August 2006 through October 2006 Status Report

Coliseum Boulevard Plume Site
Montgomery, Alabama

Submitted By:

Alabama Department of Transportation
1409 Coliseum Boulevard
Montgomery, Alabama

November 2006

August 2006 through October 2006 Status Report

Coliseum Boulevard Plume Investigation

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Plate

Attachments

August 2006 through October 2006
Status Report

Summary

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

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

I. Routine Monitoring

Water Level Measurements

October 3 through October 5, 2006: Depths to ground water were measured in piezometers, monitoring wells, CMT wells, and pump test wells associated with the Coliseum Boulevard Plume Investigation. Groundwater elevations are provided in Tables 1a through 1f. Groundwater elevations for 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 October 3, 2006. The groundwater level for CMT 3-5 was remeasured on October 19, 2006 and this value used in the report. CMT 3-1 and 4-1 were dry for this event.

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 October 2006. Groundwater samples were collected from 67 monitoring wells at the Coliseum Boulevard Plume site for analyses of VOCs.

October 4 through October 20, 2006: During the quarterly event of the approved modified groundwater monitoring program, samples were collected from the following 67 wells located at the Coliseum Boulevard Plume (CBP) site.

MW-101	MW-109	MW-130	MW-237C	MW-246B	MW-252B
MW-201	MW-209	MW-230	MW-138A	MW-147A	MW-153
MW-102	MW-116	MW-131	MW-238B	MW-247B	MW-154
MW-202	MW-216	MW-231	MW-238C	MW-149A	MW-155
MW-103	MW-117	MW-132	MW-341	MW-249B	MW-156
MW-203	MW-217	MW-232	MW-143A	MW-249C	MW-357
MW-106	MW-123	MW-133	MW-243B	MW-150A	MW-457
MW-206	MW-223	MW-233	MW-144A	MW-250B	
MW-107	MW-124	MW-134	MW-244B	MW-250C	
MW-207	MW-224	MW-234	MW-244C	MW-151A	
MW-108	MW-129	MW-137A	MW-145A	MW-251B	
MW-208	MW-229	MW-237B	MW-146A	MW-152A	

These 67 monitoring wells were sampled and analyzed for VOCs by EPA Method 8260. The concentrations of detected VOCs in groundwater samples collected from the monitoring wells are shown on Plate 1 and Table 3.

Samples were collected from monitoring wells MW-153, MW-154, MW-155, MW-156, and MW-457 and analyzed for inorganics (total alkalinity, chloride, nitrate, nitrite, and sulfate). The results are provided in Table 4. Laboratory reports are attached.

Prior to sample collection, the monitoring wells were purged using a bladder or peristaltic pump until field parameters (pH, conductivity, and turbidity) stabilized. Temperature and redox (ORP) were also measured in the field. The field data sheets are attached.

October 2006: Twenty-two (22) groundwater samples were collected from monitoring wells and analyzed for total organic carbon (TOC). The results of these analyses are provided in Table 5. Laboratory reports for TOC in the monitoring wells are attached.

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

October 4 through October 19, 2006: Groundwater samples were collected from CMT wells 1, 2, 3 and 4. Groundwater samples were not collected from CMT 3-1 (on 10/19/06) and CMT 4-1 (on 10/16/06) 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 or three (3) well volumes were measured. Temperature and oxidation-reduction potential [redox (ORP)] were also measured in the field.

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 groundwater samples were analyzed for VOCs. Results of analyses of detected VOCs in the groundwater samples collected from the CMT wells are provided in Table 6. Laboratory reports of these analyses and copies of Monitoring Well Sampling Forms are attached.

Surface Water Sampling

October 4, 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). 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 the laboratory for analyses of VOCs. Results of detected VOCs are provided in Table 8. The laboratory reports for the VOC analyses of the surface water samples are attached. During sample collection, the water samples were measured for temperature, pH, dissolved oxygen, and turbidity (see Table 9).

Compliance point water sample CP-3 contained 4 ug/l of TCE. TCE concentrations detected in sample CP-3 are below the action level concentration of 175 µg/L for TCE in surface water.

The surface water samples collected from location MP-1 and MP-2 contained TCE at 4 ug/l. There also was detection of toluene at 62 ug/l in the surface water sample collected from MP-1.

The surface water sample collected from the Zoo Ditch sampling location ZD-1 contained 5 ug/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.

