



**Environmental  
Operations, Inc.**

October 29, 2004

*Project #1393*

Elizabeth Noonan  
St. Louis County Economic Council  
121 South Meramec, Suite 900  
St. Louis, Missouri 63105

Re: Final Report of Remediation  
Former Abex Foundry  
6600 Ridge/6538 Hobart  
Wellston, Missouri

Dear Ms. Noonan:

Attached is the *Final Report of Remediation* for the above referenced subject site. The report details the actions taken to address onsite contamination, including subsurface soils, sewer outfall sediment and shallow groundwater. All onsite areas of environmental concern, including the engineered surface barrier, have been addressed following the *Remedial Action Plan, Remediation Objectives and Site Management Plan*, dated March 26, 2004.

If you have any questions concerning this project, please call me at (314) 241-0900.

Sincerely,

David Bushong  
Environmental Engineer

Attachment

cc: Michael Clark, Clark Properties  
Rob Murphy, Missouri Department of Natural Resources

Environmental Consulting & Remediation

1530 South Second Street • Suite 200 • Saint Louis, Missouri 63104-4500 • 314-241-0900 • 314-436-2900 Fax

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**Environmental  
Operations, Inc.**

## **FINAL REPORT OF REMEDIATION**

**FORMER ABEX FOUNDRY  
6600 RIDGE/6538 HOBART  
WELLSTON, MISSOURI**

Prepared for:

St. Louis County Economic Council/  
Land Clearance for Redevelopment Authority of the County of St. Louis  
121 South Meramec  
Suite 900  
St. Louis, Missouri 63105

Prepared by:

Environmental Operations, Inc.  
757 South Second Street  
St. Louis, Missouri

October 29, 2004

Environmental Consulting & Remediation

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## **SITE SUMMARY & BACKGROUND INFORMATION**

The subject site is located at 6600 Ridge/6538 Hobart Avenues in Wellston, St. Louis County, Missouri and is referred to as the Former Abex Foundry. The site comprises approximately 12 acres and is roughly bounded by Hobart Avenue/residential to the south, rail lines and Ameren to the west, Federal Mogul to the north, and Ogden Avenue/parking/residential to the east. The former Abex property is a part of the Wellston Industrial Park redevelopment project, which encompasses the Abex site as well as an additional 12 surrounding acres (approximate). The Wellston Industrial Park is part of a comprehensive redevelopment effort in the Wellston community. The Wellston Industrial Park will be roughly bounded by Ogden Avenue to the east, Ridge Avenue to the north, Lenox Avenue to the south and Ameren and rail lines to the west. Please note that only the former Abex property is part of the current remedial efforts. The attached Figure #1 indicates the boundaries of the project site.

The site is located in an industrial and residential mixed use area of the City of Wellston. Industrial areas are located to the north and west of the subject site and residential areas to the east and southeast. The local topography is characterized by moderate to steep hill slopes. A large portion of the general area has been reshaped by cutting and filling as a part of previous area-wide development. The project site is on the western slope of a hill that terminates at a drainage way adjacent to a railroad spur.

The Abex facility operated as a secondary steel foundry from 1923 until closing in 1982. During site operations, the facility manufactured steel casings. The processes included melting scrap steel, pouring molten metal into sand molds, shaking out the castings, annealing in gas fired furnaces, grinding and machining.

At the start of remedial actions, the facility was abandoned with many of the former production and support buildings demolished, leaving only concrete floor slabs and a few buildings. Numerous piles of asbestos contaminated building debris and miscellaneous trash were located over the central part of the site where most production previously occurred. Much of the site was overgrown with vegetation and was especially heavy on the west and southwestern portions. The attached Figure #2 details the project site including the former and existing site structures at the time of remedial actions.

The subject site has been entered into the Missouri Department of Natural Resources' ("MDNR") Brownfields/Voluntary Cleanup Program ("B/VCP") as part of site redevelopment. In addition, the site has been accepted into the Missouri Department of Economic Development's ("DED") Brownfield Remediation program. Remediation activities were conducted in accordance with current local, state, and federal regulations including United States Environmental Protection Agency ("USEPA"), MDNR and Occupational Safety and Health Administration ("OSHA") requirements. The B/VCP provided direct project oversight for MDNR and is the lead agency office for remediation activities.

Documentation on historic environmental activities has been forwarded to MDNR B/VCP (by others). Areas of environmental concern were based on the previous reports, conversations with MDNR B/VCP program staff and results of two rounds of environmental investigation performed by Environmental Operations, Inc. In general, the following concerns were identified during investigation and addressed during site remedial activities:

- elevated levels of hydrocarbons in subsurface soils;
- asbestos impacted debris piles located across the project site;
- limited quantities of asbestos containing materials within the existing site structures as well as miscellaneous environmental items;
- elevated levels of metals, polychlorinated biphenyls (“PCB”), volatile organics and petroleum constituents in sediment located at a storm sewer outfall; and
- elevated concentrations of metals in shallow on-site groundwater.

The MDNR B/VCP approved *Remedial Action Plan* (“RAP”), *Remediation Objectives and Site Management Plan* (March 26, 2004) detailed the actions to be conducted to address areas of known contamination on the project site. The plan also detailed the cleanup objectives which were utilized to determine the effectiveness of remedial actions. In general, areas of soil and sediment contamination were addressed by excavation and off-site disposal and asbestos materials were properly abated. Levels of groundwater contamination were monitored during two sampling events. In addition, engineering controls were installed to address residual on-site contamination.

## **Previous Investigations**

Several phases of investigation and remedial actions (underground storage tank closures) had been conducted on the project site prior to this current phase of site development. Portions of reports of these past actions were reviewed by Environmental Operations, Inc. The following sections summarize information obtained from these previous reports and the results of the two site investigation events performed by Environmental Operations, Inc.

### ***Historic Site Activities by Others***

An investigation by REACT Environmental Engineers (“REACT”) in July 1989 identified low levels of metals in shallow soils within the sand disposal and bag house area. This phase of investigation included a total of 9 samples, with 5 of the 9 being composite samples. Analytical results detected low levels of contaminants in various areas of the site. The investigation also included asbestos sampling of staged debris identified on-site.

A total of seven underground storage tanks (“USTs”) were closed by removal in August 1989 by REACT. The tanks contained various petroleum products for on-site usage. The tanks ranged in size from 1,000 to 20,000 gallons. A limited amount of soil and groundwater remediation was conducted during closure activities. Based on the confirmation sample analytical results summarized in the closure report, low levels of residual contamination remained within the UST excavations. These levels were well below current site cleanup objectives.

The MDNR performed an assessment, site inspection and subsequent investigation in 1990 across the project site. The work involved several composite samples. Areas of investigation included surface soils, subsurface soils, groundwater samples and storm line water and sediment samples. The discrete sample analytical data indicated low levels of contaminants at the sewer outfall location and at various locations across the site.

