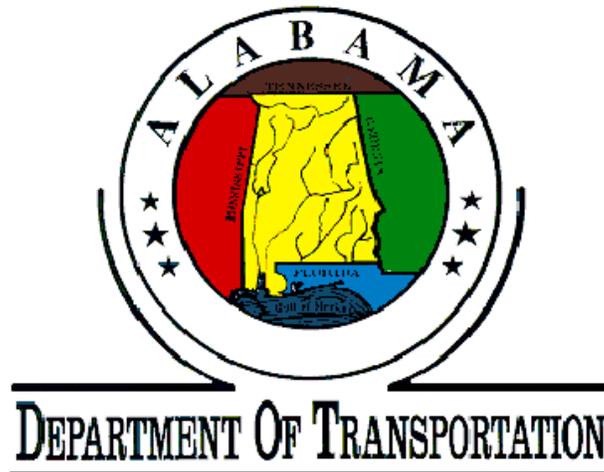


May 2006 through July 2006 STATUS REPORT

VOLUME I OF II: REPORT

COLISEUM BOULEVARD PLUME INVESTIGATION



September 8, 2006

**Submitted to:
The Alabama Department of Environmental Management
Montgomery, Alabama**



**May 2006 through July 2006
Status Report**
Coliseum Boulevard Plume Investigation

Table of Contents

Summary	1
I. Routine Monitoring	2
Water Level Measurements	2
Quarterly Sampling Event (Modification to Addendum 13 Work Plan).....	2
Quarterly Sampling of the Continuous Multi-Channel Tubing (CMT) Wells	3
Surface Water Sampling	4
Low – Lying Areas (Addendum 04 Work Plan)	5
II. Investigation Derived Waste	5
Water Treatment	5
III. Quality Assurance/Quality Control	5

Figures

- Figure 1: Ground-water elevations in 100-series monitoring wells, ALDOT and ALFA monitoring wells and piezometers on July 5 -11, 2006
- Figure 2: Ground-water elevations in 200-series monitoring wells on July 5 -11, 2006
- Figure 3: (Inset) Concentrations of volatile organic compounds (VOCs) in 100-, 200-, 300- and 400-series monitoring wells on July 5 - 26, 2006
- Figure 4: Surface Water Sample Location Points
- Figure 5: Analytical results of sediment samples collected from the “Low-Lying Areas” on July 25, 2006
- Figure 6: Analytical results of surficial water samples collected from the “Low-Lying Areas” on July 25, 2006

Tables

- Table 1a: Ground-water elevations in ALDOT wells during the last 12 month period
- Table 1b: Ground-water elevations in piezometers during the last 12 month period
- Table 1c: Ground-water elevations in Alfa monitoring wells during the last 12 month period
- Table 1d: Ground-water elevations in monitoring wells along Kilby Ditch during the last 12 month period
- Table 1e: Ground-water elevations in 100-, 200-, 300- and 400-series monitoring wells during the last 12 month period
- Table 1f: Ground-water elevations in pump test wells during the last 12 month period



May 2006 through July 2006 Status Report

Coliseum Boulevard Plume Investigation

Tables continued...

- Table 2: Ground-water elevations in continuous multi-channel tubing (CMT) wells during the last 12 month period
- Table 3: Results of analyses of detected VOCs in ground-water samples from monitoring wells
- Table 4: Results of analyses for total alkalinity, chloride, nitrate, nitrite, sulfate, ferrous [Fe(II)] iron, total iron, methane, ethane, and ethene in ground-water confirmation samples from monitoring wells
- Table 5: Results of total organic carbon (TOC) analyses in ground-water samples from monitoring wells
- Table 6: Results of analyses of detected VOCs in ground-water samples from continuous multi-channel tubing (CMT) wells
- Table 7: Results of analyses for total alkalinity, chloride, nitrate, nitrite, sulfate, ferrous [Fe(II)] iron, total iron, methane, ethane, and ethene in ground-water samples from Continuous Multi-Channel Tubing (CMT) wells
- Table 8: Results of analyses of surface-water samples collected at compliance points and monitoring points and select locations near the Montgomery Zoo
- Table 9: Surface water quarterly field parameters (temperature, conductivity, pH, dissolved oxygen, and turbidity)
- Table 10: Concentrations of detected VOCs in samples of sediment from the "Low-Lying Areas"
- Table 11: Concentrations of detected VOCs in samples of surface water from the "Low-Lying Areas"
- Table 12: Results of analyses of detected VOCs and treated volumes of water from treatment system
- Table 13: Results of analyses of detected VOCs in quality assurance/ quality control samples

