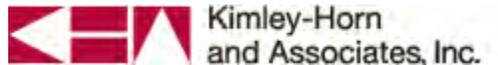


Appendix 5

**REEDY CREEK FEASIBILITY STUDY
REEDY CREEK STREAM RESTORATION BENTHIC
MACROINVERTABRATE MONITORING AND WATER QUALITY
SAMPLING SUMMARY REPORT**

**S&ME Project Nos. 1357-11-011 & 1357-12-009
Individual Project Order Nos. 015016139-1 & 015016139-4**

Prepared for:



2000 South Boulevard, Suite 440
Charlotte, North Carolina 28203

Prepared by:



Charlotte, North Carolina

June 5, 2012



June 5, 2012

Kimley-Horn and Associates, Inc.
2000 South Blvd.
Suite 440
Charlotte, North Carolina 28203

Attention: Mr. Will Wilhelm, P.E.

Subject: Sampling Summary Report
Reedy Creek Feasibility Study
Charlotte, North Carolina
S&ME Project Nos. 1357-11-011 & 1357-12-009

Dear Mr. Wilhelm:

S&ME, Inc. (S&ME) is pleased to present Kimley-Horn and Associates, Inc. (KHA) with benthic macroinvertebrate monitoring and water quality sampling results in connection with the above-referenced projects. Initial services were performed in general accordance with S&ME Proposal No. 1357-23735-11 rev3 and a March 2010 Master Agreement for Continuing Professional Services between KHA and S&ME, as referenced in the KHA individual project order number 015016139-1. Additional sampling services were performed in general accordance with S&ME Proposal No. 1357-25126-12rev1, dated March 28, 2012.

If you need additional information with respect to this report, please do not hesitate to contact us at 704.523.4726.

Sincerely,

S&ME

D. David Homans
Natural Resources Project Professional

Darrin M. Peine, QEP
Natural Resources Project Professional

Senior Review by Liz Porter, V.P.

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BACKGROUND INFORMATION

KHA is conducting an assessment of the Reedy Creek drainage basin for Charlotte-Mecklenburg Storm Water Services. The project area consists of three reaches of Reedy Creek tributaries within the Reedy Creek Park and Nature Preserve, located off Rocky River Road. The Reedy Creek Park and Nature Preserve is owned and managed by Mecklenburg County Parks and Recreation. The approximate location of the project area is depicted by a Site Vicinity map (Figure 1) and the appropriate portion of the 1996 Harrisburg, N.C. USGS topographic map (Figure 2). In support of KHA's assessment, S&ME conducted benthic macroinvertebrate monitoring and water quality sampling at nine representative locations (R1, R2, R3 and R5 through R10) within nine segments (reaches) of Reedy Creek and tributaries of Reedy Creek that KHA identified for possible restoration opportunities. The locations of these sampling site areas are identified on Figure 2, and a 2011 aerial photograph (Figure 3), and the coordinates of each sampling reach are included in Table 1. Photographs of the sampling sites are included in Appendix III.

Fieldwork for sites R1-3 was conducted jointly by S&ME and KHA personnel on May 24, 2011. Additional fieldwork for R5-10 was also conducted jointly by S&ME and KHA personnel on April 25-26 and May 16, 2012.

1. SCOPE OF SERVICES

S&ME's approach to conducting the necessary sampling was based on Task 2.2.2 as specified in the *Reedy Creek Tech Memo - Scope of Services* provided for S&ME by KHA, and is as follows:

1.1 Benthic Macroinvertebrate Sampling

S&ME conducted benthic macroinvertebrate sampling in accordance with Task 2.2.2 of the aforementioned *Reedy Creek Tech Memo - Scope of Services* at nine specific biomonitoring sites determined by KHA. The field collection effort was lead by S&ME staff trained and certified to collect benthic macroinvertebrate samples as part of the Division of Water Quality (DWQ) 401 certification process, and who have obtained a Certification of Compliance from DWQ's training course: *Aquatic Insect Collection Protocols for Stream Mitigation and Restoration Projects as Related to NCDENR DWQ 401 Certifications*. S&ME staff was assisted in the field by a biologist from KHA.

Samples were collected according to the procedures outlined in the NC Department of Environment and Natural Resources (NCDENR) DWQ December 1, 2011 *Standard Operating Procedure for Benthic Macroinvertebrates (Version 3.0)*. The Standard Collection Method was used for sampling sites with drainage areas greater than three square miles (samples R5 and R10) and the Qual-4 collection method was used for the remaining smaller streams. The Qual-4 collection method entails four samples taken at each monitoring site: one kick net sample, one sweep net sample, one leafpack, and one "visual." In this method, organisms collected were "picked" and preserved in the field using 95% Ethyl Alcohol. S&ME then sent the collected samples and associated Benthos Collection Cards to Lenat Consulting Services (Lenat) in Raleigh, North Carolina. Lenat identified the collected specimens to the lowest possible taxonomic level, and provided abundance values for each taxon. The metrics calculated include total and EPT taxa

richness, EPT abundance, North Carolina Biotic Index (NCBI), and bioclassification values. Metrics were calculated according to the *Standard Operating Procedure for Benthic Macroinvertebrates (Version 3.0)*; bioclassification values for sites sampled with the Qual-4 method were determined using NCDWQ's *Biocriteria for the Small Streams of the North Carolina Mountains and Piedmont: Memorandum (2009)*.

1.2 Water Quality Sampling

S&ME also conducted water quality monitoring in general accordance with Task 2.2.2 of the aforementioned *Reedy Creek Tech Memo - Scope of Services*. Water quality parameters were collected approximately concurrently with biological data at each monitoring site. Specifically, the parameters were collected during normal flow conditions and were then used to calculate a water quality index (WQI) using the Charlotte-Mecklenburg Storm Water Services prescribed method. A water quality meter was used to determine ambient water conditions, e.g., surface water temperature, dissolved oxygen, and pH. Grab samples were collected to assess the surface water chemical conditions, e.g., fecal coliform, phosphorous, nitrates, biological oxygen demand (BOD), and total solids. Laboratory results of the grab samples for Reaches 1-3 were analyzed and reported by Shealy Environmental Services, Inc. Laboratory results of the grab samples for Reaches 5-10 were analyzed and reported by Prism Laboratories, Inc.

Following completion of the field and laboratory work identified above, S&ME prepared this written summary that describes the findings of our fieldwork and laboratory analysis. We have included maps of station locations, a list of taxa collected, and summary statistics (taxa richness, abundance, biotic index values, etc.). Ambient and laboratory water quality measurements were also used to provide a calculation of the WQI.

2. RESULTS

2.1 Benthic Macroinvertebrate Sampling

Table 1 summarizes the benthic macroinvertebrate data collected at each monitoring site. Benthos collection cards, lists of identified taxa prepared by Lenat Consulting Services, and a metric calculation worksheet is included in Appendix I. Note that the metrics calculated by Lenat are based off of dated tolerance values and metric calculations methods and are therefore not consistent with those derived on the metric calculation worksheet.

Summary data indicate that relatively healthy macroinvertebrate communities were present at R3, R6, R8 and R9, all of which received a "Good" or Good-Fair" bioclassification score. The benthic macroinvertebrate communities observed at these sites were of atypically high quality for streams in Mecklenburg County, and the EPT Taxa richness of 13 observed at sites R6 and R9 were notably high for small streams in a generally urban area. A "Fair" bioclassification score was observed for sites R1, R5, R7 and R10. The "Poor" bioclassification score observed at site R2 indicates that the macroinvertebrate community at this reach is impaired.

2.2 Water Quality Sampling

Results of the general water quality sampling are summarized in Table 2. Laboratory water quality results presented in two reports dated June 3 and June 27, 2011 prepared by Shealy Environmental Services, Inc. and one report dated May 10, 2012 prepared by Prism Laboratories, Inc. are include in Appendix II, along with WQI calculation tables. Note that a second sampling effort was necessary in order to obtain the total solids and laboratory turbidity parameters used to calculate the WQI for sites R1, R2 and R3 as these parameters were not collected during the initial sampling effort.

Eight of the nine monitoring sites had an adjusted WQI rating classification of “good” while site R5 received an “average” rating. Sources of possible water quality impairment observed included elevated fecal coliform levels at sites R1, R3, R5, R7, R9 and R10, elevated BOD at sites R5, R6 and R 10 and elevated nitrate levels at sites R3 and R8.

