Benzo (k) fluoranthene	mg/kg	0.330 U	3.000 J	13.000		NA	11.5
Benzo (a) pyrene	mg/kg	0.330 U	2.700 J	22.000		NA	0.23
Dibenzo(a,h)anthracene	mg/kg	0.330 U	0.720 J	3.750 U		NA	0.21
Indeno(1,2,3-cd)pyrene	mg/kg	0.330 U	1.800 J	3.750 U		NA	4.20
Benzo(g,h,i)Perylene	mg/kg	0.330 U	5.000 U	3.750 U		NA	NA

mg/kg - Milligrams per kilogram
U - Not detected at or above method detection limit
NA - Not applicable
B - Analyte detected in method blank
J - Estimated value; below reporting limit
* - Diluted due to interference
- Exceeds 20 X TCLP levels and/or CALM levels

** Using Tier 1 Standards, Exposure Scenario B

Note: Only those Volatile Organic Compounds and Semi-Volatile Organic Compounds with detections were included in table.

Table 5
TCLP Analytical Summary
Drum Excavation
Former GM Leeds Assembly Plant
Kansas City, Missouri

Sample ID:		S-TRENCH	PW-TRENCH	PW-MDNR		TCLP
Sample Date:		01/17/00	01/17/00	01/17/00		
Laboratory Number:			28824.01	2006		
Parameter	Units					
Total Extractable Hydrocarbons (SW Method M8015)						
Gasoline	mg/L	NA	NA	NA		NA
Mineral Spirits	mg/L	NA	NA	NA		NA
Kerosene	mg/L	NA	NA	NA		NA
Diesel	mg/L	NA	NA	NA		NA
#6 Fuel Oil	mg/L	NA	NA	NA		NA
Hydraulic Fluid	mg/L	NA	NA	NA		NA
Motor Oil	mg/L	NA	NA	NA		NA
Miscellaneous (1)	mg/L	NA	NA	NA		NA
Miscellaneous (2)	mg/L	NA	NA	NA		NA
pH (USEPA Method 150.1)						
pH	S.U.	NA	NA	NA		NA
Metals (SW Method 6010/7471)						
Arsenic	mg/L	0.1 *U*	0.1 *U*	NA		5.0
Barium	mg/L	1.83	1 *U*	0.9		100.0
Cadmium	mg/L	0.01 *U*	0.12	0.14		1.0
Chromium	mg/L	0.01 *U*	0.016	0.02		5.0
Lead	mg/L	0.1 *U*	12.7	12.2		5.0
Silver	mg/L	0.02 *U*	0.02 *U*	NA		5.0
Selenium	mg/L	0.1 *U*	0.1 *U*	0.02		1.0
Mercury	mg/L	0.002 *U*	0.002 *U*	NA		0.2
Manganese	mg/L	NA	NA	NA		NA
Zinc	mg/L	NA	NA	NA		NA
Volatile Organic Compounds (USEPA Method 8060)						
Xylene (Total)	mg/kg	NA	NA	NA		NA
Acetone	mg/kg	NA	NA	NA		NA
Methylene Chloride	mg/kg	NA	NA	NA		NA
2-Butanone	mg/kg	NA	NA	0.500 *U*		20.0
Benzene	mg/kg	NA	NA	0.700		0.5
4-Methyl-2-Pentanone	mg/kg	NA	NA	NA		NA
Toluene	mg/kg	NA	NA	NA		NA
Ethylbenzene	mg/kg	NA	NA	NA		NA
Isopropylbenzene	mg/kg	NA	NA	NA		NA
n-Propylbenzene	mg/kg	NA	NA	NA		NA
1,3,5-Trimethylbenzene	mg/kg	NA	NA	NA		NA
1,2,4-Trimethylbenzene	mg/kg	NA	NA	NA		NA
sec-Butylbenzene	mg/kg	NA	NA	NA		NA
p-Isopropyltoluene	mg/kg	NA	NA	NA		NA
n-Butylbenzene	mg/kg	NA	NA	NA		NA
Naphthalene	mg/kg	NA	NA	NA		NA
Semi-Volatile Organic Compounds (USEPA Method 8270)						
Benzoic Acid	mg/kg	NA	NA	NA		NA
Naphthalene	mg/kg	NA	NA	NA		NA
2-Methylnaphthalene	mg/kg	NA	NA	NA		NA
Acenaphthylene	mg/kg	NA	NA	NA		NA
Acenaphthene	mg/kg	NA	NA	NA		NA
Dibenzofuran	mg/kg	NA	NA	NA		NA
Fluorene	mg/kg	NA	NA	NA		NA
Phenanthrene	mg/kg	NA	NA	NA		NA
Anthracene	mg/kg	NA	NA	NA		NA
Di-n-butylphthalate	mg/kg	NA	NA	NA		NA
Fluoranthene	mg/kg	NA	NA	NA		NA
Pyrene	mg/kg	NA	NA	NA		NA
Butylbenzylphthalate	mg/kg	NA	NA	NA		NA
Bis (2-ethylhexyl) phthalate	mg/kg	NA	NA	NA		NA
Benzo (a) anthracene	mg/kg	NA	NA	NA		NA
Chrysene	mg/kg	NA	NA	NA		NA
Di-n-octylphthalate	mg/kg	NA	NA	NA		NA
Benzo (b) fluoranthene	mg/kg	NA	NA	NA		NA
Benzo (k) fluoranthene	mg/kg	NA	NA	NA		NA
Benzo (a) pyrene	mg/kg	NA	NA	NA		NA
Dibenzo(a,h)anthracene	mg/kg	NA	NA	NA		NA
Indeno(1,2,3-cd)pyrene	mg/kg	NA	NA	NA		NA
Benzo(g,h,i)Perylene	mg/kg	NA	NA	NA		NA

mg/kg - Milligrams per kilogram
U - Not detected at or above method detection limit
NA - Not applicable
B - Analyte detected in method blank
J - Estimated value; below reporting limit
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Exceeds TCLP

** Using Tier 1 Standards, Exposure Scenario B

Note: Only those Volatile Organic Compounds and Semi-Volatile Organic Compounds with detections were included in table.