Plate

- Plate 1: Concentrations of VOCs in ground-water samples from 100-, 200-, 300- and 400-series monitoring wells collected on July 5 - 26, 2006

Attachments

- Analytical Results
- Monitoring Well Sampling Forms



May 2006 through July 2006 Status Report

Coliseum Boulevard Plume Investigation

May 2006 through July 2006 Status Report

Summary

During the period between May 1, 2006, and July 31, 2006, investigations at the Coliseum Boulevard Plume (CBP) site continued.

- Routine monitoring of selected ground-water monitoring wells and continuous multi-channel tubing (CMT) wells, the Kilby Ditch and the "Low-Lying Areas" were conducted in July 2006 in accordance with the approved plans and are summarized in Section I. This report contains results of samples collected through July 31, 2006.

Section II contains information about the investigation derived waste and treated water generated during this period.

Section III contains a summary of quality assurance/quality control (QA/QC) samples collected during this period.



May 2006 through July 2006 Status Report

Coliseum Boulevard Plume Investigation

I. Routine Monitoring

Water Level Measurements

- July 5 through July 11, 2006: Depths to ground water were measured in piezometers, monitoring wells, CMT wells, and pump test wells associated with the Coliseum Boulevard Plume Investigation. Ground-water elevations on July 5 through July 11, 2006, are provided in Tables 1a through 1f. Ground-water elevations on July 5 through July 11, 2006, in the 100- and 200-series “shallow zone” monitoring wells and piezometers are shown on Figures 1 and 2, respectively.

Depths to ground water were measured in continuous multi-channel tubing (CMT) wells 1 through 7 (see Table 2) on July 5 through July 10, 2006. The water levels were not measured in CMT 1-2, 3-7 and CMT 4-7 on July 5, 2006, because of an obstruction in the well ports that prevented the water level indicator cable from freely advancing through the ports.

Quarterly Sampling Event (Modification to Addendum 13 Work Plan)

- A quarterly event under the Modification to Addendum 13 – Ground Water Monitoring Plan (dated March 17, 2005) was conducted in July 2006. Ground-water samples were collected from 63 monitoring wells at the Coliseum Boulevard Plume site for analyses for VOCs.
- July 5 through July 26, 2006: During the quarterly event of the approved modified ground-water monitoring program, samples were collected from the following 63 wells located at the Coliseum Boulevard Plume (CBP) site.

MW-101	MW-216	MW-131	MW-138A	MW-246B	MW-152A
MW-201	MW-117	MW-231	MW-238B	MW-147A	MW-252B
MW-103	MW-217	MW-132	MW-238C	MW-247B	MW-153
MW-203	MW-123	MW-232	MW-341	MW-149A	MW-154
MW-106	MW-223	MW-133	MW-143A	MW-249B	MW-155
MW-206	MW-124	MW-233	MW-243B	MW-249C	MW-156
MW-107	MW-224	MW-134	MW-144A	MW-150A	MW-357
MW-207	MW-129	MW-234	MW-244B	MW-250B	MW-457
MW-108	MW-229	MW-137A	MW-244C	MW-250C	
MW-208	MW-130	MW-237B	MW-145A	MW-151A	
MW-116	MW-230	MW-237C	MW-146A	MW-251B	

These 63 monitoring wells were sampled and analyzed for VOCs by **TTL**'s laboratory using EPA Method 8260. The ground-water samples were measured in the field for

F:\2000\0700\024\Status Reports\2006\May 2006 - July 2006\May 2006 through July 2006.doc



May 2006 through July 2006 Status Report

Coliseum Boulevard Plume Investigation

ferrous iron and total iron using a CHEMetrics VVR photometer[®]. The concentrations of detected VOCs in ground-water samples collected from the monitoring wells are shown on Plate 1 and Figure 3.