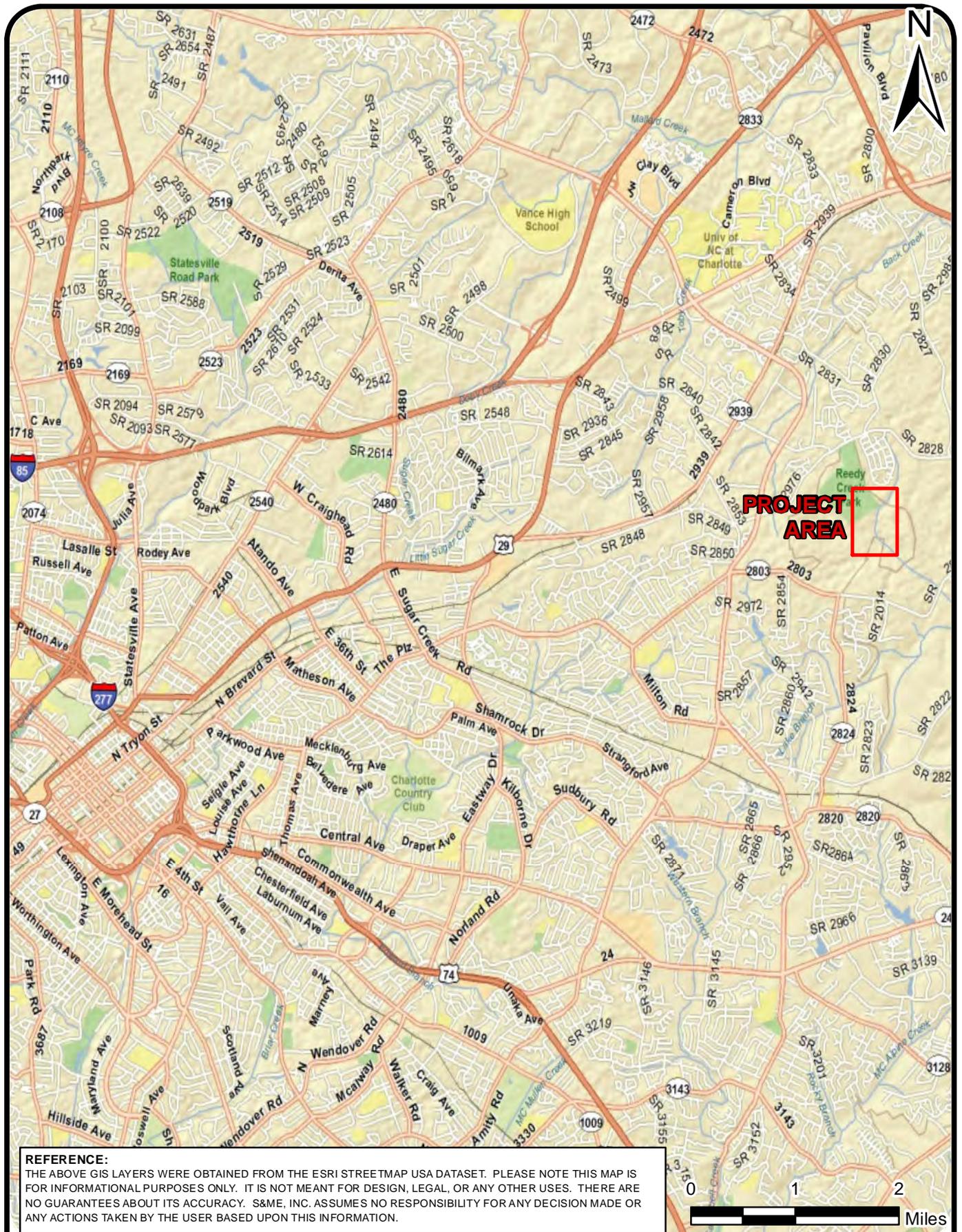
FIGURES

Figure 1 Site Vicinity Map

Figure 2 USGS Topographic Map

Figure 3 2011 Aerial Photograph





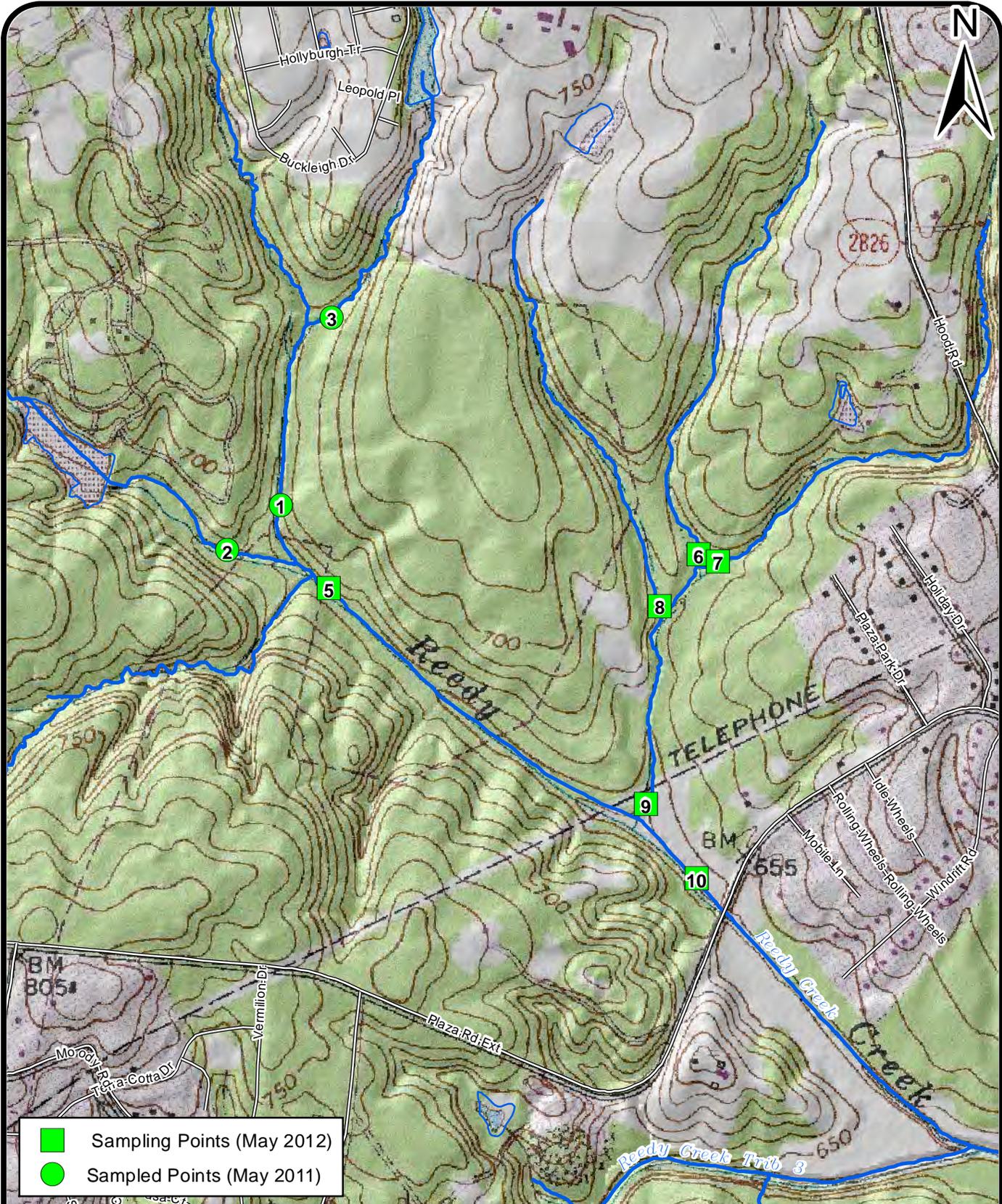
SCALE:	AS SHOWN
DATE:	6-29-2011
DRAWN BY:	DDH
CHECKED BY:	DMP

S&ME
 WWW.SMEINC.COM

SITE VICINITY MAP
 Reedy Creek Feasibility Study
 Charlotte, North Carolina

PROJECT NO: 1357-11-011

FIGURE NO.
1



- Sampling Points (May 2012)
- Sampled Points (May 2011)

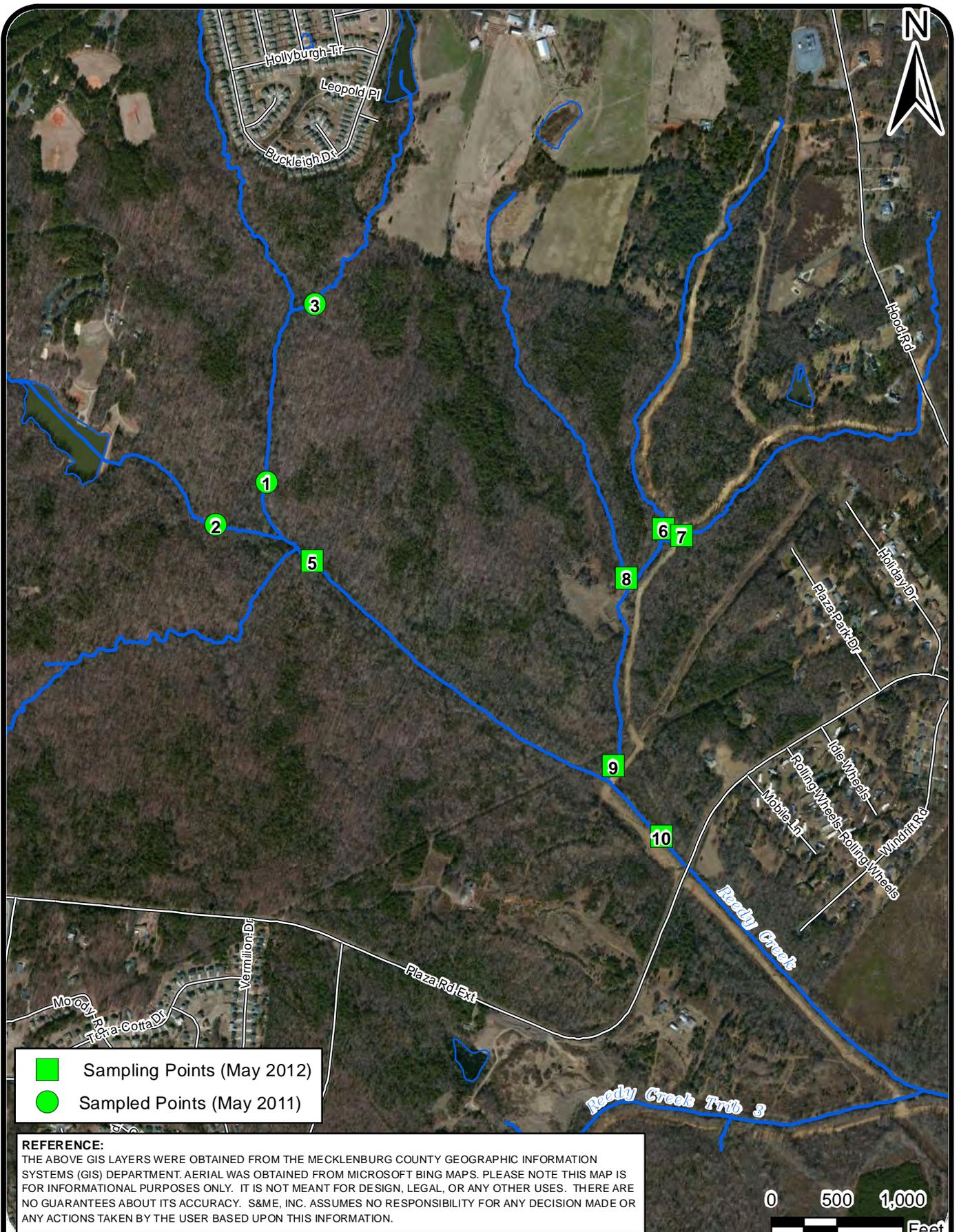
REFERENCE: 1996 HARRISBURG [NC] USGS 1:24,000 TOPOGRAPHIC QUAD SHEET
 THE ABOVE GIS LAYERS WERE OBTAINED FROM THE USDA GEOSPATIAL DATA GATEWAY AND NCDOT GIS. PLEASE NOTE THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. IT IS NOT MEANT FOR DESIGN, LEGAL, OR ANY OTHER USES. THERE ARE NO GUARANTEES ABOUT ITS ACCURACY. S&ME, INC. ASSUMES NO RESPONSIBILITY FOR ANY DECISION MADE OR ANY ACTIONS TAKEN BY THE USER BASED UPON THIS INFORMATION.



SCALE:	1" = 1,000'
DATE:	3-28-2012
DRAWN BY:	DDH
CHECKED BY:	DMP

USGS TOPOGRAPHIC MAP
 Reedy Creek Feasibility Study
 Charlotte, North Carolina
 PROJECT NO. 1357-11-011; 1357-12-009

FIGURE NO.
2



- Sampling Points (May 2012)
- Sampled Points (May 2011)

REFERENCE:
 THE ABOVE GIS LAYERS WERE OBTAINED FROM THE MECKLENBURG COUNTY GEOGRAPHIC INFORMATION SYSTEMS (GIS) DEPARTMENT. AERIAL WAS OBTAINED FROM MICROSOFT BING MAPS. PLEASE NOTE THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. IT IS NOT MEANT FOR DESIGN, LEGAL, OR ANY OTHER USES. THERE ARE NO GUARANTEES ABOUT ITS ACCURACY. S&ME, INC. ASSUMES NO RESPONSIBILITY FOR ANY DECISION MADE OR ANY ACTIONS TAKEN BY THE USER BASED UPON THIS INFORMATION.

SCALE:	1" = 1,000'
DATE:	3-28-2012
DRAWN BY:	DDH
CHECKED BY:	DMP



2011 AERIAL PHOTOGRAPH
 Reedy Creek Feasibility Study
 Charlotte, North Carolina

PROJECT NO. 1357-11-011; 1357-12-009

FIGURE NO.
3

TABLES

Table 1 Macrobenthic Results Summary

Table 2 Water Quality Results Summary



Table 1: Macrobenthic Results Summary
 Reedy Creek Feasibility Study- Additional Samples, Charlotte, N.C.

S&ME Project No. 1357-12-009
 June 5, 2012

Parameter	Sampling Site								
	R1	R2	R3	R5	R6	R7	R8	R9	R10
Latitude	35.26365	35.26355	35.26803	35.26279	35.26335	35.26322	35.26325	35.25839	35.25692
Longitude	-80.7116	-80.71336	-80.71033	-80.71051	-80.7014	-80.70093	-80.70232	-80.70257	-80.70133
Sampling Method	Qual-4	Qual-4	Qual-4	Standard	Qual-4	Qual-4	Qual-4	Qual-4	Standard
Sampling Date	5/24/2011	5/25/2011	5/25/2011	4/26/2012	4/25/2012	5/16/2012	5/16/2021	4/25/2012	4/26/2012
Total Taxa Richness	16	17	22	31	33	25	35	38	18
Total Abundance	66	55	82	102	175	105	170	143	49
EPT Taxa Richness	4	2	9	9	13	5	9	13	4
EPT Abundance	34	8	48	30	117	11	58	61	15
NCBI	6.69	7.09	5.36	5.87	4.82	6.43	5	5.67	6.23
Bioclassification Score*	Fair	Poor	Good	Fair	Good	Fair	Good	Good-Fair	Fair

*Bioclassification score for standards samples is calculated using both EPT taxa richness and NCBI score in accordance with NCDWQ's *Standard Operating Procedure for Benthic Macroinvertebrates (Version 3.0)*. Bioclassification score for Qual-4 samples is calculated using NCBI alone in accordance with NCDWQ's *Biocriteria for the Small Streams of the North Carolina Mountains and Piedmont: Memorandum (2009)*.

Table 2: Water Quality Results Summary
 Reedy Creek Feasibility Study- Additional Samples, Charlotte, N.C.

S&ME Project No. 1357-12-009
 June 5, 2012

Monitoring Site		R1	R2	R3	R5	R6	R7	R8	R9	R10	Class C Water Quality Standards or Typical Range
Sample Dates		5/24/11 6/16/11	5/24/11 6/16/11	5/24/11 6/16/11	4/26/12	4/26/12	4/26/12	4/26/12	4/26/12	4/26/12	
Parameter	Units										
Nitrate	mg/L	0.49	0.086	1.3	0.28	0.52	0.16	1.8	0.68	0.28	<1 mg/L ³
Phosphorus	mg/L	0.054	0.021	0.025	0.077	0.089	0.09	0.12	0.094	0.08	<0.4 mg/L ³
BOD5	mg/L	ND	ND	ND	20	16	2.1	ND	ND	13	<5 mg/L ³
Fecal Coliform	col/100ml	520	100	690	1000	62	350	200	740	470	< 200/100ml mean ²
Turbidity (lab)	NTU	ND	4.4	1.2	2.6	2.8	11	1.8	4.4	2.9	< 50 NTU ²
pH	SU	6.95	6.26	7.44	8.01	7.75	7.98	8.18	8.18	8.01	Between 6.0 and 9.0 ²
DO	mg/L	9.22	6.54	8.93	8.11	7.18	8.67	8.91	8.41	8.11	> than 5.0 mg/l ²
Temperature	°C	19.25	18.4	19.22	16	14.2	13.2	11.6	14.2	15.5	< 2.8° C above natural water temperature ²
TS	mg/L	96	100	93	90	110	100	120	100	90	<200 mg/L ³
WQI	--	81.1	74.9	81.1	68.4	71.9	76.7	79.4	75.7	71.0	--

mg/L = milligram per liter; col/100ml = colonies per 100 milliliters; NTU = nephelometric turbidity unit

SU = standard units; °C = degrees Celsius; ND = Not detected

¹ WQI Scores: 0-25 = poor; 26-50 = fair; 51-70 = average; 71-90 = good; and 91-100 = excellent

² Class C Water Quality Standard

³ Typical Range

Highlighted values are outside of typical range and / or exceed Class C Water Quality Standards

APPENDIX I

BIOLOGICAL FIELD ASSESSMENT DATA

Benthos Collection Cards **(S&ME)**

Taxa list and abundance for Reedy Creek Sties
(R1-R3), Mecklenburg County, 25 May 2011
(Lenat)