The surface water sample collected from the Zoo Pond sampling location ZP-1 did not contain detectable VOCs.

Low – Lying Areas (Addendum 04 Work Plan)

October 4, 2006: Soil/sediment and surface water samples were collected from locations N, O, and P in the "Low-Lying Areas". Results of the analyses for VOCs are provided in Tables 10 and 11, respectively. Laboratory reports of these analyses are attached.

II. Investigation Derived Waste

Water Treatment

October 2006: Water accumulated during cleaning of sampling equipment, and purging and sampling of monitoring wells, has not been treated because the carbon filters need to be replaced. Replacement filters are ordered and the treatment will occur after the new filters are operational.

III. Quality Assurance/Quality Control

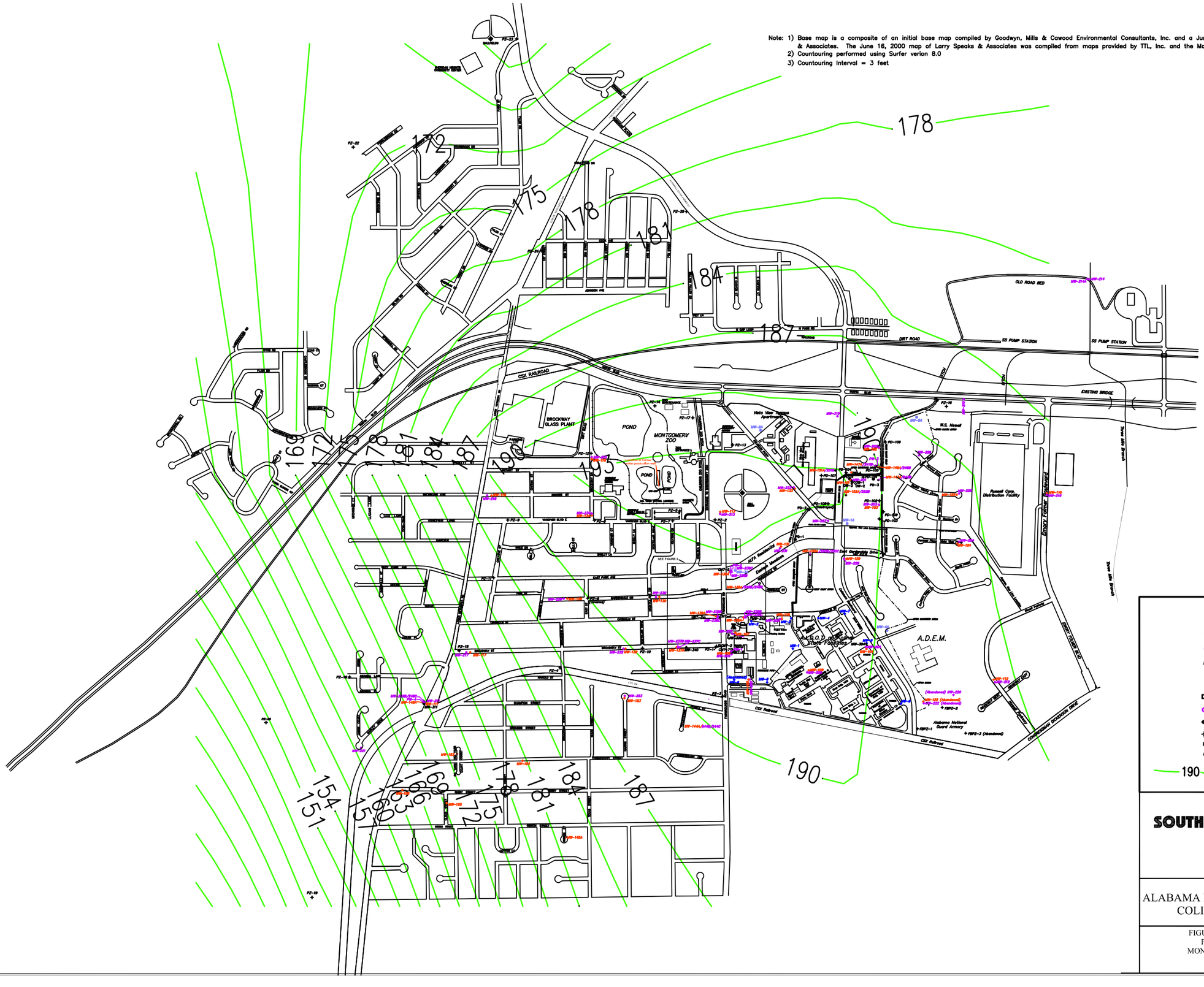
During the October 2006 quarterly groundwater sampling event, duplicate groundwater samples were collected from monitoring wells MW-202, MW-106, MW-217, MW-341, MW-147A, MW-250B, MW-252B, MW-154 and CMT wells 2-5 and 4-3 and analyzed for VOCs.

