



July 14, 2010  
Project 993600-2-2001

Geotechnical  
Environmental  
Water Resources  
Ecological

Mr. Leonardo Ceron  
On-Scene Coordinator  
U.S. Environmental Protection Agency, Region 4  
11<sup>th</sup> Floor/Superfund  
61 Forsyth Street, SW  
Atlanta, GA 30303

Re: Removal Action Work Plan Investigations  
Summary Letter  
Huntsville Gas Company Site  
Huntsville, Madison County, Alabama  
**USEPA ID# ALN000407462**  
**Docket Number 04-2010-3756**

Dear Mr. Ceron:

On behalf of the Alabama Gas Corporation (ALAGASCO) and the Huntsville Housing Authority (HHA), GEI Consultants, Inc. (GEI) has prepared this letter to summarize investigations completed at the Huntsville former Manufactured Gas Plant (MGP), herein referenced as the "Site". The investigations were completed in accordance with the Removal Action Work Plan (RAWP) dated March 30, 2010, approved by the U.S. Environmental Protection Agency (EPA), Region 4 on April 22, 2010.

GEI summarized the completed tasks in the Monthly Status Report dated June 15, 2010. The completed tasks were:

- Electromagnetic (EM) and Ground Penetrating Radar (GPR) mapping for the old foundation elements and utilities at the Site;
- Collection of 5 sediment samples in the unnamed ditch;
- Collection of 3 sediment samples in Pinhook Creek;
- Installation and sampling of 4 temporary well points per the RAWP scope and an additional 3 piezometers to aid in groundwater flow characterization;
- Collection of 34 surface soil samples from 0-1.0 feet;
- Collection of 34 shallow subsurface soil samples from 1.0-4.0 feet;
- Collection and selected analysis of 8 subsurface soil samples from soils below 4 feet;
- Collection of 4 groundwater samples; and
- Partial excavation of 5 test pits identified through soil borings and geophysical survey.

This letter discusses the field observations made during the investigations and summarizes the preliminary laboratory analytical data for surface soil, shallow subsurface soil, subsurface soil, sediment, and groundwater. Based on the field observations and laboratory analytical results, GEI has developed a scope for additional investigations to complete the characterization of the Site for remediation. A revised project schedule is proposed for completion of the additional characterization and remediation.

## **1.0 Surface Soil and Shallow Subsurface Soil Investigation**

Between May 11 and May 18, 2010, GEI completed a total of 40 soil borings across the Site. The approximate locations of the soil borings are presented in Figure 1 – Sample Locations Plan. GEI located the soil borings per Figure 5 of the RAWP with minor variations as necessary to avoid utilities and surface features. Two (2) additional soil boring locations HG-RES-28-2 and HG-RES-19-1 were added at the request of the On Scene Coordinator (OSC) to delineate impacts identified visually in the field in TWP-1 and HG-RES-15-1.

The soil borings were completed to delineate soil impacts identified during previous investigations of the surface soil (i.e., 0.0 to 1.0 feet) and shallow subsurface soil (i.e., 1.0 to 4.0 feet). GEI advanced the soil borings using either hand augers or by direct-push drilling methods. Direct-push drilling was completed by Technical Drilling Services, Inc., of Knoxville, Alabama, a licensed driller in Alabama. Table 1 – Soil Boring and Sample Summary lists each soil boring completed at the Site.

Two samples were collected from each soil boring proposed for delineation of surface soil and shallow subsurface soil; one (1) sample was collected from the 0.0 to 1.0 foot interval below ground surface (bgs) and one (1) sample was collected from the 1.0 to 4.0 foot interval. Soil borings HG-RES-41, HG-RES-42, and HG-RES-43 were completed to a depth of approximately 0.5 feet bgs. A total of 34 surface soil and 34 shallow subsurface soil samples were collected from the soil borings. The soil samples were analyzed per the RAWP for Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) using EPA Method 8260B, Polynuclear Aromatic Hydrocarbons (PAHs) using EPA Method 8270C with Selected Ion Monitoring (SIM), and metals, including arsenic, lead, and mercury using EPA Method 6010/7470A.

The samples were analyzed by Analytical Environmental Services, Inc., of Atlanta, Georgia. Laboratory analytical results for the surface soil and shallow subsurface soil samples are presented in Table 2 (attached). Table 2 compares the results of the soil analysis to the Proposed Removal Goals (PRGs) developed for the Site. The PRGs were developed using exposure scenarios for both Residential Soil and Construction/Utility Soil. PRGs were developed based on a target Cancer Risk Level (CRL) of  $1 \times 10^{-4}$  for carcinogenic compounds. With the exception of arsenic, PRGs were conservatively developed based on a Hazard Quotient (HQ) of 1.0 for non-carcinogenic compounds. For non-carcinogenic risk associated with arsenic, the PRG was developed based on an HQ of 3.0 in accordance with USEPA Region 4 guidance presented in memoranda dated August 20, 2008 and September 19, 2008 regarding the review of the Removal Site Evaluation Report and Final Data for the Huntsville Gas Company Site. When PRGs were developed based on both carcinogenic and non-carcinogenic risk, the lower of the two PRG values is presented in Table 2.

Residential PRGs apply to the top 1 foot of surface soil at the Site while Construction/Utility PRGs apply to subsurface soil at a depth of 1 to 4 feet. Construction/Utility PRGs are based on the assumption that subsurface soil below 1 foot will continue to be subsurface soil in the future and that only an adult worker would be exposed to subsurface soil. Soil PRGs are based on direct contact with soil and include the following exposure routes: incidental ingestion, dermal contact, and inhalation of particulates. Residential PRGs are based on USEPA Regional Screening Levels (RSLs) (USEPA, 2010). USEPA RSLs were updated following submittal of the RAWP; therefore, PRGs presented in Table 2 are consistent with current USEPA RSLs (USEPA, 2010).

Construction/Utility PRGs are based on adult worker exposure to soil for 250 days for a 1-year construction project. Construction worker exposure assumptions are based on default values provided by the Alabama Department of Environmental Management (ADEM, 2008).

Comparison of the soil data to the PRGs shows that no volatile organic compounds were detected above the Residential PRG based on an HQ of 1.0 in soil samples collected in the surface and shallow subsurface zones. Concentrations of PAHs above the Residential PRGs based on cancer risk including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(g,h,i)perylene, and indeno(1,2,3-cd)pyrene were detected in 11 soil samples collected from the following surface soil sample locations: HG-RES-15-1-1, HG-RES-15-2-1, HG-RES-18-1-1, HG-RES-24-2-1, HG-RES-25-1-1, HG-RES-27-1-1, HG-RES-27-3-1, HG-RES-30-1-1, HG-RES-31-1-1, HG-RES-32-1-1, HG-Res-41-SW (collected at the base of the un-named ditch slope), and TWP-1-1. No organic compounds were detected above PRGs in shallow subsurface soil samples. Concentrations of compounds exceeding PRGs are presented on Figure 2 for each soil boring location.

No inorganic compounds were detected above Residential PRGs based on cancer risk in soil samples collected in the surface and shallow subsurface zones. Lead concentrations exceeded the Residential PRG of 400 milligrams per kilogram (mg/kg) in four samples HG-RES-18-1-1 (514 mg/kg), HG-RES-18-2-1 (487 mg/kg), HG-RES-27-3-1 (447 mg/kg). Concentrations of inorganic compounds exceeding PRGs are also presented on Figure 2 for each soil boring location.

## **2.0 Subsurface Soil Investigation**

Per the RAWP, 10 soil borings were completed to refusal at the bedrock surface. These soil borings were intended to provide vertical delineation of any potential free and/or residual product. The soil borings advanced to refusal included HG-RES-05-2, HG-RES-15-1, HG-RES-19-1, HG-RES-24-1, HG-RES-24-2, HG-RES-25-1 (TWP-6), HG-RES-28-1, HG-RES-28-2, HG-RES-29-1 (TWP-2), HG-RES-30-1 (TWP-5), HG-RES-31-1, HG-RES-32-1 (TWP-3), TWP-1, and TWP-4. The depth of refusal in each of these soil borings ranged from a minimum of approximately 9.5 feet in HG-RES-24-1 to a maximum of approximately 36.0 feet in two soil borings HG-RES-05-2 and HG-RES-28-1. It should be noted that refusal encountered in HG-RES-24-1 was due to the large holder wall foundation and is not indicative of the bedrock surface. The bedrock surface ranged from approximately 20.5 to 36 feet bgs.

Indications of impacts to the subsurface soils including elevated readings with the photoionization detector (PID), coating and sheens on the soil grains and pore-space water, and odors were observed in all of the deeper soil borings with the exception of HG-RES-05-2, HG-RES-28-1, HG-RES-28-2, and TWP-4. The highest PID reading, 1,400 parts per million (ppm), or instrument units above background, was detected in soil boring HG-RES-29-1 (TWP-2) at a depth of approximately 19.5 feet bgs. Visual indications of the presence of Dense Non-Aqueous Phase Liquids (DNAPL) were also observed in HG-RES-29-1 (TWP-2) when the temporary well screen was removed and noted to be coated with a tar-like substance from the portion of the well screen corresponding to 35 feet to 28 feet bgs.

GEI collected subsurface soil samples from several of the soil borings. The RAWP did not call for any soil samples to be collected below 4.0 feet bgs. However, based on the visual observations, it was determined in consult with the EPA OSC that collection of deeper samples for vertical delineation would be prudent. The OSC was also concerned with establishing subsurface soil

background concentrations. It was decided that soil samples would be collected from the soil boring completed for the installation of temporary well point TWP-4.

A total of eight (8) subsurface soil samples were submitted for analysis. The subsurface soil samples were analyzed for the same parameters as the surface soil and shallow subsurface soils, BTEX, PAHs, and metals. The results of the laboratory analysis are presented in Table 3 (attached). No numerical standards for soils underlying 4.0 feet bgs have been established for the Site at this time. It should be noted that no organic compounds were detected in soil samples collected from TWP-4 at 9.5'-10.0' bgs and 20.0'-20.5' bgs. In addition, soil samples HG-RES-15-1-3 (12.0'-12.5') and HG-RES-32-1-3 (10.0'-10.5') provide data for vertical delineation of compounds exceeding PRGs in surface and shallow subsurface soil samples. Soil sample HG-RES-29-1-3 provides analytical data for soils collected from the soil interval with the highest PID reading at the Site.

### **3.0 Un-named Ditch and Pinhook Creek Sediment Investigation**

The RAWP called for the collection of three (3) sediment samples in the un-named ditch (drainage swale) at locations HG-RES41, HG-RES-42, and HG-RES-43. GEI collected two (2) additional sediment samples in the un-named ditch, referenced as SED-4-SWALE and SED-5-SWALE. The OSC requested that these additional upstream sediment samples be collected; one in the area of the large holder and one upgradient near an observed out cropping of coal-like fill material located outside of the MGP footprint. GEI collected three (3) sediment samples in Pinhook Creek referenced as PC-SED-1, PC-SED-2, and PC-SED-3 per the RAWP. Sediment sample PC-SED-3 was collected upstream of the confluence of Pinhook Creek with the un-named ditch, PC-SED-2 was collected at the confluence of Pinhook Creek with the un-named ditch, and PC-SED-1 was collected downstream of the confluence of Pinhook Creek with the un-named ditch.

The sediment samples were analyzed for the same parameters as the soil samples, BTEX, PAHs, and metals. GEI evaluated the laboratory analytical results for the sediment samples collected in the un-named ditch differently than the sediment samples collected from Pinhook Creek. The un-named ditch is a man-made swale designed for stormwater drainage and has been observed to be intermittently dry. During storms, there is a high-energy flow regime which can cause substantial erosion. Based on this, the un-named ditch is not a viable ecological habitat in comparison to Pinhook Creek. The primary concern for sediment in the un-named ditch is residential exposure via direct contact. Therefore, the laboratory analytical results for the un-named ditch sediment samples are compared to the residential soil PRGs in Table 2. No concentrations of compounds exceeded the PRGs in sediment samples collected from the un-named ditch.

Table 4 (attached) compares the results of the Pinhook Creek sediment analysis to the EPA Region 4 sediment screening values. No compounds detected in sediment exceeded established screening values, with the exception of arsenic and lead. Arsenic exceeded the effects value and screening value of 7.24 mg/kg in all of the sediment samples. Lead exceeded the effects value and screening value of 30.2 in only one sediment sample (PC-SED-1). All of the sediment samples had detected concentrations of BTEX and PAH compounds.

#### **4.0 Groundwater Investigation**

GEI completed a groundwater investigation at the Site through installation and monitoring of temporary well points and piezometers. Four (4) temporary well points, referenced as TWP-1 through TWP-4 were proposed to be installed per the RAWP. Temporary well points were installed per the RAWP at the TWP-1 and TWP-4 locations. The proposed TWP-2 location was installed within soil boring HG-RES-29-1 and the proposed TWP-3 location was installed within soil boring HG-RES-32-1. Two additional well points were installed as piezometers to augment data points for a better determination of groundwater flow; TWP-5 was installed in soil boring HG-RES-30-1 and TWP-6 was installed in soil boring HG-RES-25-1.