List of macroinvertebrates collected at Reedy
Creek sites, Mecklenburg County, April and May
2012. **(Lenat)**

Benthic Macroinvertebrate Calculations **(S&ME)**

Sample Site: Reach 1 Reedy Creek

BENTHOS COLLECTION CARD

DATE 5/24/11 COLLECT. TIME 10:00 COLLECTORS S&ME, KHA CARD# 1
 STAT. LOC. 35.26365, -80.71160 RIVER BASIN Catawba COUNTY Mecklenburg

<u>Substrate:</u>		<u>River:</u>		<u>Field Parameters:</u>			
Boulder (10")	<u>0</u> %	Mid depth	<u>1 ft</u>	Bank erosion	None	Mod	Severe
Cobble (2 1/2 - 10")	<u>5</u> %	Max depth	<u>3 ft</u>	Canopy	% <u>100</u>	Type	trees
Gravel (2 1/2 - 1/12")	<u>5</u> %	Width	<u>6 ft</u>	Aufwuchs	None	Mod	Severe
Sand (1/12")	<u>60</u> %	Current	<u>slow</u>	Podostemum	None	Mod	Severe
Silt, fine particles	<u>30</u> %	Recent Rain?	No	Tribs present?		no	
Other	<u>-</u> %	<u>Photos (#)</u>					

<u>Instream Habitat: (0, +, ++)</u>			<u>Samples: (# + Comments)</u>		<u>Water Chemistry</u>	
Pools	<u>+</u>	Backwaters	<u>0</u>	Kicks	<u>1</u>	pH <u>6.95</u>
Riffles	<u>+</u>	Detritus	<u>+</u>	Sweeps	<u>1</u>	Conductivity
Snags	<u>0</u>	Aquatic weeds	<u>0</u>	Leaf Packs	<u>1</u>	Dissolved Oxygen <u>9.22</u>
Undercut	<u>+</u>	Other		Rock-Log		Temperature <u>19.25 C</u>
Root Mats	<u>0</u>			Sand		Total Dissolved Solids
				Visuals	<u>1</u>	
				Other		

Field Observation: **Severely eroded banks, unknown cause**

Sample Site: Reach 2 Reedy Creek

BENTHOS COLLECTION CARD

DATE 5/24/11 COLLECT. TIME 10:45 COLLECTORS S&ME, KHA CARD# 2
 STAT. LOC. 35.26355, -80.71336 RIVER BASIN Catawba COUNTY Mecklenburg

<u>Substrate:</u>		<u>River:</u>		<u>Field Parameters:</u>			
Boulder (10")	<u>0</u> %	Mid depth	<u>1 ft</u>	Bank erosion	None	Mod	Severe
Cobble (2 1/2 - 10")	<u>10</u> %	Max depth	<u>3 ft</u>	Canopy	% <u>100</u>	Type	trees
Gravel (2 1/2 - 1/12")	<u>10</u> %	Width	<u>6 ft</u>	Aufwuchs	None	Mod	Severe
Sand (1/12")	<u>60</u> %	Current	<u>slow</u>	Podostemum	None	Mod	Severe
Silt, fine particles	<u>20</u> %	Recent Rain?	No	Tribs present?		no	
Other	<u>-</u> %	<u>Photos (#)</u>					

<u>Instream Habitat: (0, +, ++)</u>			<u>Samples: (# + Comments)</u>		<u>Water Chemistry</u>	
Pools	<u>+</u>	Backwaters	<u>0</u>	Kicks	<u>1</u>	pH <u>6.26</u>
Riffles	<u>+</u>	Detritus	<u>+</u>	Sweeps	<u>1</u>	Conductivity
Snags	<u>+</u>	Aquatic weeds	<u>0</u>	Leaf Packs	<u>1</u>	Dissolved Oxygen <u>6.54</u>
Undercut	<u>+</u>	Other		Rock-Log		Temperature <u>18.4 C</u>
Root Mats	<u>0</u>			Sand		Total Dissolved Solids
				Visuals	<u>1</u>	
				Other		

Field Observation: **Severely eroded banks, unknown cause; substrate course sand**

Sample Site: Reach 3 Reedy Creek

BENTHOS COLLECTION CARD

DATE 5/24/11 COLLECT. TIME 12:45 COLLECTORS S&ME, KHA CARD# 3
 STAT. LOC. 35.26803, -80.71033 RIVER BASIN Catawba COUNTY Mecklenburg

<u>Substrate:</u>		<u>River:</u>		<u>Field Parameters:</u>			
Boulder (10")	<u>0</u> %	Mid depth	<u>1 ft</u>	Bank erosion	None	Mod	Severe
Cobble (2 1/2 - 10")	<u>10</u> %	Max depth	<u>3 ft</u>	Canopy	% <u>100</u>	Type	trees
Gravel (2 1/2 - 1/12")	<u>10</u> %	Width	<u>9 ft</u>	Aufwuchs	None	Mod	Severe
Sand (1/12")	<u>60</u> %	Current	<u>slow</u>	Podostemum	None	Mod	Severe
Silt, fine particles	<u>20</u> %	Recent Rain?	No	Tribs present?		no	
Other	<u>-</u> %	<u>Photos (#)</u>					

<u>Instream Habitat: (0, +, ++)</u>			<u>Samples: (# + Comments)</u>		<u>Water Chemistry</u>	
Pools	<u>+</u>	Backwaters	<u>0</u>	Kicks	<u>1</u>	pH <u>7.4</u>
Riffles	<u>+</u>	Detritus	<u>+</u>	Sweeps	<u>1</u>	Conductivity
Snags	<u>+</u>	Aquatic weeds	<u>0</u>	Leaf Packs	<u>1</u>	Dissolved Oxygen <u>8.9</u>
Undercut	<u>+</u>	Other		Rock-Log		Temperature <u>19.2 C</u>
Root Mats	<u>0</u>			Sand		Total Dissolved Solids
				Visuals	<u>1</u>	
				Other		

Field Observation: **Severely eroded banks, unknown cause; substrate coarse sand with bedrock**

Sample Site: Reach 5 Reedy Creek

BENTHOS COLLECTION CARD

DATE 4/26/12 COLLECT. TIME 13:15 COLLECTORS S&ME, KHA CARD# 5
 STAT. LOC. 35.26279° N, -80.71051° W RIVER BASIN Catawba COUNTY Mecklenburg

<u>Substrate:</u>		<u>River:</u>		<u>Field Parameters:</u>			
Boulder (10")	<u>5</u> %	Mid depth	<u>inches</u>	Bank erosion	None	<u>Mod</u>	<u>Severe</u>
Cobble (2 1/2 - 10")	<u>25</u> %	Max depth	<u>0.5 ft</u>	Canopy	% <u>75</u>	Type	<u>trees</u>
Gravel (2 1/2 - 1/12")	<u>20</u> %	Width	<u>10 ft</u>	Aufwuchs	<u>None</u>	<u>Mod</u>	<u>Severe</u>
Sand (1/12")	<u>40</u> %	Current	<u>slow</u>	Podostemum	<u>None</u>	Mod	<u>Severe</u>
Silt, fine particles	<u>10</u> %	Recent Rain?	<u>No</u>	Tribs present?		<u>Yes</u>	
Other	-	% <u>Photos (#)</u>					

<u>Instream Habitat:</u> (0, +, ++)			<u>Samples:</u> (# + Comments)			<u>Water Chemistry</u>	
Pools	<u>+</u>	Backwaters	<u>0</u>	Kicks	<u>2</u>	pH	<u>8.01</u>
Riffles	<u>+</u>	Detritus	<u>+</u>	Sweeps	<u>3</u>	Conductivity	<u>105.6</u>
Snags	<u>0</u>	Aquatic weeds	<u>0</u>	Leaf Packs	<u>1</u>	Dissolved Oxygen	<u>8.11</u>
Undercut	<u>+</u>	Other		Rock-Log	<u>2</u>	Temperature	<u>16.0 C</u>
Root Mats	<u>+</u>			Sand	<u>1</u>	Total Dissolved Solids	
				Visuals	<u>1</u>		
				Other			

Field Observation: **Reedy Creek main stem inside the nature preserve park**

Sample Site: Reach 6 Reedy Creek

BENTHOS COLLECTION CARD

DATE 4/25/12 COLLECT. TIME 14:30 COLLECTORS S&ME, KHA CARD# 3
 STAT. LOC. 35.26335° N, -80.70140° W RIVER BASIN Catawba COUNTY Mecklenburg

<u>Substrate:</u>		<u>River:</u>		<u>Field Parameters:</u>			
Boulder (10")	<u>0</u> %	Mid depth	<u>inches</u>	Bank erosion	<input type="text" value="None"/>	Mod	Severe
Cobble (2 1/2 - 10")	<u>5</u> %	Max depth	<u>0.5 ft</u>	Canopy	% <u>75</u>	Type	trees
Gravel (2 1/2 - 1/12")	<u>35</u> %	Width	<u>3 ft</u>	Aufwuchs	<input type="text" value="None"/>	Mod	Severe
Sand (1/12")	<u>50</u> %	Current	<u>slow</u>	Podostemum	<input type="text" value="None"/>	Mod	Severe
Silt, fine particles	<u>10</u> %	Recent Rain?	<u>No</u>	Tribs present?		No	
Other	- %	<u>Photos (#)</u>					

<u>Instream Habitat:</u> (0, +, ++)		<u>Samples:</u> (# + Comments)		<u>Water Chemistry</u>			
Pools	<u>0</u>	Backwaters	<u>0</u>	Kicks	<u>1</u>	pH	<u>7.75</u>
Riffles	<u>+</u>	Detritus	<u>+</u>	Sweeps	<u>1</u>	Conductivity	<u>140.2</u>
Snags	<u>+</u>	Aquatic weeds	<u>0</u>	Leaf Packs	<u>1</u>	Dissolved Oxygen	<u>7.18</u>
Undercut	<u>+</u>	Other		Rock-Log	<u>1</u>	Temperature	<u>14.2 C</u>
Root Mats	<u>0</u>			Sand		Total Dissolved Solids	
				Visuals			
				Other			

Field Observation: **Reedy Creek main stem inside the nature preserve park**

Sample Site: Reach 7 Reedy Creek

BENTHOS COLLECTION CARD

DATE 4/25/12 COLLECT. TIME 12:45 COLLECTORS S&ME, KHA CARD# 2
 STAT. LOC. 35.26322° N, -80.70093° W RIVER BASIN Catawba COUNTY Mecklenburg

<u>Substrate:</u>		<u>River:</u>		<u>Field Parameters:</u>			
Boulder (10")	<u>0</u> %	Mid depth	<u>inches</u>	Bank erosion	<input type="text" value="None"/>	Mod	Severe
Cobble (2 1/2 - 10")	<u>15</u> %	Max depth	<u>0.5 ft</u>	Canopy	% <u>75</u>	Type	trees
Gravel (2 1/2 - 1/12")	<u>25</u> %	Width	<u>3 ft</u>	Aufwuchs	<input type="text" value="None"/>	Mod	Severe
Sand (1/12")	<u>50</u> %	Current	<u>slow</u>	Podostemum	<input type="text" value="None"/>	Mod	Severe
Silt, fine particles	<u>10</u> %	Recent Rain?	<u>No</u>	Tribs present?		No	
Other	- %	<u>Photos (#)</u>					

<u>Instream Habitat:</u> (0, +, ++)		<u>Samples:</u> (# + Comments)		<u>Water Chemistry</u>			
Pools	<u>0</u>	Backwaters	<u>0</u>	Kicks	<u>1</u>	pH	<u>7.98</u>
Riffles	<u>+</u>	Detritus	<u>+</u>	Sweeps	<u>1</u>	Conductivity	<u>122.6</u>
Snags	<u>+</u>	Aquatic weeds	<u>0</u>	Leaf Packs	<u>1</u>	Dissolved Oxygen	<u>8.67</u>
Undercut	<u>0</u>	Other		Rock-Log	<u>1</u>	Temperature	<u>13.2 C</u>
Root Mats	<u>0</u>			Sand		Total Dissolved Solids	
				Visuals			
				Other			

Field Observation: **Headwater tributary; shallow water depth. Sample on 4/25/12 was broken during shipment and was resampled on 5/16/12.**

Sample Site: Reach 8 Reedy Creek

BENTHOS COLLECTION CARD

DATE 4/25/12 COLLECT. TIME 09:40 COLLECTORS S&ME, KHA CARD# 1
 STAT. LOC. 35.26325° N, -80.70232° W RIVER BASIN Catawba COUNTY Mecklenburg

<u>Substrate:</u>		<u>River:</u>		<u>Field Parameters:</u>			
Boulder (10")	<u>0</u> %	Mid depth	<u>inches</u>	Bank erosion	<input type="text" value="None"/>	Mod	Severe
Cobble (2 1/2 - 10")	<u>10</u> %	Max depth	<u>0.5 ft</u>	Canopy	% <u>75</u>	Type	trees
Gravel (2 1/2 - 1/12")	<u>30</u> %	Width	<u>3 ft</u>	Aufwuchs	<input type="text" value="None"/>	Mod	Severe
Sand (1/12")	<u>50</u> %	Current	<u>slow</u>	Podostemum	<input type="text" value="None"/>	Mod	Severe
Silt, fine particles	<u>10</u> %	Recent Rain?	<u>slight</u>	Tribs present?		No	
Other	- %	<u>Photos (#)</u>					