The duplicate sample results are shown with the parent sample results (see Tables 3 and 6). A sample collected from monitoring well MW-154 was analyzed for inorganics (alkalinity, chloride, nitrate, nitrite, and sulfate).

Equipment rinse samples were collected and trip blank samples accompanied water samples that were submitted for analyses for VOCs in October 2006. There were no detected VOCs for the rinse and trip blank samples. Laboratory reports of the analyses are attached.

Note: 1) 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.
2) Countouring performed using Surfer verion 8.0
3) Countouring Interval = 3 feet

N
W E
S



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)
- CMT-2 — CMT WELL AND IDENTIFIER
- PW-1 — PUMP TEST WELL AND IDENTIFIER
- PD-1 — PIEZOMETER AND IDENTIFIER
- PD-101 — PIEZOMETER AND IDENTIFIER
- PD-4 — PIEZOMETER AND IDENTIFIER
- PZ-2 — PIEZOMETER AND IDENTIFIER
- 190 — GROUNDWATER ELEVATION CONTOUR

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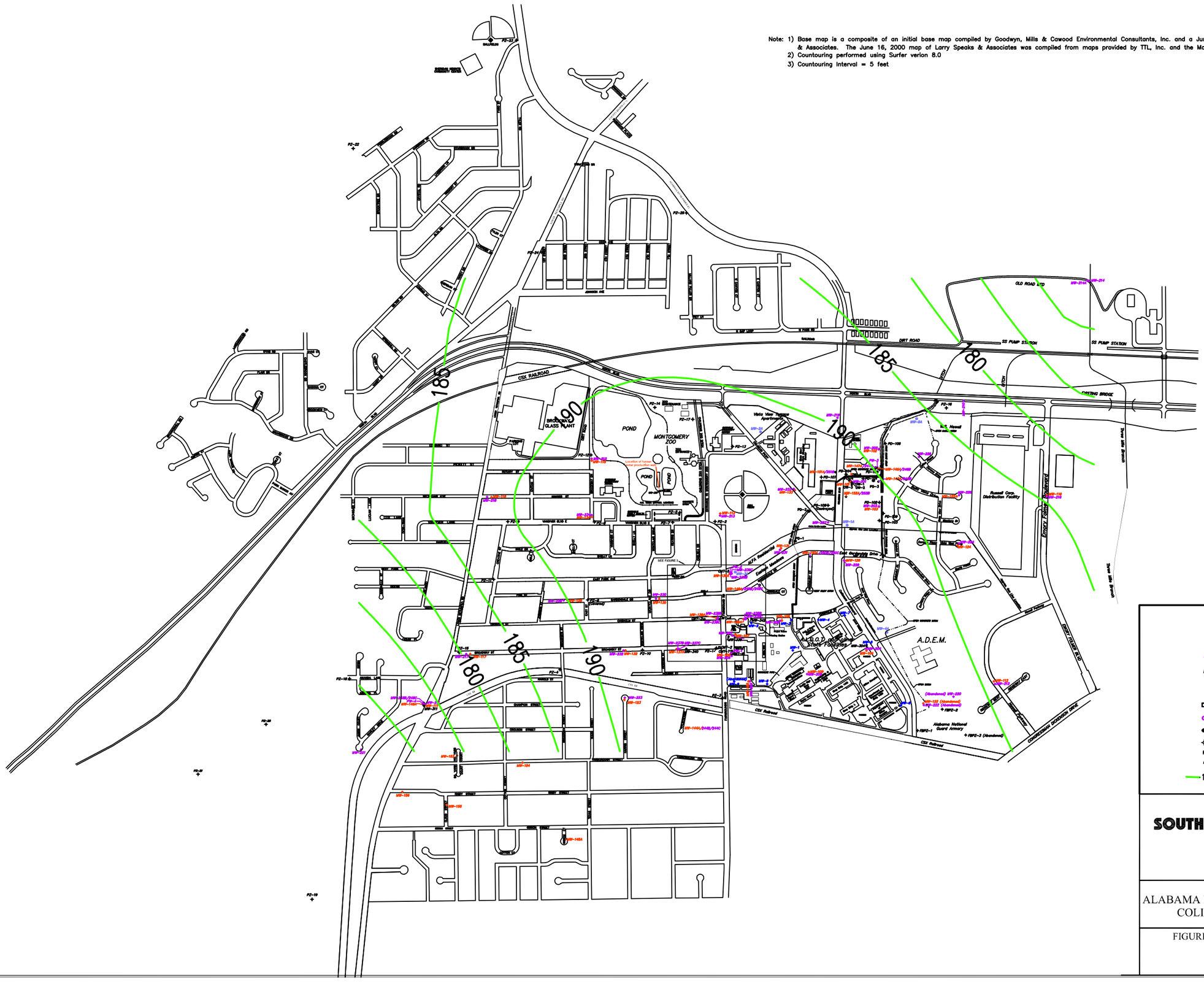
COLISEUM PLUME INVESTIGATION