Additional site sampling was conducted by REACT in 1995. The area of investigation was the former bag house. Several surface and near surface samples were collected and analyzed. The purpose of the investigation was to delineate the extent of contaminants previously detected in this area. The results of the investigation indicated elevated levels of total chromium and lead throughout this area of the project site. Chromium levels were detected up to 881 mg/Kg and lead levels detected up to 998 mg/Kg.

Two subsequent investigations conducted in 1998 and 2000 by McCoy & McCoy and Seals Enterprises, Inc., respectively, attempted to further delineate areas of potential contamination. The investigation included analysis for metals, polynuclear aromatic hydrocarbons ("PAH"), volatiles and SPLP chromium. Based on a review of the analytical results, the investigations did not detect levels of contaminants above anticipated site cleanup objectives.

***Report of Phase II Investigation – February 7, 2002 – Environmental Operations, Inc.***

This investigation included the advancement of 47 soil borings for the collection of subsurface soil samples and one sediment sample. Six of the soil borings were converted to permanent monitoring wells for groundwater evaluation. Hydrocarbons were detected in six areas throughout the subject site. These on-site areas included the machine shop, pump house, oil house/boiler house, maintenance/storage & blacksmith shop, one former aboveground storage tank ("AST") location, one former UST area and the sewer outfall. Metals were detected in the machine shop, foundry, maintenance/storage & blacksmith shop, chemistry lab, sand disposal area, parking lot and the sewer outfall. PAHs were detected in the chemistry lab, parking lot and the sewer outfall. Manganese and chromium were detected in the on-site groundwater.

***Report of Additional Site Investigation – January 23, 2004 – Environmental Operations, Inc.***

This investigation included the advancement of 33 soil borings for the collection of subsurface soil samples and associated laboratory analysis. Two of these soil borings were converted to permanent monitoring wells for groundwater evaluation. The purpose of the investigation was to investigate areas of the project site with limited historic environmental data and to determine the potential leachability of the metals detected during previous site investigations. In general, the investigation detected elevated levels of contaminants across the project site. Comparison of the analytical results with the anticipated cleanup objectives did not reveal any sampling locations requiring active remediation. Results of the SPLP testing indicated that metal contaminants across the project site did not leach at concentrations above regulatory levels.

## **AREAS OF ENVIRONMENTAL CONCERN & CONTAMINANTS OF CONCERN**

Previous site environmental activities identified the following areas of environmental concern requiring remediation:

- Impacted Subsurface Soils: Soil contaminants were identified in the shallow soil horizon (above the shallow groundwater table) at one previous sampling location (MS-1).
- Asbestos Contaminated Debris Piles: Scattered surface piles of building debris, including asbestos containing materials (“ACM”), were identified across the project site.
- Building ACMs and Miscellaneous Items: Site inspections identified limited amounts of ACMs within the existing site structures and miscellaneous environmental items (light fixtures and waste tires). In addition, existing subsurface conduits, if not properly abandoned, may cause the migration of contaminants.
- Storm Sewer Outfall: Sediment located at a storm sewer outfall (southwest area of site) had been identified as containing elevated levels of contaminants.
- On-site Groundwater: Elevated metals were identified within the on-site shallow groundwater.

The subsurface soil area of remediation consisted of an area approximately 25 feet by 25 feet (625 square feet) centered on a previous sampling location having analytical results greater than project cleanup objectives. The sewer outfall area of remediation consisted of an area approximately 10 feet by 10 feet. The vertical extent of each area of remediation was based on the results of the previous investigations.

In general, contaminants of concern for the project site included the following:

- Heavier hydrocarbons (TPH OA-2);
- Total and Dissolved Metals (arsenic, beryllium, cadmium, chromium, lead, manganese & nickel);
- PAH; and
- PCB.

Areas of concern across the project site included specific contaminants for that area, from the list detailed above. Subsequent sections of this document provide detailed information on the areas of concern and the associated contaminants of concern.

## **REMEDIAL ACTION – IMPACTED SUBSURFACE SOILS**

Soil remediation activities were initiated on June 23, 2004 and completed on July 2, 2004. Subsurface soil cleanup objectives were based on the MDNR Cleanup Levels for Missouri (“CALM”), September 1, 2001. Ten times Tier 1 Scenario C ( $C_{idi}$ ) and leaching to groundwater pathway ( $C_{leach}$ ) Soil Target Concentrations (“STARC”) were used to

determine soil cleanup levels for confirmation sampling. These cleanup objectives were established in conjunction with the engineered surface cap.

Previous site investigations identified one area of subsurface soils with contaminant concentrations exceeding remediation objectives. The contaminant of concern for the area was total petroleum hydrocarbons (TPH OA-2). Utilizing ten times MDNR CALM Scenario C levels, the remediation objective for TPH OA-2 was 10,000 mg/kg.

A total of 126.82 tons of soil, classified as special waste, were removed and properly disposed from the subject site from the previously identified remediation area. The area of excavation is noted on the attached Figure 3. Initial excavation occurred in a 6 foot lift, approximately 25 feet by 25 feet centered on the previous sampling location. Confirmation soil samples with analytical results greater than the remediation objectives were over-excavated and re-sampled.

Special waste soils were transported by B. Garcia Trucking of Fairmont City, Illinois and disposed in Waste Management Inc.'s Milam Landfill located in East St. Louis, Illinois. Waste disposal manifests are included with Appendix C.

## **REMEDIAL ACTION – ASBESTOS CONTAMINATED DEBRIS**

As a part of site development, the existing debris piles were properly disposed off-site. Previous site investigations identified various non-friable asbestos materials commingled with the existing debris. The material was profiled, handled and disposed as a special waste.

Debris pile remediation activities began on May 24, 2004 with equipment mobilization and site clearing and grubbing. The last of the asbestos impacted surface debris was removed from the project site and properly disposed on June 30, 2004. Additional loads of residual non-asbestos impacted debris encountered during site development were removed and properly disposed after this date.

As a part of debris remediation efforts, air monitoring was conducted to determine if airborne asbestos particles were possibly migrating to off-site locations. Additional confirmation sampling was not performed since the impacted debris was located on residual concrete surfaces.

A total of 6,484.62 tons of debris, classified as special waste, were removed and properly disposed from across the subject site. The approximate lateral extent of the impacted debris is noted on the attached Figure 4. Special waste materials were transported by B. Garcia Trucking of Fairmont City, Illinois, Frontier Hauling of Florissant, Missouri and Clark Trucking of East St. Louis, Illinois and disposed in Waste Management Inc.'s Milam Landfill located in East St. Louis, Illinois. Waste disposal manifests are included with Appendix C.