The piezometers were screened from refusal (assumed bedrock surface) which ranged from approximately 20.5 to 36 feet below grade to approximately 5 feet below grade. Based on depth-to-water measurements, it was determined that a confined aquifer is present immediately overlying the bedrock underlying the site. The confining layer consists of clayey soils present from approximately 15 to 20 feet below grade. A water table aquifer is also present underlying the site. A piezometer was installed approximately 30 feet to the southwest of HG-RES-29-1 (TWP-2) to an approximate depth of 10 feet below grade. A head differential of approximately 2 feet was observed between the wells screened to the bedrock surface and the piezometer. Groundwater in the confined aquifer was determined to flow to the west/southwest from TWP-4 to the swale and Pinhook Creek at an approximate gradient of 0.025 ft./ft.

Groundwater samples were collected from temporary well points TWP-1 through TWP-4. The samples were analyzed for BTEX, PAHs, and metals. The results of the laboratory analysis are presented in Table 5 (attached). Dissolved-phase concentrations of BTEX and PAHs were detected in all of the wells. In temporary well TWP-4, benzene and toluene were detected at concentrations below the EPA drinking water standards. In the remaining temporary wells points, higher dissolved-phase concentrations were detected; with the maximum concentrations detected in temporary well point TWP-2.

The concentrations detected in the temporary well points are most-likely artificially high. However, the data does indicate that there is a dissolved-phase plume present in the confined aquifer immediately overlying the bedrock and possibly impacts to the overlying water table aquifer.

#### **5.0 Structure Investigation**

GEI completed contingency task 1 (Section 4.7 of the RAWP) on May 19 and 20 with no impact to the overall initial schedule. Five (5) test pits were excavated at the site (see Figure 1). GEI located the test pits based on the preliminary GPR survey and test boring data. Soil boring HG-RES-24-1 was located in the area of the large holder. Refusal was encountered at 9.5 feet in HG-RES-24-1, which indicated the presence of the holder in that location. The preliminary GPR report also showed the possible holder location near HG-RES-24-1. Test Pit TP-1 was excavated between the possible holder wall as delineated from the GPR preliminary report and soil boring HG-RES-24-1.

The large holder wall was identified and exposed in test pit TP-1, with the test pit located on the exterior of the holder. No indications of impacts to the soils were observed in TP-1. It was determined that soil boring HG-RES-24-1 was advanced directly adjacent to the holder wall and

that refusal was encountered on the holder foundation at 9.5 feet below grade. Test pit TP-2 was then excavated in the interior of the large holder from the identified wall extending 10 feet into the interior of the large holder. The test pit extended to a maximum depth of approximately 10 feet below grade. No base for the holder was encountered at this depth. No impacts were observed within the interior of the large holder.

GEI could not excavate additional test pits within the holder due to the presence of utilities and surface features. We estimated the location of the footprint of the large holder based on the exposed wall. The location closely matches the estimated location plotted in Figure 3 of the RAWP, which was based on the Sanborn fire insurance maps. The approximate location of the large holder is presented in Figure 1.

The approximate location of the small holder was estimated based on the identified large holder wall and the preliminary GPR report. GEI excavated test pit TP-3 to locate the small holder wall. The wall was identified approximately 1.5 feet below grade. The test pit exposed the interior of the small holder which was observed to be filled with demolition debris. Naphthalene-like odors and tarry soils were encountered at an approximate depth of 4 feet below grade. Due to the observed impacts, GEI terminated the soil boring at approximately 5 feet for health and safety purposes. Impacted soil spoils were returned to the excavation and covered with un-impacted soils. A second test pit, TP-4 was excavated to verify the location of small holder wall approximately on the opposite side of the holder wall identified in test pit TP-3. The wall was exposed and the location of the center of the small holder was more accurately determined.

GEI excavated test pit TP-5 to identify the western boundary of the coal shed on the western part of the Site. The test pit extended to an approximate depth 9 feet below grade. No intact elements of the coal shed were identified in the test pit. Demolition debris, presumably from the coal shed was exposed including brick wall sections and floor slab, intermixed with coal-like material and soil.

## **6.0 Summary and Conclusions**

The following summary is based on the preliminary field and laboratory data collected per the approved RAWP:

- Concentrations of PAHs exceeding the established Residential PRGs for the Site were detected in 14 of the 34 surface soil samples. No BTEX or metals compounds were detected in concentrations exceeding the Residential PRGs in any of the samples. No exceedances of the Construction/Utility PRGs were detected in and of the shallow subsurface soil samples.
- Soil impacts are present in surface and subsurface soils. These impacts appear to be confined to the area of the MGP operations, particularly the holders and purifier house. Tar-like material, staining and sheens related to the MGP operation are present in the underlying unconsolidated aquifer. The presence of these materials has not been completely delineated vertically or horizontally.
- The small and large holders have been identified and are present at the Site. Impacts were observed in the soils contained in the small holder. No impacts were observed in the soil in the interior of the large holder.

- Dissolved-phase impacts are likely present in the groundwater underlying the Site
- Arsenic and lead were the only two compounds to exceed the EPA Region 4 sediment effects values and screening values in the sediment samples collected from Pinhook Creek. Concentrations of BTEX and PAHs were detected in all of the sediment samples collected from Pinhook Creek at concentrations below EPA Region 4 sediment effects values and screening values. The presence of these compounds at relatively consistent concentrations in both the upgradient and downgradient samples may represent background concentrations in the area, but suggest that compounds are coming from an off-site source. Based on this data, additional ecological assessment of the Pinhook Creek is not warranted at this time. GEI recommends collecting additional sediment samples from the Pinhook Creek and un-named ditch following the completion of proposed remedial actions to confirm that upgradient sources are contributing to the detected sediment concentrations and that the Site is not a continuing source with the potential to cause ecological impacts.

#### **7.0 Additional Site Characterization Scope of Work**

In Section 4.15 of the RAWP, GEI proposed five (5) contingency tasks to be implemented based on field observations as necessary. A discussion of each task is presented below:

- As stated previously, GEI completed contingency Task 1 (Section 4.7 of the RAWP) on May 19 and 20 with no impact to the overall initial schedule. Five (5) test pits were excavated at the site (see Figure 1). To augment Task 1 GEI proposes completing additional direct-push soil borings within the identified small and large holder areas. Completion of the soil borings will aid in more-accurately determining the depth of the holders, the construction of the bases of the holders, and the extent of impacts in the holders from residual MGP materials. To accomplish this, GEI will advance 4 soil borings in the interior of the large holder and 3 soil borings in the interior of the small holder. The proposed locations of these soil borings are presented in Figure 4 (attached). These borings will be advanced to depths required to characterize the material present within each holder, but will not be advanced beyond the base of the holders to prevent potential downward migration of any residual MGP material. Additional soil borings completed on the perimeter of the small and large holders will be advanced to the bedrock surface.
- Contingency Task 2 (Section 4.8 of the RAWP) requires completion if non-aqueous phase liquids/residual MGP-related materials were observed in the deeper soil borings. GEI observed indications of soil impacts present below 4 feet in several soil borings including HG-RES-19-1, HG-RES-30-1, HG-RES-31-1, HG-RES-32-1, HG-RES-29-1, HG-RES-24-2, and TWP-1. The observed impacts included elevated PID readings, coatings and sheen on soil grains and groundwater, and in TWP-1, a tar-like coating on the temporary well casing following removal from the soil boring. Based on these observations, additional investigation and delineation of free and/or residual product is proposed as a contingency task as described in section 4.8 of the RAWP.
  - Based on observed subsurface conditions, contingency Task 2 will be modified from the original work plan due to the localized nature of identified impacts. In lieu of the TarGOST GEI will delineate impacts observed in TWP-2 using a direct-push drill rig. The proposed locations of the soil borings are presented in Figure 4

(attached). GEI will retrieve soils from the ground surface until refusal is encountered at the bedrock surface. The subsurface soils will be reviewed for the presence of impacts through visual and olfactory observations and scanning using a PID.

- Contingency Task 3 (Section 4.9 of the RAWP) outlines investigations into the bedrock underlying the Site to vertically delineate the presence of DNAPL. Prior to implementation of contingency Task 3, GEI recommends installing four permanent monitoring wells terminated at the bedrock surface. Installation of these wells will achieve two objectives. First they will more accurately characterize the potential dissolved-phase plume identified through the sampling of the temporary well points. Secondly they will allow GEI to more accurately determine if significant quantities of DNAPL have accumulated on the bedrock and prior to vertical delineation into the bedrock.

These wells will be screened from the bedrock surface to 10 feet above the bedrock surface and will be constructed with 2" diameter slotted PVC screened with solid PVC riser to reach the surface. All wells will be completed with flush-mount protective caps. The location and elevation of each well will be surveyed by a licensed surveyor.

The wells will be developed using a submersible pump until the water is turbid free. All development water will be containerized in either DOT-approved 55-gallon drums, or a holding tank if the volume of development water warrants it. The wells will be allowed to equilibrate for a minimum of 24 hours following development. Following the equilibration period, GEI will probe each well with an oil/water interface meter to identify any potential DNAPL.

GEI will return to the Site a minimum of two weeks after the development to collect dissolved-phase samples. Prior to sampling, the depth to groundwater in each of the four wells will be measured. Each of the wells will be purged using low flow techniques. In-situ testing (i.e., temperature, pH, dissolved oxygen, oxidation-reduction potential, and conductivity) of the groundwater will be performed continuously during well purging. Purging will continue until the groundwater parameters stabilize. Purge water will be containerized on-site with the development water for future classification and disposal.

Upon completion of purging, a groundwater sample will be collected from each well using low flow sampling techniques. The collected groundwater samples will be immediately transferred into laboratory-prepared sample bottles. The collected groundwater samples will be stored in a cooler containing ice, prior to transport to a certified laboratory for analyses. The collected groundwater samples will be analyzed for BTEX, PAHs, arsenic, lead, and mercury, using the same EPA methods previously employed for sample analysis at the Site.

- The decision to implement contingency Task 4 (Section 4.10 Soil Gas Sampling in the RAWP) will be made following completion of contingency Task 2.
- As discussed in Section 6.0, completion of Task 5, forensic analysis related to sediment impacts in the Pinhook Creek is not warranted at this time. GEI recommends collecting additional sediment samples from the Pinhook Creek and un-named ditch following the

completion of proposed remedial actions to confirm that upgradient sources are contributing to the detected sediment concentrations and that the Site is not a continuing source with the potential to cause ecological impacts.

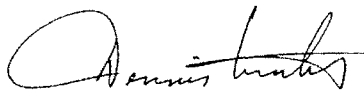
## 8.0 Revised Project Schedule

Following approval of the implementation of the contingency tasks discussed above, GEI can mobilize to the Site within three weeks. The RAWP contemplated these contingency activities and presented anticipated schedule impacts. The schedule impact for Contingency Task 2 presented in the RAWP was 6 weeks; the impact for Contingency Task 3 was 3 weeks. As these tasks can be completed during the same mobilization, we estimate a total schedule impact of 6 weeks. The remainder of the proposed removal action schedule approved in the RAWP will be modified as follows:

| Task/Milestone                                       | Estimated Task/Milestone Duration (weeks)         |
|--|---|
| Mobilization for Contingency Tasks from EPA Approval | 3 weeks   |
| Contingency Investigation Activities                 | 3 weeks   |
| Prepare Bid Documents for Removal Action             | 12 weeks from completion of investigation         |
| Commencement of removal activities                   | 20 weeks from acceptance of revised RAWP and CBSP |
| Submission RA Report to EPA                          | 12 weeks from completion of removal activities    |

If you have any questions, feel free to contact me at (856) 608-6860 or by email at [dunites@geiconsultants.com](mailto:dunites@geiconsultants.com).

Sincerely,



Dennis Unites  
Project Coordinator

### Attachments

cc: C. Brown (Alagasco)  
S. Chapman (Alagasco)  
P. Goldman (Alagasco)  
D. Smith (Alagasco)  
J. Taylor (Maynard Cooper)  
C. Geiger (KGL)  
S. Kazmarek (KGL)  
T. Olean (GEI)

**Table 1**  
**Soil Boring and Sample Summary**  
**Removal Action Work Plan Investigation**  
**Huntsville Former MGP Site**  
**Huntsville, Alabama**