FIGURE 1 GROUNDWATER ELEVATION
PLAN - 100 SERIES, ALDOT, ALFA
MONITORING WELLS AND PIEZOMETER
OCTOBER 2-6, 2006
SESI JOB #: M06-401

Note: 1) 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.
2) Countouring performed using Surfer verion 8.0
3) Countouring Interval = 5 feet



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, 1990)
- CMT-2 CMT WELL AND IDENTIFIER
- PW-1 PUMP TEST WELL AND IDENTIFIER
- PD-1 PIEZOMETER AND IDENTIFIER
- PD-101 PIEZOMETER AND IDENTIFIER
- PD-4 PIEZOMETER AND IDENTIFIER
- PZ-2 PIEZOMETER AND IDENTIFIER
- 180 GROUNDWATER ELEVATION CONTOUR

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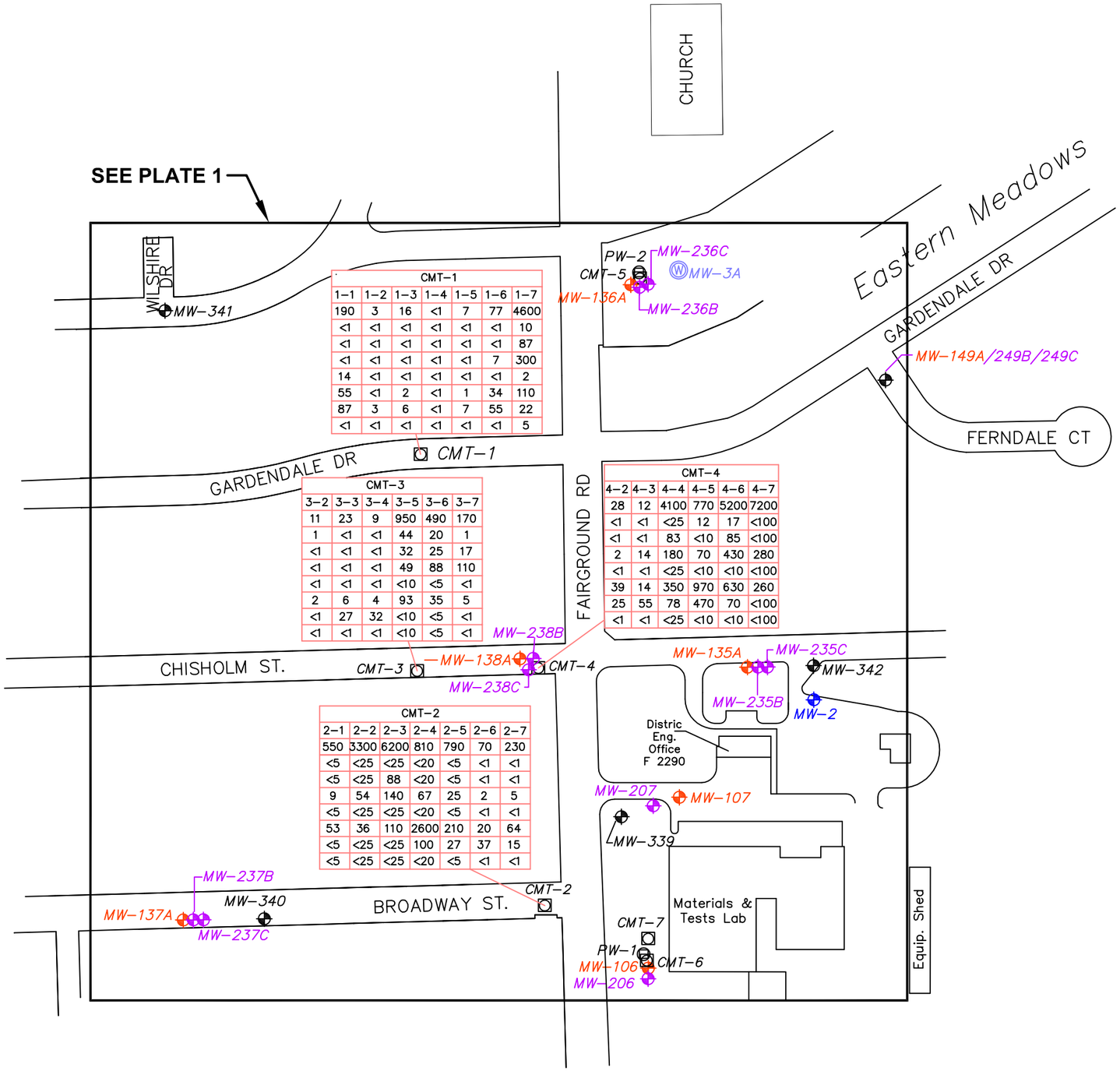
COLISEUM PLUME INVESTIGATION

