D H E C

PROMOTE PROTECT PROSPER

September 24, 2010

Mr. Robert Apple
Environmental Division
South Carolina Electric and Gas Company
Mail Code 049
Columbia SC 29218

RE: Delineation Work Plan
Congaree River

Dear Mr. Apple,

The Department has reviewed the Delineation Work Plan, for the Congaree River. The Department approves the work plan but reserves the right to request additional samples be collected during the investigation, in addition to the samples proposed in the work plan. If you have any questions or comments please contact Lucas Berresford at (803)896-4071.

Sincerely

Lucas Berresford, Project Manager
State Remediation Section
Bureau of Land and Waste Management

CC: Gary Stewart
File 52561
John Ansell, Region 3

MTR
MANAGEMENT AND TECHNICAL RESOURCES, INC.

DELINEATION WORK PLAN

CONGAREE RIVER SEDIMENTS INVESTIGATION
COLUMBIA, SOUTH CAROLINA

September 2010

Prepared for:

SCANA Services, Inc.
Palmetto Center
1426 Main Street
Columbia, South Carolina 29201

Prepared by:

Management and Technical Resources, Inc.

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1.0 INTRODUCTION

1.1 Introduction

This Delineation Work Plan (DWP) was developed by South Carolina Electric & Gas Company (SCE&G) to determine the extent of tar-like material (TLM) in the Congaree River sediments adjacent to the Gervais Street Bridge. As anticipated, the delineation will define the horizontal and vertical extent of TLM that was noted in river sediments in June 2010 and during a July 20, 2010 reconnaissance of the area.

1.2 Sediments Investigation Target Areas

For evaluation purposes, the project area is limited to the stretch of the Congaree River from the Gervais Street Bridge to approximately 1,500 feet downstream towards the Blossom Street Bridge and extending from the eastern shore to approximately 200 feet to the west into the Congaree River. The actual project area may vary based on the findings of this scope of work. Figure 1-1 shows the targeted investigation areas and some of the physical features of the river and surrounding area.

1.3 Field Reconnaissance Activities and Recent Observations

The intent of this section is to provide a summary of the June 28, 2010 sediment analytical results and an overview of the July 20, 2010 field reconnaissance so that a basis may be established in developing the technical elements of this DWP.

1.3.1 Sediment and Analytical Results and Visual Observations

The following items briefly summarize the sediment analytical results and visual observations noted during the field reconnaissance:

- Three (3) sediment samples were collected by SCDHEC and split with SCE&G on June 28, 2010. The approximate locations of the sediment samples are noted on Figure 1-2. The sediment samples were analyzed by two separate laboratories and the analytical results were interpreted to be similar (Table 1-1).
- The analytical results indicated the presence of some volatile organic compounds (VOCs). The dominant group of semi-volatile organic compounds (SVOCs) detected is characterized as polynuclear aromatic hydrocarbons (PAHs). Table 1-1 summarizes the detected constituents and Appendix A provides a more comprehensive list of the constituents analyzed and results (both detected and not-detected). The analytical results suggested that the sediment samples contained TLM.
- Using rudimentary investigative techniques on July 20, 2010, SCDHEC and SCE&G representatives noted the occurrence of TLM over an approximate area as shown on Figure 1-2. Based on the field reconnaissance, it was inferred that a northern boundary of the TLM area exists (just south of the boulder field) and the western, eastern, and southern boundaries are not yet fully defined.
- The TLM appeared to reside under a layer of un-impacted sediment ranging from approximately ½ inch in thickness to approximately 1 foot thick.
- The TLM-containing layer varies from approximately less than 1 inch in thickness to at least 1 foot.
- As shown on Figure 1-2, two points located on the eastern shoreline of the Congaree River near the Gervais Street Bridge, were observed to contain visual brown blebs of TLM and exhibited a tar-like odor. The observations were encountered at sample intervals approximately 3 to 6 inches below ground surface (bgs).

- There was no TLM observed in the boulder field (Figure 1-2).

1.3.2 Physical Attributes of the Congaree River in the Target Area

The following provides a summary of the physical attributes of the Congaree River in the Target Area:

- Water velocity may be characterized as quiescent to low around the sand bar, boat launch apron, and south of the boat apron area along the shoreline. Water velocity may be characterized as low to moderate within and north of the boulder field. The highest water velocity occurs west of the boat launch apron and sand bar and approximately 150 feet west of the shoreline.
- The river sediments range from fine sand to cobble sized material. Boulders exist and tend to be more common in the northern, southern, and western stretches of the River. Generally, finer grained sediments (silts, clay) occur along the shoreline.

1.3.3 Other Issues

It has been confirmed that in 1865, live munitions were dumped into the Congaree River near the Gervais Street Bridge by Union forces under the direction of General Sherman during the destruction of Columbia. Subsequent archeological investigations (as late as 1980) recovered some live and unstable munitions from the area. Due to the potential presence of live munitions within the project area, an additional reconnaissance and screening must be conducted to address health and safety concerns associated with completing the intrusive fieldwork. Therefore, SCE&G will initiate additional screening activities within the study area to determine if munitions are present prior to conducting sampling activities as described herein.

1.4 Objectives

The objectives of the DWP are:

- Delineate the vertical and lateral extent of TLM in the target area by visual observations of sediments obtained by coring;
- Collect a sufficient number of sediment samples, which are not visually impacted by TLM, for laboratory analysis to define the limit of impacts; and
- Complete the work in a safe and efficient manner.

2.0 INVESTIGATIVE APPROACH

The TLM delineation project is structured to be implemented in a phased manner with SCDHEC involvement and concurrence. The methods and techniques to be used in completing the work are intended to incorporate flexibility to:

- Adjust sampling methodologies based on conditions encountered during the sampling event (i.e., sediment thickness, physical characteristics, precipitation events, fluctuating river elevations, etc.); and
- Refine spatial sampling locations based on observations during field implementation.

2.1 Investigative Extent

For investigative purposes, the Congaree River has been separated into three separate areas (A, B, and C) as shown on Figure 1-1. The separate area designations are based on river features (i.e., boulders, potential bedrock outcroppings, etc.) and subsequent sediment depositions, and the approximate boundary of TLM based on the field reconnaissance. The river features will also dictate to a large extent the sampling methodology that may be employed and the actual locations for sampling.

A grid system will be established within the three areas to define the location and extent of TLM by visual and olfactory methods. The grid will be established using a common coordinate system (e.g., state plane) and at each grid node the coordinate will be identified. The grid nodes may be established using a navigational guide such as global positioning system (GPS) and/or defined by physical markers established via surveying. Figure 2-1 shows the proposed sampling grids for Areas A, B, and C.

2.1.1 Area A

Area A is comprised of the Congaree River stretch starting at the Gervais Street Bridge and extending to the southern most limits of the boulder field. West to east, it is comprised of the area from the high velocity current line (relatively arbitrary) to the eastern shore (Figure 1-2).