Unvalidated Data

| Soil Boring Number | Date Started | Date Completed | Total Depth (feet) | Visual Indications of Impacts Detected Y/N | Maximum PID Reading (ppm) | Depth of Maximum PID Reading (feet) | Laboratory Sample Number | Depth (feet) | BTEX (EPA 8260B) | PAHs (EPA 8270C with SIM Analysis) | Metals (EPA 6010/7470A) | Exceedances of PRGs Detected Y/N | Compounds   | Concentration (µg/Kg organics mg/Kg metals) |
|--------------------|--------------|----------------|--------------------|--|---------------------------|-------------------------------------|--------------------------|--------------|------------------|------------------------------------|-------------------------|----------------------------------|---|---|
| HG-RES-05-1        | 5/12/2010    | 5/12/2010      | 4.0                | N  | 0.0                       | NA                                  | HG-RES-05-1-1            | 0.0-1.0      | X                | X                                  | X                       | N                                |   |   |
| HG-RES-05-2        | 5/12/2010    | 5/12/2010      | 36.0               | N  | 0.0                       | NA                                  | HG-RES-05-1-2            | 2.5-3.0      | X                | X                                  | X                       | N                                |   |   |
| HG-RES-07-1        | 5/12/2010    | 5/12/2010      | 4.0                | N  | 0.0                       | NA                                  | HG-RES-05-2-1            | 0.0-1.0      | X                | X                                  | X                       | N                                |   |   |
| HG-RES-08-1        | 5/12/2010    | 5/12/2010      | 4.0                | N  | 0.0                       | NA                                  | HG-RES-05-2-2            | 2.5-3.0      | X                | X                                  | X                       | N                                |   |   |
| HG-RES-12-1        | 5/18/2010    | 5/18/2010      | 4.0                | N  | 0.0                       | NA                                  | HG-RES-07-1-1            | 0.0-1.0      | X                | X                                  | X                       | N                                |   |   |
| HG-RES-14-1        | 5/18/2010    | 5/18/2010      | 4.0                | N  | 0.0                       | NA                                  | HG-RES-07-1-2            | 2.5-3.0      | X                | X                                  | X                       | N                                |   |   |
| HG-RES-14-2        | 5/18/2010    | 5/18/2010      | 4.0                | N  | 0.0                       | NA                                  | HG-RES-08-1-1            | 0.0-1.0      | X                | X                                  | X                       | N                                |   |   |
| HG-RES-14-3        | 5/18/2010    | 5/18/2010      | 4.0                | N  | 0.0                       | NA                                  | HG-RES-08-1-2            | 2.5-3.0      | X                | X                                  | X                       | N                                |   |   |
|                    |              |                |                    |  |                           |                                     | HG-RES-12-1-1            | 0.5-1.0      | X                | X                                  | X                       | Y                                | Benzo(a)pyrene  | 2,200                                       |
|                    |              |                |                    |  |                           |                                     | HG-RES-12-1-2            | 3.5-4.0      | X                | X                                  | X                       | N                                |   |   |
|                    |              |                |                    |  |                           |                                     | HG-RES-14-1-1            | 0.5-1.0      | X                | X                                  | X                       | N                                |   |   |
|                    |              |                |                    |  |                           |                                     | HG-RES-14-1-2            | 3.5-4.0      | X                | X                                  | X                       | N                                |   |   |
|                    |              |                |                    |  |                           |                                     | HG-RES-14-2-1            | 0.5-1.0      | X                | X                                  | X                       | N                                |   |   |
|                    |              |                |                    |  |                           |                                     | HG-RES-14-2-2            | 3.5-4.0      | X                | X                                  | X                       | N                                |   |   |
|                    |              |                |                    |  |                           |                                     | HG-RES-14-3-1            | 0.5-1.0      | X                | X                                  | X                       | N                                |   |   |
|                    |              |                |                    |  |                           |                                     | HG-RES-14-3-2            | 3.5-4.0      | X                | X                                  | X                       | N                                |   |   |
| HG-RES-15-1        | 5/14/2010    | 5/14/2010      | 12.5               | Y  | 0.0                       | NA                                  | HG-RES-15-1-1            | 0.5-1.0      | X                | X                                  | X                       | Y                                | Benzo(a)pyrene<br>Benzo(b)fluoranthene<br>Dibenz(a,h)anthracene | 9,300<br>18,000<br>2,000                    |
| HG-RES-15-2        | 5/18/2010    | 5/18/2010      | 4.0                | N  | 3.4                       | 4                                   | HG-RES-15-1-2            | 3.5-4.0      | X                | X                                  | X                       | N                                |   |   |
| HG-RES-16-1        | 5/18/2010    | 5/18/2010      | 4.0                | N  | 0.0                       | NA                                  | HG-RES-15-1-3            | 12.0-12.5    | X                | X                                  | X                       | N                                |   |   |
| HG-RES-17-1        | 5/18/2010    | 5/18/2010      | 4.0                | N  | 0.0                       | NA                                  | HG-RES-15-2-1            | 0.5-1.0      | X                | X                                  | X                       | Y                                | Benzo(a)pyrene  | 2,200                                       |
|                    |              |                |                    |  |                           |                                     | HG-RES-15-2-2            | 3.5-4.0      | X                | X                                  | X                       | N                                |   |   |
|                    |              |                |                    |  |                           |                                     | HG-RES-16-1-1            | 0.5-1.0      | X                | X                                  | X                       | N                                |   |   |
|                    |              |                |                    |  |                           |                                     | HG-RES-16-1-2            | 3.5-4.0      | X                | X                                  | X                       | N                                |   |   |
|                    |              |                |                    |  |                           |                                     | HG-RES-17-1-1            | 0.5-1.0      | X                | X                                  | X                       | N                                |   |   |
|                    |              |                |                    |  |                           |                                     | HG-RES-17-1-2            | 3.5-4.0      | X                | X                                  | X                       | N                                |   |   |



## Unvalidated Data

sc  
uo

**Table 1**  
**Soil Boring and Sample Summary**  
**Removal Action Work Plan Investigation**  
**Huntsville Former MGP Site**  
**Huntsville, Alabama**

Unvalidated Data

| Soil Boring Number  | Date Started | Date Completed | Total Depth (feet) | Visual Indications of Impacts Detected Y/N | Maximum PID Reading (ppm) | Depth of Maximum PID Reading (feet) | Laboratory Sample Number | Depth (feet) | BTEX (EPA 8260B) | PAHs (EPA 8270C with SIM Analysis) | Metals (EPA 6010/7470A) | Exceedances of PRGs Detected Y/N | Compounds   | Concentration (µg/Kg metals)        |
|---------------------|--------------|----------------|--------------------|--|---------------------------|-------------------------------------|--------------------------|--------------|------------------|------------------------------------|-------------------------|----------------------------------|---|-------------------------------------|
| HG-RES-32-1 (TWP-3) | 5/12/2012    | 5/13/2010      | 29.5               | Y  | 52.2                      | 5                                   | HG-RES-32-1-1            | 0.5-1.0      | X                | X                                  | X                       | Y                                | Benzo(a)pyrene  | 5,000                               |
|                     |              |                |                    |  |                           |                                     | HG-RES-32-1-2            | 3.5-4.0      | X                | X                                  | X                       | N                                |   |                                     |
|                     |              |                |                    |  |                           |                                     | HG-RES-32-1-3            | 10.0-10.5    | X                | X                                  | X                       | NA                               | PRGs not established for soils below 4 feet   |                                     |
| HG-RES-33-1         | 5/17/2010    | 5/17/2010      | 4.0                | N  | 0.0                       | NA                                  | HG-RES-33-1-1            | 0.5-1.0      | X                | X                                  | X                       | N                                |   |                                     |
|                     |              |                |                    |  |                           |                                     | HG-RES-33-1-2            | 3.5-4.0      | X                | X                                  | X                       | N                                |   |                                     |
| HG-RES-33-2         | 5/17/2010    | 5/17/2010      | 4.0                | N  | 0.0                       | NA                                  | HG-RES-33-2-1            | 0.5-1.0      | X                | X                                  | X                       | N                                |   |                                     |
|                     |              |                |                    |  |                           |                                     | HG-RES-33-2-2            | 3.5-4.0      | X                | X                                  | X                       | N                                |   |                                     |
| HG-RES-36-1         | 5/17/2010    | 5/17/2010      | 4.0                | N  | 0.0                       | NA                                  | HG-RES-36-1-1            | 0.5-1.0      | X                | X                                  | X                       | N                                |   |                                     |
|                     |              |                |                    |  |                           |                                     | HG-RES-36-1-2            | 3.5-4.0      | X                | X                                  | X                       | N                                |   |                                     |
| HG-RES-36-2         | 5/17/2010    | 5/17/2010      | 4.0                | N  | 0.0                       | NA                                  | HG-RES-36-2-1            | 0.5-1.0      | X                | X                                  | X                       | N                                |   |                                     |
|                     |              |                |                    |  |                           |                                     | HG-RES-36-2-2            | 3.5-4.0      | X                | X                                  | X                       | N                                |   |                                     |
| HG-RES-39-1         | 5/17/2010    | 5/17/2010      | 4.0                | N  | 0.0                       | NA                                  | HG-RES-39-1-1            | 0.5-1.0      | X                | X                                  | X                       | N                                |   |                                     |
|                     |              |                |                    |  |                           |                                     | HG-RES-39-1-2            | 3.5-4.0      | X                | X                                  | X                       | N                                |   |                                     |
| HG-RES-41           | 5/20/2010    | 5/20/2010      | 0.5                | N  | 0.0                       | NA                                  | HG-RES-41-SW             | 0.0-0.5      | X                | X                                  | X                       | Y                                | Benzo(a)pyrene  | 9,100                               |
| HG-RES-42           | 5/20/2010    | 5/20/2010      | 0.5                | N  | 0.0                       | NA                                  | HG-RES-42-SW             | 0.0-0.5      | X                | X                                  | X                       | N                                |   |                                     |
| HG-RES-43           | 5/20/2010    | 5/20/2010      | 0.5                | N  | 0.0                       | NA                                  | HG-RES-43-SW             | 0.0-0.5      | X                | X                                  | X                       | N                                |   |                                     |
| TWP-1               | 5/13/2012    | 5/13/2010      | 32.0               | Y  | 123.2                     | 22.5                                | TWP-1-1                  | 0.5-1.0      | X                | X                                  | X                       | Y                                | Benzo(a)anthracene<br>Benzo(a)pyrene<br>Benzo(b)fluoranthene<br>Dibenz(a,h)anthracene | 15,000<br>12,000<br>23,000<br>2,600 |
|                     |              |                |                    |  |                           |                                     | TWP-1-2                  | 3.5-4.0      | X                | X                                  | X                       | N                                |   |                                     |
|                     |              |                |                    |  |                           |                                     | TWP-4-1                  | 9.5-10.0     | X                | X                                  | X                       | NA                               | PRGs not established for soils below 4 feet   |                                     |
| TWP-4               | 5/14/2010    | 5/14/2010      | 34.5               | N  | 0.0                       | NA                                  | TWP-4-2                  | 20.0-20.5    | X                | X                                  | X                       | NA                               | PRGs not established for soils below 4 feet   |                                     |

| Compound               | CASRN     | Sample ID    |              | Sample Depth:<br>Lab ID:<br>Date Sampled:<br>Matrix:<br>Dilution Factor: | Residential Soil<br>PRGs | Construction/Utility<br>Soil PRGs | HG-RES-05-1-1<br>0.0-1.0'<br>1005B49-0138<br>05/13/10<br>Soil<br>1 | HG-RES-05-1-2<br>3.5-4.0'<br>1005B49-008A<br>05/13/10<br>Soil<br>1 | HG-RES-05-2-1<br>0.0-1.0'<br>1005B49-025A<br>05/13/10<br>Soil<br>1 | HG-RES-05-2-2<br>3.5-4.0'<br>1005B49-009A<br>05/13/10<br>Soil<br>1 | HG-RES-07-1-1<br>0.0-1.0'<br>1005H21-028A<br>40310<br>Soil<br>1 | HG-RES-07-1-2<br>2.5-3.0<br>1005D29-011A<br>40310<br>Soil<br>1 | HG-RES-08-1-1<br>0.0-1.0'<br>1005B49-018A<br>05/13/10<br>Soil<br>1 |
|------------------------|-----------|--------------|--------------|--|--------------------------|-----------------------------------|--|--|--|--|---|--|--|
|                        |           | VOCs (µg/Kg) | PAHs (µg/Kg) |  |                          |                                   |  |  |  |  |   |  |  |
| Benzene                | 71-43-2   | 86,000       | 3,400,000    | 341,000  | 86,000                   | 341,000                           | 1.1 U  | 0.91 U   | 1.1  | 0.93 U   | 0.89 U  | 1.0 U  | 1.7  |
| Ethylbenzene           | 100-41-4  | 3,500,000    | 1,700,000    | 15,600,000   | 3,500,000                | 15,600,000                        | 1.1 U  | 0.91 U   | 1.1 U  | 0.93 U   | 0.89 U  | 1.0 U  | 1.1 U  |
| m,p-Xylene             | 1330-20-7 | 630,000      | 17,000,000   | 2,160,000  | 630,000                  | 2,160,000                         | 1.1 U  | 0.91 U   | 1.1 U  | 0.93 U   | 0.89 U  | 1.0 U  | 1.1 U  |
| o-Xylene               | 1330-20-6 | 630,000      | 17,000,000   | 2,160,000  | 630,000                  | 2,160,000                         | 1.0 U  | 0.91 U   | 1.1 U  | 0.93 U   | 0.89 U  | 1.0 U  | 1.1 U  |
| Toluene                | 108-88-3  | 5,000,000    | 5,000,000    | 29,400,000   | 5,000,000                | 29,400,000                        | 1.1 U  | 0.91 U   | 1.4  | 0.93 U   | 0.89 U  | 1.0 U  | 3.2  |
| Acenaphthene           | 83-32-9   | 3,400,000    | 3,400,000    | 18,900,000   | 3,400,000                | 18,900,000                        | 240 U  | 230 U  | 230 U  | 230 U  | 230 U   | 240 U  | 220 U  |
| Acenaphthylene         | 208-96-8  | 1,700,000    | 1,700,000    | 9,430,000  | 1,700,000                | 9,430,000                         | 240 U  | 230 U  | 230 U  | 230 U  | 230 U   | 240 U  | 220 U  |
| Anthracene             | 120-12-7  | 17,000,000   | 17,000,000   | 94,300,000   | 17,000,000               | 94,300,000                        | 240 U  | 230 U  | 230 U  | 230 U  | 230 U   | 240 U  | 220 U  |
| Benz(a)anthracene      | 56-55-3   | 15,000       | 15,000       | 3,010,000  | 15,000                   | 3,010,000                         | 240 U  | 230 U  | 230 U  | 230 U  | 230 U   | 240 U  | 220 U  |
| Benzo(a)pyrene         | 50-32-8   | 1,500        | 1,500        | 301,000  | 1,500                    | 301,000                           | 240 U  | 230 U  | 230 U  | 230 U  | 230 U   | 240 U  | 220 U  |
| Benzo(b)fluoranthene   | 205-99-2  | 15,000       | 15,000       | 3,010,000  | 15,000                   | 3,010,000                         | 240 U  | 230 U  | 230 U  | 230 U  | 230 U   | 240 U  | 250  |
| Benzo(g,h,i)perylene   | 191-24-2  | 1,700,000    | 1,700,000    | 9,430,000  | 1,700,000                | 9,430,000                         | 240 U  | 230 U  | 230 U  | 230 U  | 230 U   | 240 U  | 220 U  |
| Benzo(k)fluoranthene   | 207-08-9  | 150,000      | 150,000      | 30,100,000   | 150,000                  | 30,100,000                        | 240 U  | 230 U  | 230 U  | 230 U  | 230 U   | 240 U  | 220 U  |
| Chrysene               | 218-01-9  | 1,500,000    | 1,500,000    | 100,000,000  | 1,500,000                | 100,000,000                       | 240 U  | 230 U  | 230 U  | 230 U  | 230 U   | 240 U  | 220 U  |
| Dibenz(a,h)anthracene  | 53-70-3   | 1,500        | 1,500        | 301,000  | 1,500                    | 301,000                           | 240 U  | 230 U  | 230 U  | 230 U  | 230 U   | 240 U  | 220 U  |
| Fluoranthene           | 206-44-0  | 2,300,000    | 2,300,000    | 12,600,000   | 2,300,000                | 12,600,000                        | 240 U  | 230 U  | 300  | 230 U  | 230 U   | 240 U  | 220 U  |
| Fluorene               | 86-73-7   | 2,300,000    | 2,300,000    | 12,600,000   | 2,300,000                | 12,600,000                        | 240 U  | 230 U  | 230 U  | 230 U  | 230 U   | 240 U  | 220 U  |
| Indeno(1,2,3-cd)pyrene | 193-39-5  | 15,000       | 15,000       | 3,010,000  | 15,000                   | 3,010,000                         | 240 U  | 230 U  | 230 U  | 230 U  | 230 U   | 240 U  | 220 U  |
| Naphthalene            | 91-20-3   | 140,000      | 140,000      | 484,000  | 140,000                  | 484,000                           | 240 U  | 230 U  | 230 U  | 230 U  | 230 U   | 240 U  | 220 U  |
| Phenanthrene           | 85-01-8   | 1,700,000    | 1,700,000    | 9,430,000  | 1,700,000                | 9,430,000                         | 240 U  | 230 U  | 230 U  | 230 U  | 230 U   | 240 U  | 220 U  |
| Pyrene                 | 129-00-0  | 1,700,000    | 1,700,000    | 9,430,000  | 1,700,000                | 9,430,000                         | 240 U  | 230 U  | 250  | 230 U  | 230 U   | 240 U  | 220 U  |
| Metals (mg/Kg)         |           |              |              |  |                          |                                   |  |  |  |  |   |  |  |
| Mercury                | 7439-97-6 | 5.6          | 5.6          | 24.9   | 5.6                      | 24.9                              | 0.117 U  | 0.115 U  | 0.718  | 0.480  | 0.436   | 0.117 U  | 0.613  |
| Arsenic                | 7440-38-2 | 39           | 39           | 435  | 39                       | 435                               | 7.08   | 9.24   | 13.2   | 11.7   | 7.99  | 7.81   | 23.2   |
| Lead                   | 7439-92-1 | 400          | 400          | 800  | 400                      | 800                               | 13.3   | 17.9   | 89.1   | 119  | 109   | 9.56   | 292  |