FIGURE 2 GROUNDWATER ELEVATION
PLAN - 200 SERIES WELLS
OCTOBER 2-6, 2006
SESI JOB #: M06-401



CMT-1						
1-1	1-2	1-3	1-4	1-5	1-6	1-7
190	3	16	<1	7	77	4600
<1	<1	<1	<1	<1	<1	10
<1	<1	<1	<1	<1	<1	87
<1	<1	<1	<1	<1	7	300
14	<1	<1	<1	<1	<1	2
55	<1	2	<1	1	34	110
87	3	6	<1	7	55	22
<1	<1	<1	<1	<1	<1	5

CMT-3					
3-2	3-3	3-4	3-5	3-6	3-7
11	23	9	950	490	170
1	<1	<1	44	20	1
<1	<1	<1	32	25	17
<1	<1	<1	49	88	110
<1	<1	<1	<10	<5	<1
2	6	4	93	35	5
<1	27	32	<10	<5	<1
<1	<1	<1	<10	<5	<1

CMT-4					
4-2	4-3	4-4	4-5	4-6	4-7
28	12	4100	770	5200	7200
<1	<1	<25	12	17	<100
<1	<1	83	<10	85	<100
2	14	180	70	430	280
<1	<1	<25	<10	<10	<100
39	14	350	970	630	260
25	55	78	470	70	<100
<1	<1	<25	<10	<10	<100

CMT-2						
2-1	2-2	2-3	2-4	2-5	2-6	2-7
550	3300	6200	810	790	70	230
<5	<25	<25	<20	<5	<1	<1
<5	<25	88	<20	<5	<1	<1
9	54	140	67	25	2	5
<5	<25	<25	<20	<5	<1	<1
53	36	110	2600	210	20	64
<5	<25	<25	100	27	37	15
<5	<25	<25	<20	<5	<1	<1

0 300

APPROXIMATE SCALE IN FEET

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)
- PW-1 — PUMP TEST WELL AND IDENTIFIER
- CMT-2 — CMT WELL AND IDENTIFIER

CMT-1	WELL IDENTIFICATION
1-1	1-2 PORT
850	1000 TRICHLOROETHENE in ug/L
<1	<1 CHLOROFORM in ug/L
45	63 CARBON TETRACHLORIDE in ug/L
<1	<1 1,1-DICHLOROETHENE in ug/L
11	22 1,1-DICHLOROETHANE in ug/L
<1	<1 CIS-1,2-DICHLOROETHENE in ug/L
11	22 VINYL CHLORIDE in ug/L
11	22 1,1,2-TRICHLOROETHANE in ug/L

NOTE: 1) ALL UNITS LISTED ARE IN MICROGRAMS PER LITER (UG/L) OR PARTS PER BILLION EQUIVALENT.