A grid system will be established in Area A to provide a basis for locating corings in the Congaree River (Figure 2-1). As currently planned, the grid system will be aligned with the Gervais Street Bridge, on a 50-foot east-west spacing. Moving southward, the grid will be established on a 100-foot spacing. The presence of boulders and potential bedrock outcrops and minimal sediment deposition in Area A will likely necessitate changes in boring locations. In addition to the grid sampling points, borings will also be completed (as shown in the inset of Figure 2-1) north of the mouth of unnamed tributary #1 to visually inspect for the presence of TLM that was observed during the reconnaissance.

2.1.2 Area B

Area B starts at the southern boulder field and extends south approximately 1,000 feet. East to west, Area B extends from the shoreline to approximately 200 feet to the west in the river. Figure 2-1 shows the approximate extent of Area B, which includes the known impacted sediment locations. The southern extent of Area B is shown for illustration purposes only and will be determined by the actual findings.

2.1.3 Area C

Area C is located to the south of Area B as shown in Figure 2-1. It is hypothesized that Area C may not contain TLM and therefore, proposed sampling locations within Area C will be located at the first down gradient node in which no TLM is observed. Area C will be investigated only if visual evidence of TLM from Area B warrants progression of investigative activities into Area C.

2.2 Coring Location Nomenclature

For this and subsequent discussions, the investigation points will be referred to as sediment cores or corings (unless otherwise noted) since the primary means to investigate the sediments will be via manual or mechanical coring methods.

The grid nodes will define the coring locations in Areas A and B as shown on Figure 2-1. The corings will be identified with a unique alphanumeric designation such as “A-3” or “Q-7” based on the location. Ultimately, the actual location of each coring will be referenced to a coordinate system (e.g., state plane) with established vertical and horizontal control. As appropriate, off-sets to proposed locations will be measured and documented. Table 2-1 provides examples of the coring locations with state plane coordinates.

2.3 Investigative Techniques

The intent of this section is to discuss various potential investigative techniques that may be employed by field personnel to complete the delineation work. The actual sampling devices and methods employed (or combination thereof) will be dictated by field conditions and will be left to the discretion of field personnel. Generally, the investigation will be performed by utilizing manual and/or mechanical equipment to advance the corings. Implementation of either or both is a function of the potential for subsurface impediments (e.g., cobbles, boulders, etc) and access to coring locations. The characteristics for each investigation area and the planned sampling approach are summarized on Table 2-3. Each specific technique is discussed below.

2.3.1 Manual Techniques

Manual techniques will entail the use of a continuous core driven via a slide hammer or other device (e.g., battery operated rotary hammer or gas powered percussion hammer) to the desired depth interval. The core barrel can be up to 4 feet in length, 2-inches in diameter, contain an acetate liner (dedicated to the sampling interval), and may be equipped with a basket catch to prevent sample drop during core barrel retrieval. The use of manual techniques will be most applicable in shallow water.

A sediment-sampling device such as a Ponar grab sampler may also be used as appropriate.

2.3.2 Mechanical Techniques

Mechanical techniques will involve the use of equipment such as direct push technology (DPT) [e.g., Geoprobe] and/or a Vibracore that rely on pushing/driving a core barrel to the desired depth interval. The DPT core barrels are either 4 or 5 feet in length, 2-inches in diameter, and will contain dedicated acetate liners. Both macro-core and piston core samplers can be utilized with DPT, with macro-core samplers more applicable for the first sample run and piston core samplers more applicable for deeper sample collection. Mechanical techniques can be utilized on a floating platform and on land.

2.3.3 Floating Platform

As presently envisioned, the majority of the corings will be completed from a floating platform capable of drilling in both shallow quiescent to deeper, higher energy (i.e., current) velocity water. The floating platform will be able to support the use of mechanical equipment, have the ability to provide a stable work area, be secured via anchors, ropes or piles, and have adequate space to support necessary personnel.

2.4 Sediment Coring Approach

2.4.1 Vertical

The general investigative approach will involve advancing cores to a depth where refusal is encountered.

2.4.2 Horizontal

The Area A corings in the Congaree River will be located on a 50-foot by 100-foot grid pattern since the July 21, 2010 field reconnaissance did not indicate the presence of TLM (Figure 2-1). As discussed previously, coring locations may be moved in the event a grid node occurs over a boulder, bedrock outcrop or in an area of limited sediment deposition. Figure 2-1 (inset) shows the conceptual spatial arrangement of the corings in the alluvial fan at the mouth of unnamed tributary #1.

Sediment core spacing in Area B is intended to define the horizontal and vertical extent of TLM. The coring locations are presently established on a 50-foot by 100-foot grid spacing. However, based on the reconnaissance, it appears that in some locations, the TLM may be laterally continuous. Therefore and initially, Area B corings will be drilled on 50-foot by 100-foot centers and based on the data from these initial corings, further delineation on a minimum grid pattern (50-foot by 50-foot) may be implemented if necessary.

2.4.3 Screening for Potential Obstructions

As discussed in Section 1.3.3, live munitions from the Civil War were dumped into the Congaree River within the project area. Therefore, SCE&G has completed a preliminary screening of the area to be investigated for the presence of subsurface metallic objects. Based on this preliminary information, Figure 2-2 was developed and provides the proposed sampling grid with locations of suspected subsurface obstructions and/or potential interferences. Grid locations where obstructions are known or suspected to exist will not be sampled.

2.5 Sediment Core Logging and Screening

Each sediment core retrieved will be logged to describe sediment color, grain size, and water content. Any pertinent observations noted during drilling, such as zones of decreased penetration, will also be noted.

Since the objective of the investigation is to define the extent of the TLM, the two primary methods that will be utilized to evaluate the sediment samples include visual and olfactory. Visual descriptions can vary and may include color, texture, consistency and similarity to other materials (i.e., black asphaltic-like material) to those more commonly used to describe dense non-aqueous phase liquids (DNAPL) in porous media (i.e., blebs, ganglia, stringers, etc.). A variety of odors may be encountered in the river sediment. If possible, the type of odor will be noted and qualified using descriptors such as slight, moderate, strong, or variations thereof.

Sediment samples yielding visual observations of TLM will be photographed. The photographs will include the sample interval where TLM was located and a placard will be completed that provides boring identification, depth interval, and date.

The water column thickness will also be recorded during the investigation.

2.6 Samples for Laboratory Analyses

During the July 20, 2010 reconnaissance, the SCDHEC requested the collection of additional sediment samples for laboratory analyses. The following presents the proposed sampling locations and proposed analytical parameters.

The proposed sediment sampling locations for laboratory analysis are shown on Figure 2-1. The objective of the sediment sampling and analysis is to provide laboratory data to augment the visual observation data. Generally, the sediment sampling locations are targeted outside the visually impacted TLM area.

A photoionization detector (PID) will be utilized to screen the sediment samples retrieved for laboratory analyses. PID measurements will be made on 1 to 2 foot intervals and will be obtained by placing the probe tip in an opening made in the retrieved sediment core. The following hierarchy will be used to select sediment samples for laboratory analyses:

- At perimeter locations where no TLM is visually observed, and there are no PID responses, a sediment sample will be composited over the entire vertical interval of the retrieved sediment sample (from surface to refusal depth); or
- At perimeter locations where no TLM is visually observed, but there are notable PID responses, a sediment sample will be collected from the interval of the highest PID response (with a minimum sample interval of 2 feet in length).