Notes:  
mg/kg = milligrams per kilogram  
µg/kg = micrograms per kilogram  
PRG = Proposed Removal Goal  
Residential Soil PRGs apply to surface soil at depths of 0 to 1 foot.  
Construction/Utility Soil PRGs apply to soil at depths of 1 to 4 feet.  
Shaded and bolded cell indicates compound concentration exceeds a PRG.  
CASRN - Chemical Abstract Services Registry Number

Table 2  
Surface Soil and Shallow Subsurface Soil Laboratory Analytical Results  
Removal Action Work Plan Investigations  
Huntsville Former MGP Site  
Huntsville, Alabama

| Compound               |           | Residential Soil PRGs | Construction/Utility Soil PRGs | Sample ID<br>Sample Depth:<br>Lab ID:<br>Date Sampled:<br>Matrix:<br>Dilution Factor: | HG-RES-08-1-2<br>3.5'-4.0'<br>1005B49-023A<br>05/13/10<br>Soil<br>1 | HG-RES-12-1-1<br>0.5'-1.0'<br>1005H21-005A<br>Soil<br>1 | HG-RES-12-1-2<br>3.5'-4.0'<br>1005H21-012A<br>Soil<br>1 | HG-RES-14-1-1<br>0.0'-1.0'<br>1005H21-003A<br>Soil<br>1 | HG-RES-14-1-2<br>3.5'-4.0'<br>1005H21-001B<br>Soil<br>1 | HG-RES-14-2-1<br>0.5'-1.0'<br>1005H21-022A<br>Soil<br>1 | HG-RES-14-2-2<br>3.5'-4.0'<br>1005H21-011A<br>Soil<br>1 |
|------------------------|-----------|-----------------------|--------------------------------|---|---|---|---|---|---|---|---|
|                        |           |                       |                                |   |   |   |   |   |   |   |   |
| VOCs (µg/Kg)           |           |                       |                                |   |   |   |   |   |   |   |   |
| Benzene                | 71-43-2   | 86,000                | 341,000                        |   | 1.2 U   | 1.2 U   | 0.66 U  | 1.3 U   | 1.1 U   | 1.1 U   | 0.84 U  |
| Ethylbenzene           | 100-41-4  | 3,500,000             | 15,600,000                     |   | 1.2 U   | 1.2 U   | 0.66 U  | 1.3 U   | 1.1 U   | 1.1 U   | 0.84 U  |
| m,p-Xylene             | 1330-20-7 | 630,000               | 2,160,000                      |   | 1.2 U   | 1.2 U   | 0.66 U  | 1.3 U   | 1.1 U   | 1.1 U   | 0.84 U  |
| o-Xylene               | 1330-20-6 | 630,000               | 2,160,000                      |   | 1.2 U   | 1.2 U   | 0.66 U  | 1.3 U   | 1.1 U   | 1.1 U   | 0.84 U  |
| Toluene                | 108-88-3  | 5,000,000             | 29,400,000                     |   | 1.9   | 1.2 U   | 0.66 U  | 1.3 U   | 1.1 U   | 1.1 U   | 0.84 U  |
| PAHs (µg/Kg)           |           |                       |                                |   |   |   |   |   |   |   |   |
| Acenaphthene           | 83-32-9   | 3,400,000             | 18,900,000                     |   | 240 U   | 230 U   | 240 U   | 230 U   | 230 U   | 240 U   | 240 U   |
| Acenaphthylene         | 208-96-8  | 1,700,000             | 9,430,000                      |   | 240 U   | 540   | 240 U   | 230 U   | 230 U   | 240 U   | 240 U   |
| Anthracene             | 120-12-7  | 17,000,000            | 94,300,000                     |   | 240 U   | 460   | 240 U   | 230 U   | 230 U   | 330   | 240 U   |
| Benz(a)anthracene      | 56-55-3   | 15,000                | 3,010,000                      |   | 240 U   | 1900  | 240 U   | 1300  | 230 U   | 1200  | 240 U   |
| Benzo(a)pyrene         | 50-32-8   | 1,500                 | 301,000                        |   | 240 U   | 2200  | 240 U   | 1300  | 230 U   | 1000  | 240 U   |
| Benzo(b)fluoranthene   | 205-99-2  | 15,000                | 3,010,000                      |   | 240 U   | 3500  | 240 U   | 2000  | 230 U   | 2200  | 240 U   |
| Benzo(g,h,i)perylene   | 191-24-2  | 1,700,000             | 9,430,000                      |   | 240 U   | 1600  | 240 U   | 750   | 230 U   | 620   | 240 U   |
| Benzo(k)fluoranthene   | 207-08-9  | 150,000               | 30,100,000                     |   | 240 U   | 1100  | 240 U   | 650   | 230 U   | 550   | 240 U   |
| Chrysene               | 218-01-9  | 1,500,000             | 100,000,000                    |   | 240 U   | 2300  | 240 U   | 1300  | 230 U   | 1300  | 240 U   |
| Dibenz(a,h)anthracene  | 53-70-3   | 1,500                 | 301,000                        |   | 240 U   | 230 U   | 240 U   | 230 U   | 230 U   | 240 U   | 240 U   |
| Fluoranthene           | 206-44-0  | 2,300,000             | 12,600,000                     |   | 240 U   | 4800  | 240 U   | 2200  | 230 U   | 1900  | 240 U   |
| Fluorene               | 86-73-7   | 2,300,000             | 12,600,000                     |   | 240 U   | 230 U   | 240 U   | 230 U   | 230 U   | 240 U   | 240 U   |
| Indeno(1,2,3-cd)pyrene | 193-39-5  | 15,000                | 3,010,000                      |   | 240 U   | 1600  | 240 U   | 720   | 230 U   | 620   | 240 U   |
| Naphthalene            | 91-20-3   | 140,000               | 484,000                        |   | 240 U   | 280   | 240 U   | 240   | 230 U   | 240 U   | 240 U   |
| Phenanthrene           | 85-01-8   | 1,700,000             | 9,430,000                      |   | 240 U   | 3600  | 240 U   | 830   | 230 U   | 1100  | 240 U   |
| Pyrene                 | 129-00-0  | 1,700,000             | 9,430,000                      |   | 240 U   | 4300  | 240 U   | 2200  | 230 U   | 1700  | 240 U   |
| Metals (mg/Kg)         |           |                       |                                |   |   |   |   |   |   |   |   |
| Mercury                | 7439-97-6 | 5.6                   | 24.9                           |   | 0.933   | 0.112 U   | 0.117 U   | 0.954   | 0.115 U   | 1.11  | 0.119 U   |
| Arsenic                | 7440-38-2 | 39                    | 435                            |   | 14.6  | 6.30  | 5.57 U  | 16.6  | 5.23 U  | 14.3  | 5.94 U  |
| Lead                   | 7439-92-1 | 400                   | 800                            |   | 355   | 65.1  | 17.3  | 164   | 7.60  | 163   | 11.9  |

Notes:

mg/kg = miligrams per kilogram

$\mu\text{g/kg}$  = micrograms per kilogram

PRG = Proposed Removal Goal

Residential Soil PRGs apply to surface

Construction/Utility Soil PRGs apply to sub-

Shaded and bolded cell indicates construction/utility soil PRGs apply

CASRN - Chemical Abstract Service

ANALYSIS - ANALYSIS - ANALYSIS



25

**LL Consultants**

Table 2  
Surface Soil and Shallow Subsurface Soil Laboratory Analytical Results  
Removal Action Work Plan Investigations  
Huntsville Former MGP Site  
Huntsville, Alabama