## **REMEDIAL ACTION – STORM SEWER OUTFALL**

Previous site investigations identified low levels of contaminants in the sediment at the outfall of the 60-inch active storm sewer located on the project site (Figure #2). The line runs in a northeast to southwest direction. Current redevelopment plans involve reusing the existing line to feed the proposed on-site detention basin. Site remedial activities included removal actions of the impacted sediment.

Sediment remediation activities were initiated on October 1, 2004 and completed on October 21, 2004. Due to space restrictions, the area of remediation was an area approximately 10 feet by 10 feet centered on the storm sewer outfall. Initially impacted sediment and water was removed using a high pressure vacuum truck. Subsequent remedial actions (due to elevated confirmation sample analytical results) involved gross removal of residual sediment and debris using conventional excavation techniques.

Sewer outfall cleanup objectives were based on the Ecotox Threshold's most conservative sediment values as stated in the USEPA Publication 9345.0-12FSI January 1996. Confirmation sediment samples were analyzed for the following parameters:

- Total Metals (arsenic, lead, nickel and zinc) using USEPA Test Method 6010.
- Polychlorinated Biphenyls (PCBs) using USEPA Test Method 8082.
- Polynuclear Aromatic Hydrocarbons (PAH) using USEPA Test Method 8310.
- Total Extractable Hydrocarbons (TPH) using USEPA Test Method 8015 OA-2.

A concrete pad was encountered beneath the sediment during remedial efforts at the outfall location. Material present on this pad was removed and disposed off-site. Final confirmation samples were not collected due to the presence of this concrete pad.

A total of 1,380 gallons of water and sediment were removed during the initial remedial effort. Five 55-gallon drums of sediment and subsurface soils were generated during the subsequent remediation. Waste materials were transported by Illini Environmental Inc. of East St. Louis, Illinois to Ecological Systems Inc. in Indianapolis, Indiana for proper disposal. Waste disposal manifests are included with Appendix D.

## **REMEDIAL ACTION – BUILDING ASBESTOS ABATEMENT AND MISCELLANEOUS ENVIRONMENTAL ITEMS**

Previous site investigations identified asbestos materials and miscellaneous items of concern within the existing on-site buildings and scattered across the project site. In addition, former utility conduits encountered in the subsurface across the project site were addressed.

### **Existing Building Abatement**

Known ACM present within the remaining site structures was properly removed. The removal strategy was based on the type of material removed and accessibility. Confirmation ambient air sampling was performed to demonstrate compliance with local

air quality standards. Upon completion of building abatement activities, the asbestos closeout report was completed. A copy of the report is attached as Appendix E.

A total of 1-20 cubic yard roll-off of ACMs was transported by Frontier Hauling of Florissant, Missouri and disposed at Bond County Landfill in Greenville, Illinois. Disposal documentation is included with the closeout report (Appendix E).

### **Utility/Conduit Removals**

Several subsurface conduits and utilities were encountered during site development. Lines encountered which were not planned for reuse during redevelopment were abandoned. The removal and abandonment of these lines will assist in preventing the migration of subsurface contaminants to off-site locations.

### **Waste Tires**

Several waste tires of varying sizes were identified across the project site. Waste tires were encountered within the existing buildings and scattered with the surface debris. A total of 3-20 yard roll-offs were transported by Behnen's Container Service, a licensed waste tire hauler, of St. Louis, Missouri to Tri-Rinse, Inc. of St. Louis, Missouri for recycling. Bills of Lading for each of the waste tire loads are included in Appendix D.

### **Miscellaneous Wastes**

As a part of site remediation, various wastes encountered across the project site were properly profiled and disposed off-site. The wastes included removal of existing fluorescent light bulbs and light ballasts from within the existing buildings. In addition, various drums and containers identified across the project site were containerized and properly disposed off-site. Documentation on the transportation and disposal of these wastes is included in Appendix D.

## **REMEDIAL ACTION – SHALLOW GROUNDWATER**

Previous site investigations identified elevated levels of contaminants within the shallow on-site groundwater. Two sampling events were conducted using the existing on-site monitoring wells. The first event was conducted in July 2004 and the second in October 2004. The attached Figure #5 indicates the location of the on-site monitoring wells.

Two monitoring wells (MW-1 and MW-2) were destroyed during site development. The wells were reinstalled (MW-1A and MW-2A) prior to the collection of the second groundwater sampling event.

Monitoring wells were properly purged prior to collection of representative groundwater samples. Samples collected for metals analyses were field filtered prior to collection using 0.45 micron field filters. Collected groundwater samples were analyzed for dissolved metals (chromium, manganese and molybdenum), using USEPA Test Method 6010.

Containerized purged groundwater was properly disposed off-site. Documentation on disposal is included in Appendix D.

Groundwater level readings recorded during sampling activities were used to generate apparent groundwater flow direction. The attached Figure #6 details the flow direction. Based on a review of this Figure, groundwater flows in a southeastern direction.

## **ENGINEERED SURFACE BARRIER**

In conjunction with the remedial objectives, engineered surface barriers have been constructed. Use of the barriers will eliminate the potential pathways for inhalation, dermal contact and ingestion of impacted soils, as well as prevent or minimize the surface infiltration of water and migration of contamination. The engineered controls consist of compacted clay soils. In general, the project site has been overlaid with a minimum of two feet of soil. In addition, surface parking lots, access roads and the concrete floors of future buildings will provide a redundant surface barrier when constructed, although these mechanisms are not part of this engineered barrier and will not be a part of the project site restrictive covenant.

The cap was prepared following the placement and guidelines specified in the grading specification plan. The existing soils on which the cap was placed were smoothed, cleaned and stripped of all organic matter. The area was prepared so as to support the engineered cap. Removal of the residual surface and subsurface concrete was necessary prior to placement of the engineered barrier. The cap was constructed by spreading the clay soils in thin layers and compacting each layer to a predetermined density.

The engineered cap was placed so that areas of previous soil samples and confirmation soil samples with analytical results greater than MDNR CALM Tier 1 Scenario C levels were completely covered. The location of the engineered cap is detailed in Figure 7, included as Appendix A. Future site development which may interfere with the engineered cap will be preapproved by the MDNR B/VCP and follow the site specific *Operations & Maintenance Plan*.

## **CONFIRMATION SAMPLING**

Confirmation sampling was performed to demonstrate compliance with the MDNR B/VCP approved cleanup objectives. Teklab, Inc., an accredited laboratory in Collinsville, Illinois, analyzed the collected confirmation samples.

Discrete soil and sediment confirmation samples were collected after remedial activities. Analysis was based on the contaminants of concern for that area of remediation. Confirmation samples were collected, where feasible, based on typical B/VCP sampling requirements of one sample every 625 square feet (25 foot grid) of excavation floor and every 25 linear feet along excavation walls. Samples were collected by Environmental Operations, Inc. personnel from the excavation floor and selected areas of the excavation walls. Figure #3 in Appendix A indicates the location of collected confirmation samples.