Approximately 15 to 20 samples will be collected and analyzed for benzene, toluene, ethylbenzene and total xylenes (BTEX) via Method 8260B, and for 16 PAHs via Method 8270D as listed in Table 2-2. At this time, it is expected that Shealy Environmental Services, Inc. of Cayce, South Carolina will perform the laboratory analyses. In consultation with SCDHEC, other sediment samples may also be collected for laboratory analysis during the delineation.

2.7 Decontamination, IDW Management, and Abandonment

Downhole drilling equipment, sampling implements, etc., will be decontaminated between each coring with a non-phosphate detergent wash and tap water rinse. An acetone rinse will be used to remove TLM in the event it is noted to adhere to downhole drilling equipment, sampling implements, etc. Dedicated sampling implements (e.g., disposable scoops) will be used to collect sediment samples for laboratory analyses. In the event non-dedicated sampling implements are used for sample collection, the implements will be decontaminated with a non-phosphate detergent wash, tap water rinse, acetone rinse, and followed by a distilled water rinse. Dedicated acetone liners will be used for each sample run.

Investigative derived waste (IDW) such as sediment, decontamination water, core liners, etc., generated from the delineation work will be containerized in 55-gallon drums for future proper disposal. Each drum will be labeled as to contents and the date collected. The drums will be temporarily staged at SCE&G's 1409 Huger Street site location and properly disposed of in accordance with applicable regulations.

Corings drilled on land will be abandoned in accordance with SCDHEC requirements.

2.8 Surveying

As currently planned, the coring locations may be surveyed prior to the start of field activities and will involve establishing the sampling grid and locating (to the extent practicable) each node with a wooden stake, metal rod, floating buoy, or PVC pipe (i.e., physical marker). The physical marker will be labeled with an alpha-numeric grid node point to aid in locating the coring.

A GPS may be used to determine coring locations in the event a surveyed grid node is not available. For those locations established with a GPS, a physical marker will be placed at the sampling location for subsequent surveying. Upon completion of surveying activities, all coring location markers will be removed from the study area.

2.9 Health and Safety Plan

A site-specific Health and Safety Plan (HASP) has been developed for the Congaree River Sediment Investigation project and is provided as Appendix B. The HASP addresses potential hazards associated with implementing the planned investigation activities, including work on both land and water. The HASP details personnel responsibilities, protective equipment, monitoring procedures, additional screening for unexploded ordinances (UXOs), lines of communication, and decontamination protocols. The HASP contains detailed information regarding the constituents of concern in addition to Material Safety Data Sheets (MSDSs) for constituents that site workers may potentially be exposed to during intrusive activities at the site. Investigation activities are intended to minimize the potential for direct contact with impacted material and will be monitored utilizing the procedures provided in the HASP. The HASP also includes emergency response procedures to be implemented by field personnel in the event of an emergency situation at the site.

3.0 DELINEATION REPORT

Visual observations and analytical data will be provided to SCDHEC in a project delineation report. This report will also include recommendations for the next phase of the project.

4.0 PROPOSED TARGET SCHEDULE

The proposed target schedule is shown on Table 4-1. As currently envisioned, field work is anticipated to commence in late September and be completed by mid October. Analytical data will be available by late October and the delineation report should be provided by late November.

TABLES

TABLE 1-1

SUMMARY OF DETECTED CONSTITUENTS IN THREE SEDIMENT SAMPLES

Congaree River Sediments Investigation
Columbia, South Carolina

	Sediment 1 Location			Sediment 2 Location		Sediment 3 Location	
Source:	**SCE&G**	**SCE&G**	**SCDHEC**	**SCE&G**	**SCDHEC**	**SCE&G**	**SCDHEC**
Field ID:	**Sed-1**	**Sed-1 Dup**	**Sed-1**	**Sed-2**	**Sed-2**	**Sed-3**	**Sed-3**
Date Sampled:	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**
Units:	**mg/kg[(1)]**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
Volatile Organic Compounds							
1,2,4-Trimethylbenzene	90.2 B	52 B	NA	4.31 B	NA	49.9 B	NA
1,3,5-Trimethylbenzene	28.8 B	16.6 B	NA	1.84 B	NA	16 B	NA
Benzene	43.9 B	22.1 B	16	1.22 B	0.97	17 B	8
Ethylbenzene	214 B	124 B	150	6.64 B	10	113 B	90
Isopropylbenzene	22.2	12.8	14	1.25	2.2	12.5	8
p-Isopropyltoluene	11.7	6.78	NA	0.965	NA	6.67	NA
Styrene	11.7 B	4.04 B	5.7 U	0.807 B	0.35 U	9.44 B	3.2 U
Toluene	6.43 B	1.47 B	5.7 U	0.555 B	0.35 U	4.33 B	3.2 U
Total Xylenes	124.3 B	74.5 B	79	NA	4.1	NA	19
Semi-Volatile Organic Compounds							
1-Methylnaphthalene	1,170 EB	666 B	NA	134 B	NA	792 B	NA
2-Methylnaphthalene	1,870 EB	1,070 EB	1,700	231 B	400	1,320 EB	1,200
Acenaphthene	644	371	730	194	380	642	740
Acenaphthylene	146	72	170	10.5	44 U	85.8	100
Anthracene	385	222	450	142	300	355	430
Benz(a)anthracene	270	154	340	40.2	130	207	290
Benzo(a)pyrene	320 B	179 B	380	60 B	130	232 B	310
Benzo(b)fluoranthene	123 B	70.9 B	220	29.1 B	110	92.3 B	180
Benzo(g,h,i)perylene	159 B	89.5 B	140 U	27.1 B	47	115 B	110
Benzo(j/k)fluoranthene	153 B	84.8 B	140 U	38 B	44 U	117 B	94
Biphenyl	302 B	172 B	300	33.3 B	64	209 B	220
Chrysene	287	163	340	54.1	110	216	280
Dibenz(a,h)anthracene	47	26.1	140 U	7.8	44 U	33	82 U
Fluoranthene	417	244	530	145	320	350	480
Fluorene	405	229	490	98.8	220	336	420
Indeno(1,2,3-cd)pyrene	116	65.1	140 U	23.6	44 U	84.6	82 U
Naphthalene	3,710 EB	2,140 EB	3,100	291 B	470	2,240 EB	2,000
Phenanthrene	1,510 E	869	1,600	365	710	1,250 E	1,400
Pyrene	737 B	432 B	900	178 B	380	607 B	800

Notes:

(1) All results are on a dry weight basis.

B - Analyte detected in the blank.

U - Analyte not detected above DL.

E - Estimate, result detected above calibration range.