Samples were also collected from monitoring wells MW-153, MW-154, MW-155, MW-156, MW-357 and MW-457 and analyzed for inorganics (total alkalinity, chloride, nitrate, nitrite, and sulfate) by TTL's laboratory and for dissolved gases (methane, ethane and ethene) by STL in Burlington, Vermont. The results of the analyses of detected VOCs in the ground-water samples collected from the monitoring wells are provided in Table 3. The results of the analyses for total alkalinity, chloride, nitrate, nitrite, sulfate, ferrous and total iron, methane, ethane, and ethene in the ground-water samples collected from the approved monitoring wells under the Modification to Addendum 13 are provided in Table 4. Laboratory reports of the results of the analyses of the ground-water samples collected during the month of July 2006 are provided on the attached compact disc - recordable (CD-R).

Prior to sample collection, the monitoring wells were purged using a bladder pump until field parameters (pH, conductivity, and turbidity) stabilized. Temperature and redox (ORP) were also measured in the field. The field parameter measurements during purging of the monitoring wells in the month of July 2006 are provided on the Monitoring Well Sampling Forms on the attached CD-R.

- July 2006: Ground-water samples were collected from 9 monitoring wells (MW-106, MW-206, MW-107, MW-207, MW-223, MW-130, MW-230, MW-131, and MW-231) and analyzed for total organic carbon (TOC). The results of these analyses are provided in Table 5. Laboratory reports of the results of the analyses for TOC in the ground-water samples collected during the month of July 2006 are provided on the attached CD-R.

Quarterly Sampling of the Continuous Multi-Channel Tubing (CMT) Wells

- July 25 through July 31, 2006: Ground-water samples were collected from CMT wells 1, 2, 3 and 4. Ground-water samples were not collected from CMT 3-1 (on 7/27/06) and CMT 4-1 (on 7/31/06) due to the lack of sufficient water in the CMT ports. After measuring depths to water, each port was purged using a peristaltic pump until field parameters (pH, conductivity, and turbidity) stabilized. Ground-water samples also were measured in the field for temperature, oxidation-reduction potential [redox (ORP)], ferrous [Fe (II)] and total iron. Approximately 2 to 6 gallons of water were removed from each of the CMT ports prior to sample collection. During sample collection, the tubing from the pump was disconnected and withdrawn from the port.

The water samples were collected by draining the water from the bottom end of the tubing (end previously inside the port) into the sample containers. The ground-water



May 2006 through July 2006 Status Report Coliseum Boulevard Plume Investigation

samples were analyzed for VOCs by TTL's laboratory. Results of analyses of detected VOCs in the ground-water samples collected from the CMT wells are provided in Table 6. Samples for total iron analyses were collected from CMT 2-2 and CMT 2-6 on July 25 and July 26, 2006, respectively, for quality assurance/ quality control purposes. The results of the analyses for ferrous and total iron are provided in Table 7. Laboratory reports of these analyses and copies of Monitoring Well Sampling Forms are provided on the attached CD-R.

Surface Water Sampling

- July 25, 2006: Surface water samples were collected from the west and main branches of Kilby Ditch at five locations (compliance points CP-1, CP-2, CP-3, and monitoring points MP-1 and MP-2) and from the Zoo Ditch at one location (ZD-1) and the Zoo Pond at one location (ZP-1). On July 25, 2006, the surface water samples were collected at each location from the central part of each respective ditch and from the pump intake location at the Zoo Pond. Figure 4 shows the locations of these seven sampling points. The water samples were placed on ice and transported to TTL's laboratory for analyses for VOCs. Results of analyses of detected VOCs are provided in Table 8. The laboratory reports for the VOC analyses of the surface water samples collected on July 25, 2006, are provided on the attached CD-R. During sample collection, the water samples also were measured for temperature, pH, conductivity, dissolved oxygen, and turbidity (see Table 9).

On July 25, 2006, compliance point water samples CP-2 and CP-3 contained 1.9J $\mu\text{g/L}$ (micrograms per liter) and 5.5J $\mu\text{g/L}$, respectively, of TCE. There also was detection of cis-1,2-dichloroethene (1.3J $\mu\text{g/L}$) in the surface water sample collected from CP-1 on July 25, 2006. The J-flag associated with the concentration means the concentration is below the practical quantitation level. TCE concentrations detected in the samples collected from CP-1, CP-2 and CP-3 on July 25, 2006, are below the action level concentration of 175 $\mu\text{g/L}$ for TCE in surface water.