<u>Instream Habitat:</u> (0, +, ++)		<u>Samples:</u> (# + Comments)		<u>Water Chemistry</u>	
Pools	<u>0</u> Backwaters	<u>0</u> Kicks	<u>1</u>	pH	<u>8.18</u>
Riffles	<u>+</u> Detritus	<u>+</u> Sweeps	<u>1</u>	Conductivity	<u>164.0</u>
Snags	<u>+</u> Aquatic weeds	<u>0</u> Leaf Packs	<u>1</u>	Dissolved Oxygen	<u>8.91</u>
Undercut	<u>0</u> Other	Rock-Log	<u>1</u>	Temperature	<u>11.6 C</u>
Root Mats	<u>+</u>	Sand		Total Dissolved Solids	
		Visuals			
		Other			

Field Observation: **Headwater tributary; shallow water depth. Sample on 4/25/12 was broken during shipment and was resampled on 5/16/12.**

Sample Site: Reach 9 Reedy Creek

BENTHOS COLLECTION CARD

DATE 4/25/12 COLLECT. TIME 08:30 COLLECTORS S&ME, KHA CARD# 4
 STAT. LOC. 35.25839° N, -80.70257° W RIVER BASIN Catawba COUNTY Mecklenburg

<u>Substrate:</u>		<u>River:</u>		<u>Field Parameters:</u>			
Boulder (10")	<u>0</u> %	Mid depth	<u>inches</u>	Bank erosion	<input type="text" value="None"/>	Mod	Severe
Cobble (2 1/2 - 10")	<u>5</u> %	Max depth	<u>0.5 ft</u>	Canopy	%	<u>25</u>	Type shrubs
Gravel (2 1/2 - 1/12")	<u>30</u> %	Width	<u>5 ft</u>	Aufwuchs	<input type="text" value="None"/>	Mod	Severe
Sand (1/12")	<u>55</u> %	Current	<u>slow</u>	Podostemum	<input type="text" value="None"/>	Mod	Severe
Silt, fine particles	<u>10</u> %	Recent Rain?	<u>slight</u>	Tribs present?			No
Other	-	%	<u>Photos (#)</u>				

<u>Instream Habitat:</u> (0, +, ++)			<u>Samples:</u> (# + Comments)		<u>Water Chemistry</u>	
Pools	<u>+</u>	Backwaters	<u>0</u>	Kicks	<u>1</u>	pH <u>8.18</u>
Riffles	<u>+</u>	Detritus	<u>+</u>	Sweeps	<u>1</u>	Conductivity <u>139.9</u>
Snags	<u>+</u>	Aquatic weeds	<u>0</u>	Leaf Packs	<u>1</u>	Dissolved Oxygen <u>8.41</u>
Undercut	<u>0</u>	Other		Rock-Log	<u>1</u>	Temperature <u>14.2 C</u>
Root Mats	<u>0</u>			Sand		Total Dissolved Solids
				Visuals		
				Other		

Field Observation: **Under an existing power-line right of way**

Sample Site: Reach 10 Reedy Creek

BENTHOS COLLECTION CARD

DATE 4/26/12 COLLECT. TIME 15:30 COLLECTORS S&ME, KHA CARD# 6
 STAT. LOC. 35.25692° N, -80.70133° W RIVER BASIN Catawba COUNTY Mecklenburg

<u>Substrate:</u>		<u>River:</u>		<u>Field Parameters:</u>			
Boulder (10")	<u>0</u> %	Mid depth	<u>inches</u>	Bank erosion	None	<u>Mod</u>	Severe
Cobble (2 1/2 - 10")	<u>5</u> %	Max depth	<u>0.5 ft</u>	Canopy	% <u>70</u>	Type	trees
Gravel (2 1/2 - 1/12")	<u>15</u> %	Width	<u>14 ft</u>	Aufwuchs	<u>None</u>	Mod	Severe
Sand (1/12")	<u>70</u> %	Current	<u>slow</u>	Podostemum	None	Mod	Severe
Silt, fine particles	<u>10</u> %	Recent Rain?	<u>No</u>	Tribs present?		No	
Other	<u>-</u> %	<u>Photos (#)</u>					

<u>Instream Habitat:</u> (0, +, ++)		<u>Samples:</u> (# + Comments)		<u>Water Chemistry</u>			
Pools	<u>0</u>	Backwaters	<u>0</u>	Kicks	<u>0</u>	pH	<u>8.01</u>
Riffles	<u>0</u>	Detritus	<u>+</u>	Sweeps	<u>5</u>	Conductivity	<u>105.6</u>
Snags	<u>0</u>	Aquatic weeds	<u>0</u>	Leaf Packs	<u>1</u>	Dissolved Oxygen	<u>8.11</u>
Undercut	<u>0</u>	Other	<u>sand</u>	Rock-Log	<u>0</u>	Temperature	<u>15.5 C</u>
Root Mats	<u>+</u>			Sand	<u>3</u>	Total Dissolved Solids	
				Visuals	<u>1</u>		
				Other			

Field Observation: **Reedy Creek main stem. Sandy stream system with little available habitat. No riffles to use kick net**

Table 3. Taxa list and abundance for Reedy Creek sites (R1-R3), Mecklenburg County, 25 May 2011, S&ME

<u>Taxon</u>	<u>TV</u>	<u>Feeding Gr¹</u>	<u>R1</u>	<u>R2</u>	<u>R3</u>
EPHEMEROPTERA					
Baetis flavistriga	7.0	Scraper	16	-	1
Baetis pluto	4.3	Scraper	2	-	6
Acerpenna pygmaea	3.9	C-G	-	-	2
Maccaffertium modestum	5.5	C-G	-	2	12
Paraleptophlebia sp	0.9	C-G	-	-	2
TRICHOPTERA					
Cheumatopsyche spp	6.2	Filterer	12	6	11
Hydropsyche betteni	7.8	Filterer	4	-	1
Diplectrona modesta	2.2	Filterer	-	-	2
Chirnarra sp	2.8	Filterer	-	-	11
COLEOPTERA					
Stenelmis crenata	7.0	C-G	-	-	1
Neoporos sp	8.6	Predator	-	6	-
ODONATA					
Argia sp	8.2	Predator	-	-	3
DIPTERA: MISCELANEOUS					
Tipula spp	7.3	Shredder	7	11	3
Antocha sp	4.3	Scraper	-	-	1
Hexatoma sp	4.3	Predator	-	-	5
Pseudoplimnophila sp	7.2	C-G	-	-	2
Anopheles sp	8.6	Filterer	1	-	-
Dixa spp	2.6	Predator	-	2	6
Empididae	7.6	C-G	-	1	-
Simulium sp	6.0	Predator	8	2	4
Simulium venustum	7.1	Predator	1	8	-
Bittacomorpha sp	-	C-G	-	1	-
DIPTERA: CHIRONOMIDAE					
Ablabesmyia mallochi	7.2	Predator	-	-	1
Conchapelopia group	8.4	Predator	1	1	2
Chironomus spp	9.6	C-G	-	5	-
Cryptochironomus sp	6.4	Predator	-	-	1
Microtendipes sp	5.5	C-G	3	-	4
Phaenopsectra flavipes gr.	7.9	C-G	1	-	-
Phaenopsectra sp	6.5	C-G	4	-	-
Paracladopelma sp	5.5	Predator?	1	-	-
Polypedilum illinoense	9.0	C-G	1	-	-
Polypedilum flavum	4.9	C-G	-	2	1
Polypedilum fallax	6.4	C-G	-	1	-
Rheotanytarsus sp	5.9	Filterer	-	1	-
Eukifferiella claripennis gr	5.6	C-G	2	-	-
Parametriocnemus lundbecki	3.7	C-G	2	2	-
CRUSTACEA					
Cambarus sp	7.6	Omnivore	-	3	-
MOLLUSCA					
Physella sp	8.8	Scraper	-	1	-
¹ C-G = Collector-Gatherer, TV = Tolerance Value					
Total Taxa Richness			18	18	22
EPT Taxa Richness			4	2	9
NC Biotic Index			6.5	7.1	4.9

Notes

- All sites are too small for a Bioclassification (rating) using normal DWQ criteria for streams greater than 4 meters wide.
- DWQ criteria for small stream assume permanent flow and are based solely on Biotic Index values. These criteria give ratings of Fair for R1, Poor for R2 and Good for R3.
- Low dissolved oxygen is suggested for site R2 (at least in some microhabitats) by the abundance of *Chironomus*.
- Site R3 is much different than all other sites, with several intolerant species being present: *Chimarra*, *Diplectrona modesta*, and *Paraleptophlebia* and *Baetis pluto*. This site has unusually good water quality for a stream in Mecklenburg County.

Table 1. List of macroinvertebrates collected at Reedy Creek sites, Mecklenburg County, April and May 2012.

Taxa	Site:	R6	R7	R8	R9	R5	R10
EPHEMEROPTERA							
Maccaffertium modestum		3	-	3	10	2	-
Paraleptophlebia/Habrophliodes		3	1	3	5	-	1
Ameletus lineatus		1	-	-	-	-	-
Baetis pluto		10	-	-	4	6	-
B. flavistriga		-	-	-	-	1	-
Centroptilum triangulifer		-	-	-	1	-	-
Dipheter hageni		-	1	3	-	-	-
Paracloeodes fleeki		1	-	1	3	1	-
Plauditus cestus		2	-	-	-	-	-
P. dubius gr (2-3?)		14	-	-	-	-	-
Pseudocloeon propinquum		25	-	5	22	1	9
Eurylophella verisimilis		2	-	-	1	-	-
PLECOPTERA							
Eccoptura xanthenes		-	-	-	1	-	-
Perlesta sp		12	-	37	4	-	-
Haploperla brevis		38	-	2	5	-	-
TRICHOPTERA							
Cheumatopsyche spp		5	7	1	1	13	4
Diplectrone modesta		-	-	3	-	-	-
Chimarra sp		-	-	-	1	2	-
Pycnopsyche spp		-	-	-	3	2	-
Ironoquia punctatissima		-	1	-	-	-	1
Triaenodes ignitus		-	1	-	-	-	-
Lepidostoma sp		1	-	-	-	2	-
COLEOPTERA							
Helichus spp		2	1	2	3	-	-
Stenelmis crenata		-	-	-	1	-	-
Neoporus spp		2	-	3	-	4	3
Tropisternus sp (larvae)		-	4	-	-	-	-
ODONATA							
Calopteryx sp		-	1	-	7	-	4
Cordulegaster sp		1	1	-	-	1	-
Ophiogomphus sp		3	-	1	6	-	1
Progomphus obscurus		-	1	-	7	-	4
Stylogomphus albistylus		1	-	1	1	-	-
Boyeria vinosa (very small)		1	-	-	-	-	1
DIPTERA: MISC.							
Dixa sp		-	-	-	3	-	-
Dixella indiana		-	1	2	2	3	2
Hexatoma sp		-	-	3	-	-	-
Tipula sp		3	3	10	10	2	-
Pseudolimnophila sp		-	-	1	1	1	-
Simulium spp (3+)		7	37	1	16	23	10
Chrysops sp		-	2	-	-	-	-

Taxa	Site:	R6	R7	R8	R9	R5	R10
DIPTERA: CHIRONOMIDAE							
Conchapelopia group		1	9	22	2	5	-
Natarsia sp		-	1	1	-	-	-
Procladius sp		1	-	-	-	-	-
Zavrelimyia sp		-	1	1	-	1	-
Brillia sp		-	-	1	-	-	-
Corynoneura spp		-	-	-	1	2	1
Thienemaniella spp		-	-	1	1	3	1
Cricotopus bicinctus		-	-	-	3	1	-
Cricotopus vierriensis gr		-	-	-	-	-	1
Krenosmittia sp		-	-	1	-	-	-
Parametrioconemus lundbecki		7	11	25	4	6	-
Tvetenia bavarica gr		4	-	2	3	3	-
Eukiefferiella claripennis gr		-	-	-	-	1	-
Rheosmittia sp		-	-	-	1	-	-
Rheotanytarsus sp		1	-	-	-	-	1
Paratanytarsus sp		-	3	-	1	-	-
Tanytarsus spp		-	-	-	-	2	1
Chironomus spp		13	10	-	2	6	1
Cryptochironomus spp		-	1	5	-	-	-
Microtendipes sp		-	-	-	-	2	-
Paratendipes sp		-	1	1	-	-	-
Polypedilum aviceps		3	3	17	-	2	-
Polypedilum illinoense gr		-	-	1	3	1	-
Polypedilum fallax gr		1	-	1	1	-	-
Polypedilum tritum		1	-	-	-	-	-
Polypedilum scalaenum gr		-	-	2	-	-	-
Phaenopsectra sp		-	1	-	1	-	-
Phaenopsectra flavipes gr		-	-	1	-	1	-
Tribelos jucundum		1	-	-	-	-	-
OLIGOCHAETA							
Ecclipidrilus sp		-	-	-	1	-	-
Lumbriculus variegatus		-	-	1	-	-	-
Nais sp		4	-	-	-	-	-
CRUSTACEA							
Cambarus spp		1	-	-	1	1	3
MOLLUSCA							
Physa sp		-	2	5	-	1	-
Total Taxa Richness		33	24	30	38	31	18
EPT Taxa Richness		13	5	9	13	9	4
EPT Abundance		116	11	58	61	30	15
NC Biotic Index		4.2	6.2	4.9	5.5	5.6	5.9
Width (ft)		3	2.5	2.5	5	10	14

Notes

-Rating by Small-stream criteria would give:

Excellent – R6

Good – R8

Good-Fair – R9, R5, R10

Fair – R7

Looking only at NCBI values for larger streams (ignoring EPT taxa richness), we would get:

Excellent – R6 and R8

Good – R9 and R5

Good-Fair – R7 and R10

Just looking at a gradient of water quality, we get:

R6 > R8 > R9/R5 > R7/R10

-These data give a very nice picture of water/habitat quality in the Reedy Creek catchment. R6 has the best water quality, with minor problem in the R8 trib and more severe problems in the R7 trib. These combine to produce only minor stress at the downstream R9 site. An EPT taxa richness of 13 is high for such small streams. [I have been sampling many such tribs in Orange and Chatham counties.]