During site development activities, subsurface soils planned for excavation were sampled to determine the environmental potential for on-site reuse. One composite sample, comprised of four separate aliquots, was collected for approximately every 100 cubic yards of planned excavated materials.

## **ANALYTICAL RESULTS**

Results from the soil, sediment and groundwater samples submitted for analysis are presented on the tables attached following this report in Appendix B. Analytical results are also indicated on the attached Figures #3 and #5. Areas where soil and sediment sample results exceeded the cleanup objectives were over-excavated and re-sampled. Appendix F contains the complete analytical report and chain of custody for confirmation soil and sediment sampling. Appendix G contains the analytical reports for groundwater sampling and Appendix H contains the analytical report for excavated material sampling. Based on the results of the confirmation soil and sediment samples, all sampled materials currently meet project cleanup objectives.

Groundwater analytical results indicate elevated levels of dissolved metals in the shallow on-site groundwater. Elevated levels have also been detected in the most upgradient monitoring well.

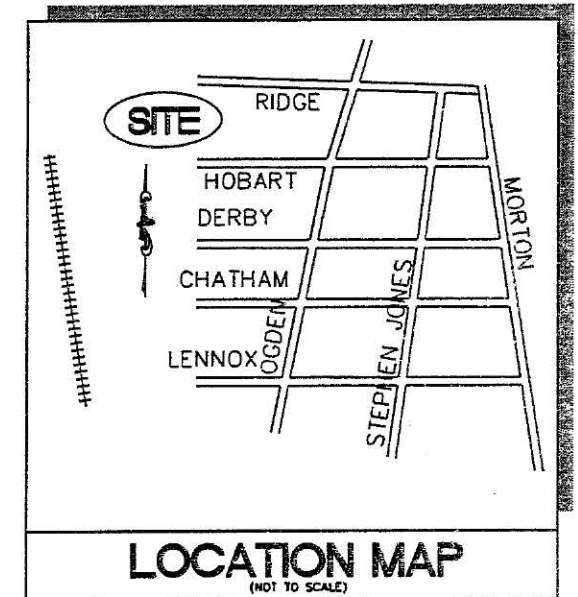
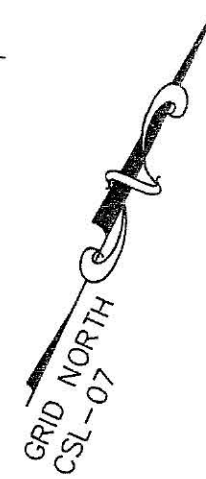
## **CONCLUSIONS**

Based on the analytical results of the remedial actions, all areas of environmental concern currently meet cleanup objectives under the RAP approved by the MDNR B/VCP. In addition, a minimum of two feet of compacted clay soils have been placed over the project site in areas requiring an engineered barrier.

Elevated levels of dissolved metals have been detected in the shallow on-site groundwater. Based on a review of the analytical results, the concentrations are relatively consistent with historic trends. One monitoring well (MW-4) indicated increased concentrations of dissolved manganese during the two sampling events. The most upgradient monitoring well (MW-6) has elevated levels of dissolved manganese detected during all site sampling activities. Based on the presence of upgradient monitoring well impacts and the surface capping of the project site, it is anticipated additional groundwater remedial actions are not warranted.

[illegible]

1 inch = 100 ft.



N/F - NOW OR FORMERLY  
SQ. - SQUARE  
FT. - FEET  
P.O.B. -POINT OF BEGINNING

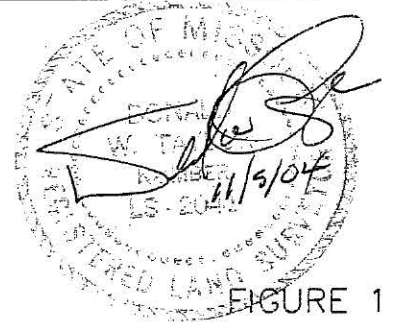


FIGURE 1

ABEX EXHIBITS

# STOCK & ASSOCIATES

Consulting Engineers, Inc.

257 Chesterfield Business Parkway  
St. Louis, MO 63025  
PH. (636) 530-9100  
FAX (636) 530-9130  
e-mail: [general@stockassoc.com](mailto:general@stockassoc.com)  
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DRAWN BY:  
R.S.B. 11/5/04

CHECKED BY:  
D.W.T. 11/5/04

JOB NUMBER:  
201-2623.7

SHEET:  
1 of 3

**PREPARED FOR:**  
**ENVIROMENTAL OPERATIONS, INC.**  
**C/ CLARK PROPERTIES**  
**U SEVENTY CENTER**  
**5391 BROWN AVENUE**  
**ST. LOUIS MISSOURI 63120**  
**PHONE: (314) 389-8822**  
**FAX: (314) 389-1765**

MDNR B/VCP PROJECT SITE BOUNDARIES

PROPERTY DESCRIPTION

The MDNR B/VCP Project

A tract of land being Lots 1 through 18 of Block 6, Lots 3 through 47 and part of Lot 48 of Block 4, Lots 1 through 12 of Block 3 of Wellston Grove 4th Addition, according to the plat thereof recorded in Plat Book 6 Page 56 of the St. Louis County Records; also part of Lot 12 of E.C. Hutchinson's Subdivision according to the plat thereof recorded in Plat Book 8 Page 119 of the records of the City (former County), also part of Lot 1 of Block 10 Page Avenue Heights according to the plat thereof recorded in Plat Book 3 Page 54 of the St. Louis County Records; also 15.00 feet wide alleys located within said Wellston Grove 4th Addition, being Southerly of Block 3, within Block 4, Northerly of Block 6, and along the Westerly line of said Wellston Grove 4th Addition; also streets within said Wellston Grove 4th Addition, being Ridge Avenue, 50.00 feet wide, Hobart Avenue, 60 feet wide, and that part of Grove Avenue, 50.00 feet wide as vacated by instrument recorded in Book 534 Page 29 of the St. Louis County Records; also a 15.00 feet wide alley located Southerly of Lot 1, Block 10 of above said Page Avenue Heights, all embraced herein; located in U.S. Surveys 2684 and 2618, Township 46 North, Range 6 East of the Fifth Principal Meridian, City of Wellston, St. Louis County, Missouri, and being the same property as recorded in Deed Book 15073 Page 1953 of the St. Louis County Records, and being more particularly described as follows:

Beginning at the Southeast corner of a tract of land conveyed to Moog Industries, Inc. as recorded in Book 6326 Page 381 of the St. Louis County Records, with its intersection of Grove Avenue, 50 feet wide; thence South 31 degrees 05 minutes 04 seconds West along the Westerly line of Grove Avenue 106.88 feet; thence departing said Westerly line South 06 degrees 41 minutes 47 seconds West 57.31 feet, and South 07 degrees 10 minutes 43 seconds West 176.61 feet to a point on the Southerly line of Ridge Avenue, 50 feet wide, said point being the Northwest corner of Lot 8, Block 4 of above said Wellston Grove 4th Addition; thence South 75 degrees 05 minutes 26 seconds East along said Southerly line 150.00 feet to the Northeast corner of Lot 3, Block 4 of said Wellston Grove 4th Addition; thence South 14 degrees 54 minutes 34 seconds West along the Easterly line of above said Lot 3 a distance of 125.00 feet to the Southeast corner of said Lot 3, said point being located on the Northerly line of a 15 feet wide alley; thence North 75 degrees 05 minutes 26 seconds West along said Northerly line 315.05 feet to a point in the Southerly line of Lot 15, Block 4 of above said Wellston Grove 4th Addition; thence departing last said Northerly line South 14 degrees 54 minutes 34 seconds West along a line which is 10.00 feet Easterly of the Westerly line of Lot 48 in last said Block 4 a distance of 140.00 feet to a point which is located 10.00 feet Easterly of the Southwest corner of said Lot 48, Block 4, said point also being located on the Northerly line of Hobart Avenue, 60 feet wide; thence North 75 degrees 05 minutes 26 seconds West along said Northerly line 178.46 feet to a point, said point being on the direct Northerly prolongation of the Easterly line of Lot 12, Block 3 of said Wellston Grove 4th Addition; thence South 14 degrees 54 minutes 34 seconds West along said prolongation line and through Lot 1, Block 10 of above said Page Avenue Heights 190.00 feet; thence departing said prolongation line North 75 degrees 05 minutes 26 seconds West through said Lot 1, Block 10 and through Lot 12 of above said Huchinson's Subdivision 368.89 feet; thence North 15 degrees 12 minutes 47 seconds West 279.98 feet; thence North 37 degrees 52 minutes 14 seconds East 326.61 feet; thence North 46 degrees 29 minutes 00 seconds East 398.97 feet to the Southerly line of above said Moog Industries tract; thence South 64 degrees 47 minutes 44 seconds East along said Southerly line 522.85 feet to the POINT OF BEGINNING and containing 538,700 square feet or 12.367 acres more or less according to calculations performed by Stock & Associates Consulting Engineers, Inc. on November 5, 2004.

NOTES:

(1) It is not warranted that these exhibits contain complete information regarding easements, reservations, restrictions, rights-of-way, building lines, and other encumbrances. For complete information, a title opinion or commitment for title insurance should be obtained.

SURVEYOR'S CERTIFICATION

This is to certify that Stock & Associates Consulting Engineers, Inc., have, during November, 2004, by order and for the use of Environmental Operations, Inc. and Clark Properties, have prepared these Exhibits of part of Wellston Grove 4th Addition, Page Avenue Heights, and E.C. Hutchinson's Subdivision and being located in U.S. Surveys 2684 and 2618, Township 45 North, Range 6 East of the 5th Principal Meridian, City of Wellston, St. Louis County, Missouri and that the results of said Exhibit are shown hereon. We further certify that the above Exhibit was prepared from an actual field survey, and said survey does not represent a Property Boundary Survey.

STOCK AND ASSOCIATES CONSULTING ENGINEERS, INC.  
LC NO. 222-D

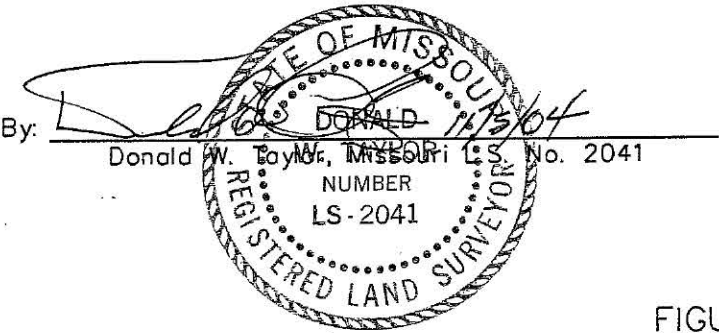


FIGURE 1a

PREPARED FOR:  
ENVIROMENTAL OPERATIONS, INC.  
C/O CLARK PROPERTIES  
N SEVENTY CENTER  
5391 BROWN AVENUE  
ST. LOUIS MISSOURI 63120  
PHONE: (314) 389-8822  
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MDNR B/VCP PROJECT SITE BOUNDARIES

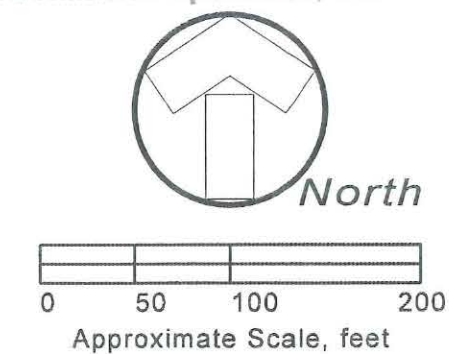
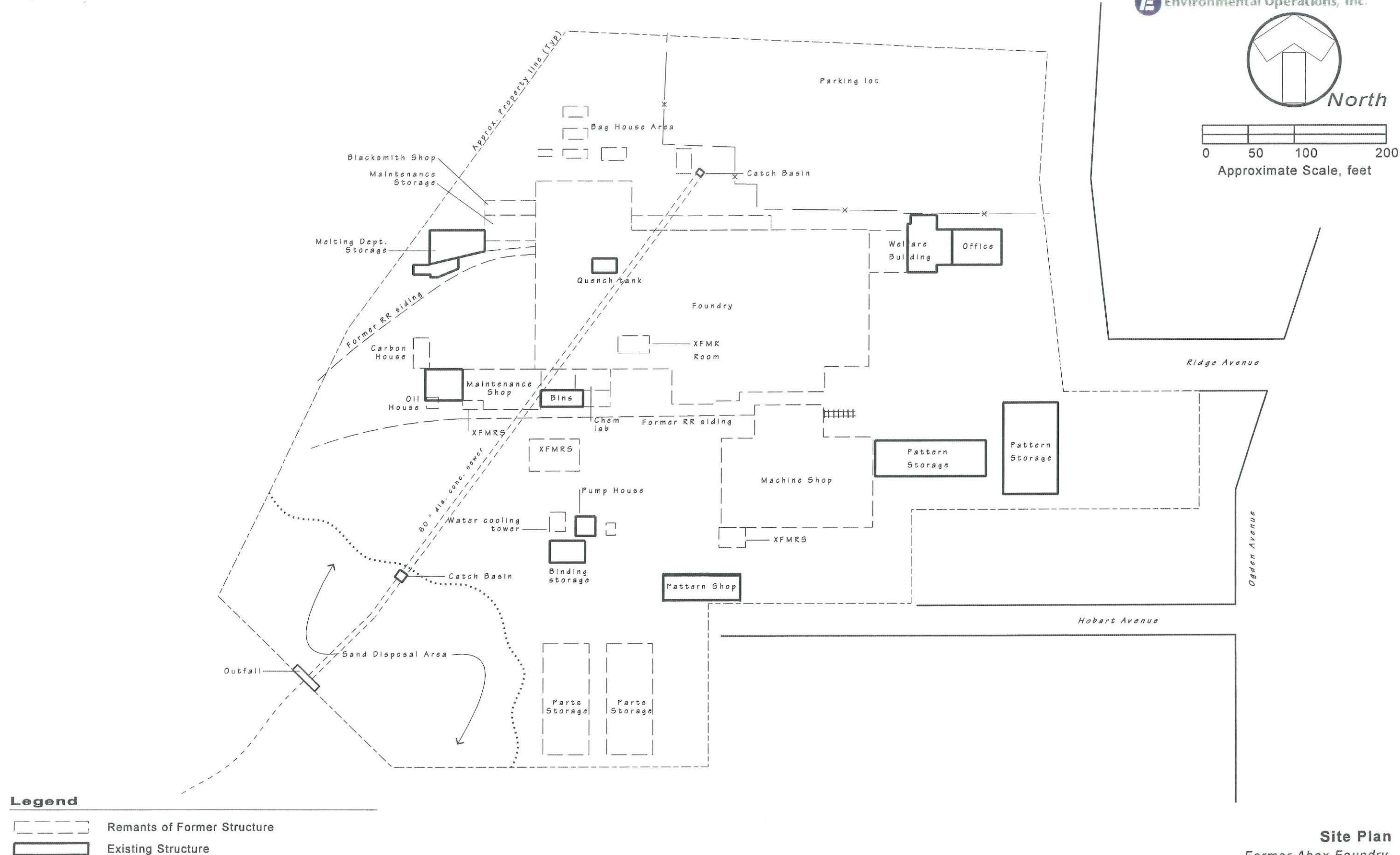
ABEX EXHIBITS