Unvalidated Data

| Compound               | CASRN     | Sample ID  |                          | HG-RES-14-3-1<br>0.5'-1.0'<br>1005H21-016A<br>Soil<br>1 | HG-RES-14-3-2<br>3.5'-4.0'<br>1005H21-002A<br>Soil<br>1 | HG-RES-15-1-1<br>0.5'-1.0'<br>1005D29-007A<br>05/14/10<br>Soil<br>1 | HG-RES-15-1-2<br>3.5'-4.0'<br>1005D29-018A<br>05/14/10<br>Soil<br>1 | HG-RES-15-2-1<br>0.5'-1.0'<br>1005H21-015A<br>05/18/10<br>Soil<br>1 | HG-RES-15-2-2<br>3.5'-4.0'<br>1005H21-013A<br>05/18/10<br>Soil<br>1 | HG-RES-16-1-1<br>0.5'-1.0'<br>1005H21-018B<br>Soil<br>1 |
|------------------------|-----------|--|--------------------------|---|---|---|---|---|---|---|
|                        |           | Sample Depth:<br>Lab ID:<br>Date Sampled:<br>Matrix:<br>Dilution Factor: | Residential Soil<br>PRGs |   |   |   |   |   |   |   |
| VOCs (µg/Kg)           |           | Construction/Utility<br>Soil PRGs  |                          |   |   |   |   |   |   |   |
| Benzene                | 71-43-2   | 341,000  | 86,000                   | 1.2 U   | 0.72 U  | 3.8   | 0.94 U  | 8.0   | 1.3 U   | 1.7   |
| Ethylbenzene           | 100-41-4  | 15,600,000   | 3,500,000                | 1.2 U   | 0.72 U  | 1.0 U   | 0.94 U  | 1.2 U   | 1.3 U   | 1.1 U   |
| m,p-Xylene             | 1330-20-7 | 2,160,000  | 630,000                  | 1.2 U   | 0.72 U  | 2.7   | 0.94 U  | 1.2 U   | 1.3 U   | 1.1 U   |
| o-Xylene               | 1330-20-6 | 2,160,000  | 630,000                  | 1.2 U   | 0.72 U  | 1.0 U   | 0.94 U  | 1.2 U   | 1.3 U   | 1.1 U   |
| Toluene                | 108-88-3  | 29,400,000   | 5,000,000                | 1.2 U   | 0.72 U  | 3.2   | 0.94 U  | 2.6   | 1.3 U   | 1.1 U   |
| PAHs (µg/Kg)           |           |  |                          |   |   |   |   |   |   |   |
| Acenaphthene           | 83-32-9   | 18,900,000   | 3,400,000                | 230 U   | 230 U   | 220 U   | 240 U   | 230 U   | 240 U   | 230 U   |
| Acenaphthylene         | 208-96-8  | 9,430,000  | 1,700,000                | 230 U   | 230 U   | 1900  | 240 U   | 1100  | 240 U   | 280   |
| Anthracene             | 120-12-7  | 94,300,000   | 17,000,000               | 330   | 230 U   | 2000  | 240 U   | 990   | 240 U   | 420   |
| Benz(a)anthracene      | 56-55-3   | 3,010,000  | 15,000                   | 1300  | 230 U   | 9900  | 240 U   | 5100  | 240 U   | 1400  |
| Benzo(a)pyrene         | 50-32-8   | 301,000  | 1,500                    | 1400  | 230 U   | 9300  | 240 U   | 4300  | 240 U   | 1300  |
| Benzo(b)fluoranthene   | 205-99-2  | 3,010,000  | 15,000                   | 2000  | 230 U   | 18000   | 240 U   | 11000   | 240 U   | 2100  |
| Benzo(g,h,i)perylene   | 191-24-2  | 9,430,000  | 1,700,000                | 910   | 230 U   | 8300  | 240 U   | 4900  | 240 U   | 1000  |
| Benzo(k)fluoranthene   | 207-08-9  | 30,100,000   | 150,000                  | 650   | 230 U   | 2400  | 240 U   | 1700  | 240 U   | 660   |
| Chrysene               | 218-01-9  | 100,000,000  | 1,500,000                | 1200  | 230 U   | 10000   | 240 U   | 5000  | 240 U   | 1400  |
| Dibenz(a,h)anthracene  | 53-70-3   | 301,000  | 1,500                    | 230 U   | 230 U   | 2000  | 240 U   | 230 U   | 240 U   | 230 U   |
| Fluoranthene           | 206-44-0  | 12,600,000   | 2,300,000                | 2000  | 230 U   | 17000   | 240 U   | 11000   | 240 U   | 3000  |
| Indeno(1,2,3-cd)pyrene | 86-73-7   | 12,600,000   | 2,300,000                | 230 U   | 230 U   | 400   | 240 U   | 230 U   | 240 U   | 230 U   |
| Naphthalene            | 193-39-5  | 3,010,000  | 15,000                   | 900   | 230 U   | 8000  | 240 U   | 4600  | 240 U   | 940   |
| Phenanthrene           | 91-20-3   | 484,000  | 140,000                  | 230 U   | 230 U   | 460   | 240 U   | 330   | 240 U   | 230 U   |
| Pyrene                 | 85-01-8   | 9,430,000  | 1,700,000                | 1100  | 230 U   | 7800  | 240 U   | 3600  | 240 U   | 1700  |
| Metals (mg/Kg)         |           |  |                          |   |   |   |   |   |   |   |
| Mercury                | 7439-97-6 | 24.9   | 5.6                      | 0.619   | 0.110 U   | 0.330   | 0.114 U   | 0.192   | 0.121 U   | 0.136   |
| Arsenic                | 7440-38-2 | 435  | 39                       | 13.7  | 13.5  | 10.7  | 14.1  | 15.1  | 5.66 U  | 7.25  |
| Lead                   | 7439-92-1 | 800  | 400                      | 226   | 10.5  | 46.8  | 15.9  | 56.4  | 20.1  | 49.6  |

Notes:  
mg/kg = milligrams per kilogram  
µg/kg = micrograms per kilogram  
PRG = Proposed Removal Goal  
Residential Soil PRGs apply to surface soil at depths of 0 to 1 foot.  
Construction/Utility Soil PRGs apply to soil at depths of 1 to 4 feet.  
Shaded and bolded cell indicates compound concentration exceeds a PRG.  
CASRN - Chemical Abstract Services Registry Number

Table 2  
Surface Soil and Shallow Subsurface Soil Laboratory Analytical Results  
Removal Action Work Plan Investigations  
Huntsville Former MGP Site  
Huntsville, Alabama

| Compound               |           | Residential Soil PRGs | Construction/Utility Soil PRGs | Sample ID     |           | HG-RES-16-1-2 | HG-RES-17-1-2 | HG-RES-18-1-1    | HG-RES-18-1-2 | HG-RES-18-2-1 | HG-RES-18-2-2 | HG-RES-22/23-1-2 |
|------------------------|-----------|-----------------------|--------------------------------|---------------|-----------|---------------|---------------|------------------|---------------|---------------|---------------|------------------|
|                        |           |                       |                                | Sample Depth: | Lab ID:   | Date Sampled: | Matrix:       | Dilution Factor: |               |               |               |                  |
| VOGs (µg/Kg)           |           |                       |                                | 0.5'-1.0'     | 3.5'-4.0' | 05/18/10      | Soil          | 1                | 1             | 1             | 1             | 1                |
| Benzene                | 71-43-2   | 86,000                | 341,000                        | 0.89 U        | 1.2 U     | 05/18/10      | Soil          | 1                | 1             | 1             | 1             | 1                |
| Ethylbenzene           | 100-41-4  | 3,500,000             | 15,600,000                     | 0.89 U        | 1.2 U     | 05/18/10      | Soil          | 1                | 1             | 1             | 1             | 1                |
| m,p-Xylene             | 1330-20-7 | 630,000               | 2,160,000                      | 0.89 U        | 1.2 U     | 05/18/10      | Soil          | 1                | 1             | 1             | 1             | 1                |
| o-Xylene               | 1330-20-6 | 630,000               | 2,160,000                      | 0.89 U        | 1.2 U     | 05/18/10      | Soil          | 1                | 1             | 1             | 1             | 1                |
| Toluene                | 108-88-3  | 5,000,000             | 29,400,000                     | 0.89 U        | 1.2 U     | 05/18/10      | Soil          | 1                | 1             | 1             | 1             | 1                |
| PAHs (µg/Kg)           |           |                       |                                |               |           |               |               |                  |               |               |               |                  |
| Acenaphthene           | 83-32-9   | 3,400,000             | 18,900,000                     | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Acenaphthylene         | 208-96-3  | 1,700,000             | 9,430,000                      | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Anthracene             | 120-12-7  | 17,000,000            | 94,300,000                     | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Benz(a)anthracene      | 56-55-3   | 15,000                | 3,010,000                      | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Benzo(a)pyrene         | 50-32-8   | 1,500                 | 301,000                        | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Benzo(b)fluoranthene   | 205-99-2  | 15,000                | 3,010,000                      | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Benzo(g,h,i)perylene   | 191-24-2  | 1,700,000             | 9,430,000                      | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Benzo(k)fluoranthene   | 207-08-9  | 150,000               | 30,100,000                     | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Chrysene               | 218-01-9  | 1,500,000             | 100,000,000                    | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Dibenz(a,h)anthracene  | 53-70-3   | 1,500                 | 301,000                        | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Fluoranthene           | 206-44-0  | 2,300,000             | 12,600,000                     | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Fluorene               | 86-73-7   | 2,300,000             | 12,600,000                     | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Indeno(1,2,3-cd)pyrene | 193-39-5  | 15,000                | 3,010,000                      | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Naphthalene            | 91-20-3   | 140,000               | 484,000                        | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Phenanthrene           | 85-01-8   | 1,700,000             | 9,430,000                      | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Pyrene                 | 129-00-0  | 1,700,000             | 9,430,000                      | 240 U         | 240 U     |               |               |                  |               |               |               |                  |
| Metals (mg/Kg)         |           |                       |                                |               |           |               |               |                  |               |               |               |                  |
| Mercury                | 7439-97-6 | 5.6                   | 24.9                           | 0.120 U       | 0.118 U   |               |               |                  |               |               |               |                  |
| Arsenic                | 7440-38-2 | 39                    | 435                            | 5.67 U        | 19.6      |               |               |                  |               |               |               |                  |
| Lead                   | 7439-92-1 | 400                   | 800                            | 12.8          | 54.0      |               |               |                  |               |               |               |                  |
|                        |           |                       |                                | 2.84          | 23.2      | 514           | 13.1          | 487              | 0.755         | 0.119 U       | 16.7          | 0.117 U          |
|                        |           |                       |                                |               |           |               |               |                  |               |               | 69.5          | 9.55             |

Notes:

mg/kg = milligrams per kilogram  
 µg/kg = micrograms per kilogram  
 PRG = Proposed Removal Goal  
 Residential Soil PRGs apply to surface soil at depths of 0 to 1 foot.  
 Construction/Utility Soil PRGs apply to soil at depths of 1 to 4 feet.  
 Shaded and bolded cell indicates compound concentration exceeds a PRG.  
 CASRN - Chemical Abstract Services Registry Number

Table 2

**Notes:**  
mg/kg = milligrams per kilogram  
µg/kg = micrograms per kilogram  
PRG = Proposed Removal Goal  
Residential Soil PRGs apply to surface soil at depths of 0 to 1 foot.  
Construction/Utility Soil PRGs apply to soil at depths of 1 to 4 feet.  
Shaded and bolded cell indicates compound concentration exceeds a PRG.  
CASRN - Chemical Abstract Services Registry Number

Table 2  
Surface Soil and Shallow Subsurface Soil Laboratory Analytical Results  
Removal Action Work Plan Investigations  
Huntsville Former MGP Site  
Huntsville, Alabama

**Notes:**  
mg/kg = milligrams per kilogram  
µg/kg = micrograms per kilogram  
PRG = Proposed Removal Goal  
Residential Soil PRGs apply to surface soil at depths of 0 to 1 foot.  
Construction/Utility Soil PRGs apply to soil at depths of 1 to 4 feet.  
Shaded and bolded cell indicates compound concentration exceeds a PRG.  
CASRN - Chemical Abstract Services Registry Number

| Compound               |           | Sample ID                |                                   | Sample Depth:<br>Lab ID:<br>Date Sampled:<br>Matrix:<br>Dilution Factor: | HG-RES-27-3-1<br>0.5'-1.0'<br>1005F46-014A<br>05/17/10<br>Soil<br>1 | HG-RES-27-3-2<br>3.5'-4.0'<br>1005F46-015A<br>05/17/10<br>Soil<br>1 | HG-RES-28-1-1<br>0.5'-1.0'<br>1005D29-006A<br>05/14/10<br>Soil<br>1 | HG-RES-28-1-2<br>3.5'-4.0'<br>1005D29-014B<br>Soil<br>1 | HG-RES-29-1-2<br>3.5'-4.0'<br>1005B49-010A<br>05/12/10<br>Soil<br>1 | HG-RES-30-1-1<br>0.5'-1.0'<br>1005B49-022A<br>05/12/10<br>Soil<br>1 | HG-RES-30-1-2<br>3.5'-4.0'<br>1005B49-019A<br>05/12/10<br>Soil<br>1 |
|------------------------|-----------|--------------------------|-----------------------------------|--|---|---|---|---|---|---|---|
|                        |           | Residential Soil<br>PRGs | Construction/Utility<br>Soil PRGs |  |   |   |   |   |   |   |   |
| VOCs (µg/Kg)           |           | CASRN                    |                                   |  |   |   |   |   |   |   |   |
| Benzene                | 71-43-2   | 86,000                   | 341,000                           |  |   |   |   |   |   |   |   |
| Ethylbenzene           | 100-41-4  | 3,500,000                | 15,600,000                        | 2.1  | 0.75 U  | 0.98 U  | 0.90 U  | 2.4   | 0.65 U  | 4.6   | 9.8   |
| m,p-Xylene             | 1330-20-7 | 630,000                  | 2,160,000                         | 1.5 U  | 0.75 U  | 0.98 U  | 0.90 U  | 0.65 U  | 0.89 U  | 0.89 U  | 0.69 U  |
| o-Xylene               | 1330-20-6 | 630,000                  | 2,160,000                         | 1.5 U  | 0.75 U  | 0.98 U  | 0.90 U  | 0.65 U  | 0.89 U  | 0.89 U  | 0.69 U  |
| Toluene                | 108-88-3  | 5,000,000                | 29,400,000                        | 1.8  | 0.75 U  | 0.98 U  | 0.90 U  | 0.72  | 0.65 U  | 0.89 U  | 0.69 U  |
| PAHs (µg/Kg)           |           |                          |                                   |  |   |   |   |   |   |   |   |
| Acenaphthene           | 83-32-9   | 3,400,000                | 18,900,000                        | 230 U  | 230 U   | 220 U   | 240 U   | 230 U   | 230 U   | 1200  | 2400 U  |
| Acenaphthylene         | 94-30-0   | 1,700,000                | 9,430,000                         | 480  | 230 U   | 220 U   | 240 U   | 420   | 420   | 10000   | 14000   |
| Anthracene             | 120-12-7  | 17,000,000               | 94,300,000                        | 580  | 230 U   | 220 U   | 240 U   | 230 U   | 230 U   | 12000   | 19000   |
| Benz(a)anthracene      | 56-55-3   | 15,000                   | 3,010,000                         | 2100   | 230 U   | 220 U   | 240 U   | 240   | 240   | 36000   | 63000   |
| Benzo(a)pyrene         | 50-32-8   | 1,500                    | 301,000                           | 2100   | 230 U   | 220 U   | 240 U   | 240   | 240   | 36000   | 41000   |
| Benzo(b)fluoranthene   | 205-99-2  | 15,000                   | 3,010,000                         | 3700   | 230 U   | 220 U   | 240 U   | 240   | 240   | 50000   | 17000   |
| Benzo(g,h,i)perylene   | 191-24-2  | 1,700,000                | 9,430,000                         | 1900   | 230 U   | 220 U   | 240 U   | 240   | 240   | 21000   | 25000   |
| Benzo(k)fluoranthene   | 207-08-9  | 150,000                  | 30,100,000                        | 1000   | 230 U   | 220 U   | 240 U   | 240   | 240   | 9000  | 17000   |
| Chrysene               | 218-01-9  | 1,500,000                | 100,000,000                       | 2300   | 230 U   | 220 U   | 240 U   | 240   | 240   | 30000   | 52000   |
| Dibenz(a,h)anthracene  | 53-70-3   | 1,500                    | 301,000                           | 450  | 230 U   | 220 U   | 240 U   | 240   | 240   | 6400  | 13000   |
| Fluorene               | 206-44-0  | 2,300,000                | 12,600,000                        | 4200   | 230 U   | 220 U   | 240 U   | 240   | 240   | 81000   | 2400  |
| Indeno(1,2,3-cd)pyrene | 86-73-7   | 2,300,000                | 12,600,000                        | 230 U  | 230 U   | 220 U   | 240 U   | 240   | 240   | 5000  | 7400  |
| Naphthalene            | 193-39-5  | 15,000                   | 3,010,000                         | 1800   | 230 U   | 220 U   | 240 U   | 240   | 240   | 19000   | 26000   |
| Phenanthrene           | 91-20-3   | 140,000                  | 484,000                           | 490  | 230 U   | 220 U   | 240 U   | 240   | 240   | 5500  | 14000   |
| Pyrene                 | 85-01-8   | 1,700,000                | 9,430,000                         | 2500   | 230 U   | 220 U   | 240 U   | 240   | 240   | 56000   | 59000   |
| Metals (mg/Kg)         |           |                          |                                   |  |   |   |   |   |   |   |   |
| Mercury                | 7439-97-6 | 5.6                      | 24.9                              | 1.07   | 0.115 U   | 0.109 U   | 0.115 U   | 0.111 U   | 0.111 U   | 0.300   | 0.200   |
| Arsenic                | 7440-38-2 | 39                       | 435                               | 16.3   | 18.2  | 15.8  | 5.68 U  | 5.61 U  | 5.61 U  | 17.8  | 26.0  |
| Lead                   | 7439-92-1 | 400                      | 800                               | 447  | 26.4  | 26.9  | 15.9  | 19.1  | 19.1  | 78.9  | 67.4  |