-Both mainstem sites show some problems, more severe at the downstream site.

-Very few taxa of interest, except that this is Mecklenburg County where it is rare to find any abundant stoneflies. The *Perlesta* looks a little different from the usual species, and may be an unknown or unassociated species. *Krenosmittia* is rarely seen, although this may reflect its small size and habitat.

Benthic Macroinvertebrate Calculations
Reedy Creek Feasibility Study- Additional Sampling, Charlotte, N.C.

S&ME Project No. 1357-12-009
June 5, 2012

		R1	R2	R3	R6	R7	R8	R9	R5	R10
Collection date:		5/25/11	5/25/11	5/25/11	4/25/12	5/16/12	5/16/21	4/26/12	4/26/12	4/26/12
Taxon	TV	Number Identified								
EPHEMEROPTERA										
Maccaffertium modestum	5.7	0	2	12	3	0	3	10	2	0
Paraleptophlebia/Habrophliodes	1.2	0	0	2	3	1	3	5	0	1
Ameletus lineatus	2.4	0	0	0	1	0	0	0	0	0
Baetis pluto	3.4	2	0	6	10	0	0	4	6	0
Baetis flavistriga	6.8	16	0	1	0	0	0	0	1	0
Acerpenna pygmaea	3.7	0	0	2	0	0	0	0	0	0
Centroptilum triangulifer	3.8	0	0	0	0	0	0	1	0	0
Dipheter hageni	1.1	0	0	0	0	1	3	0	0	0
Paracloeodes fleeki	8	0	0	0	1	0	1	3	1	0
Plauditus cestus	4.6	0	0	0	2	0	0	0	0	0
Plauditus dubius gr (2-3?)	2.2	0	0	0	14	0	0	0	0	0
Pseudocloeon propinquum	5.8	0	0	0	25	0	5	22	1	9
Eurylophella verisimilis	3.9	0	0	0	2	0	0	1	0	0
PLECOPTERA										
Eccoptura xanthenes	4.7	0	0	0	0	0	0	1	0	0
Perlesta sp	2.9	0	0	0	12	0	37	4	0	0
Haploperla brevis	1.4	0	0	0	38	0	2	5	0	0
TRICHOPTERA										
Cheumatopsyche spp	6.6	12	6	11	5	7	1	1	13	4
Hydropsyche betteni	7.9	4	0	1	0	0	0	0	0	0
Diplectrona modesta	2.3	0	0	2	0	0	3	0	0	0
Chimarra sp	3.3	0	0	11	0	0	0	1	2	0
Pycnopsyche spp	2.5	0	0	0	0	0	0	3	2	0
Ironoquia punctatissima	6.7	0	0	0	0	1	0	0	0	1
Triaenodes ignitus	2.7	0	0	0	0	1	0	0	0	0
Lepidostoma sp	1	0	0	0	1	0	0	0	2	0
COLEOPTERA										
Helichus spp	4.1	0	0	0	2	1	2	3	0	0
Stenelmis crenata	7.8	0	0	1	0	0	0	1	0	0
Neoporus spp	5	0	6	0	2	0	3	0	4	3
Tropisternus sp (larvae)	9.3	0	0	0	0	4	0	0	0	0
ODONATA										
Argia sp	8.3	0	0	3	0	0	0	0	0	0
Calopteryx sp	7.5	0	0	0	0	1	0	7	0	4
Cordulegaster sp	5.7	0	0	0	1	1	0	0	1	0
Ophiogomphus sp	5.9	0	0	0	3	0	1	6	0	1

Benthic Macroinvertebrate Calculations
 Reedy Creek Feasibility Study- Additional Sampling, Charlotte, N.C.

S&ME Project No. 1357-12-009
 June 5, 2012

		R1	R2	R3	R6	R7	R8	R9	R5	R10
Collection date:		5/25/11	5/25/11	5/25/11	4/25/12	5/16/12	5/16/21	4/26/12	4/26/12	4/26/12
Taxon	TV	Number Identified								
Progomphus obscurus	8.2	0	0	0	0	1	0	7	0	4
Stylogomphus albistylus	5	0	0	0	1	0	1	1	0	0
Boyeria vinosa (very small)	5.8	0	0	0	1	0	0	0	0	1
DIPTERA: MISC.										
Dixa sp	2.5	0	2	6	0	0	0	3	0	0
Dixella indiana	4.9	0	0	0	0	1	2	2	3	2
Empididae	7.6	0	1	0	0	0	0	0	0	0
Hexatoma sp	3.5	0	0	5	0	0	3	0	0	0
Antocha sp.	4.4	0	0	1	0	0	0	0	0	0
Tipula sp	7.5	7	11	3	3	3	10	10	2	0
Pseudolimnophila sp	6.2	0	0	2	0	0	1	1	1	0
Anopheles sp.	8.6	1	0	0	0	0	0	0	0	0
Simulium spp (3+)	4.9	8	2	4	7	37	1	16	23	10
Simulium venustum	7.3	1	8	0	0	0	0	0	0	0
Bittacomorpha sp	--	0	1	0	0	0	0	0	0	0
Chrysops sp	6.7	0	0	0	0	2	0	0	0	0
DIPTERA: CHIRONOMIDAE										
Ablabesmyia mallochi	7.4	0	0	1	0	0	0	0	0	0
Brillia sp	5.7	0	0	0	0	0	1	0	0	0
Chironomus spp	9.3	0	5	0	13	10	0	2	6	1
Conchapelopia group	--	1	1	2	1	9	22	2	5	0
Corynoneura spp	5.7	0	0	0	0	0	0	1	2	1
Cricotopus bicinctus	8.7	0	0	0	0	0	0	3	1	0
Cricotopus vierriensis gr	5.4	0	0	0	0	0	0	0	0	1
Cryptochironomus spp	6.4	0	0	1	0	1	5	0	0	0
Eukiefferiella claripennis gr	6.2	2	0	0	0	0	0	0	1	0
Krenosmittia sp	--	0	0	0	0	0	1	0	0	0
Microtendipes sp	4.6	3	0	4	0	0	0	0	2	0
Natarsia sp	9.6	0	0	0	0	1	1	0	0	0
Paracladopelma sp	6.3	1	0	0	0	0	0	0	0	0
Parametrioconemus lundbecki	3.9	2	2	0	7	11	25	4	6	0
Paratanytarsus sp	8	0	0	0	0	3	0	1	0	0
Paratendipes sp	5.6	0	0	0	0	1	1	0	0	0

Benthic Macroinvertebrate Calculations
Reedy Creek Feasibility Study- Additional Sampling, Charlotte, N.C.

S&ME Project No. 1357-12-009
June 5, 2012

Collection date:		R1	R2	R3	R6	R7	R8	R9	R5	R10
		5/25/11	5/25/11	5/25/11	4/25/12	5/16/12	5/16/21	4/26/12	4/26/12	4/26/12
Taxon	TV	Number Identified								
Phaenopsectra flavipes gr	--	1	0	0	0	0	1	0	1	0
Phaenopsectra sp	--	4	0	0	0	1	0	1	0	0
Polypedilum aviceps	3.6	0	0	0	3	3	17	0	2	0
Polypedilum fallax gr	6.5	0	1	0	1	0	1	1	0	0
Polypedilum flavum	5.7	0	2	1	0	0	0	0	0	0
Polypedilum illinoense gr	8.7	1	0	0	0	0	1	3	1	0
Polypedilum scalaenum gr	8.5	0	0	0	0	0	2	0	0	0
Polypedilum tritum	--	0	0	0	1	0	0	0	0	0
Procladius sp	8.8	0	0	0	1	0	0	0	0	0
Rheosmittia sp	6.8	0	0	0	0	0	0	1	0	0
Rheotanytarsus sp	6.5	0	1	0	1	0	0	0	0	1
Tanytarsus spp	6.6	0	0	0	0	0	0	0	2	1
Thienemaniella spp	6.4	0	0	0	0	0	1	1	3	1
Tribelos jucundum	5.7	0	0	0	1	0	0	0	0	0
Tvetenia bavarica gr	3.6	0	0	0	4	0	2	3	3	0
Zavrelimyia sp	8.6	0	0	0	0	1	1	0	1	0
OLIGOCHAETA										
Eclipidrilus sp	--	0	0	0	0	0	0	1	0	0
Lumbriculus variegatus	--	0	0	0	0	0	1	0	0	0
Nais sp	8.7	0	0	0	4	0	0	0	0	0
CRUSTACEA										
Cambarus spp	7.5	0	3	0	1	0	0	1	1	3
MOLLUSCA										
Physa sp	8.7	0	1	0	0	2	5	0	1	0
TOTALS		66	55	82	175	105	170	143	102	49

Summary Metrics	R1	R2	R3	R6	R7	R8	R9	R5	R10
Survey Method	Qual4	Standard	Standard						
Total Taxa Richness	16	17	22	33	25	35	38	31	18
Total Abundance	66	55	82	175	105	170	143	102	49
EPT Taxa Richness	4	2	9	13	5	9	13	9	4
EPT Abundance	34	8	48	117	11	58	61	30	15
NC Raw Biotic Index	6.49	6.89	5.16	4.62	6.23	4.80	5.47	5.67	6.03
Seasonally Corrected Biotic Index	6.69	7.09	5.36	4.82	6.43	5.00	5.67	5.87	6.23
Biotic Index Bioclassification Score	Fair	Poor	Good	Good	Fair	Good	Good-Fair	Fair	Fair

APPENDIX II

PHYSIOCHEMICAL FIELD ASSESSMENT DATA

Water Quality Laboratory Results:
Report of Analysis 6/3/2011 (**Shealy**)
Report of Analysis 6/27/2011 (**Shealy**)
Sample Results 5/10/2012 (**Prism**)

Water Quality Index (WQI) Calculations
(**S&ME**)



Report of Analysis

S&ME, Inc.

9751 Southern Pine Blvd
Charlotte, NC 28273
Attention: Joey Lawler

Project Name: **Reedy Creek**

Project Number: **1357-11-011**

Lot Number: **ME24031**

Date Completed: **06/03/2011**



Nisreen Saikaly
Project Manager



This report shall not be reproduced, except in its entirety, without the written approval of Shealy Environmental Services, Inc.

The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

* ME24031 *

SHEALY ENVIRONMENTAL SERVICES, INC.

SC DHEC No: 32010

NELAC No: E87653

NC DEHNR No: 329

Case Narrative

S&ME, Inc.

Lot Number: ME24031

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

Shealy is not NELAC certified for Phosphorus by 365.1 but is certified in SC and NC.

Shealy is not NELAC certified for VPH, but is certified for VPH in NC.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

SHEALY ENVIRONMENTAL SERVICES, INC.

Sample Summary

S&ME, Inc.

Lot Number: ME24031

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	Reach 1	Aqueous	05/24/2011 1200	05/24/2011
002	Reach 2	Aqueous	05/24/2011 1100	05/24/2011
003	Reach 3	Aqueous	05/24/2011 1220	05/24/2011

(3 samples)

SHEALY ENVIRONMENTAL SERVICES, INC.

Executive Summary

S&ME, Inc.