NA - Not analyzed

TABLE 2-1

EXAMPLE CORING LOCATION WITH STATE PLANE COORDINATES

Congaree River Sediments Investigation
Columbia, South Carolina

Area	Grid Node	Approximate Coordinate Tie-In	
		Northing	Easting
A	A-3	362205	1984850
A	C-7	362005	1984900
B	I-9	361900	1985000
B	Q-7	361800	1984950
C	AA-5	360800	1984800
C	DD-9	360600	1984850

TABLE 2-2

PROPOSED SEDIMENT ANALYTICAL PARAMETERS AND ESTIMATED REPORTING LIMITS

Congaree River Sediments Investigation
Columbia, South Carolina

Parameter	Method	Reporting Limit (ug/Kg)
Volatile Organic Compounds		
Benzene	8260B	5
Ethylbenzene	8260B	5
Toluene	8260B	5
Total Xylenes	8260B	5
Semi-Volatile Organic Compounds		
Acenaphthene	8270D	330
Acenaphthylene	8270D	330
Anthracene	8270D	330
Benz(a)anthracene	8270D	330
Benzo(a)pyrene	8270D	330
Benzo(b)fluoranthene	8270D	330
Benzo(k)fluoranthene	8270D	330
Benzo(g,h,i)perylene	8270D	330
Chrysene	8270D	330
Dibenz(a,h)anthracene	8270D	330
Fluoranthene	8270D	330
Fluorene	8270D	330
Indeno(1,2,3-cd)pyrene	8270D	330
Naphthalene	8270D	330
Phenanthrene	8270D	330
Pyrene	8270D	330

TABLE 2-3

SUMMARY OF AREA CHARACTERISTICS AND PLANNED SAMPLING APPROACH

Congaree River Sediment Investigation
Columbia, South Carolina

Area A	
Characteristics	• 26 potential investigation points • High density of boulders and limited sediment accumulation • Sediment accumulation typically in "low energy areas" around boulders • Includes alluvial fan located at the mouth of unnamed tributary #1 that can be submerged during high water
Approach	• Wading will be used to access investigation points • The presence of boulders at grid nodes will likely require adjusting some sample locations
Investigative Tools	• Gas powered jackhammer (Wacker BH24) equipped with Geoprobe macrocore or piston sampling barrels • Hand-held, back pack vibracore • Shovel

Area B	
Characteristics	• Area B separated into two sub-areas (B-1 and B-2) - 23 potential investigation points in Area B-1 and 25 in Area B-2 • Boulders distributed throughout, more defined areas of sediment deposition • Variable water current velocity - high velocity near middle of the Congaree River to low or absent near shoreline • Sand bar and boat launch apron present • Steep banks leading to shoreline and shoreline width decreases to the south • Water depth ranges from 0 feet along the shoreline to less than 10 feet at western extent • Land area free of surface obstructions. Drainage swale on boat launch apron may present some challenges accessing on-land investigation points • Cable crossing appears to trend through southern Area B-1
Approach	• A variety of investigative techniques may be implemented in this area due to site conditions that include manually via wading, a floating platform (i.e., pontoon boat), direct push technology (DPT) • A "boundary delineation" approach may be used to determine the sequence of sampling points to define TLM extent • Some sample location adjustments may be required due to magnetic anomalies and boulders
Investigative Tools	• Pontoon boat containing a vibracore and DPT • DPT for land drilling • Gas powered jackhammer (Wacker BH24) equipped with Geoprobe macrocore or piston sampling barrels • Shovel

Area C - To Be Determined

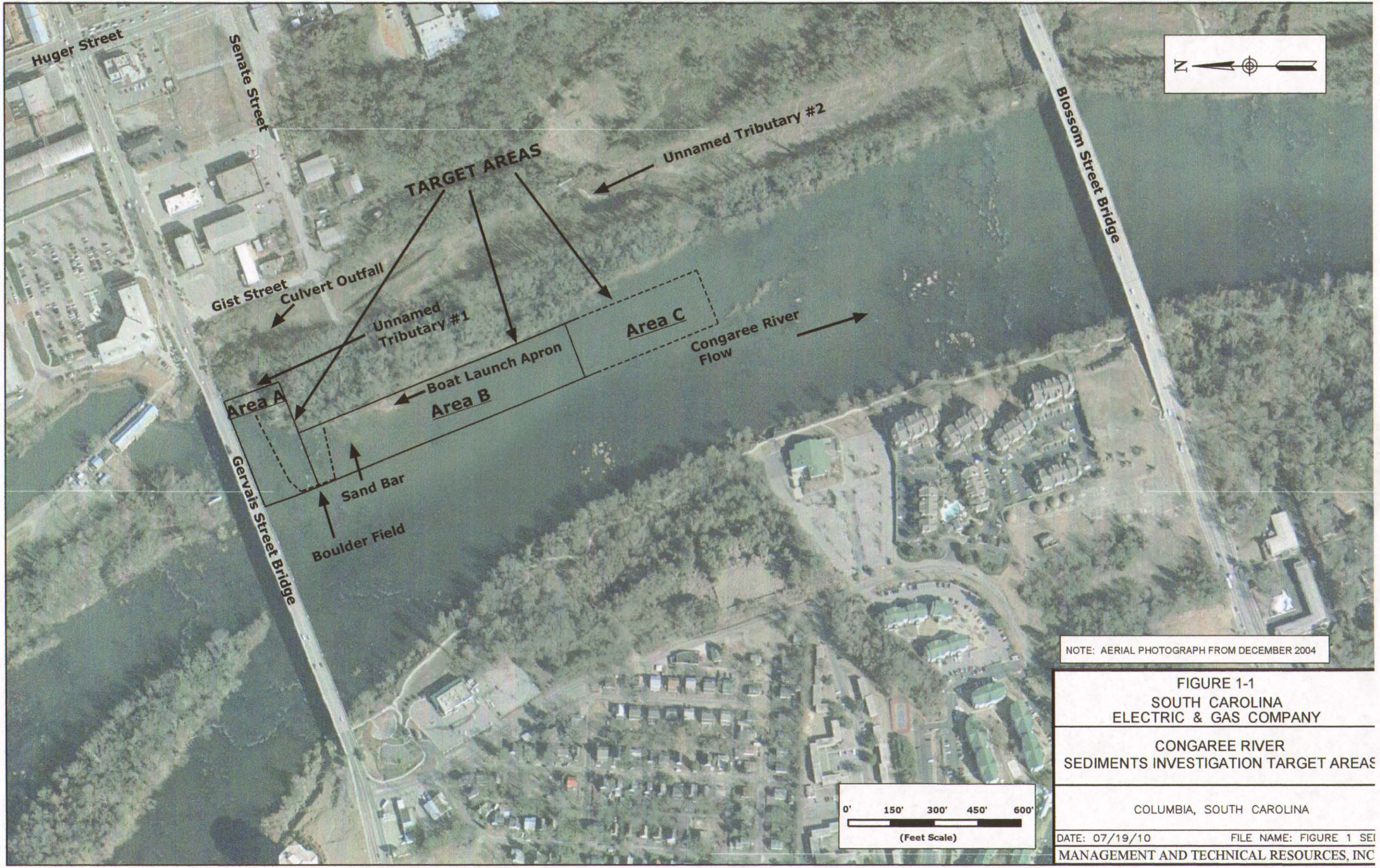
TABLE 4-1

PROPOSED TARGET SCHEDULE

Congaree River Sediments Investigation
Columbia, South Carolina

Milestone	Target Dates
Submit DWP to SCDHEC	September 17, 2010
SCDHEC Review and Comments	September 17 through 24, 2010
Area Reconnaissance (for munitions and historic considerations)	On-going
Access Agreements	On-going
Mobilizing and Field Work	September 17 through October 8, 2010
Laboratory Analyses	October 8 through October 29, 2010
Report Preparation	October 27 through November 24, 2010