Notes: µg/kg = micrograms per kilogram

mg/kg = miligrams per kilogram

µg/kg = micrograms per kilogram

PRG = Proposed Removal Goal

Residential Soil PRGs apply to sur-

Construction/Utility Soil PRGs apply

Shaded and bolded cell indicates CASRN - Chemical Abstract Service

Abstract



**Consultants**

Table 2  
Surface Soil and Shallow Subsurface Soil Laboratory Analytical Results  
Removal Action Work Plan Investigations  
Huntsville Former MGP Site  
Huntsville, Alabama

Unvalidated Data

| Compound               | CASRN     | Residential Soil PRGs | Construction/Utility Soil PRGs | Sample ID<br>Sample Depth:<br>Lab ID:<br>Date Sampled:<br>Matrix:<br>Dilution Factor: | HG-RES-31-1-1<br>0.5'-1.0'<br>1005B49-006A<br>05/12/10<br>Soil<br>1 | HG-RES-32-1-1<br>0.5'-1.0'<br>1005B49-007A<br>05/12/10<br>Soil<br>1 | HG-RES-32-1-2<br>3.5'-4.0'<br>1005B49-005A<br>05/12/10<br>Soil<br>1 | HG-RES-33-1-1<br>0.5'-1.0'<br>1005F46-001A<br>05/17/10<br>Soil<br>1 | HG-RES-33-1-2<br>3.5'-4.0'<br>1005F46-002A<br>05/17/10<br>Soil<br>1 | HG-RES-33-2-1<br>0.5'-1.0'<br>1005F46-006A<br>05/17/10<br>Soil<br>1 | HG-RES-33-2-2<br>3.5'-4.0'<br>1005F46-007A<br>05/17/10<br>Soil<br>1 |
|------------------------|-----------|-----------------------|--------------------------------|---|---|---|---|---|---|---|---|
|                        |           |                       |                                |   |   |   |   |   |   |   |   |
| VOCs (µg/Kg)           |           |                       |                                |   |   |   |   |   |   |   |   |
| Benzene                | 71-43-2   | 86,000                | 341,000                        |   |   |   |   |   |   |   |   |
| Ethylbenzene           | 100-41-4  | 3,500,000             | 15,600,000                     |   |   |   |   |   |   |   |   |
| m,p-Xylene             | 1330-20-7 | 630,000               | 2,160,000                      |   |   |   |   |   |   |   |   |
| o-Xylene               | 1330-20-6 | 630,000               | 2,160,000                      |   |   |   |   |   |   |   |   |
| Toluene                | 108-88-3  | 5,000,000             | 29,400,000                     |   |   |   |   |   |   |   |   |
| PAHs (µg/Kg)           |           |                       |                                |   |   |   |   |   |   |   |   |
| Acenaphthene           | 83-32-9   | 3,400,000             | 18,900,000                     |   |   |   |   |   |   |   |   |
| Acenaphthylene         | 208-96-8  | 1,700,000             | 9,430,000                      |   |   |   |   |   |   |   |   |
| Anthracene             | 120-12-7  | 17,000,000            | 94,300,000                     |   |   |   |   |   |   |   |   |
| Benz(a)anthracene      | 56-55-3   | 15,000                | 3,010,000                      |   |   |   |   |   |   |   |   |
| Benzo(a)pyrene         | 50-32-8   | 1,500                 | 301,000                        |   |   |   |   |   |   |   |   |
| Benzo(b)fluoranthene   | 205-99-2  | 15,000                | 3,010,000                      |   |   |   |   |   |   |   |   |
| Benzo(g,h,i)perylene   | 191-24-2  | 1,700,000             | 9,430,000                      |   |   |   |   |   |   |   |   |
| Benzo(k)fluoranthene   | 207-08-9  | 150,000               | 710,000                        |   |   |   |   |   |   |   |   |
| Chrysene               | 218-01-9  | 1,500,000             | 100,000,000                    |   |   |   |   |   |   |   |   |
| Dibenz(a,h)anthracene  | 53-70-3   | 1,500                 | 301,000                        |   |   |   |   |   |   |   |   |
| Fluorene               | 206-44-0  | 2,300,000             | 12,600,000                     |   |   |   |   |   |   |   |   |
| Indeno(1,2,3-cd)pyrene | 86-73-7   | 2,300,000             | 12,600,000                     |   |   |   |   |   |   |   |   |
| Naphthalene            | 193-39-5  | 15,000                | 3,010,000                      |   |   |   |   |   |   |   |   |
| Phenanthrene           | 91-20-3   | 140,000               | 484,000                        |   |   |   |   |   |   |   |   |
| Pyrene                 | 85-01-8   | 1,700,000             | 9,430,000                      |   |   |   |   |   |   |   |   |
| Metals (mg/Kg)         |           |                       |                                |   |   |   |   |   |   |   |   |
| Mercury                | 7439-97-6 | 5.6                   | 24.9                           |   |   |   |   |   |   |   |   |
| Arsenic                | 7440-38-2 | 39                    | 435                            |   |   |   |   |   |   |   |   |
| Lead                   | 7439-92-1 | 400                   | 800                            |   |   |   |   |   |   |   |   |

mg/kg = milligrams per kilogram  
µg/kg = micrograms per kilogram

PRG = Proposed Removal Goal

Residential Soil PRGs apply to surface soil at depths of 0 to 1 foot.

Construction/Utility Soil PRGs apply to soil at depths of 1 to 4 feet.

Shaded and bolded cell indicates compound concentration exceeds a PRG.

CASRN - Chemical Abstract Services Registry Number

Table 2  
Surface Soil and Shallow Subsurface Soil Laboratory Analytical Results  
Removal Action Work Plan Investigations  
Huntsville Former MGP Site  
Huntsville, Alabama

Unvalidated Data

| Compound               | Sample ID    |            | HG-RES-36-1-1<br>1005F46-003A<br>05/17/10<br>Soil<br>1 | HG-RES-36-1-2<br>0.5'-1.0'<br>1005F46-004A<br>05/17/10<br>Soil<br>1 | HG-RES-36-2-1<br>3.5'-4.0'<br>1005F46-025A<br>05/17/10<br>Soil<br>1 | HG-RES-36-2-2<br>1005F46-005A<br>05/17/10<br>Soil<br>1 | HG-RES-39-1-1<br>1005F46-008A<br>05/17/10<br>Soil<br>1 | HG-RES-39-1-2<br>1005F46-009A<br>05/17/10<br>Soil<br>1 | TVWP-1-1<br>0.5'-1.0'<br>1005B49-031A<br>05/13/10<br>Soil<br>1 |
|------------------------|--------------|------------|--|---|---|--|--|--|--|
|                        | VOCs (µg/Kg) | CASRN      |  |   |   |  |  |  |  |
| Benzene                | 71-43-2      | 86,000     | 2.1  | 0.96 U  | 0.65 U  | 0.68 U   | 0.62 U   | 0.80 U   | 4.0  |
| Ethylbenzene           | 100-41-4     | 3,500,000  | 0.85 U   | 0.96 U  | 0.65 U  | 0.68 U   | 0.62 U   | 0.80 U   | 1.0 U  |
| m,p-Xylene             | 1330-20-7    | 630,000    | 0.85 U   | 0.96 U  | 0.65 U  | 0.68 U   | 0.62 U   | 0.80 U   | 1.0 U  |
| o-Xylene               | 1330-20-6    | 630,000    | 0.85 U   | 0.96 U  | 0.65 U  | 0.68 U   | 0.62 U   | 0.80 U   | 1.0 U  |
| Toluene                | 108-88-3     | 5,000,000  | 1.5  | 0.96 U  | 0.83  | 0.68 U   | 0.62 U   | 0.80 U   | 1.8  |
| PAHs (µg/Kg)           |              |            |  |   |   |  |  |  |  |
| Acenaphthene           | 83-32-9      | 3,400,000  | 220 U  | 240 U   | 230 U   | 240 U  | 230 U  | 230 U  | 220 U  |
| Acenaphthylene         | 208-96-8     | 1,700,000  | 220 U  | 240 U   | 230 U   | 240 U  | 230 U  | 230 U  | 2000   |
| Anthracene             | 120-12-7     | 17,000,000 | 220 U  | 240 U   | 230 U   | 240 U  | 230 U  | 230 U  | 2400   |
| Benz(a)anthracene      | 56-55-3      | 15,000     | 740  | 240 U   | 230 U   | 240 U  | 230 U  | 230 U  | 15000  |
| Benzo(a)pyrene         | 50-32-8      | 1,500      | 770  | 240 U   | 230 U   | 240 U  | 230 U  | 230 U  | 12000  |
| Benzo(b)fluoranthene   | 205-99-2     | 3,010,000  | 1100   | 240 U   | 300   | 240 U  | 230 U  | 230 U  | 23000  |
| Benzo(g,h,i)perylene   | 191-24-2     | 1,700,000  | 750  | 240 U   | 230 U   | 240 U  | 230 U  | 230 U  | 10000  |
| Benzo(k)fluoranthene   | 207-08-9     | 150,000    | 390  | 240 U   | 230 U   | 240 U  | 230 U  | 230 U  | 2400   |
| Chrysene               | 218-01-9     | 1,500,000  | 820  | 240 U   | 230 U   | 240 U  | 230 U  | 230 U  | 14000  |
| Dibenz(a,h)anthracene  | 53-70-3      | 1,500      | 220 U  | 240 U   | 230 U   | 240 U  | 230 U  | 230 U  | 2600   |
| Fluoranthene           | 206-44-0     | 2,300,000  | 1500   | 240 U   | 360   | 240 U  | 230 U  | 230 U  | 25000  |
| Fluorene               | 86-73-7      | 2,300,000  | 220 U  | 240 U   | 230 U   | 240 U  | 230 U  | 230 U  | 460  |
| Indeno(1,2,3-cd)pyrene | 193-39-5     | 15,000     | 630  | 240 U   | 230 U   | 240 U  | 230 U  | 230 U  | 9900   |
| Naphthalene            | 91-20-3      | 140,000    | 220 U  | 240 U   | 320   | 240 U  | 230 U  | 230 U  | 520  |
| Phenanthrene           | 85-01-8      | 1,700,000  | 580  | 240 U   | 350   | 240 U  | 230 U  | 230 U  | 11000  |
| Pyrene                 | 129-00-0     | 1,700,000  | 1400   | 240 U   | 300   | 240 U  | 230 U  | 230 U  | 23000  |
| Metals (mg/Kg)         |              |            |  |   |   |  |  |  |  |
| Mercury                | 7439-97-6    | 5.6        | 24.9   | 0.117 U   | 0.129   | 0.117 U  | 0.110 U  | 0.114 U  | 1.09   |
| Arsenic                | 7440-38-2    | 39         | 435  | 11.8  | 5.45  | 15.9   | 6.58   | 17.7   | 17.7   |
| Lead                   | 7439-92-1    | 400        | 800  | 25.0  | 197   | 62.5   | 12.9   | 73.3   | 83.6   |

Notes:

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

PRG = Proposed Removal Goal

Residential Soil PRGs apply to surface soil at depths of 0 to 1 foot.

