RI Phase Report
For Phase II
Remedial Investigation
North Carolina Finishing Plant
Spencer, Rowan County, North Carolina

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S&ME, Inc. has conducted a Remedial Investigation (RI") at the North Carolina Finishing Plant Site (the "Site") in Spencer, Rowan County, North Carolina. The Yadkin River forms the boundaries of the Site along the eastern to northwestern quadrants. Property across the river is residential, agricultural, or undeveloped.

A former school is located along the western border of the Site on property owned by Colortex, Inc (Figure 2). The Yadkin United Methodist Church is located adjacent to the southwestern border of the Site. A residential area is located southwest of the Site. The nearest occupied residence is located approximately ¼-mile away.

The Site is currently owned by Colortex, Inc. who purchased the property in 1998. The Site was operated by Colortex, Inc. until December 2000 when the company abandoned the Site. The current owners of the Site are in the process of performing limited demolition and salvage operations. This RI is being performed by S&ME, Inc. for Fieldcrest who is responsible for historical environmental conditions at the Site under the oversight of the North Carolina Department of Environment and Natural Resources ("NCDENR"), Inactive Hazardous Sites Branch ("Inactive Sites Branch"). Currently, no commercial or industrial activities are occurring at the Site.

The Site is currently an in-active textile mill known as a "wet finishing" plant that was involved in the continuous dyeing and finishing of fabric ("grey goods"). The Site is believed to have been in continuous operation since approximately 1918 until December 2000 when Colortex filed for bankruptcy and abandoned the plant. Former operations at the facility utilized the following types of dyes: sulfur, naphtha, vat, dispersion, pigment, and exhaust dye.

The objectives of RI Phase II were to: (1) characterize the extent and magnitude of impacted soil in known or suspected on-Site source areas; (2) assess the extent and magnitude of impacted groundwater in the Shallow Aquifer on-Site; (3) evaluate surface water and sediments in the Yadkin River that lie adjacent to the Site; and (4) determine if groundwater in the bedrock aquifer has been impacted by Site contaminants.

Three specific areas of the Site with known environmental impacts were targeted by this RI and include (1) the Machine Shop Area, (2) the Clarifier/Former Burn Pit Area, and (3) the Chemic Area. In addition, environmental conditions beneath the plant production facility were evaluated.

S&ME offers the following preliminary conclusions based on the data presented in the RI Report.

1. The Site is located on a bend of the Yadkin River at the headwaters of High Rock Lake. The river forms the northern and eastern boundaries of the Site as the river channel swings from an east/west orientation north of the Site to a north/south orientation east of the Site. The Yadkin River flows to the southeast and is the dominant hydrologic feature at the Site and serves as a major groundwater discharge point.

2. The majority of the Site, including the most of the plant structures and parking lots, rest on the uplands overlooking the river. A process-water pond and a few small structures are located on a small terrace east of the plant just above the Yadkin River floodplain. The Site extends onto the floodplain but only two water-intake structures are located on the floodplain.

3. The geologic sequence in the study area consists of unconsolidated material overlying igneous bedrock. Bedrock is principally pink granite with fractures ranging in orientation from horizontal to near vertical. Two significant cavities

were encountered in Bedrock test Borehole FMW-304 in the upper portion of the bedrock. The cavities are filled with what appears to be fluvial silt.

4. The unconsolidated material includes residual soil and/or saprolite in the upland portion of the Site. Fluvial deposits overlie bedrock in the floodplain portion of the Site along the Yadkin River. In the upland portion of the Site, the contact between the unconsolidated saprolite and bedrock is generally gradational with saprolite grading downward to weathered rock and then competent bedrock. A sharp contact is present between the fluvial deposits and the underlying bedrock in the floodplain portion of the Site. In the northern portion of the Site, the fluvial deposits along the river are generally less than 20 feet thick. In the southern portion of the Site near Highway 29, the fluvial deposits are more than 90 feet thick at existing well VE-2.

5. The Shallow Aquifer is present in the unconsolidated material overlying bedrock. The Bedrock Aquifer is present in the granitic bedrock. A confining layer is not present between the two aquifers.

6. Groundwater in the Shallow Aquifer at the Site is under water table conditions. Groundwater flow is generally semi-radial from the Site to the river, which is the discharge point for the aquifer. Groundwater flow is toward the northeast in the northern portion of Site and to east-southeast in the southern portion of Site. The former process-water pond appears to have accentuated the radial flow regime in the Shallow Aquifer as it formed a groundwater mound during its operational period.