2) ONLY DETECTED CONSTITUENT ARE ILLUSTRATED.

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FIGURE 3 CMT WELL VOLATILE ORGANICS CONCENTRATION PLAN-OCTOBER 2006 SAMPLING EVENT
SESI JOB #: M06-401

NOTE: 1) ALL UNITS LISTED ARE IN MICROGRAMS PER LITER (UG/L) OR PARTS PER BILLION EQUIVALENT.
2) ONLY DETECTED CONSTITUENT ARE ILLUSTRATED.

-400 -200 0 -400

SCALE, IN FEET

RAILROAD

DIRT ROAD

SS PUMP STATION

DITCH

DITCH

NORTH BLVD

NORTH BLVD

ZOO MAINTENANCE

CP-1
<1
<1
<1

ZD-1
<1
<1
5

POND

MONTGOMERY ZOO

ZOO ENTRANCE

CHILDRENS ZOO DITCH

CHISHOLM COMMUNITY CENTER

Vista View Terrace Apartments

COLISEUM PKWY

Vista View Winn-Dixie Shopping Center

AMOCO STATION

W.S. Newell

OPEN EARTH DITCH

CP-3
4
<1
<1

CP-2
<1
<1
<1

OPEN EARTH DITCH

CP-1
<1
<1
<1

OPEN CONCRETE DITCH

MP-1
4
62
<1

MP-2
4
<1
<1

PIZZA HUT

COLISEUM BLVD

Bella Celine Place

Corona Drive

Bella Vista Drive

Vista View Drive

Montero Dr

Vista View Place

Carmen Place

POND

POND

CHISHOLM ELEMENTARY SCHOOL

BROCKWAY DR

R.R. TRACK (APPROX. LOCATION)

CONCRETE DITCH

CHISHOLM FAMILY HEALTH CENTER

ENTRANCE TO MONTGOMERY ZOO

CHILDRENS ZOO DITCH

BALL FIELDS

VANDIVER BLVD E

VANDIVER CT

SHELLY LN

SHELLY LN

MONTCLAIR DRIVE

KEATING DR

CHELSEA DR

WILSHIRE DR

EAST PARK AVE

MONTCLAIR DR

CHURCH

OPEN EARTH DITCH

Approx. Gas Line Location

Approx. Gas Line Location

Approx. Gas Line Location

ALFA Residential

Eastern Meadows

GARDENDALE DR

FERNDALE CT

OPEN CONCRETE DITCH

WOODBURY CT

WEST KILBY DITCH

East Gardendale Drive
100' R.O.W.

OPEN CONCRETE DITCH

OPEN CONCRETE DITCH

Coliseum Boulevard

Vista Park Place

N.Oakview Ct.

S.Oakview Ct.