The surface water sample collected from location MP-2 contained TCE (5.4J $\mu\text{g/L}$) on July 25, 2006. There also was detection of cis-1,2-dichloroethene (7.6J $\mu\text{g/L}$) in the surface water sample collected from MP-2 on July 25, 2006.

On July 25, 2006, the surface water sample collected from the Zoo Ditch sampling location ZD-1 contained 4.3J $\mu\text{g/L}$ of chloroform. The presence of chloroform is likely the result of the discharge of municipal water into the Zoo Ditch. TCE was not detected in the sample collected from the Zoo Ditch.

On July 25, 2006, the surface water sample collected from the Zoo Pond sampling location ZP-1 did not contain detectable VOCs.



May 2006 through July 2006 Status Report

Coliseum Boulevard Plume Investigation

Low – Lying Areas (Addendum 04 Work Plan)

- July 25, 2006: On July 25, 2006, soil/sediment samples were collected from locations I, J, K, L, M, N, O, and P in the “Low-Lying Areas”. On July 25, 2006, surface-water samples were collected from locations I, K, L, M, N, O, and P in the “Low-Lying Areas”. On July 25, 2006, there was insufficient surface water to collect a sample at location J. Results of the analyses for VOCs in the soil/sediment and surface water samples collected from these locations on July 25, 2006, are provided in Tables 10 and 11, respectively. Laboratory reports of these analyses are provided on the attached CD-R.

II. Investigation Derived Waste

Water Treatment

- May 4 and August 3, 2006 : Water accumulated during cleaning of sampling equipment, and purging and sampling of monitoring wells, was treated through a liquid-phase carbon filter treatment system at the ALDOT staging area. A total of 1,044 gallons of water was treated on May 4, 2006 (see Table 12). A total of 480 gallons of water was treated on August 3, 2006 (see Table 12). The treated water was discharged into the sanitary sewer at the staging area. During treatment of the water, samples were collected from water discharged from the second carbon filter to monitor for breakthrough and from the third carbon filter to monitor for compliance with the Montgomery Water Works and Sanitary Sewer Board discharge requirements. The water samples were submitted for VOC analyses. Results of analyses of detected VOCs and volumes of treated water are provided in Table 12. Laboratory reports of the analytical results for samples collected in May and August 2006 are on the attached CD-R.

III. Quality Assurance/Quality Control

- During the July 2006 quarterly ground-water sampling event, duplicate ground-water samples were collected from monitoring wells MW-230, MW-131, MW-233, MW-238B, MW-244C, MW-152A and CMT wells CMT 2-1, 3-2 and 4-4, and analyzed for VOCs. The duplicate sample results are shown with the parent sample results (see Tables 3 and 6). Samples collected from monitoring wells MW-153, MW-154, MW-155, MW-156, MW-357 and MW-457 were analyzed for inorganics (alkalinity, chloride, nitrate, nitrite, and sulfate) by TTL and dissolved gases (methane, ethane, and ethene) by STL. Ground-water samples also were collected from monitoring wells MW-116, MW-133, MW-137A, MW-244C, MW-249C, MW-250C and MW-153 and CMT wells CMT 2-2 and CMT 2-6 and shipped to TTL’s laboratory to be analyzed for total iron for quality assurance/quality control purposes (see Tables 4 and 7). Equipment rinse samples