FIGURES



NOTE: AERIAL PHOTOGRAPH FROM DECEMBER 2004

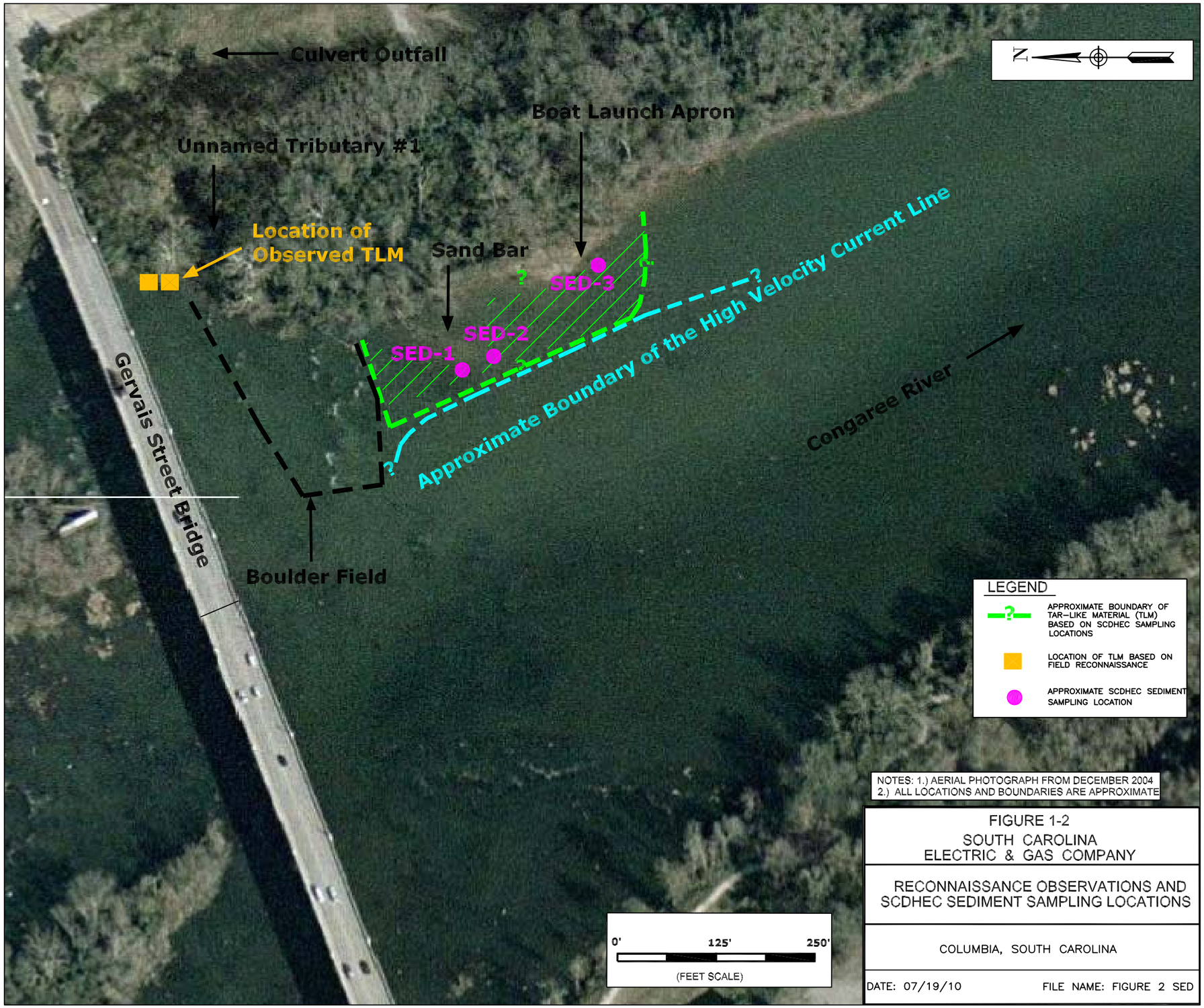
FIGURE 1-1
SOUTH CAROLINA
ELECTRIC & GAS COMPANY