7. Groundwater flow in the Bedrock Aquifer (based on limited data) also appears to be generally semi-radial from the Site towards the Yadkin River. Groundwater from the Bedrock Aquifer is expected to discharge to the river in the northern portion of the Site where the fluvial deposits are relatively thin (<20 feet thick) with some smaller component of discharge to the Basal portion of the Shallow

Aquifer. In the southern portion of the Site where the fluvial deposits are thicker, discharge from the Bedrock Aquifer will be principally to the Shallow Aquifer with a minor component of discharge to the river.

8. A downward vertical gradient from the Shallow Aquifer to the Bedrock Aquifer appears to be present throughout most of the upland portion of the Site. An upward vertical gradient from the Bedrock Aquifer to the Shallow Aquifer is expected to be present on the floodplain.

9. Soil impacted by metals and SVOCs above their respective RGs is present in the vicinity of the Machine Shop and the Burn Pit/Clarifier. Other detected metals, VOCs and SVOCs are below their respective RGs.

10. Releases of PCE at the Machine Shop have impacted groundwater in the Shallow Aquifer and upper part of the Bedrock Aquifer in the northern portion of the Site. PCE is present at concentrations above the North Carolina 2L.

11. The Shallow Aquifer PCE plume originates at the Machine Shop and extends to the northeast apparently to the Yadkin River. The Bedrock Aquifer is not impacted by PCE at the Machine Shop, but an impact is present in the upper portion of the aquifer in the area of the Burn Pit/Clarifier (downgradient from the Machine Shop) as evidenced by shallow discrete-interval sample data from Bedrock Test Borehole FWM-306. The vertical extent of impact in the Bedrock Aquifer appears to be less than 30 feet. The lateral extent of the Bedrock Aquifer PCE plume is expected to be similar to the Shallow Aquifer plume except that it is truncated in the upgradient direction and probably extends to the river. However, PCE has not been detected in any surface-water samples collected from the river.

12. Releases of chlorobenzenes at the Chemic Area and the adjacent southern part of the plant building have impacted groundwater in the Shallow Aquifer and the

Bedrock Aquifer in the southern portion of the Site. Chlorobenzene, 1,2-dichlorobenzene, and 1,4-dichlorobenzene are the principal constituents of concern and were detected at concentrations greater than their respective North Carolina 2Ls in many samples.

13. The Shallow Aquifer chlorobenzene plume originates at the Chemic Area and the adjacent southern part of the plant building and extends to the east-southeast out into the floodplain of the Yadkin River. The chlorobenzene plume extends off Site into the median area of Highway 29 but does not reach the river. The chlorobenzene plume is intermixed in the upper part of the Shallow Aquifer with the historical fuel-oil release from the former 20,000-gallon UST and 100,000-gallon AST.

14. The Bedrock Aquifer is impacted by chlorobenzenes, and Benzene from the historical fuel-oil releases, at the southern part of the plant building, but the lateral extent of impact appears to be limited; chlorobenzenes have not been detected in groundwater samples collected from existing well VE-2 which is downgradient and 90-feet deep. The vertical extent of chlorobenzene impact in the Bedrock Aquifer, however, appears to be potentially more than 200 feet. In the impact area, horizontal permeability along fractures in the bedrock appears to be limited, potentially as evidenced by the fluvial silt filled cavities, but vertical permeability is more open.

15. Surface-water and sediments in the Yadkin River do not appear to have been impacted by Site contaminants.

1.0 Introduction

On behalf of Pillowtex/Fieldcrest Cannon ("Fieldcrest"), S&ME is pleased to submit to the North Carolina Department of Environmental and Natural Resources ("NCDENR") this *RI Phase Report* for Phase II of the Remedial Investigation ("RI") at the former North Carolina Finishing ("NCF") facility in Spencer, North Carolina (the "Site"). This *RI Phase Report* presents a summary of the RI field activities. The RI Phase II was performed in accordance with the *Remedial Investigation Work Plan* submitted to NCDENR in June 2000.