Construction/Utility Soil PRGs apply to soil at depths of 1 to 4 feet.

Shaded and bolded cell indicates compound concentration exceeds a PRG.

CASRN - Chemical Abstract Services Registry Number

Table 2  
Surface Soil and Shallow Subsurface Soil Laboratory Analytical Results  
Removal Action Work Plan Investigations  
Huntsville Former MGP Site  
Huntsville, Alabama

Unvalidated Data

| Compound               | CASRN     | Sample ID             |                                | TWP-1-2 | HG-RES-41-SW | HG-RES-42-SW | HG-RES-43-SW | HR-RES-41 | HG-RES-42    | HG-RES-43    |
|------------------------|-----------|-----------------------|--------------------------------|---------|--------------|--------------|--------------|-----------|--------------|--------------|
|                        |           | Residential Soil PRGs | Construction/Utility Soil PRGs |         |              |              |              |           |              |              |
| VOCs (µg/Kg)           |           |                       |                                |         |              |              |              |           |              |              |
| Benzene                | 71-43-2   | 86,000                | 341,000                        | 2.1     | 6.9          | 0.87 U       | 0.81 U       | 1.4       | 0.0-0.5'     | 0.0-0.5'     |
| Ethylbenzene           | 100-41-4  | 3,500,000             | 15,600,000                     | 0.98 U  | 0.88 U       | 0.87 U       | 0.81 U       | 0.75 U    | 0.0-0.5'     | 0.0-0.5'     |
| m,p-Xylene             | 1330-20-7 | 630,000               | 2,160,000                      | 0.98 U  | 0.88 U       | 0.87 U       | 0.81 U       | 1.9       | 1005B49-002A | 1005B49-003A |
| o-Xylene               | 1330-20-6 | 630,000               | 2,160,000                      | 0.98 U  | 0.88 U       | 0.87 U       | 0.81 U       | 0.75 U    | 0.0-0.5'     | 0.0-0.5'     |
| Toluene                | 108-88-3  | 5,000,000             | 29,400,000                     | 0.98 U  | 1.6          | 0.87 U       | 0.81 U       | 2.5       | 0.0-0.5'     | 0.0-0.5'     |
| PAHs (µg/Kg)           |           |                       |                                |         |              |              |              |           |              |              |
| Acenaphthene           | 83-32-9   | 3,400,000             | 18,900,000                     | 260 U   | 560          | 270 U        | 280 U        | 240 U     | 0.0-0.5'     | 0.0-0.5'     |
| Acenaphthylene         | 208-96-8  | 1,700,000             | 9,430,000                      | 260 U   | 2400         | 270 U        | 280 U        | 240 U     | 0.0-0.5'     | 0.0-0.5'     |
| Anthracene             | 120-12-7  | 17,000,000            | 94,300,000                     | 260 U   | 2500         | 270 U        | 280 U        | 370       | 0.0-0.5'     | 0.0-0.5'     |
| Benz(a)anthracene      | 56-55-3   | 15,000                | 3,010,000                      | 760     | 11000        | 270 U        | 280 U        | 1700      | 0.0-0.5'     | 0.0-0.5'     |
| Benz(a)pyrene          | 50-32-8   | 1,500                 | 301,000                        | 630     | 9100         | 270 U        | 280 U        | 1400      | 0.0-0.5'     | 0.0-0.5'     |
| Benz(b)fluoranthene    | 205-95-2  | 15,000                | 3,010,000                      | 1200    | 9100         | 270 U        | 280 U        | 2300      | 0.0-0.5'     | 0.0-0.5'     |
| Benz(g,h,i)perylene    | 191-24-2  | 1,700,000             | 9,430,000                      | 590     | 4500         | 270 U        | 280 U        | 810       | 0.0-0.5'     | 0.0-0.5'     |
| Benz(k)fluoranthene    | 207-08-9  | 150,000               | 30,100,000                     | 330     | 2200         | 270 U        | 280 U        | 710       | 0.0-0.5'     | 0.0-0.5'     |
| Chrysene               | 218-01-9  | 1,500,000             | 100,000,000                    | 740     | 10000        | 270 U        | 280 U        | 1700      | 0.0-0.5'     | 0.0-0.5'     |
| Dibenz(a,h)anthracene  | 53-70-3   | 1,500                 | 301,000                        | 260 U   | 240 U        | 270 U        | 280 U        | 300       | 0.0-0.5'     | 0.0-0.5'     |
| Fluoranthene           | 206-44-0  | 2,300,000             | 12,600,000                     | 1500    | 19000        | 270 U        | 280 U        | 3000      | 0.0-0.5'     | 0.0-0.5'     |
| Indeno(1,2,3-cd)pyrene | 86-73-7   | 2,300,000             | 12,600,000                     | 260 U   | 780          | 270 U        | 280 U        | 240 U     | 0.0-0.5'     | 0.0-0.5'     |
| Naphthalene            | 193-39-5  | 15,000                | 3,010,000                      | 560     | 4300         | 270 U        | 280 U        | 810       | 0.0-0.5'     | 0.0-0.5'     |
| Phenanthrene           | 91-20-3   | 140,000               | 484,000                        | 260 U   | 970          | 270 U        | 280 U        | 240 U     | 0.0-0.5'     | 0.0-0.5'     |
| Pyrene                 | 85-01-8   | 1,700,000             | 9,430,000                      | 670     | 8100         | 270 U        | 280 U        | 1200      | 0.0-0.5'     | 0.0-0.5'     |
| Metals (mg/Kg)         | 129-00-0  | 1,700,000             | 9,430,000                      | 1300    | 17000        | 270 U        | 280 U        | 2600      | 0.0-0.5'     | 0.0-0.5'     |
| Mercury                | 7439-97-6 | 5.6                   | 24.9                           | 0.125 U | 0.120        | 0.131 U      | 0.138 U      | 0.120 U   | 0.0-0.5'     | 0.0-0.5'     |
| Arsenic                | 7440-38-2 | 39                    | 435                            | 13.6    | 19.8         | 15.5         | 19.1         | 27.0      | 0.0-0.5'     | 0.0-0.5'     |
| Lead                   | 7439-92-1 | 400                   | 800                            | 26.1    | 71.7         | 27.7         | 25.3         | 51.5      | 0.0-0.5'     | 0.0-0.5'     |
| Notes:                 |           |                       |                                |         |              |              |              |           |              |              |

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

PRG = Proposed Removal Goal

Residential Soil PRGs apply to surface soil at depths of 0 to 1 foot.

Construction/Utility Soil PRGs apply to soil at depths of 1 to 4 feet.

Shaded and bolded cell indicates compound concentration exceeds a PRG.

CASRN - Chemical Abstract Services Registry Number

Table 2  
Surface Soil and Shallow Subsurface Soil Laboratory Analytical Results  
Removal Action Work Plan Investigations  
Huntsville Former MGP Site  
Huntsville, Alabama

Unvalidated Data

| Compound               | CASRN     | Residential Soil PRGs | Construction/Utility Soil PRGs | Sample ID<br>Sample Depth:<br>Lab ID:<br>Date Sampled:<br>Matrix:<br>Dilution Factor: | SED-4-SWALE<br>0.0-0.5'<br>1005H21-019A<br>05/20/10<br>Soil<br>1 | SED-5-SWALE<br>0.0-0.5'<br>1005H21-024A<br>05/20/10<br>Soil<br>1 |
|------------------------|-----------|-----------------------|--------------------------------|---|--|--|
|                        |           |                       |                                |   |  |  |
| <b>VOCs (µg/Kg)</b>    |           |                       |                                |   |  |  |
| Benzene                | 71-43-2   | 86,000                | 341,000                        |   | 3.9  | 1.3  |
| Ethylbenzene           | 100-41-4  | 3,500,000             | 15,600,000                     |   | 1.2 U  | 1.0 U  |
| m,p-Xylene             | 1330-20-7 | 630,000               | 2,160,000                      |   | 1.2 U  | 1.7  |
| o-Xylene               | 1330-20-6 | 630,000               | 2,160,000                      |   | 1.2 U  | 1.0 U  |
| Toluene                | 108-88-3  | 5,000,000             | 29,400,000                     |   | 4.9  | 2.9  |
| <b>PAHs (µg/Kg)</b>    |           |                       |                                |   |  |  |
| Acenaphthene           | 83-32-9   | 3,400,000             | 18,900,000                     |   | 270 U  | 260 U  |
| Acenaphthylene         | 208-96-8  | 1,700,000             | 9,430,000                      |   | 270 U  | 260 U  |
| Anthracene             | 120-12-7  | 17,000,000            | 94,300,000                     |   | 280  | 260 U  |
| Benz(a)anthracene      | 56-55-3   | 15,000                | 3,010,000                      |   | 1500   | 270  |
| Benzo(a)pyrene         | 50-32-8   | 1,500                 | 301,000                        |   | 1500   | 260  |
| Benzo(b)fluoranthene   | 205-99-2  | 15,000                | 3,010,000                      |   | 2800   | 510  |
| Benzo(g,h,i)perylene   | 191-24-2  | 1,700,000             | 9,430,000                      |   | 1100   | 260 U  |
| Benzo(k)fluoranthene   | 207-08-9  | 150,000               | 30,100,000                     |   | 710  | 260 U  |
| Chrysene               | 218-01-9  | 1,500,000             | 100,000,000                    |   | 1900   | 360  |
| Dibenz(a,h)anthracene  | 53-70-3   | 1,500                 | 301,000                        |   | 270 U  | 260 U  |
| Fluoranthene           | 206-44-0  | 2,300,000             | 12,600,000                     |   | 3200   | 750  |
| Fluorene               | 86-73-7   | 2,300,000             | 12,600,000                     |   | 270 U  | 260 U  |
| Indeno(1,2,3-cd)pyrene | 193-39-5  | 15,000                | 3,010,000                      |   | 1100   | 260 U  |
| Naphthalene            | 91-20-3   | 140,000               | 484,000                        |   | 270 U  | 260 U  |
| Phenanthrene           | 85-01-8   | 1,700,000             | 9,430,000                      |   | 1500   | 280  |
| Pyrene                 | 129-00-0  | 1,700,000             | 9,430,000                      |   | 2700   | 590  |
| <b>Metals (mg/Kg)</b>  |           |                       |                                |   |  |  |
| Mercury                | 7439-97-6 | 5.6                   | 24.9                           |   | 0.145  | 0.126 U  |
| Arsenic                | 7440-38-2 | 39                    | 435                            |   | 13.2   | 29.2   |
| Lead                   | 7439-92-1 | 400                   | 800                            |   | 297  | 83.0   |

Notes:  
mg/kg = milligrams per kilogram  
µg/kg = micrograms per kilogram  
PRG = Proposed Removal Goal  
Residential Soil PRGs apply to surface soil at depths of 0 to 1 foot.  
Construction/Utility Soil PRGs apply to soil at depths of 1 to 4 feet.  
Shaded and bolded cell indicates compound concentration exceeds a PRG.  
CASRN - Chemical Abstract Services Registry Number

Table 3  
Subsurface Soil Analytical Results  
Removal Action Work Plan Investigations  
Huntsville Former MGP  
Huntsville, Alabama