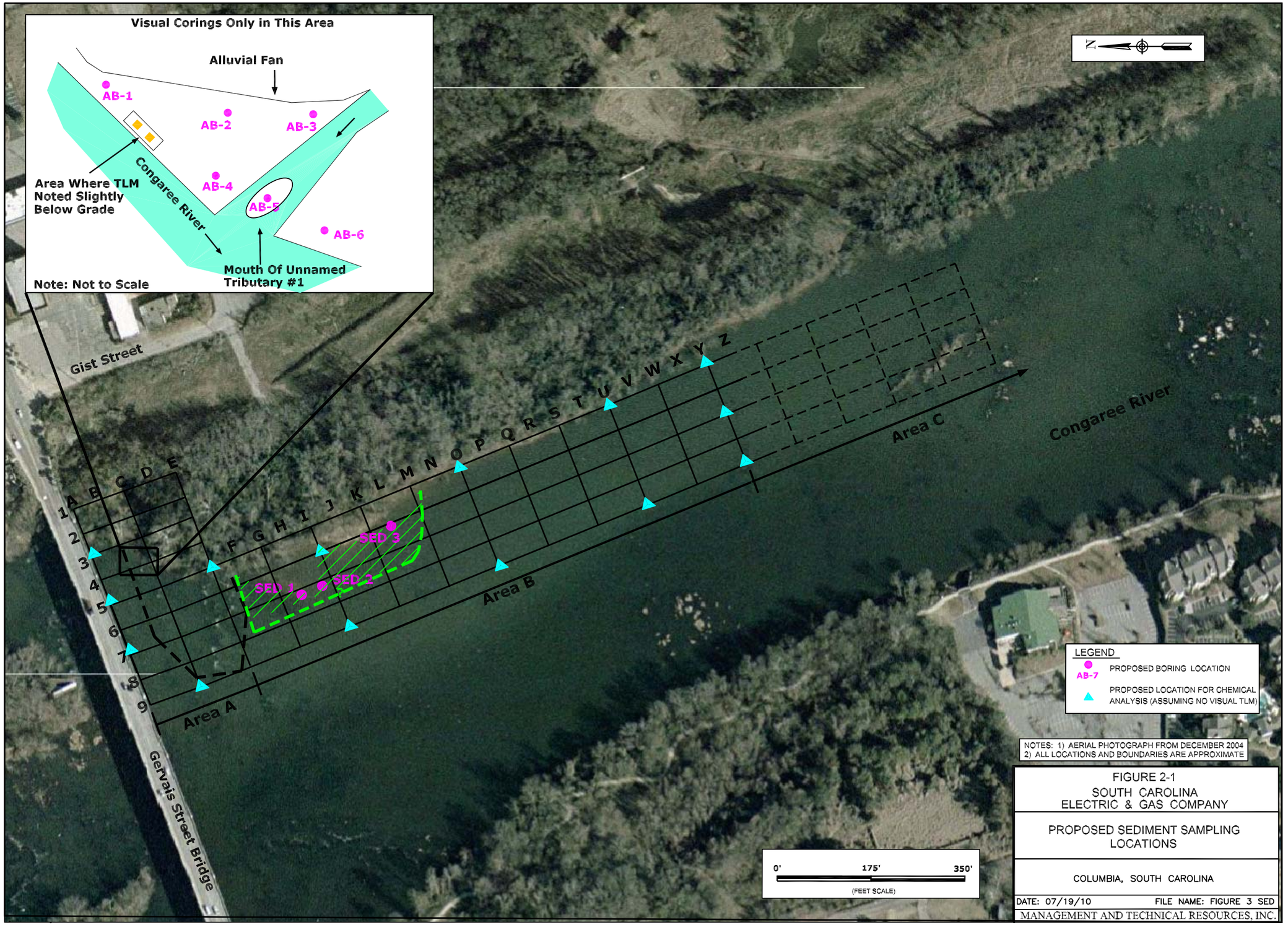
CONGAREE RIVER
SEDIMENTS INVESTIGATION TARGET AREAS

COLUMBIA, SOUTH CAROLINA

DATE: 07/19/10 FILE NAME: FIGURE 1 SE

MANAGEMENT AND TECHNICAL RESOURCES, INC


Culvert Outfall
Boat Launch Apron
Unnamed Tributary #1
Location of Observed TLM
Sand Bar
SED-3
SED-2
SED-1
Approximate Boundary of the High Velocity Current Line
Congaree River
Gervais Street Bridge
Boulder Field
LEGEND
APPROXIMATE BOUNDARY OF TAR-LIKE MATERIAL (TLM) BASED ON SCDHEC SAMPLING LOCATIONS
LOCATION OF TLM BASED ON FIELD RECONNAISSANCE
APPROXIMATE SCDHEC SEDIMENT SAMPLING LOCATION
0'
125'
250'
(FEET SCALE)
NOTES: 1.) AERIAL PHOTOGRAPH FROM DECEMBER 2004
2.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE
FIGURE 1-2
SOUTH CAROLINA ELECTRIC & GAS COMPANY
RECONNAISSANCE OBSERVATIONS AND SCDHEC SEDIMENT SAMPLING LOCATIONS
COLUMBIA, SOUTH CAROLINA
DATE: 07/19/10
FILE NAME: FIGURE 2 SED



NOTES: 1) AERIAL PHOTOGRAPH FROM DECEMBER 2004
2) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE

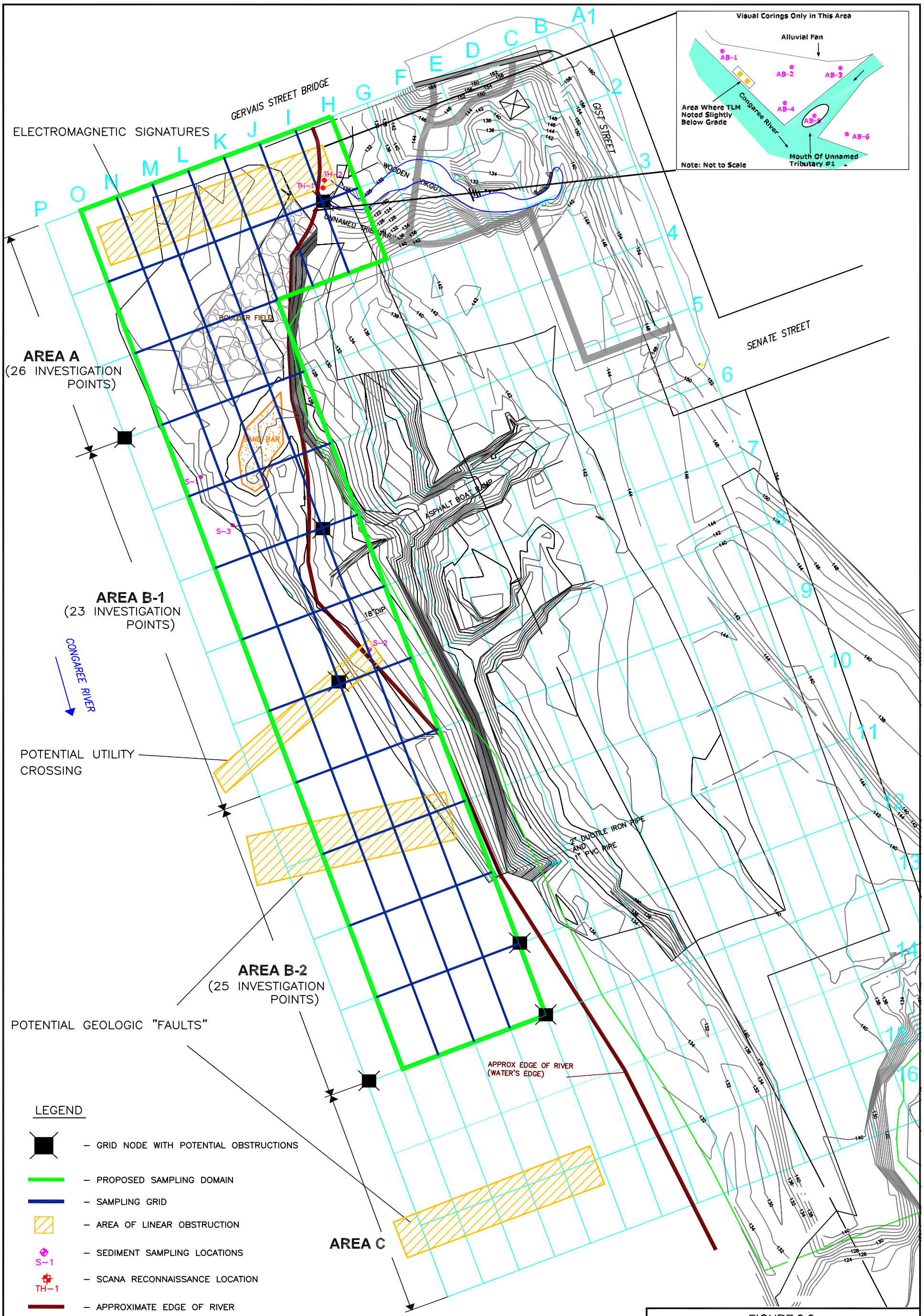
FIGURE 2-1
SOUTH CAROLINA
ELECTRIC & GAS COMPANY

PROPOSED SEDIMENT SAMPLING LOCATIONS

COLUMBIA, SOUTH CAROLINA

DATE: 07/19/10 FILE NAME: FIGURE 3 SED

MANAGEMENT AND TECHNICAL RESOURCES, INC.