Lot Number: ME24031

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	Reach 1	Aqueous	Nitrate - N	353.2	0.49		mg/L	5
001	Reach 1	Aqueous	Phosphorus	365.1	0.054		mg/L	5
001	Reach 1	Aqueous	TDS	SM 2540C	100		mg/L	5
001	Reach 1	Aqueous	Fecal Coliform-MF	SM 9222D	520		col/100	5
002	Reach 2	Aqueous	Nitrate - N	353.2	0.086		mg/L	6
002	Reach 2	Aqueous	Phosphorus	365.1	0.021		mg/L	6
002	Reach 2	Aqueous	TDS	SM 2540C	92		mg/L	6
002	Reach 2	Aqueous	Fecal Coliform-MF	SM 9222D	100	*	col/100	6
003	Reach 3	Aqueous	Nitrate - N	353.2	1.3		mg/L	7
003	Reach 3	Aqueous	Phosphorus	365.1	0.025		mg/L	7
003	Reach 3	Aqueous	TDS	SM 2540C	130		mg/L	7
003	Reach 3	Aqueous	Fecal Coliform-MF	SM 9222D	690	*	col/100	7

(12 detections)

Inorganic non-metals

Client: **S&ME, Inc.**

Laboratory ID: **ME24031-001**

Description: **Reach 1**

Matrix: **Aqueous**

Date Sampled: **05/24/2011 1200**

Date Received: **05/24/2011**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(BOD, 5 day) SM 5210B	1	05/30/2011 1002	LDJ	05/25/2011 1141	6379
1		(Nitrate - N) 353.2	1	05/24/2011 1829	SMH		60308
1		(Phosphorus) 365.1	1	05/26/2011 1835	PMM	05/26/2011 0937	60426
1		(TDS) SM 2540C	1	05/25/2011 1400	MML		60331
1		(Fecal Colifo) SM	1	05/25/2011 1610	HBB	05/24/2011 1628	

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
BOD, 5 day		SM 5210B	ND		2.0	mg/L	1
Nitrate - N		353.2	0.49		0.020	mg/L	1
Phosphorus	7723-14-0	365.1	0.054		0.010	mg/L	1
TDS		SM 2540C	100		10	mg/L	1
Fecal Coliform-MF		SM 9222D	520		2	col/100mL	1

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

ND = Not detected at or above the PQL

J = Estimated result < PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

N = Recovery is out of criteria

H = Out of holding time

Inorganic non-metals

Client: **S&ME, Inc.**

Laboratory ID: **ME24031-002**

Description: **Reach 2**

Matrix: **Aqueous**

Date Sampled: **05/24/2011 1100**

Date Received: **05/24/2011**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(BOD, 5 day) SM 5210B	1	05/30/2011 1002	LDJ	05/25/2011 1141	6379
1		(Nitrate - N) 353.2	1	05/24/2011 1832	SMH		60308
1		(Phosphorus) 365.1	1	05/26/2011 1835	PMM	05/26/2011 0937	60426
1		(TDS) SM 2540C	1	05/25/2011 1400	MML		60331
1		(Fecal Colifo) SM	1	05/25/2011 1610	HBB	05/24/2011 1628	

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
BOD, 5 day		SM 5210B	ND		2.0	mg/L	1
Nitrate - N		353.2	0.086		0.020	mg/L	1
Phosphorus	7723-14-0	365.1	0.021		0.010	mg/L	1
TDS		SM 2540C	92		10	mg/L	1
Fecal Coliform-MF		SM 9222D	100	*	2	col/100mL	1

Footnote(s): * Estimated

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

ND = Not detected at or above the PQL

J = Estimated result < PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

N = Recovery is out of criteria

H = Out of holding time

Inorganic non-metals

Client: **S&ME, Inc.**

Laboratory ID: **ME24031-003**

Description: **Reach 3**

Matrix: **Aqueous**

Date Sampled: **05/24/2011 1220**

Date Received: **05/24/2011**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(BOD, 5 day) SM 5210B	1	05/30/2011 1002	LDJ	05/25/2011 1141	6379
1		(Nitrate - N) 353.2	1	05/24/2011 1833	SMH		60308
1		(Phosphorus) 365.1	1	05/26/2011 1835	PMM	05/26/2011 0937	60426
1		(TDS) SM 2540C	1	05/25/2011 1400	MML		60331
1		(Fecal Colifo) SM	1	05/25/2011 1610	HBB	05/24/2011 1628	

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
BOD, 5 day		SM 5210B	ND		2.0	mg/L	1
Nitrate - N		353.2	1.3		0.020	mg/L	1
Phosphorus	7723-14-0	365.1	0.025		0.010	mg/L	1
TDS		SM 2540C	130		10	mg/L	1
Fecal Coliform-MF		SM 9222D	690	*	2	col/100mL	1

Footnote(s): * Estimated

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

ND = Not detected at or above the PQL

J = Estimated result < PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

N = Recovery is out of criteria

H = Out of holding time

Report of Analysis

S&ME, Inc.
9751 Southern Pine Blvd
Charlotte, NC 28273
Attention: Darrin Peine

Project Name: Reedy Creek

Project Number: 1357-11-011

Lot Number: MF16043

Date Completed: 06/27/2011



Nisreen Saikaly
Project Manager



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The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

*** MF 16043 ***

SHEALY ENVIRONMENTAL SERVICES, INC.

SC DHEC No: 32010

NELAC No: E87653

NC DEHNR No: 329

Case Narrative

S&ME, Inc.

Lot Number: MF16043

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

Shealy is not NELAC certified for Phosphorus by 365.1 but is certified in SC and NC.

Shealy is not NELAC certified for VPH, but is certified for VPH in NC.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

SHEALY ENVIRONMENTAL SERVICES, INC.

Sample Summary

S&ME, Inc.

Lot Number: MF16043

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	Reach 1	Aqueous	06/16/2011 1100	06/16/2011
002	Reach 2	Aqueous	06/16/2011 1045	06/16/2011
003	Reach 3	Aqueous	06/16/2011 1130	06/16/2011

(3 samples)

SHEALY ENVIRONMENTAL SERVICES, INC.

Executive Summary

S&ME, Inc.

Lot Number: MF16043

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	Reach 1	Aqueous	TS	SM 2540B	96		mg/L	5
002	Reach 2	Aqueous	TS	SM 2540B	100		mg/L	6
002	Reach 2	Aqueous	Turbidity	180.1	4.4		NTU	6
003	Reach 3	Aqueous	TS	SM 2540B	93		mg/L	7
003	Reach 3	Aqueous	Turbidity	180.1	1.2		NTU	7

(5 detections)

Inorganic non-metals

Client: S&ME, Inc.	Laboratory ID: MF16043-001
Description: Reach 1	Matrix: Aqueous
Date Sampled: 06/16/2011 1100	
Date Received: 06/16/2011	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(TS) SM 2540B	1	06/22/2011 0813	ARW		62360
1		(Turbidity) 180.1	1	06/17/2011 1330	ARW		

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
TS		SM 2540B	96		10	mg/L	1
Turbidity		180.1	ND		1.0	NTU	1

PQL = Practical quantitation limit B = Detected in the method blank E = Quantitation of compound exceeded the calibration range
 ND = Not detected at or above the PQL J = Estimated result < PQL and ≥ MDL P = The RPD between two GC columns exceeds 40%
 Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W" N = Recovery is out of criteria H = Out of holding time

Inorganic non-metals

Client: S&ME, Inc.	Laboratory ID: MF16043-002
Description: Reach 2	Matrix: Aqueous
Date Sampled: 06/16/2011 1045	
Date Received: 06/16/2011	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(TS) SM 2540B	1	06/22/2011 0813	ARW		62360
1		(Turbidity) 180.1	1	06/17/2011 1330	ARW		

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
TS		SM 2540B	100		10	mg/L	1
Turbidity		180.1	4.4		1.0	NTU	1

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

ND = Not detected at or above the PQL

J = Estimated result < PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

N = Recovery is out of criteria

H = Out of holding time

Inorganic non-metals

Client: S&ME, Inc.	Laboratory ID: MF16043-003
Description: Reach 3	Matrix: Aqueous
Date Sampled: 06/16/2011 1130	
Date Received: 06/16/2011	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(TS) SM 2540B	1	06/22/2011 0813	ARW		62360
1		(Turbidity) 180.1	1	06/17/2011 1330	ARW		

Parameter	CAS Number	Analytical Method	Result	Q	PQL	Units	Run
TS		SM 2540B	93		10	mg/L	1
Turbidity		180.1	1.2		1.0	NTU	1

PQL = Practical quantitation limit

B = Detected in the method blank

E = Quantitation of compound exceeded the calibration range

ND = Not detected at or above the PQL

J = Estimated result < PQL and ≥ MDL

P = The RPD between two GC columns exceeds 40%

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

N = Recovery is out of criteria

H = Out of holding time



SHEALY ENVIRONMENTAL SERVICES, INC.
 106 Vantage Point Drive
 West Columbia, South Carolina 29172
 Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 113335

Client: **S F M G** Telephone No. / Fax No. / E-mail: **7645234726 dpeinc@smcinc.com** Quote No. _____
 Address: _____ City: _____ State: _____ Zip Code: _____ Page: _____ of _____
 Project Name: **Reedy Creek** P.O. No.: **54676**
 Project No.: **1357-11-011** Date: _____
 (Containers for each sample may be combined on one line.)

Report to Contact: **Darin Peine** Telephone No. / Fax No. / E-mail: _____ Quote No. _____
 Sampler's Signature: *Darin M. Peine* X
 Printed Name: **Darin M. Peine**

Project No.	P.O. No.	Date	Time	Matrix				No. of Containers by Preservative Type						Lot No.	Remarks / Cooler I.D.
				Aqueous	Solid	Agarous	Other	Unpres.	Formal.	HCl	WOM	SCS	KF		
Reach 1		6/16/11	11:00	6	0	0	0	0	0	0	0	0	0	0	MF16043
Reach 2		6/16/11	10:45	6	0	0	0	0	0	0	0	0	0		
Reach 3		6/16/11	11:30	6	0	0	0	0	0	0	0	0	0		

Possible Hazard Identification: Non-Hazard Flammable Skin Irritant Poison Unknown
 Turn Around Time Required (Prior lab approval required for expedited TAT): _____
 Standard: Rush (Specify) _____
 1. Requisitioned by: **S F M G** Date: **6/16/11** Time: **12:30**
 2. Requisitioned by: *[Signature]* Date: **6-16-11** Time: **15:25**
 3. Requisitioned by: _____ Date: _____ Time: _____

Sample Disposal: Return to Client Disposed by Lab
 Note: All samples are retained for six weeks from receipt unless other arrangements are made.
 QC Requirements (Specify): **Std: DRY TAT**
 1. Approved by: *[Signature]* Date: **6/16/11** Time: **12:30**
 2. Received by: _____ Date: _____ Time: _____
 3. Laboratory received by: *[Signature]* Date: **6/16/11** Time: **15:25**
 Comments: _____
 LAB USE ONLY: Received on ice (Circle) No Ice Pack

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy
 Document Number: F-AQ-012 Effective Date: 09-04-02

SHEALY ENVIRONMENTAL SERVICES, INC.

Shealy Environmental Services, Inc.
 Document Number: F-AD-016
 Revision Number: 8

Page 1 of 1
 Replaces Date: 02/23/11
 Effective Date: 05/06/11

Sample Receipt Checklist (SRC)

Client: SIME Cooler Inspected by/date: lu 16/16/11 Lot #: MF11043

Means of receipt: <input checked="" type="checkbox"/> SESI <input type="checkbox"/> Client <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Airborne Exp <input type="checkbox"/> Other			
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	1. Were custody seals present on the cooler?	
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	2. If custody seals were present, were they intact and unbroken?	
Cooler ID/temperature upon receipt: <u>5/5</u> °C <u>1</u> °C <u>1</u> °C <u>1</u> °C <u>1</u> °C <u>1</u> °C <u>1</u> °C <u>1</u> °C			
Method: <input type="checkbox"/> Temperature Blank <input checked="" type="checkbox"/> Against Bottles			
Method of coolant: <input checked="" type="checkbox"/> Wet Ice <input type="checkbox"/> Blue Ice <input type="checkbox"/> Dry Ice <input type="checkbox"/> None			
If response is No (or Yes for 14, 15, 16), an explanation/resolution must be provided.			
Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other: _____ (For coolers received via commercial courier, PMs are to be notified immediately.)
Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input type="checkbox"/>	4. Is the commercial courier's packing slip attached to this form?
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		5. Were proper custody procedures (relinquished/received) followed?
Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>	5a. Were samples relinquished by client to commercial courier?
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		6. Were sample IDs listed?
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		7. Was collection date & time listed?
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		8. Were tests to be performed listed on the COC?
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		9. Did all samples arrive in the proper containers for each test?
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		10. Did all container label information (ID, date, time) agree with COC?
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		11. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		12. Was adequate sample volume available?
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		13. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		14. Were any samples containers missing?
Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		15. Were there any excess samples not listed on COC?
Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>	16. Were bubbles present >"pea-size" (¼" or 6mm in diameter) in any VOA vials?
Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>	17. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>	18. Were all cyanide and/or sulfide samples received at a pH >12?
Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>	19. Were all applicable NH3/TKN/cyanide/phenol/BNA/pest/PCB/herb (<0.2mg/L) samples free of residual chlorine?
Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>	20. Were collection temperatures documented on the COC for NC samples?
Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)			
Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H ₂ SO ₄ , HNO ₃ , HCl, NaOH) with the SR # (number) _____			
Sample(s) _____ were received with bubbles >6 mm in diameter.			
Sample(s) _____ were received with TRC >0.2 mg/L for NH3/TKN/cyanide/BNA/pest/PCB/herb.			

Corrective Action taken, if necessary:

Was client notified: Yes No

SESI employee: _____

Comments: _____

Did client respond: Yes No

Date of response: _____

S&ME, Inc - Charlotte
Darren Peine
9751 Southern Pine Blvd.
Charlotte, NC 28273-5560

Project: Reedy Creek

Lab Submittal Date: 04/26/2012

Prism Work Order: 2040612

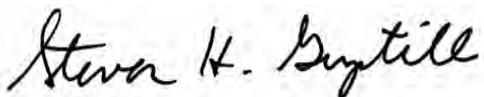
This data package contains the analytical results for the project identified above and includes a Case Narrative, Sample Results and Chain of Custody. Unless otherwise noted, all samples were received in acceptable condition and processed according to the referenced methods.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative.