May 2006 through July 2006 Status Report

Coliseum Boulevard Plume Investigation

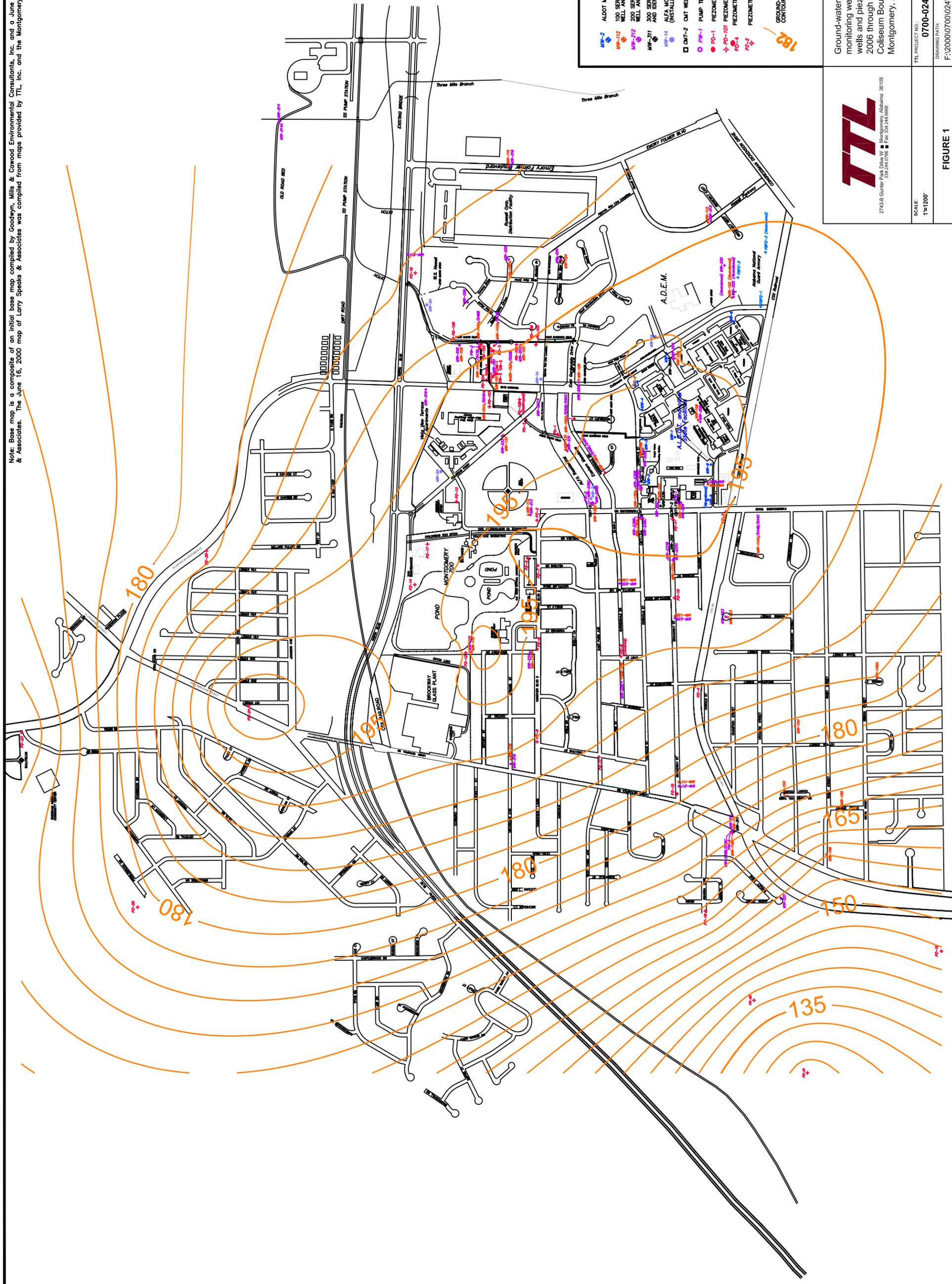
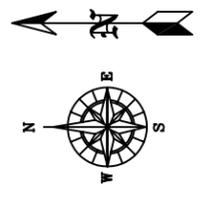
were collected and trip blank samples accompanied water samples that were submitted for analyses for VOCs in July 2006. Results of VOC analyses for the rinse and trip blank samples are provided in Table 13. Laboratory reports of the analyses are provided on the attached CD-R.



May 2006 through July 2006
Status Report
Coliseum Boulevard Plume Investigation

FIGURES

Note: Base map is a composite of an initial base map compiled by Goodwyn, Mills & Cawood Environmental Consultants, Inc. and a June 16, 2000 map by Larry E. Speaks & Associates. The June 16, 2000 map of Larry Speaks & Associates was compiled from maps provided by TTL, Inc. and the Montgomery, Alabama Tax Assessor's Office.