Visual Corings Only in This Area
Alluvial Fan
AB-1
AB-2
AB-3
AB-4
AB-5
AB-6
Congaree River
Area Where TLM Noted Slightly Below Grade
Mouth Of Unnamed Tributary #1
Note: Not to Scale
ELECTROMAGNETIC SIGNATURES
GERVAIS STREET BRIDGE
GIST STREET
SENATE STREET
WOODEN JETTY
UNNAMED CREEK
BOULDER FIELD
SAND BAR
ASPHALT BOAT RAMP
18"DIP
2" DUCTILE IRON PIPE AND 1" PVC PIPE
APPROX EDGE OF RIVER (WATER'S EDGE)
AREA A (26 INVESTIGATION POINTS)
AREA B-1 (23 INVESTIGATION POINTS)
AREA B-2 (25 INVESTIGATION POINTS)
AREA C
CONGAREE RIVER
POTENTIAL UTILITY CROSSING
POTENTIAL GEOLOGIC "FAULTS"
TH-1
TH-2
S-1
S-2
S-3
LEGEND
– GRID NODE WITH POTENTIAL OBSTRUCTIONS
– PROPOSED SAMPLING DOMAIN
– SAMPLING GRID
– AREA OF LINEAR OBSTRUCTION
– SEDIMENT SAMPLING LOCATIONS
– SCANA RECONNAISSANCE LOCATION
– APPROXIMATE EDGE OF RIVER
NOTES:
1) FAULT IS USED GENERICALLY TO REPRESENT DIFFERENCE IN MAGNETIC RESULTS.
2) INVESTIGATION POINTS ARE LOCATED AT GRID INTERSECTIONS. AT LOCATIONS WITH OBSTRUCTIONS, THE INVESTIGATION POINT MAY BE RELOCATED IN THE DIRECTION OF FEWER OBSTRUCTIONS.
0 60 120 180
FEET
N
FIGURE 2-2
SOUTH CAROLINA ELECTRIC & GAS COMPANY
SAMPLING GRID WITH LOCATIONS OF POTENTIAL SUBSURFACE OBSTRUCTIONS
COLUMBIA, SOUTH CAROLINA
DATE: 9–14–10 FILE NAME: SAMPLING LOCATIONS
MANAGEMENT AND TECHNICAL RESOURCES, INC.

APPENDIX A

SCE&G AND SCDHEC JUNE 2010 SEDIMENT ANALYTICAL RESULTS

TABLE A-1

SCE&G AND SCDHEC SEDIMENT ANALYTICAL RESULTS AND COMPARISON

Congaree River Sediments Investigation
Columbia, South Carolina

	Sediment 1 Location			Sediment 2 Location		Sediment 3 Location	
Source:	**SCANA**	**SCANA**	**SCDHEC**	**SCANA**	**SCDHEC**	**SCANA**	**SCDHEC**
Field ID:	**Sed-1**	**Sed-1 Dup**	**Sed-1**	**Sed-2**	**Sed-2**	**Sed-3**	**Sed-3**
Date Sampled:	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**
Units:	**mg/kg[(1)]**	**mg/kg**	**mg/kg**	**mg/kg[(1)]**	**mg/kg**	**mg/kg[(1)]**	**mg/kg**
Volatile Organic Compounds							
1,1,1-Trichloroethane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
1,1,2,2-Tetrachloroethane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
1,1,2-Trichloroethane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
1,1-Dichloroethane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
1,1-Dichloroethene	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
1,2,4-Trichlorobenzene	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
1,2,4-Trimethylbenzene	90.2 B	52 B	NA	4.31 B	NA	49.9 B	NA
1,2-Dibromo-3-chloropropane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
1,2-Dibromoethane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
1,2-Dichlorobenzene	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
1,2-Dichloroethane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
1,2-Dichloropropane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
1,3-Dichlorobenzene	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
1,3,5-Trimethylbenzene	28.8 B	16.6 B	NA	1.84 B	NA	16 B	NA
1,4-Dichlorobenzene	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
2-Butanone	NA	NA	11 U	NA	0.71 U	NA	6.5 U
2-Hexanone	NA	NA	11 U	NA	0.71 U	NA	6.5 U
4-Methyl-2-pentanone	NA	NA	11 U	NA	0.71 U	NA	6.5 U
Acetone	NA	NA	23 U	NA	1.4 U	NA	13 U
Benzene	43.9 B	22.1 B	16	1.22 B	0.97	17 B	8
Bromodichloromethane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Bromoform	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Bromomethane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Carbon Disulfide	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Carbon Tetrachloride	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Chlorobenzene	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Chloroethane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Chloroform	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Chloromethane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
cis-1,2-Dichloroethene	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
cis-1,3-Dichloropropene	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Cyclohexane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Dibromochloromethane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Dichlorodifluoromethane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Ethylbenzene	214 B	124 B	150	6.64 B	10	113 B	90
Isopropylbenzene	22.2	12.8	14	1.25	2.2	12.5	8
m/p-Xylenes	65.4 B	40.4 B	NA	1.82 B	NA	20.3 B	NA
Methyl Acetate	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Methyl tertiary butyl ether	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Methylcyclohexane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Methylene Chloride	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
o-Xylene	58.9 B	34.1 B	NA	0.953 B	NA	6.12 B	NA
p-Isopropyltoluene	11.7	6.78	NA	0.965	NA	6.67	NA
Styrene	11.7 B	4.04 B	5.7 U	0.807 B	0.35 U	9.44 B	3.2 U
Tetrachloroethene	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Toluene	6.43 B	1.47 B	5.7 U	0.555 B	0.35 U	4.33 B	3.2 U