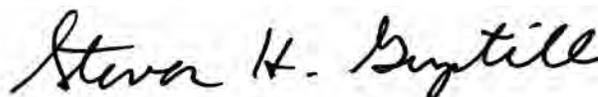
Please call if you have any questions relating to this analytical report.

Respectfully,

PRISM LABORATORIES, INC.



Project Manager



Reviewed By

Data Qualifiers Key Reference:

- A Seed value is greater than 1 mg/L, but validity of the data is not affected.
- BRL Below Reporting Limit
- MDL Method Detection Limit
- RPD Relative Percent Difference
- * Results reported to the reporting limit. All other results are reported to the MDL with values between MDL and reporting limit indicated with a J.

Client Sample ID	Lab Sample ID	Matrix	Date Sampled	Date Received
R6	2040612-01	Water	04/26/12	04/26/12
R7	2040612-02	Water	04/26/12	04/26/12
R8	2040612-03	Water	04/26/12	04/26/12
R9	2040612-04	Water	04/26/12	04/26/12
R10	2040612-05	Water	04/26/12	04/26/12
R5	2040612-06	Water	04/26/12	04/26/12

Samples received in good condition at 3.7 degrees C unless otherwise noted.

S&ME, Inc - Charlotte
Attn: Darren Peine
9751 Southern Pine Blvd.
Charlotte, NC 28273-5560

Project: Reedy Creek

Sample Matrix: Water

Client Sample ID: R6
Prism Sample ID: 2040612-01
Prism Work Order: 2040612
Time Collected: 04/26/12 11:55
Time Submitted: 04/26/12 14:07

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Anions by Ion Chromatography									
Nitrate as N	0.52	mg/L	0.10	0.0015	1	*300.0	4/27/12 16:50	RSL	P2D0498
General Chemistry Parameters									
Biochemical Oxygen Demand	16 A	mg/L	2.0		1	*SM5210 B	4/27/12 14:30	MSV	P2E0005
Phosphorus-Total	0.089	mg/L	0.050	0.0088	1	*SM4500-P F	5/1/12 8:19	CLB	P2D0549
Total Solids	110	mg/L	20	4.9	1	*SM2540 B	4/30/12 12:30	JAB	P2D0544
Turbidity	2.8	NTU	0.40	0.022	1	*180.1	4/27/12 8:45	JAB	P2D0515
Microbiological Parameters									
Fecal Coliforms	62	CFU/100 ml	2		1	*SM9222 D	4/26/12 15:04	RSL	P2D0521

S&ME, Inc - Charlotte
 Attn: Darren Peine
 9751 Southern Pine Blvd.
 Charlotte, NC 28273-5560

Project: Reedy Creek

Sample Matrix: Water

Client Sample ID: R7
 Prism Sample ID: 2040612-02
 Prism Work Order: 2040612
 Time Collected: 04/26/12 12:00
 Time Submitted: 04/26/12 14:07

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Anions by Ion Chromatography									
Nitrate as N	0.16	mg/L	0.10	0.0015	1	*300.0	4/27/12 17:06	RSL	P2D0498
General Chemistry Parameters									
Biochemical Oxygen Demand	2.1 A	mg/L	2.0		1	*SM5210 B	4/27/12 14:30	MSV	P2E0005
Phosphorus-Total	0.090	mg/L	0.050	0.0088	1	*SM4500-P F	5/1/12 8:19	CLB	P2D0549
Total Solids	100	mg/L	20	4.9	1	*SM2540 B	4/30/12 12:30	JAB	P2D0544
Turbidity	11	NTU	0.40	0.022	1	*180.1	4/27/12 8:45	JAB	P2D0515
Microbiological Parameters									
Fecal Coliforms	350	CFU/100 ml	2		1	*SM9222 D	4/26/12 15:04	RSL	P2D0521

S&ME, Inc - Charlotte
 Attn: Darren Peine
 9751 Southern Pine Blvd.
 Charlotte, NC 28273-5560

Project: Reedy Creek

Sample Matrix: Water

Client Sample ID: R8
 Prism Sample ID: 2040612-03
 Prism Work Order: 2040612
 Time Collected: 04/26/12 11:45
 Time Submitted: 04/26/12 14:07

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Anions by Ion Chromatography									
Nitrate as N	1.8	mg/L	0.10	0.0015	1	*300.0	4/27/12 16:33	RSL	P2D0498
General Chemistry Parameters									
Biochemical Oxygen Demand	BRL _A	mg/L	2.0		1	*SM5210 B	4/27/12 14:30	MSV	P2E0005
Phosphorus-Total	0.12	mg/L	0.050	0.0088	1	*SM4500-P F	5/1/12 8:19	CLB	P2D0549
Total Solids	120	mg/L	20	4.9	1	*SM2540 B	4/30/12 12:30	JAB	P2D0544
Turbidity	1.8	NTU	0.40	0.022	1	*180.1	4/27/12 8:45	JAB	P2D0515
Microbiological Parameters									
Fecal Coliforms	200	CFU/100 ml	2		1	*SM9222 D	4/26/12 15:04	RSL	P2D0521

S&ME, Inc - Charlotte
 Attn: Darren Peine
 9751 Southern Pine Blvd.
 Charlotte, NC 28273-5560

Project: Reedy Creek

Sample Matrix: Water

Client Sample ID: R9
 Prism Sample ID: 2040612-04
 Prism Work Order: 2040612
 Time Collected: 04/26/12 12:15
 Time Submitted: 04/26/12 14:07

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Anions by Ion Chromatography									
Nitrate as N	0.68	mg/L	0.10	0.0015	1	*300.0	4/27/12 17:22	RSL	P2D0498
General Chemistry Parameters									
Biochemical Oxygen Demand	BRL _A	mg/L	2.0		1	*SM5210 B	4/27/12 14:30	MSV	P2E0005
Phosphorus-Total	0.094	mg/L	0.050	0.0088	1	*SM4500-P F	5/1/12 8:19	CLB	P2D0549
Total Solids	100	mg/L	20	4.9	1	*SM2540 B	4/30/12 12:30	JAB	P2D0544
Turbidity	4.4	NTU	0.40	0.022	1	*180.1	4/27/12 8:45	JAB	P2D0515
Microbiological Parameters									
Fecal Coliforms	740	CFU/100 ml	2		1	*SM9222 D	4/26/12 15:04	RSL	P2D0521

S&ME, Inc - Charlotte
Attn: Darren Peine
9751 Southern Pine Blvd.
Charlotte, NC 28273-5560

Project: Reedy Creek

Sample Matrix: Water

Client Sample ID: R10
Prism Sample ID: 2040612-05
Prism Work Order: 2040612
Time Collected: 04/26/12 12:20
Time Submitted: 04/26/12 14:07

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Anions by Ion Chromatography									
Nitrate as N	0.28	mg/L	0.10	0.0015	1	*300.0	4/27/12 17:39	RSL	P2D0498
General Chemistry Parameters									
Biochemical Oxygen Demand	13 A	mg/L	2.0		1	*SM5210 B	4/27/12 14:30	MSV	P2E0005
Phosphorus-Total	0.080	mg/L	0.050	0.0088	1	*SM4500-P F	5/1/12 8:19	CLB	P2D0549
Total Solids	90	mg/L	20	4.9	1	*SM2540 B	4/30/12 12:30	JAB	P2D0544
Turbidity	2.9	NTU	0.40	0.022	1	*180.1	4/27/12 8:45	JAB	P2D0515
Microbiological Parameters									
Fecal Coliforms	470	CFU/100 ml	2		1	*SM9222 D	4/26/12 15:04	RSL	P2D0521

S&ME, Inc - Charlotte
 Attn: Darren Peine
 9751 Southern Pine Blvd.
 Charlotte, NC 28273-5560

Project: Reedy Creek

Sample Matrix: Water

Client Sample ID: R5
 Prism Sample ID: 2040612-06
 Prism Work Order: 2040612
 Time Collected: 04/26/12 13:15
 Time Submitted: 04/26/12 14:07

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Anions by Ion Chromatography									
Nitrate as N	0.28	mg/L	0.10	0.0015	1	*300.0	4/27/12 17:55	RSL	P2D0498
General Chemistry Parameters									
Biochemical Oxygen Demand	20 A	mg/L	7.0		1	*SM5210 B	4/27/12 14:30	MSV	P2E0005
Phosphorus-Total	0.077	mg/L	0.050	0.0088	1	*SM4500-P F	5/1/12 8:19	CLB	P2D0549
Total Solids	90	mg/L	20	4.9	1	*SM2540 B	4/30/12 12:30	JAB	P2D0544
Turbidity	2.6	NTU	0.40	0.022	1	*180.1	4/27/12 8:45	JAB	P2D0515
Microbiological Parameters									
Fecal Coliforms	1000	CFU/100 ml	2		1	*SM9222 D	4/26/12 15:04	RSL	P2D0521

S&ME, Inc - Charlotte
Attn: Darren Peine
9751 Southern Pine Blvd.
Charlotte, NC 28273-5560

Project: Reedy Creek

Prism Work Order: 2040612
Time Submitted: 4/26/2012 2:07:00PM

Anions by Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P2D0498 - NO PREP										
Blank (P2D0498-BLK1)										
Prepared & Analyzed: 04/26/12										
Nitrate as N	BRL	0.10	mg/L							
LCS (P2D0498-BS1)										
Prepared & Analyzed: 04/26/12										
Nitrate as N	1.88	0.10	mg/L	2.000		94	90-110			

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Project: Reedy Creek

Prism Work Order: 2040612
 Time Submitted: 4/26/2012 2:07:00PM

General Chemistry Parameters - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P2D0515 - NO PREP										
Blank (P2D0515-BLK1)				Prepared & Analyzed: 04/27/12						
Turbidity	BRL	0.40	NTU							
LCS (P2D0515-BS1)				Prepared & Analyzed: 04/27/12						
Turbidity	3.65	0.40	NTU	4.000		91	90-110			
Duplicate (P2D0515-DUP1)				Source: 2040612-06		Prepared & Analyzed: 04/27/12				
Turbidity	2.73	0.40	NTU		2.64			3	20	
Batch P2D0544 - NO PREP										
Blank (P2D0544-BLK1)				Prepared & Analyzed: 04/30/12						
Total Solids	BRL	20	mg/L							
LCS (P2D0544-BS1)				Prepared & Analyzed: 04/30/12						
Total Solids	982	20	mg/L	1000		98	90-110			
Duplicate (P2D0544-DUP1)				Source: 2040612-06		Prepared & Analyzed: 04/30/12				
Total Solids	84.0	20	mg/L		90.0			7	20	
Batch P2D0549 - SM4500-PB5										
Blank (P2D0549-BLK1)				Prepared: 04/30/12 Analyzed: 05/01/12						
Phosphorus-Total	BRL	0.050	mg/L							
LCS (P2D0549-BS1)				Prepared: 04/30/12 Analyzed: 05/01/12						
Phosphorus-Total	2.00	0.050	mg/L	2.000		100	90-110			

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Charlotte, NC 28273-5560

Project: Reedy Creek

Prism Work Order: 2040612
Time Submitted: 4/26/2012 2:07:00PM

General Chemistry Parameters - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P2E0005 - NO PREP										
Blank (P2E0005-BLK1)				Prepared & Analyzed: 04/27/12						
Biochemical Oxygen Demand	BRL	2.0	mg/L							
LCS (P2E0005-BS1)				Prepared & Analyzed: 04/27/12						
Biochemical Oxygen Demand	208	2.0	mg/L	198.0		105	85-115			

S&ME, Inc - Charlotte
Attn: Darren Peine
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Charlotte, NC 28273-5560

Project: Reedy Creek

Prism Work Order: 2040612
Time Submitted: 4/26/2012 2:07:00PM

Microbiological Parameters - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P2D0521 - NO PREP

Blank (P2D0521-BLK1) Prepared & Analyzed: 04/26/12

Fecal Coliforms	BRL	2	CFU/100 ml							
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Duplicate (P2D0521-DUP1) Source: 2040612-03 Prepared & Analyzed: 04/26/12

Fecal Coliforms	200	2	CFU/100 ml		200			0	20	
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Sample Extraction Data

Prep Method: SM4500-PB5

Lab Number	Batch	Initial	Final	Date/Time
2040612-01	P2D0549	50 mL	50 mL	04/30/12 14:18
2040612-02	P2D0549	50 mL	50 mL	04/30/12 14:18
2040612-03	P2D0549	50 mL	50 mL	04/30/12 14:18
2040612-04	P2D0549	50 mL	50 mL	04/30/12 14:18
2040612-05	P2D0549	50 mL	50 mL	04/30/12 14:18
2040612-06	P2D0549	50 mL	50 mL	04/30/12 14:18



Full-Service Analytical & Environmental Solutions

449 Springbrook Road • P.O. Box 240543 • Charlotte, NC 28224-0543
Phone: 704/529-6364 • Fax: 704/525-0409

Client Company Name: S E M E
Report To/Contact Name: DARRIN PEINE
Reporting Address: 9711 Southern Pine Blvd

Phone: _____ Fax (Yes) (No): _____
Email (Yes) (No) Email Address: dpeine@semeinc.com
EDD Type: PDF Excel _____ Other _____
Site Location Name: Reedy Creek
Site Location Physical Address: _____