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DRAWN BY: R.S.B. 11/5/04	CHECKED BY: D.W.T. 11/5/04	JOB NUMBER: 201-2623.7	SHEET: 2 of 3
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**Legend**

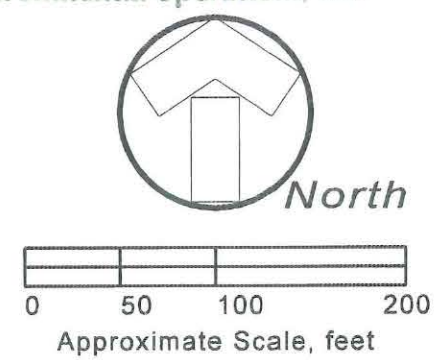
- Remnants of Former Structure
- Existing Structure

Note: Structure locations and site features obtained from previous site plan prepared by Others.

**Site Plan**  
Former Abex Foundry  
6600 Ridge/6538 Hobart Avenue  
Wellston, Missouri

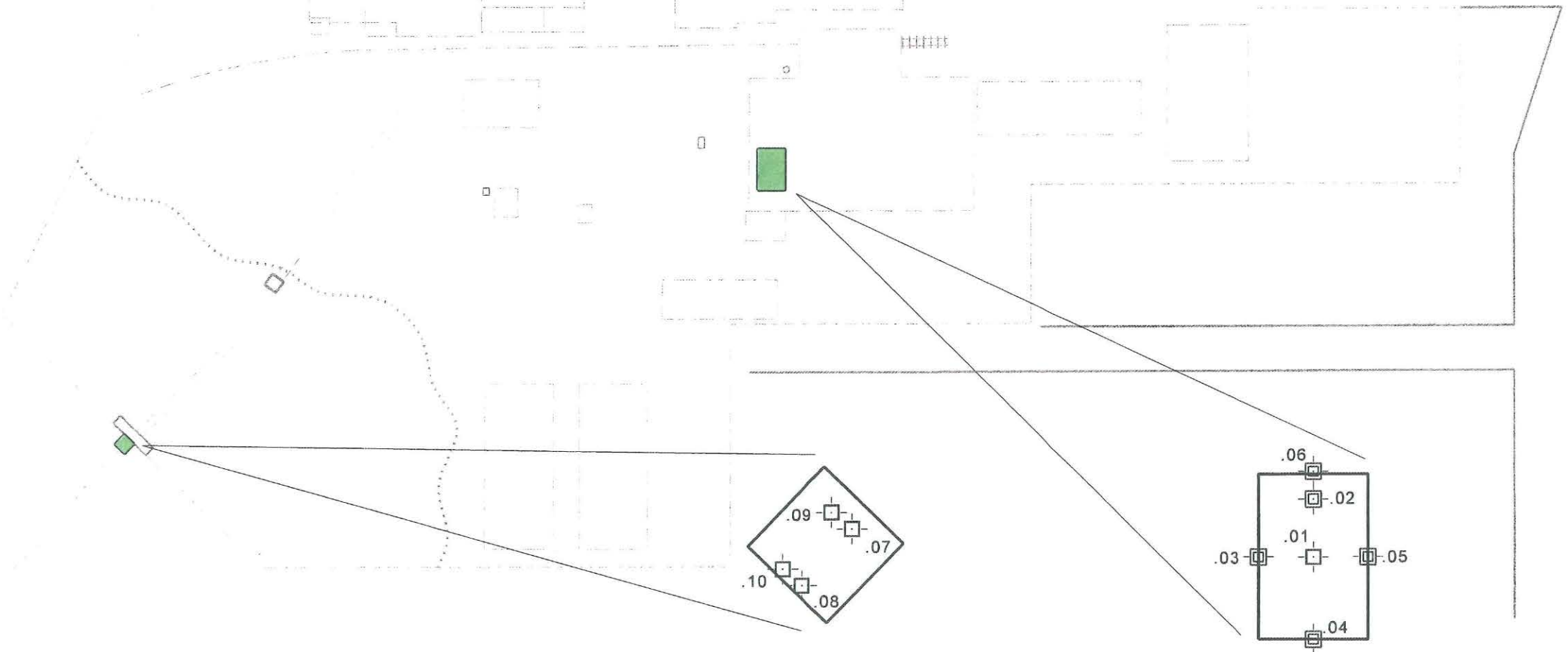
Sample ID		1393.07	1393.08	1393.09	1393.10
Total Metals					
Arsenic	mg/Kg	4.75	4.52	na	na
Lead	mg/Kg	499	269	191	123
Nickel	mg/Kg	56.9	44.7	36.5	51.8
Zinc	mg/Kg	70.9	95.8	na	na
Total Petroleum Hydrocarbons (OA-2)					
Total OA-2	mg/Kg	61	65.5	na	na
Polychlorinated Biphenyls					
Total PCBs	mg/Kg	ND	0.221	na	na
Polynuclear Aromatic Hydrocarbons					
Acenaphthene	mg/Kg	3.8	1.4	1.4	7.5
Acenaphthylene	mg/Kg	<0.069	<0.07	<.17	<0.036
Anthracene	mg/Kg	1.2	0.22	0.42	0.74
Benzo(a)anthracene	mg/Kg	3.4	1	1.1	3.9
Benzo(a)pyrene	mg/Kg	3.4	1.2	1.2	3.1
Benzo(a)fluoranthene	mg/Kg	2.7	0.94	1.1	1.9
Benzo(g,h,i)perylene	mg/Kg	2.2	0.94	0.79	2.9
Benzo(k)fluoranthene	mg/Kg	1	0.54	0.44	0.86
Chrysene	mg/Kg	3.2	1.3	1.3	3.1
Dibenzo(a,h)anthracene	mg/Kg	<0.023	<0.023	<0.057	<0.012
Fluoranthene	mg/Kg	10	3.9	3.8	9.7
Fluorene	mg/Kg	1.3	0.36	0.4	1.6
Indeno(1,2,3-cd)pyrene	mg/Kg	1.8	0.9	0.78	1.7
Naphthalene	mg/Kg	6.8	4	2.6	7
Phenanthrene	mg/Kg	7.2	2.5	2.2	7.2
Pyrene	mg/Kg	6.9	2.8	2.8	7.7