LEGEND

- ▲ MW-2 ALDOT MONITORING WELL AND IDENTIFIER
- MW-112 100 SERIES "SHALLOW ZONE" MONITORING WELL AND IDENTIFIER
- MW-212 200 SERIES "SHALLOW ZONE" MONITORING WELL AND IDENTIFIER
- MW-311 300 SERIES MONITORING WELL AND IDENTIFIER
- MW-14 ALFA MONITORING WELL AND IDENTIFIER (INSTALLED SEPTEMBER, 1999)
- CMT-2 CMT WELL AND IDENTIFIER
- PWT-1 PUMP TEST WELL AND IDENTIFIER
- PD-1 PEZOMETER AND IDENTIFIER
- PD-101 PEZOMETER AND IDENTIFIER
- PD-4 PEZOMETER AND IDENTIFIER
- PD-2 PEZOMETER AND IDENTIFIER
- GROUND-WATER CONTOUR (FEET AMSL) CONTOUR INTERVAL = 5 FEET

Ground-water elevations in 100-series monitoring wells, ALDOT and ALFA monitoring wells and piezometers on July 5-11, 2006; May 2006 through July 2006 Status Report, Coliseum Boulevard Plume Investigation; Montgomery, Alabama.

TTL PROJECT NO.: **0700-024**

SCALE: 1"=1200'

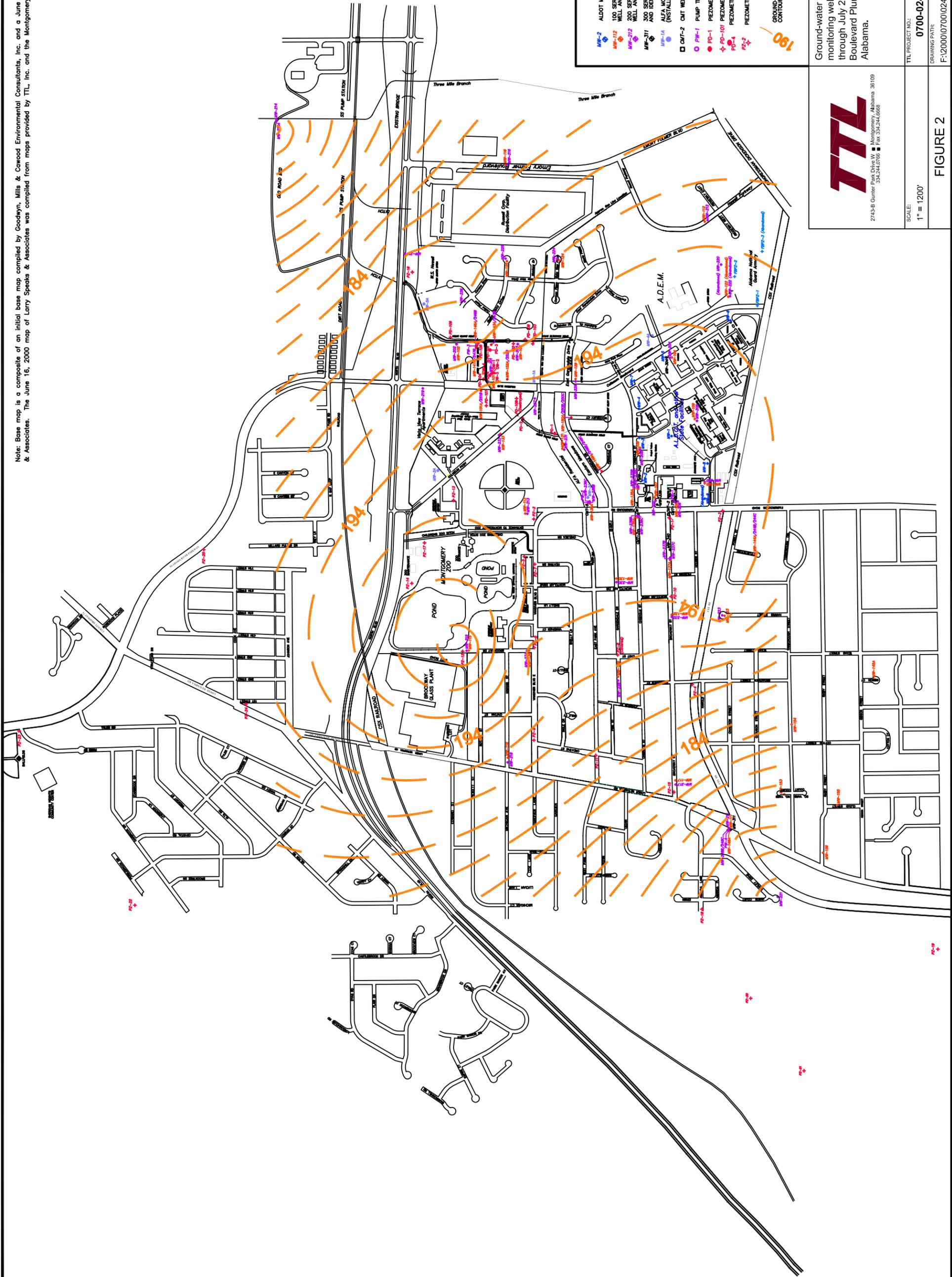
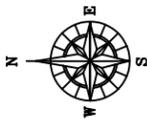
DRAWING DATE: **FIGURE 1**