East Gardendale Drive

LEGEND

⊗ SURFACE WATER SAMPLE AND IDENTIFIER

CP-1 KILBY DITCH COMPLIANCE POINTS

MP-1 KILBY DITCH MONITORING POINTS

ZD-1 ZOO DITCH MONITORING POINT

ZP-1 ZOO POND MONITORING POINT

CP-1	WELL
<1	TRICHLOROETHENE in ug/L
4	TOLUENE in ug/l
<1	CHLOROFORM in ug/L

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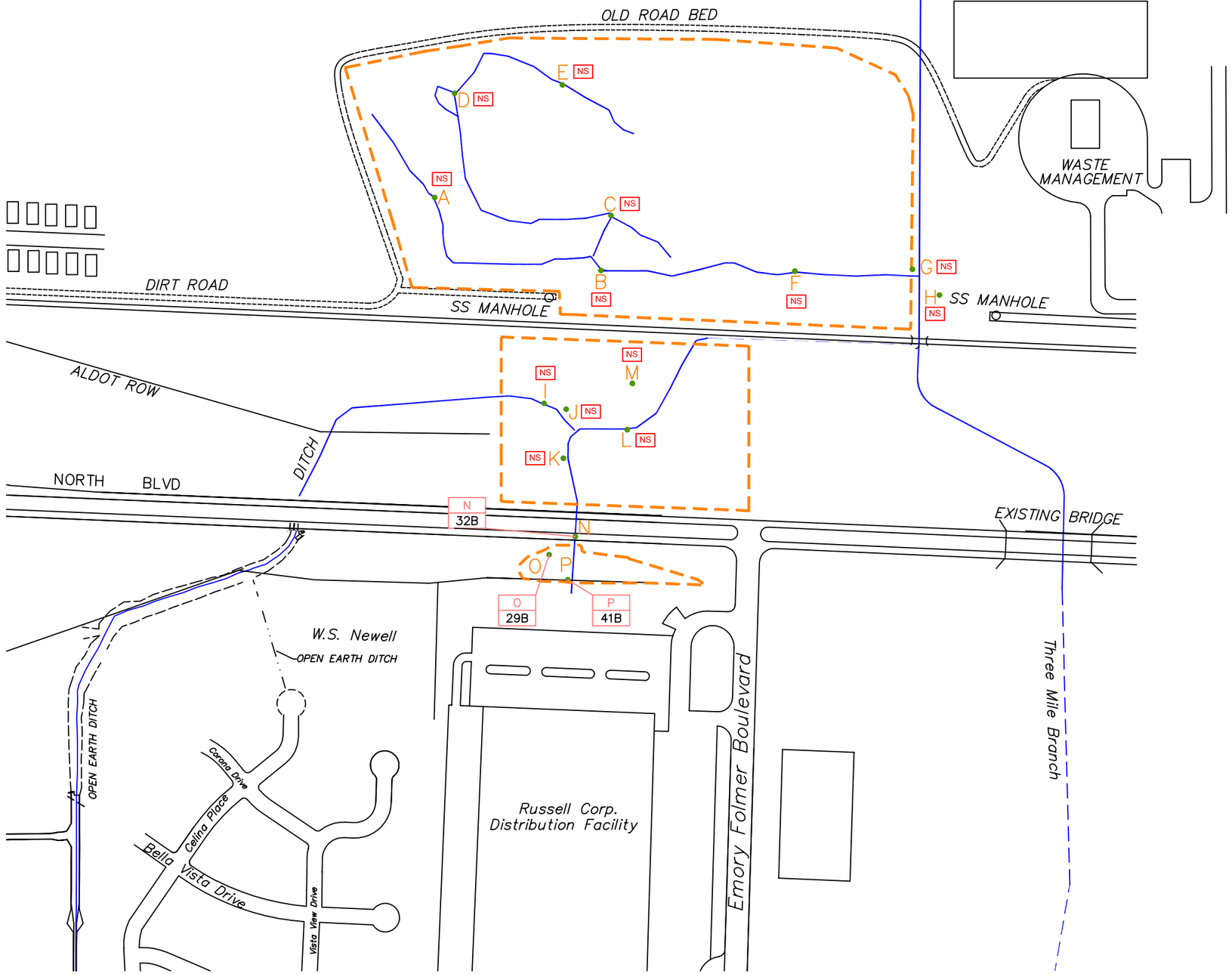
FIGURE 4 - SURFACE WATER
VOLATILE ORGANICS CONCENTRATION PLAN
OCTOBER 2006 SAMPLING EVENT
SESI JOB # M06-401

NOTE: 1) ALL UNITS LISTED ARE IN MICROGRAMS PER KILOGRAM (UG/KG) OR PARTS PER BILLION EQUIVALENT.

2) ONLY DETECTED CONSTITUENT ARE ILLUSTRATED.