Sample ID	1393.01	1393.02	1393.03	1393.04	1393.05	1393.06	
Sample Depth (feet bgs)	6	4	4	4	4	4	
Total Petroleum Hydrocarbons (OA-2)							
Diesel	mg/Kg	<62.5	737	<63.4	198	<156	<316
Kerosene	mg/Kg	<62.5	<625	<63.4	<61	<156	<316
Mineral Spirits	mg/Kg	<62.5	<625	<63.4	<61	<156	<316
Motor Oil	mg/Kg	646	11700	1250	1560	3010	5820
Total OA-2	mg/Kg	646	12437	1250	1758	3010	5820



**Legend**

- Excavation Floor Confirmation Sample Location
- Excavation Sidewall Confirmation Sample Location
- Former Structure

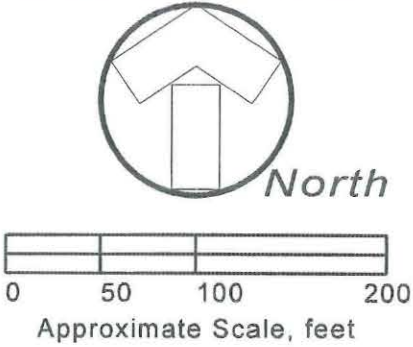


Former SO-1 and 90-0555 Sample Locations

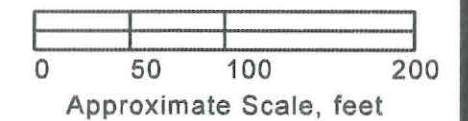
Former MS-1 Sample Location

Areas of Environmental Remediation and Confirmation Sampling  
Former Abex Foundry  
6600 Ridge/6538 Hobart Avenue  
Wellston, Missouri

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**Location of Contaminated Debris  
Piles and Building ACMs**  
Former Abex Foundry  
6600 Ridge/6538 Hobart Avenue  
Wellston, Missouri



Sample Date	12/19/2001	9/9/2003	7/2/2004	10/14/2004
Arsenic mg/L	<0.003	<0.025	—	—
Beryllium mg/L	<0.001	—	—	—
Cadmium mg/L	<0.002	<0.002	—	—
Chromium mg/L	<0.010	<0.010	<0.01	<0.0100
Lead mg/L	<0.002	—	—	—
Manganese mg/L	4.54	—	16	28.7
Mercury mg/L	<0.0002	—	—	—
Molybdenum mg/L	<0.010	—	0.0154	<0.0100
Nickel mg/L	—	0.074	—	—
Vanadium mg/L	<0.010	—	—	—
Zinc mg/L	<0.010	—	—	—

Sample Date	12/19/2001	9/9/2003	7/2/2004	10/14/2004
Arsenic mg/L	<0.003	<0.025	—	—
Beryllium mg/L	<0.001	—	—	—
Cadmium mg/L	<0.002	<0.002	—	—
Chromium mg/L	<0.010	<0.010	<0.01	<0.0100
Lead mg/L	<0.002	—	—	—
Manganese mg/L	7.08	—	3.65	3.79
Mercury mg/L	<0.0002	—	—	—
Molybdenum mg/L	<0.010	—	<0.01	<0.0100
Nickel mg/L	—	<0.010	—	—
Vanadium mg/L	<0.010	—	—	—
Zinc mg/L	0.01	—	—	—

Sample Date	9/9/2003	7/2/2004	10/14/2004
Arsenic mg/L	<0.025	—	—
Cadmium mg/L	<0.002	—	—
Chromium mg/L	0.046	<0.01	<0.0100
Manganese mg/L	—	<0.005	<0.005
Molybdenum mg/L	—	0.237	0.299
Nickel mg/L	<0.010	—	—

Sample Date	12/19/2001	9/9/2003	7/2/2004	10/14/2004
Arsenic mg/L	0.01	<0.025	—	—
Beryllium mg/L	<0.001	—	—	—
Cadmium mg/L	<0.002	<0.002	—	—
Chromium mg/L	<0.010	<0.010	<0.01	<0.0100
Lead mg/L	<0.002	—	—	—
Manganese mg/L	5.15	—	6.3	6.62
Mercury mg/L	<0.0002	—	—	—
Molybdenum mg/L	<0.010	—	<0.01	<0.0100
Nickel mg/L	—	<0.010	—	—
Vanadium mg/L	<0.010	—	—	—
Zinc mg/L	<0.010	—	—	—

Sample Date	12/19/2001	9/9/2003	7/2/2004	10/14/2004
Arsenic mg/L	<0.003	<0.025	—	—
Beryllium mg/L	<0.001	—	—	—
Cadmium mg/L	<0.002	<0.002	—	—
Chromium mg/L	<0.010	<0.010	<0.01	<0.0100
Lead mg/L	<0.002	—	—	—
Manganese mg/L	3.27	—	4.79	1.08
Mercury mg/L	<0.0002	—	—	—
Molybdenum mg/L	<0.010	—	<0.01	<0.0100
Nickel mg/L	—	0.015	—	—
Vanadium mg/L	<0.010	—	—	—
Zinc mg/L	<0.010	—	—	—