| Sample ID HG-RES-15-1-3 |           | HG-RES-29-1-3 |  | HG-RES-31-1-4 |  | HG-RES-31-1-5 |  | HG-RES-32-1-3 |  | TWP-1-3      |  | TWP-4-1      |  | TWP-4-2      |  |
|-------------------------|-----------|---------------|--|---------------|--|---------------|--|---------------|--|--------------|--|--------------|--|--------------|--|
| Sample Depth: 12.0-12.5 |           | 19.5-20.0     |  | 11.5-12.0     |  | 22.5-23.0     |  | 10.0-10.5     |  | 22.0-22.5    |  | 9.5-10.0     |  | 20.0-20.5    |  |
| Lab ID: 1005J30-008B    |           | 1005J30-005A  |  | 1005J30-001A  |  | 1005J30-002A  |  | 1005J30-003A  |  | 1005J30-004A |  | 1005J30-007A |  | 1005J30-006A |  |
| Date Sampled: 05/14/10  |           | 05/13/10      |  | 05/12/10      |  | 05/12/10      |  | 05/13/10      |  | 05/13/10     |  | 05/13/10     |  | 05/13/10     |  |
| Matrix: Soil            |           | Soil          |  | Soil          |  | Soil          |  | Soil          |  | Soil         |  | Soil         |  | Soil         |  |
| Dilution Factor: 1      |           | 1             |  | 1             |  | 1             |  | 1             |  | 1            |  | 1            |  | 1            |  |
| Units: µg/Kg            |           | µg/Kg         |  | µg/Kg         |  | µg/Kg         |  | µg/Kg         |  | µg/Kg        |  | µg/Kg        |  | µg/Kg        |  |
| Compound CASRN          |           |               |  |               |  |               |  |               |  |              |  |              |  |              |  |
| <b>VOCs (µg/Kg)</b>     |           |               |  |               |  |               |  |               |  |              |  |              |  |              |  |
| Benzene                 | 71-43-2   | 0.72 U        |  | 150000        |  | 1700          |  |               |  |              |  |              |  | 1.2 U        |  |
| Ethylbenzene            | 100-41-4  | 0.72 U        |  | 9600          |  | 19000         |  | 0.66 U        |  | 5900         |  | 0.69 U       |  | 1.2 U        |  |
| m,p-Xylene              | 1330-20-7 | 0.72 U        |  | 67000         |  | 68000         |  | 0.66 U        |  | 3300         |  | 0.69 U       |  | 1.2 U        |  |
| o-Xylene                | 1330-20-6 | 0.72 U        |  | 29000         |  | 25000         |  | 0.66 U        |  | 1200         |  | 0.69 U       |  | 1.2 U        |  |
| Toluene                 | 108-88-3  | 0.72 U        |  | 130000        |  | 14000         |  | 0.66 U        |  | 2300         |  | 0.69 U       |  | 1.2 U        |  |
| <b>PAHs (µg/Kg)</b>     |           |               |  |               |  |               |  |               |  |              |  |              |  |              |  |
| Acenaphthene            | 83-32-9   | 260 U         |  | 1700          |  | 54000         |  | 240 U         |  | 4300 U       |  | 250 U        |  | 300 U        |  |
| Acenaphthylene          | 208-96-8  | 260 U         |  | 1800          |  | 36000         |  | 240 U         |  | 1800         |  | 250 U        |  | 300 U        |  |
| Anthracene              | 120-12-7  | 260 U         |  | 11000         |  | 79000         |  | 240 U         |  | 12000        |  | 250 U        |  | 300 U        |  |
| Benz(a)anthracene       | 56-55-3   | 260 U         |  | 11000         |  | 64000         |  | 240 U         |  | 8600         |  | 250 U        |  | 300 U        |  |
| Benzo(a)pyrene          | 50-32-8   | 260 U         |  | 6500          |  | 57000         |  | 240 U         |  | 6800         |  | 250 U        |  | 300 U        |  |
| Benzo(b)fluoranthene    | 205-99-2  | 260 U         |  | 4300          |  | 43000         |  | 240 U         |  | 6600         |  | 250 U        |  | 300 U        |  |
| Benzo(g,h,i)perylene    | 191-24-2  | 260 U         |  | 3800          |  | 32000         |  | 240 U         |  | 3300         |  | 250 U        |  | 300 U        |  |
| Benzo(k)fluoranthene    | 207-08-9  | 260 U         |  | 5900          |  | 39000         |  | 240 U         |  | 1800         |  | 250 U        |  | 300 U        |  |
| Chrysene                | 218-01-9  | 260 U         |  | 9600          |  | 57000         |  | 240 U         |  | 8000         |  | 250 U        |  | 300 U        |  |
| Dibenz(a,h)anthracene   | 53-70-3   | 260 U         |  | 250 U         |  | 23000 U       |  | 240 U         |  | 260 U        |  | 250 U        |  | 300 U        |  |
| Fluoranthene            | 206-44-0  | 260 U         |  | 28000         |  | 200000        |  | 240 U         |  | 21000        |  | 250 U        |  | 300 U        |  |
| Fluorene                | 86-73-7   | 260 U         |  | 6000          |  | 76000         |  | 240 U         |  | 9000         |  | 250 U        |  | 300 U        |  |
| Indeno(1,2,3-cd)pyrene  | 193-39-5  | 260 U         |  | 3200          |  | 27000         |  | 240 U         |  | 2700         |  | 250 U        |  | 300 U        |  |
| Naphthalene             | 91-20-3   | 260 U         |  | 280000        |  | 910000        |  | 240 U         |  | 17000        |  | 250 U        |  | 300 U        |  |
| Phenanthrene            | 85-01-8   | 260 U         |  | 72000         |  | 320000        |  | 240 U         |  | 66000        |  | 250 U        |  | 300 U        |  |
| Pyrene                  | 129-00-0  | 260 U         |  | 37000         |  | 160000        |  | 240 U         |  | 28000        |  | 250 U        |  | 300 U        |  |
| <b>Metals (mg/Kg)</b>   |           |               |  |               |  |               |  |               |  |              |  |              |  |              |  |
| Mercury                 | 7439-97-6 | 0.127 U       |  | 0.121 U       |  | 0.289         |  | 0.121 U       |  | 0.125 U      |  | 0.124 U      |  | 0.148 U      |  |
| Arsenic                 | 7440-38-2 | 17.1          |  | 11.8          |  | 9.96          |  | 6.89          |  | 13.3         |  | 8.31         |  | 6.23         |  |
| Lead                    | 7439-92-1 | 6.69          |  | 53.0          |  | 68.7          |  | 8.62          |  | 24.5         |  | 11.1         |  | 5.94         |  |

Notes:  
mg/Kg = milligrams per kilogram  
µg/Kg = micrograms per kilogram

CASRN - Chemical Abstract Services Registry Number

Table 4  
Sediment Analytical Results  
Removal Action Work Plan Investigations  
Huntsville Former MGP  
Huntsville, Alabama

| Compound               | CASRN        |               | Sample ID       |         | Sample Depth: |         | Lab ID: |         | Date Sampled: |         | Matrix: |         | Dilution Factor: |         | PC-SED-1 |         | PC-SED-2 |         | PC-SED-3 |         |
|------------------------|--------------|---------------|-----------------|---------|---------------|---------|---------|---------|---------------|---------|---------|---------|------------------|---------|----------|---------|----------|---------|----------|---------|
|                        | VOCs (µg/Kg) | Effects Value | Screening Value | NS      | NS            | NS      | NS      | NS      | NS            | NS      | NS      | NS      | NS               | NS      | NS       | NS      | NS       | NS      | NS       | NS      |
| Benzene                | 71-43-2      | NS            | NS              | NS      | NS            | NS      | NS      | NS      | NS            | NS      | NS      | NS      | NS               | NS      | NS       | NS      | NS       | NS      | NS       | NS      |
| Ethylbenzene           | 100-41-4     | NS            | NS              | NS      | NS            | NS      | NS      | NS      | NS            | NS      | NS      | NS      | NS               | NS      | NS       | NS      | NS       | NS      | NS       | NS      |
| m,p-Xylene             | 1330-20-7    | NS            | NS              | NS      | NS            | NS      | NS      | NS      | NS            | NS      | NS      | NS      | NS               | NS      | NS       | NS      | NS       | NS      | NS       | NS      |
| o-Xylene               | 1330-20-6    | NS            | NS              | NS      | NS            | NS      | NS      | NS      | NS            | NS      | NS      | NS      | NS               | NS      | NS       | NS      | NS       | NS      | NS       | NS      |
| Toluene                | 108-88-3     | NS            | NS              | NS      | NS            | NS      | NS      | NS      | NS            | NS      | NS      | NS      | NS               | NS      | NS       | NS      | NS       | NS      | NS       | NS      |
| PAHs (µg/Kg)           |              |               |                 |         |               |         |         |         |               |         |         |         |                  |         |          |         |          |         |          |         |
| Acenaphthene           | 83-32-9      | 6,710         | 330,000         | 300 U   | 260 U         | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Acenaphthylene         | 208-96-8     | 5,870         | 330,000         | 310     | 260 U         | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Anthracene             | 120-12-7     | 46,900        | 330,000         | 300 U   | 260 U         | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Benz(a)anthracene      | 56-55-3      | 74,800        | 330,000         | 2100    | 280           | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Benzo(a)pyrene         | 50-32-8      | 88,800        | 330,000         | 1600    | 260 U         | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Benzo(b)fluoranthene   | 205-99-2     | NS            | 330,000         | 2500    | 470           | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Benzo(g,h,i)perylene   | 191-24-2     | NS            | 330,000         | 960     | 260 U         | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Benzo(k)fluoranthene   | 207-08-9     | NS            | 330,000         | 660     | 260 U         | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Chrysene               | 218-01-9     | 108,000       | 330,000         | 2000    | 340           | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Dibenz(a,h)anthracene  | 53-70-3      | 6,220         | 330,000         | 300 U   | 260 U         | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Fluoranthene           | 206-44-0     | 113,000       | 330,000         | 3100    | 600           | 300     | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Fluorene               | 86-73-7      | NS            | 330,000         | 300 U   | 260 U         | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Indeno(1,2,3-cd)pyrene | 193-39-5     | NS            | 330,000         | 930     | 260 U         | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Naphthalene            | 91-20-3      | 34,600        | 330,000         | 300 U   | 260 U         | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Phenanthrene           | 85-01-8      | 86,700        | 330,000         | 860     | 260 U         | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Pyrene                 | 129-00-0     | 153,000       | 330,000         | 2900    | 490           | 250 U   | 250 U   | 250 U   | 250 U         | 250 U   | 250 U   | 250 U   | 250 U            | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   | 250 U    | 250 U   |
| Metals (mg/Kg)         |              |               |                 |         |               |         |         |         |               |         |         |         |                  |         |          |         |          |         |          |         |
| Mercury                | 7439-97-6    | 0.13          | 0.13            | 0.150 U | 0.127 U       | 0.125 U | 0.125 U | 0.125 U | 0.125 U       | 0.125 U | 0.125 U | 0.125 U | 0.125 U          | 0.125 U | 0.125 U  | 0.125 U | 0.125 U  | 0.125 U | 0.125 U  | 0.125 U |
| Arsenic                | 7440-38-2    | 7.24          | 7.24            | 18.9    | 19.1          | 15.2    | 15.2    | 15.2    | 15.2          | 15.2    | 15.2    | 15.2    | 15.2             | 15.2    | 15.2     | 15.2    | 15.2     | 15.2    | 15.2     | 15.2    |
| Lead                   | 7439-92-1    | 30.2          | 30.2            | 43.6    | 28.7          | 26.4    | 26.4    | 26.4    | 26.4          | 26.4    | 26.4    | 26.4    | 26.4             | 26.4    | 26.4     | 26.4    | 26.4     | 26.4    | 26.4     | 26.4    |

Notes:

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

Shaded and bolded cell indicates compound concentration exceeds a EPA

Region 4 Sediment Effects Value or Sediment Screening Value

CASRN - Chemical Abstract Services Registry Number

Table 5  
Temporary Monitoring Well Groundwater Analytical Results  
Removal Action Work Plan Investigations  
Huntsville Former MGP  
Homes  
Huntsville, Alabama

Unvalidated Data

| Sample ID              |           | TWP-1        | TWP-2        | TWP-3        | TWP-4        |
|------------------------|-----------|--------------|--------------|--------------|--------------|
| Lab ID:                |           | 1005F46-016A | 1005F46-017A | 1005F46-018A | 1005F46-019A |
| Date Sampled:          |           | 05/17/10     | 05/17/10     | 05/17/10     | 05/17/10     |
| Matrix:                |           | Water        | Water        | Water        | Water        |
| Dilution Factor:       |           | 1            | 1            | 1            | 1            |
| Units:                 |           | µg/L         | µg/L         | µg/L         | µg/L         |
| Compound               |           |              |              |              |              |
| VOCs (µg/L)            |           |              |              |              |              |
| Benzene                | 71-43-2   | 4300         | 40000        | 150          | 1.8          |
| Ethylbenzene           | 100-41-4  | 250          | 470          | 18           | 1.0 U        |
| m,p-Xylene             | 1330-20-7 | 230          | 2400         | 240          | 1.0 U        |
| o-Xylene               | 1330-20-6 | 58           | 1100         | 65           | 1.0 U        |
| Toluene                | 108-88-3  | 230          | 11000        | 20           | 1.3          |
| PAHs (µg/L)            |           |              |              |              |              |
| Acenaphthene           | 83-32-9   | 15           | 21           | 8.7          | 0.50 U       |
| Acenaphthylene         | 208-96-8  | 6.0          | 38           | 100 U        | 1.0 U        |
| Anthracene             | 120-12-7  | 3.3          | 11           | 6.1          | 0.050 U      |
| Benzo(a)anthracene     | 56-55-3   | 0.25         | 2.2          | 1.5          | 0.050 U      |
| Benzo(a)pyrene         | 50-32-8   | 0.18         | 1.6          | 1.1          | 0.050 U      |
| Benzo(b)fluoranthene   | 205-99-2  | 0.15         | 1.3          | 1.3          | 0.10 U       |
| Benzo(g,h,i)perylene   | 191-24-2  | 0.14         | 0.76         | 0.51         | 0.10 U       |
| Benzo(k)fluoranthene   | 207-08-9  | 0.080        | 0.55         | 0.43         | 0.050 U      |
| Chrysene               | 218-01-9  | 0.19         | 1.6          | 1.2          | 0.050 U      |
| Dibenz(a,h)anthracene  | 53-70-3   | 0.10 U       | 0.10 U       | 0.10 U       | 0.10 U       |
| Fluoranthene           | 206-44-0  | 1.8          | 8.4          | 5.1          | 0.10 U       |
| Fluorene               | 86-73-7   | 10           | 39           | 23           | 0.10 U       |
| Indeno(1,2,3-cd)pyrene | 193-39-5  | 0.090        | 0.61         | 0.47         | 0.050 U      |
| Naphthalene            | 91-20-3   | 860          | 11000        | 960          | 2.7          |
| Phenanthrene           | 85-01-8   | 17           | 65           | 21           | 0.14         |
| Pyrene                 | 129-00-0  | 2.4          | 9.5          | 3.9          | 0.050 U      |
| Metals (µg/L)          |           |              |              |              |              |
| Mercury                | 7439-97-6 | 0.00020 U    | 0.00020 U    | 0.00020 U    | 0.00020 U    |
| Arsenic                | 7440-38-2 | 5.00 U       | 5.00 U       | 5.00 U       | 5.00 U       |
| Lead                   | 7439-92-1 | 5.45         | 3.94         | 16.6         | 15.3         |

**Notes:**

µg/L - micrograms per liter

CASRN - Chemical Abstract Services Registry Number