TABLE A-1

SCE&G AND SCDHEC SEDIMENT ANALYTICAL RESULTS AND COMPARISON

Congaree River Sediments Investigation
Columbia, South Carolina

	Sediment 1 Location			Sediment 2 Location		Sediment 3 Location	
Source:	**SCANA**	**SCANA**	**SCDHEC**	**SCANA**	**SCDHEC**	**SCANA**	**SCDHEC**
Field ID:	**Sed-1**	**Sed-1 Dup**	**Sed-1**	**Sed-2**	**Sed-2**	**Sed-3**	**Sed-3**
Date Sampled:	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**
Units:	**mg/kg[(1)]**	**mg/kg**	**mg/kg**	**mg/kg[(1)]**	**mg/kg**	**mg/kg[(1)]**	**mg/kg**
Total Xylenes	NA	NA	79	NA	4.1	NA	19
trans-1,2-Dichloroethene	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
trans-1,3-Dichloropropene	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Trichloroethene	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Trichlorofluoromethane	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Vinyl Chloride	NA	NA	5.7 U	NA	0.35 U	NA	3.2 U
Semi-Volatile Organic Compounds - acid extractables							
2,4,5-Trichlorophenol	NA	NA	140 U	NA	44 U	NA	82 U
2,4,6-Trichlorophenol	NA	NA	140 U	NA	44 U	NA	82 U
2,4-Dichlorophenol	NA	NA	140 U	NA	44 U	NA	82 U
2,4-Dimethylphenol	NA	NA	140 U	NA	44 U	NA	82 U
2,4-Dinitrophenol	NA	NA	360 U	NA	110 U	NA	210 U
2-Chlorophenol	NA	NA	140 U	NA	44 U	NA	82 U
2-Methylphenol	NA	NA	140 U	NA	44 U	NA	82 U
2-Nitrophenol	NA	NA	140 U	NA	44 U	NA	82 U
3 & 4-Methylphenol	NA	NA	290 U	NA	89 U	NA	170 U
4,6-Dinitro-2-methylphenol	NA	NA	360 U	NA	110 U	NA	210 U
4-Chloro-3-methylphenol	NA	NA	140 U	NA	44 U	NA	82 U
4-Nitrophenol	NA	NA	360 U	NA	110 U	NA	210 U
Pentachlorophenol	NA	NA	360 U	NA	110 U	NA	210 U
Phenol	NA	NA	140 U	NA	44 U	NA	82 U
Semi-Volatile Organic Compounds - base/neutral extractables							
1-Methylnaphthalene	1,170 EB	666 B	NA	134 B	NA	792 B	NA
2,4-Dinitrotoluene	NA	NA	140 U	NA	44 U	NA	82 U
2,6-Dinitrotoluene	NA	NA	140 U	NA	44 U	NA	82 U
2-Chloronaphthalene	NA	NA	140 U	NA	44 U	NA	82 U
2-Methylnaphthalene	1,870 EB	1,070 EB	1,700	231 B	400	1,320 EB	1,200
2-Nitroaniline	NA	NA	140 U	NA	44 U	NA	82 U
3,3-Dichlorobenzidine	NA	NA	360 U	NA	110 U	NA	210 U
3-Nitroaniline	NA	NA	140 U	NA	44 U	NA	82 U
4-Bromophenyl phenyl ether	NA	NA	140 U	NA	44 U	NA	82 U
4-Chloroaniline	NA	NA	140 U	NA	44 U	NA	82 U
4-Chlorophenyl phenyl ether	NA	NA	140 U	NA	44 U	NA	82 U
4-Nitroaniline	NA	NA	140 U	NA	44 U	NA	82 U
Acenaphthene	644	371	730	194	380	642	740
Acenaphthylene	146	72	170	10.5	44 U	85.8	100
Acetophenone	NA	NA	140 U	NA	44 U	NA	82 U
Anthracene	385	222	450	142	300	355	430
Atrazine	NA	NA	140 U	NA	44 U	NA	82 U
Benz(a)anthracene	270	154	340	40.2	130	207	290
Benzaldehyde	NA	NA	360 U	NA	110 U	NA	210 U
Benzo(a)pyrene	320 B	179 B	380	60 B	130	232 B	310
Benzo(b)fluoranthene	123 B	70.9 B	220	29.1 B	110	92.3 B	180
Benzo(e)pyrene	171 B	96.8 B	NA	29.5 B	NA	125 B	NA
Benzo(g,h,i)perylene	159 B	89.5 B	140 U	27.1 B	47	115 B	110
Benzo(j/k)fluoranthene	153 B	84.8 B	140 U	38 B	44 U	117 B	94
Biphenyl	302 B	172 B	300	33.3 B	64	209 B	220

TABLE A-1

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Congaree River Sediments Investigation
Columbia, South Carolina

	Sediment 1 Location			Sediment 2 Location		Sediment 3 Location	
Source:	**SCANA**	**SCANA**	**SCDHEC**	**SCANA**	**SCDHEC**	**SCANA**	**SCDHEC**
Field ID:	**Sed-1**	**Sed-1 Dup**	**Sed-1**	**Sed-2**	**Sed-2**	**Sed-3**	**Sed-3**
Date Sampled:	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**	**6/28/2010**
Units:	**mg/kg[(1)]**	**mg/kg**	**mg/kg**	**mg/kg[(1)]**	**mg/kg**	**mg/kg[(1)]**	**mg/kg**
bis(2-Chloroethoxy)methane	NA	NA	140 U	NA	44 U	NA	82 U
bis(2-Chloroethyl)ether	NA	NA	140 U	NA	44 U	NA	82 U
bis(2-Chloroisopropyl)ether	NA	NA	140 U	NA	44 U	NA	82 U
bis(2-Ethylhexyl)phthalate	NA	NA	140 U	NA	44 U	NA	82 U
Butylbenzyl phthalate	NA	NA	140 U	NA	44 U	NA	82 U
Caprolactam	NA	NA	360 U	NA	110 U	NA	210 U
Carbazole	NA	NA	140 U	NA	44 U	NA	82 U
Chrysene	287	163	340	54.1	110	216	280
Dibenz(a,h)anthracene	47	26.1	140 U	7.8	44 U	33	82 U
Dibenzofuran	NA	NA	140 U	30.6	63	33.4	82 U
Diethylphthalate	NA	NA	140 U	NA	44 U	NA	82 U
Dimethylphthalate	NA	NA	140 U	NA	44 U	NA	82 U
Di-n-butyl phthalate	NA	NA	140 U	NA	44 U	NA	82 U
Di-n-octyl phthalate	NA	NA	140 U	NA	44 U	NA	82 U
Fluoranthene	417	244	530	145	320	350	480
Fluorene	405	229	490	98.8	220	336	420
Hexachlorobenzene	NA	NA	140 U	NA	44 U	NA	82 U
Hexachlorobutadiene	NA	NA	140 U	NA	44 U	NA	82 U
Hexachloroethane	NA	NA	140 U	NA	44 U	NA	82 U
Hexachlorocyclopentadiene	NA	NA	360 U	NA	110 U	NA	210 U
Indeno(1,2,3-cd)pyrene	116	65.1	140 U	23.6	44 U	84.6	82 U
Isophorone	NA	NA	140 U	NA	44 U	NA	82 U
Naphthalene	3,710 EB	2,140 EB	3,100	291 B	470	2,240 EB	2,000
Nitrobenzene	NA	NA	140 U	NA	44 U	NA	82 U
N-Nitrosodi-n-propylamine	NA	NA	140 U	NA	44 U	NA	82 U
N-Nitrosodiphenylamine	NA	NA	NA U	NA	44 U	NA	82 U
Phenanthrene	1,510 E	869	1,600	365	710	1,250 E	1,400
Pyrene	737 B	432 B	900	178 B	380	607 B	800

Notes:
(1) All results are on a dry weight basis.
B - Analyte detected in the Blank.
E - Estimate, result detected above calibration range.
EB - Analyte was detected in the blank and estimated; result detected above the calibration range.
J - Estimated value; detected between the RL and DL.
U - Analyte not detected above DL.
NA - Not analyzed

APPENDIX B

HEALTH AND SAFETY PLAN