-400 -200 0 -400

SCALE, IN FEET

LEGEND

NS — Not Sampled

Boundary of Low Lying Area

M • — Sample location and Identifier

Approximate locations of intermittent streams

N / <5 — SAMPLE LOCATION METHYLENE CHLORIDE in ug/kg

B – CONSTITUENT DETECTED IN LABORATORY BLANK

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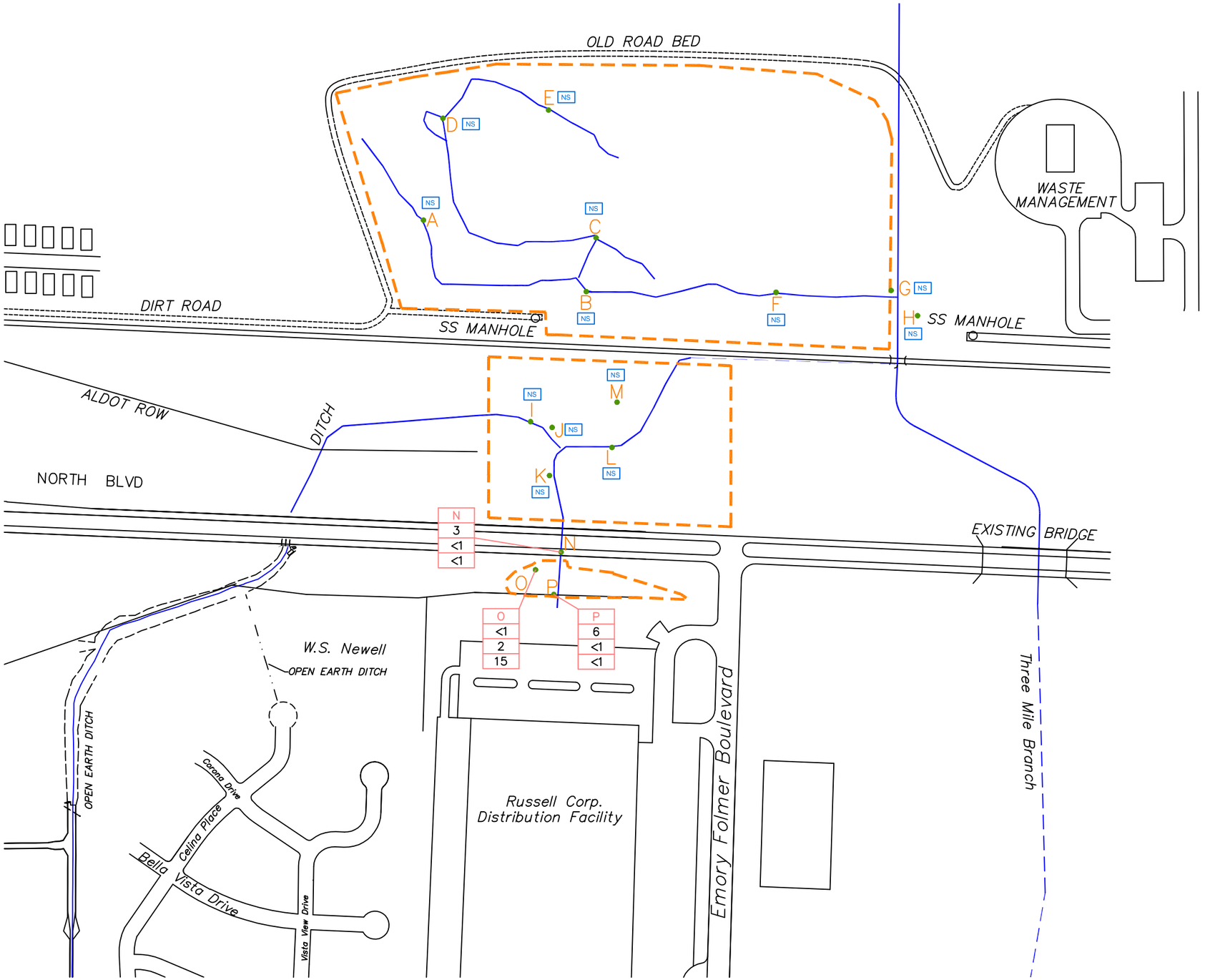
FIGURE 5 - SEDIMENT SAMPLES
COLLECTED FROM LOW LYING AREAS
OCTOBER 2006 SAMPLING EVENT
SESI JOB # M06-401

NOTE: 1) ALL UNITS LISTED ARE IN MICROGRAMS PER LITER (UG/L) OR PARTS PER BILLION EQUIVALENT.
2) ONLY DETECTED CONSTITUENT ARE ILLUSTRATED.



-400 -200 0 -400

SCALE, IN FEET

LEGEND

NS	Not Sampled
	Boundary of Low Lying Area
M •	Sample location and Identifier
	Approximate locations of intermittent streams

N	SAMPLE LOCATION
3	TRICHLOROETHENE in ug/L
<1	VINYL CHLORIDE in ug/L
<1	cis–1,3–DICHLOROETHENE in ug/L

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FIGURE 6 - SURFICIAL WATER SAMPLES
COLLECTED FROM LOW LYING AREAS
OCTOBER 2006 SAMPLING EVENT
SESI JOB # M06-401