2745-B Gutter Park, Suite 101, Montgomery, Alabama 36109
 334.244.0700 Fax 334.244.6500



FIGURE 1

Note: Base map is a composite of an initial base map compiled by Goodwyn, Mills & Cawood Environmental Consultants, Inc. and a June 16, 2000 map by Larry E. Speaks & Associates. The June 16, 2000 map of Larry Speaks & Associates was compiled from maps provided by TTL, Inc. and the Montgomery, Alabama Tax Assessor's Office.



LEGEND

- MW-2 ALDOT MONITORING WELL AND IDENTIFIER
- MW-112 100 SERIES "SHALLOW ZONE" MONITORING WELL AND IDENTIFIER
- MW-212 200 SERIES "SHALLOW ZONE" MONITORING WELL AND IDENTIFIER
- MW-311 300 SERIES MONITORING WELL AND IDENTIFIER
- MW-1A ALFA MONITORING WELL AND IDENTIFIER (INSTALLED SEPTEMBER, 1999)
- CMF-2 CMT WELL AND IDENTIFIER
- PTW-1 PUMP TEST WELL AND IDENTIFIER
- PD-1 PIEZOMETER AND IDENTIFIER
- PD-101 PIEZOMETER AND IDENTIFIER
- PD-4 PIEZOMETER AND IDENTIFIER
- PS-2 PIEZOMETER AND IDENTIFIER
- 180 GROUND-WATER CONTOUR (FEET AMSL) CONTOUR INTERVAL = 2 FEET

Ground-water elevations in 200-series monitoring wells on July 5-11, 2006; May 2006 through July 2006 Status Report, Coliseum Boulevard Plume Investigation; Montgomery, Alabama.