Sample Date	12/19/2001	9/9/2003	10/14/2004
Arsenic mg/L	<0.003	<0.025	—
Beryllium mg/L	<0.001	—	—
Cadmium mg/L	<0.002	<0.002	—
Chromium mg/L	0.037	<0.010	<0.0100
Lead mg/L	<0.002	—	—
Manganese mg/L	0.748	—	0.921
Mercury mg/L	<0.0002	—	—
Molybdenum mg/L	0.016	—	<0.0100
Nickel mg/L	—	<0.010	—
Vanadium mg/L	<0.010	—	—
Zinc mg/L	<0.010	—	—

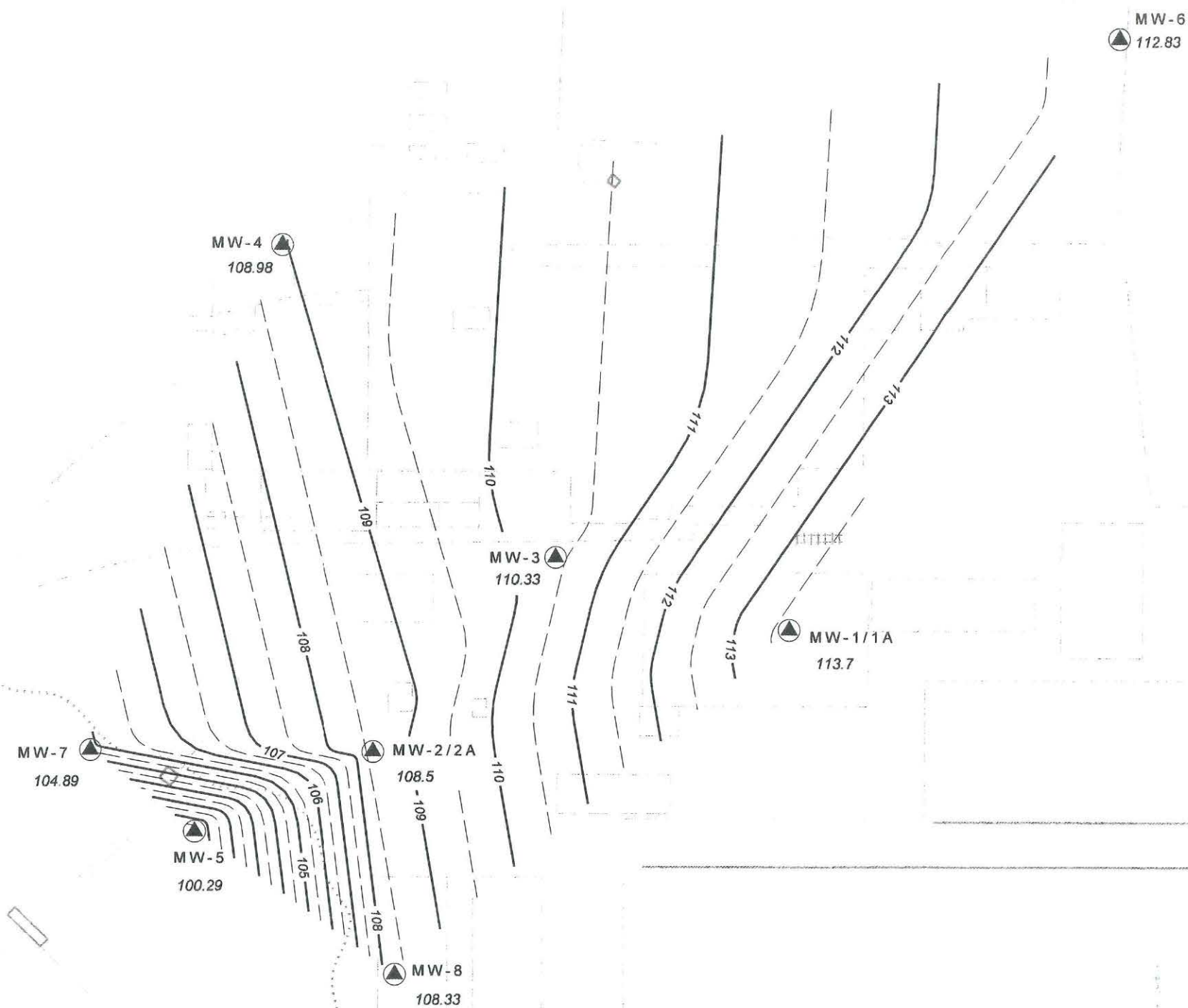
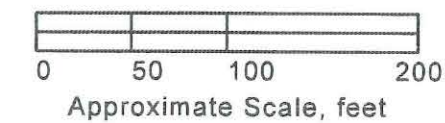
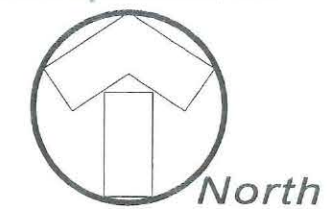
Sample Date	9/9/2003	7/2/2004	10/14/2004
Arsenic mg/L	<0.025	—	—
Cadmium mg/L	<0.002	—	—
Chromium mg/L	0.046	<0.01	<0.0100
Manganese mg/L	—	<0.005	<0.005
Molybdenum mg/L	—	0.237	0.299
Nickel mg/L	<0.010	—	—

Sample Date	9/9/2003	7/2/2004	10/14/2004
Arsenic mg/L	<0.025	—	—
Cadmium mg/L	<0.002	—	—
Chromium mg/L	<0.010	<0.01	<0.0100
Manganese mg/L	—	4.17	4.93
Molybdenum mg/L	—	0.0212	<0.0100
Nickel mg/L	<0.010	—	—

**Legend**

- Existing Monitoring Well Location  
 Former Structure

**Groundwater Monitoring Wells  
and Analytical Results**  
Former Abex Foundry  
6600 Ridge/6538 Hobart Avenue  
Wellston, Missouri



**Legend**

- Existing Monitoring Well Location
- Former Structure
- Potentiometric Surface Elevation
- Groundwater Elevation

**Groundwater Potentiometric  
Map, 13 October 2004**  
Former Abex Foundry  
Wellston, Missouri

Figure 6

# ENGINEERED CAP LOCATION



GRAPHIC SCALE



( IN FEET )  
1 inch = 100 ft.

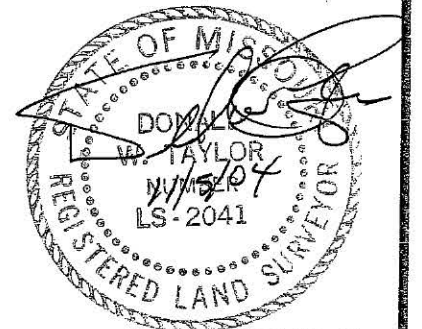


FIGURE 7

ENGINEERED CAP LOCATION

ABEX EXHIBITS

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