CHAIN OF CUSTODY RECORD

PAGE _____ OF _____ QUOTE # TO ENSURE PROPER BILLING: _____

Project Name: _____
Short Hold Analysis: (Yes) (No) UST Project: (Yes) (No)
*Please ATTACH any project specific reporting (QC LEVEL I II III IV) provisions and/or QC Requirements
Invoice To: _____
Address: _____

LAB USE ONLY			
	YES	NO	N/A
Samples INTACT upon arrival?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Received ON WET ICE? Temp <u>3.7</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROPER PRESERVATIVES indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Received WITHIN HOLDING TIMES?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CUSTODY SEALS INTACT?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
VOLATILES rec'd W/OUT HEADSPACE?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
PROPER CONTAINERS used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Purchase Order No./Billing Reference _____
Requested Due Date 1 Day 2 Days 3 Days 4 Days 5 Days
"Working Days" 6-9 Days Standard 10 days Rush Work Must Be Pre-Approved
Samples received after 15:00 will be processed next business day.
Turnaround time is based on business days, excluding weekends and holidays.
(SEE REVERSE FOR TERMS & CONDITIONS REGARDING SERVICES RENDERED BY PRISM LABORATORIES, INC. TO CLIENT)

TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL
Certification: NELAC _____ USACE _____ FL _____ NC _____
SC _____ OTHER _____ N/A _____
Water Chlorinated: YES _____ NO _____
Sample Iced Upon Collection: YES _____ NO _____

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER			PRESERVATIVES	ANALYSES REQUESTED						REMARKS	PRISM LAB ID NO.
				*TYPE SEE BELOW	NO.	SIZE		Nitrate	Phos T	BOD	FC	Turb	TS		
R6	4-26-12	11:55	Water												Ø1
R7	4-26-12	12:00													Ø2
R8	4-26-12	11:45													Ø3
R9	4-26-12	12:15													Ø4
R10	4-26-12	12:20													Ø5
R5	4-26-12	13:15													Ø6

Sampler's Signature Darrin Peine Sampled By (Print Name) Darrin Peine Affiliation SEME

PRESS DOWN FIRMLY - 3 COPIES

Upon relinquishing, this Chain of Custody is your authorization for Prism to proceed with the analyses as requested above. Any changes must be submitted in writing to the Prism Project Manager. There will be charges for any changes after analyses have been initialized.

Relinquished By: (Signature) <u>[Signature]</u>	Received By: (Signature) _____	Date _____	Military/Hours _____	Additional Comments:
Relinquished By: (Signature) _____	Received By: (Signature) _____	Date _____	_____	
Relinquished By: (Signature) _____	Received For Prism Laboratories By: <u>[Signature]</u>	Date <u>4/26/12 1407</u>	_____	
Method of Shipment: <input type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input checked="" type="checkbox"/> Hand-delivered <input type="checkbox"/> Prism Field Service <input type="checkbox"/> Other _____		NOTE: ALL SAMPLE COOLERS SHOULD BE TAPED SHUT WITH CUSTODY SEALS FOR TRANSPORTATION TO THE LABORATORY. SAMPLES ARE NOT ACCEPTED AND VERIFIED AGAINST COC UNTIL RECEIVED AT THE LABORATORY.		COC Group No. <u>2044612</u>

PRISM USE ONLY
Site Arrival Time: _____
Site Departure Time: _____
Field Tech Fee: _____
Mileage: _____

NPDES: NC SC NC SC
 UST: NC SC
 GROUNDWATER: NC SC
 DRINKING WATER: NC SC
 SOLID WASTE: NC SC
 RCRA: NC SC NC SC
 CERCLA: NC SC
 LANDFILL: NC SC
 OTHER: NC SC
 *CONTAINER TYPE CODES: A = Amber C = Clear G = Glass P = Plastic; TL = Teflon-Lined Cap VOA = Volatile Organics Analysis (Zero Head Space)

SEE REVERSE FOR TERMS & CONDITIONS

R1 Water Quality Index Calculation

Parameter	Test Results		Q-Value	Weighing		Adjusted	
				Factor	Total	Factor	Total
Nitrate	0.49	mg/L	97	0.1	9.7	0.11	10.8
TP	0.054	mg/L	98	0.1	9.8	0.11	10.9
BOD-5*	2	mg/L	80	0.11	8.8	0.12	9.8
Fecal Coliform	520	c/100ml	28	0.16	4.48	0.18	5.0
Turbidity	0	NTU	99	0.08	7.92	0.09	8.8
pH	6.95	Units	87	0.11	9.57	0.12	10.6
DO	97	% sat***	99	0.17	16.83	0.19	18.7
	9.22	mg/L					
Temperature**	19.25	°C	--	0.1	--	--	--
TS	96	mg/L	84	0.07	5.88	0.08	6.5
TOTALS:					73.0		81.1

R2 Water Quality Index Calculation

Parameter	Test Results		Q-Value	Weighing		Adjusted	
				Factor	Total	Factor	Total
Nitrate	0.086	mg/L	97	0.1	9.7	0.11	10.8
TP	0.021	mg/L	99	0.1	9.9	0.11	11.0
BOD-5*	2	mg/L	80	0.11	8.8	0.12	9.8
Fecal Coliform	100	c/100ml	44	0.16	7.04	0.18	7.8
Turbidity	4.4	NTU	87	0.08	6.96	0.09	7.7
pH	6.26	Units	62	0.11	6.82	0.12	7.6
DO	69	% sat***	73	0.17	12.41	0.19	13.8
	6.54	mg/L					
Temperature**	18.4	°C	--	0.1	--	--	--
TS	100	mg/L	83	0.07	5.81	0.08	6.5
TOTALS:					67.4		74.9

R3 Water Quality Index Calculation

Parameter	Test Results		Q-Value	Weighing		Adjusted	
				Factor	Total	Factor	Total
Nitrate	1.3	mg/L	96	0.1	9.6	0.11	10.7
TP	0.025	mg/L	99	0.1	9.9	0.11	11.0
BOD-5*	2	mg/L	80	0.11	8.8	0.12	9.8
Fecal Coliform	690	c/100ml	26	0.16	4.16	0.18	4.6
Turbidity	1.2	NTU	95	0.08	7.6	0.09	8.4
pH	7.44	Units	93	0.11	10.23	0.12	11.4
DO	96	% sat***	99	0.17	16.83	0.19	18.7
	8.93	mg/L					
Temperature**	19.22	°C	--	0.1	--	--	--
TS	93	mg/L	84	0.07	5.88	0.08	6.5
TOTALS:					73.0		81.1

*BOD results were below the reporting limit, thus the reporting limit of 3.7 was used to provide a conservative Q-value estimate.

**No exposed upstream area was available for temperature change sampling. In order to compensate for this, the weighting factors of all other components of the WQI were adjusted up so that the sum of the remaining factors equals 1.

***DO percent saturation calculated based on the known saturation level for the observed mg/L at the observed temperature

R5 Water Quality Index Calculation

Parameter	Test Results		Q-Value	Weighing		Adjusted	
				Factor	Total	Factor	Total
Nitrate	0.28	mg/L	97	0.1	9.7	0.11	10.8
TP	0.077	mg/L	97	0.1	9.7	0.11	10.8
BOD-5	20	mg/L	12	0.11	1.32	0.12	1.5
Fecal Coliform	1000	c/100ml	22	0.16	3.52	0.18	3.9
Turbidity	2.6	NTU	91	0.08	7.28	0.09	8.1
pH	8.01	Units	84	0.11	9.24	0.12	10.3
DO	81	% sat***	88	0.17	14.96	0.19	16.6
	8.11	mg/L					
Temperature**	16	°C	--	0.1	--	--	--
TS	90	mg/L	84	0.07	5.88	0.08	6.5
TOTALS:					61.6		68.4

R6 Water Quality Index Calculation

Parameter	Test Results		Q-Value	Weighing		Adjusted	
				Factor	Total	Factor	Total
Nitrate	0.52	mg/L	96	0.1	9.6	0.11	10.7
TP	0.089	mg/L	96	0.1	9.6	0.11	10.7
BOD-5	16	mg/L	18	0.11	1.98	0.12	2.2
Fecal Coliform	62	c/100ml	50	0.16	8	0.18	8.9
Turbidity	2.8	NTU	91	0.08	7.28	0.09	8.1
pH	7.75	Units	91	0.11	10.01	0.12	11.1
DO	69	% sat***	73	0.17	12.41	0.19	13.8
	7.18	mg/L					
Temperature**	14.2	°C	--	0.1	--	--	--
TS	110	mg/L	83	0.07	5.81	0.08	6.5
TOTALS:					64.7		71.9

R7 Water Quality Index Calculation

Parameter	Test Results		Q-Value	Weighing		Adjusted	
				Factor	Total	Factor	Total
Nitrate	0.16	mg/L	97	0.1	9.7	0.11	10.8
TP	0.09	mg/L	96	0.1	9.6	0.11	10.7
BOD-5	2.1	mg/L	78	0.11	8.58	0.12	9.5
Fecal Coliform	350	c/100ml	32	0.16	5.12	0.18	5.7
Turbidity	11	NTU	74	0.08	5.92	0.09	6.6
pH	7.98	Units	85	0.11	9.35	0.12	10.4
DO	81	% sat***	88	0.17	14.96	0.19	16.6
	8.67	mg/L					
Temperature**	13.2	°C	--	0.1	--	--	--
TS	100	mg/L	83	0.07	5.81	0.08	6.5
TOTALS:					69.0		76.7

R8 Water Quality Index Calculation

Parameter	Test Results		Q-Value	Weighing		Adjusted	
				Factor	Total	Weighting Factor	Adjusted Total
Nitrate	1.8	mg/L	95	0.1	9.5	0.11	10.6
TP	0.12	mg/L	92	0.1	9.2	0.11	10.2
BOD-5*	2	mg/L	80	0.11	8.8	0.12	9.8
Fecal Coliform	200	c/100ml	37	0.16	5.92	0.18	6.6
Turbidity	1.8	NTU	99	0.08	7.92	0.09	8.8
pH	8.18	Units	87	0.11	9.57	0.12	10.6
DO	80	% sat***	87	0.17	14.79	0.19	16.4
	8.91	mg/L					
Temperature**	11.6	°C	--	0.1	--	--	--
TS	120	mg/L	82	0.07	5.74	0.08	6.4
TOTALS:					71.4		79.4

R9 Water Quality Index Calculation

Parameter	Test Results		Q-Value	Weighing		Adjusted	
				Factor	Total	Weighting Factor	Adjusted Total
Nitrate	0.68	mg/L	96	0.1	9.6	0.11	10.7
TP	0.094	mg/L	96	0.1	9.6	0.11	10.7
BOD-5*	2	mg/L	80	0.11	8.8	0.12	9.8
Fecal Coliform	740	c/100ml	25	0.16	4	0.18	4.4
Turbidity	4.4	NTU	87	0.08	6.96	0.09	7.7
pH	8.18	Units	78	0.11	8.58	0.12	9.5
DO	80	% sat***	87	0.17	14.79	0.19	16.4
	8.41	mg/L					
Temperature**	14.2	°C	--	0.1	--	--	--
TS	100	mg/L	83	0.07	5.81	0.08	6.5
TOTALS:					68.1		75.7

R10 Water Quality Index Calculation

Parameter	Test Results		Q-Value	Weighing		Adjusted	
				Factor	Total	Weighting Factor	Adjusted Total
Nitrate	0.28	mg/L	97	0.1	9.7	0.11	10.8
TP	0.08	mg/L	97	0.1	9.7	0.11	10.8
BOD-5	13	mg/L	25	0.11	2.75	0.12	3.1
Fecal Coliform	470	c/100ml	29	0.16	4.64	0.18	5.2
Turbidity	2.9	NTU	90	0.08	7.2	0.09	8.0
pH	8.01	Units	84	0.11	9.24	0.12	10.3
DO	80	% sat***	87	0.17	14.79	0.19	16.4
	8.11	mg/L					
Temperature**	15.5	°C	--	0.1	--	--	--
TS	90	mg/L	84	0.07	5.88	0.08	6.5
TOTALS:					63.9		71.0

*BOD results were below the reporting limit, thus the reporting limit was used to provide a conservative Q-value estimate.

**No exposed upstream area was available for temperature change sampling. In order to compensate for this, the weighting factors of all other components of the WQI were adjusted up so that the sum of the remaining factors equals 1.

***DO percent saturation calculated based on the known saturation level for the observed mg/L at the observed temperature

APPENDIX III

SITE PHOTOGRAPHS





1 Reach 1. Facing upstream



2 Reach 2. Facing upstream



3 Reach 3. Facing upstream



4 Reach 6. Facing downstream



5 Reach 7. Facing downstream



6 Reach 8. Facing downstream

Taken by: DMP

Checked by: DMH



SITE PHOTOGRAPHS

Reedy Creek Feasibility Study
Mecklenburg County, North Carolina

Project Nos.: 1357-11-011 & 12-009

Photo Page 1



7 **Reach 9.** Facing downstream



8 **Reach 10.** Facing downstream



9 **Reach 5.** Facing downstream

Taken by: DMP

Checked by: DMH



SITE PHOTOGRAPHS

Reedy Creek Feasibility Study
Mecklenburg County, North Carolina

Project Nos.: 1357-11-011 & 12-009

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