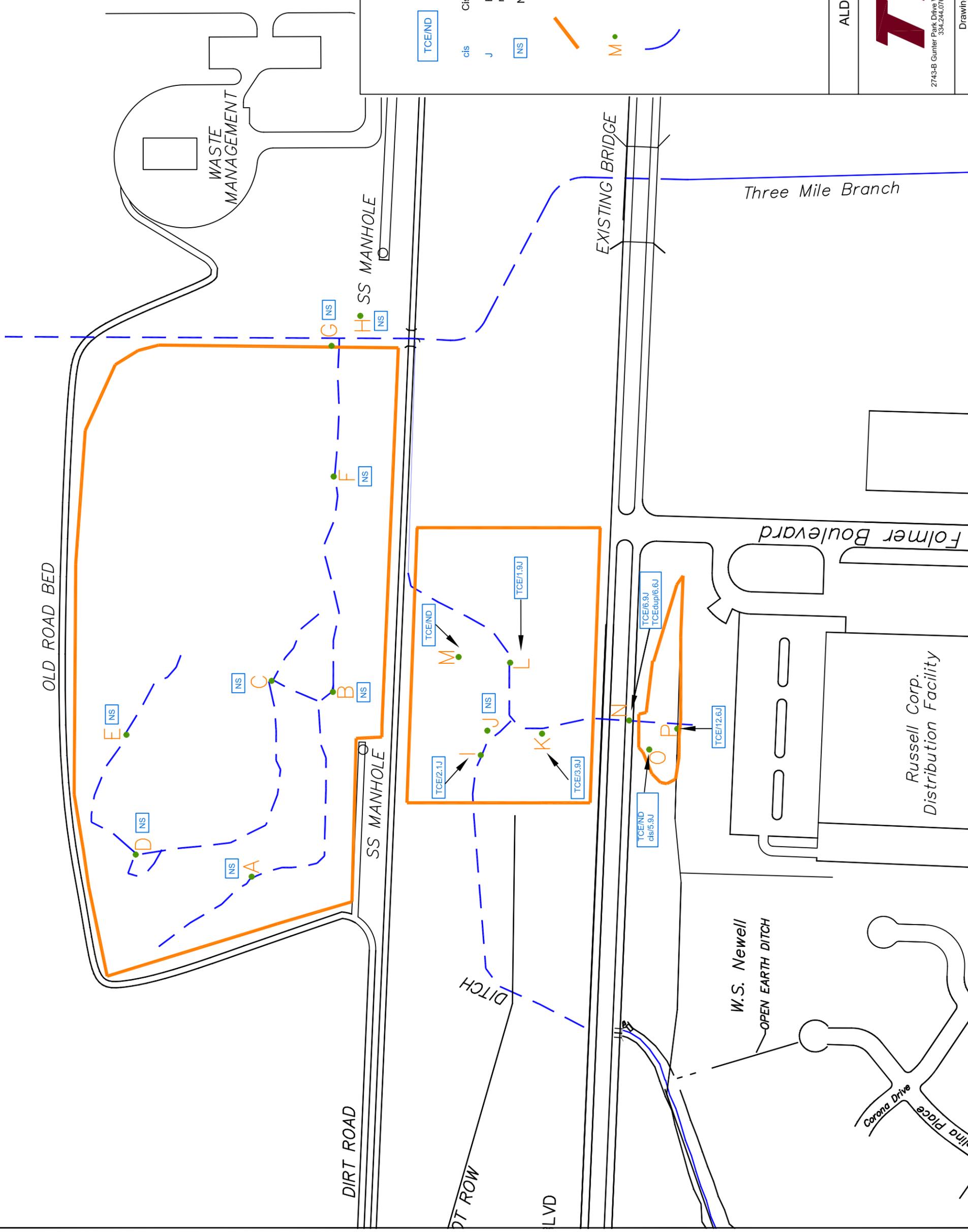
2743-B Gunter Park Drive W
Montgomery, Alabama 36109
336.244.0786 Fax 336.244.0686

TTL PROJECT NO.: **0700-024**

SCALE: 1" = 1200'

DRAWING PATH: F:\2000\0700\024\2006 Drawings\060717.1 - Jul06WL

FIGURE 2



LEGEND:

- TCE/IND TCE/concentration ug/L
Method Detection Limit (MDL)=1.0 micrograms per liter (ug/L)
- cis Cis-1,2-Dichloroethene/concentration ug/L
- J Estimated (concentration below the practical quantitation level, rather than the calibration curve values)
- NS Not Sampled
- Boundary of Low Lying Area
- M Sample location and Identifier
- - - Approximate locations of intermittent streams

ALDOT Coliseum Boulevard Plume Investigation



Analytical results of surficial water samples collected from Low-Lying Areas on July 25, 2006. Work plan 04- Investigation of "Low-Lying Areas"; Coliseum Boulevard Plume; Montgomery, Alabama.

2743-B Gunter Park Drive W. ■ Montgomery, Alabama 36109
334.244.0766 ■ Fax 334.244.6668

TTL PROJECT NUMBER:0700-024

Drawing No. 060620.1

SCALE: 1" = 300'

Figure 6

Russell Corp.
Distribution Facility

W.S. Newell
OPEN EARTH DITCH

Three Mile Branch

Folmer Boulevard

Corona Drive

Blind Place

DIRT ROAD

SS MANHOLE

SS MANHOLE

EXISTING BRIDGE

DIRT ROW

LVD

OLD ROAD BED

WASTE
MANAGEMENT