The objectives of RI Phase II were to: (1) characterize the extent and magnitude of impacted soil in known or suspected on-Site source areas; (2) assess the extent and magnitude of impacted groundwater in the Shallow Aquifer on-Site; (3) evaluate surface water and sediments in the Yadkin River that lie adjacent to the Site; and (4) determine if groundwater in the bedrock aquifer has been impacted by Site contaminants.

Three specific areas of the Site with known environmental impacts were targeted by this RI and include (1) the Machine Shop Area, (2) the Clarifier/Former Burn Pit Area, and (3) the Chemic Area. In addition, environmental conditions beneath the plant production facility were evaluated.

1.1 Project Description

The objective of the RI was to evaluate the extent of soil and groundwater affected by chemical releases. The RI consisted of data gathering activities focused principally on the collection of soil, groundwater, surface-water, and sediment samples for chemical analysis, and evaluation of hydrogeologic conditions.

1.2 Site Description

The Site is located at 2555 North U.S. Highway 29, Spencer, North Carolina 28159. The Site is located on the south bank of a bend of the Yadkin River on U.S. Highway 29 in the City of Spencer, Rowan County, North Carolina (Figure 1).

The Site is located on the Salisbury USGS 7.5-minute quadrangle map at north latitude 35^0 43' 20" and west longitude 80^0 23' 48". The Site consists of two tracts separated by U.S. Highway 29, (1) an approximately 37-acre tract that contains the former textile finishing plant, and (2) an approximately 61-acre tract that contains a wastewater treatment plant ("WWTP"), and two former construction-debris landfills (Figure 2). As specified in the Work Plan the focus of this RI is limited to the 37-acre tract where textile and waste handling occurred except as previously noted.

The majority of the Site is situated on a weathered bedrock bench along the Yadkin River. The Site has perimeter fencing and the finishing portion of the plant currently contains the following buildings:

- Office Building that contains administrative and plant management offices;
- Fabric Dye and Finishing Production Buildings that contain a Bleach Department, Dye Units Nos. 1 and 2, Finishing Department, Boiler Room, a Coal Storage Area, and shipping and receiving warehouse and docks;
- Maintenance/Repair Building;
- Garage Building; and
- Guard and Personnel Building.

A water filtration system (the "Clarifier") is located at the northern end of the Site. The Clarifier was used to filter fines from surface water withdrawn from the Yadkin River upstream of the Site prior to use as process water (Figure 2). Filtered surface water was temporarily stored in a pond located southeast of the Clarifier on a terrace just above river level.

The Site is currently owned by Colortex, Inc. who purchased the property in 1998. The Site was operated by Colortex, Inc. until December 2000 when the company abandoned the Site. The current owners of the Site are in the process of performing limited demolition and salvage operations. This RI is being performed by S&ME, Inc. for Fieldcrest who is responsible for historical environmental conditions at the Site under the oversight of the North Carolina Department of Environment and Natural Resources ("NCDENR"), Inactive Hazardous Sites Branch ("Inactive Sites Branch"). Currently, no commercial or industrial activities are occurring at the Site.

The Site is currently an in-active textile mill known as a "wet finishing" plant that was involved in the continuous dyeing and finishing of fabric ("grey goods"). The Site is believed to have been in continuous operation since approximately 1918 until December 2000 when Colortex filed for bankruptcy and abandoned the plant. Former operations at the facility utilized the following types of dyes: sulfur, naphtha, vat, dispersion, pigment, and exhaust dye.

The location and contents of 30 aboveground storage tanks ("ASTs") formerly used to store process materials and petroleum products at the Site are summarized on Figure 3 and Table 1. Caustic soda is stored in nine ASTs, and hydrogen peroxide, salt brine, Aqualene Softener, urea formaldehyde, and diesel fuel are stored in two tanks each. Single ASTs contained fuel oil, acetic acid, propane, catalyst, alum, waste oil, gasoline, and kerosene.

The Site formerly contained the following underground storage tanks ("USTs") that were used to store petroleum products:

- One 550-gallon UST used for the storage of gasoline (Garage Area);
- One 2,000-gallon UST used for the storage of gasoline (Garage Area);

- One 3,000-gallon UST used for the storage of kerosene (Garage Area); and
- One 20,000-gallon UST used for the storage of fuel oil (Former 20,000-Gallon UST Area).

The Garage Area USTs were removed in 1990, and the 20,000-gallon UST was removed in 1994. The locations of these former USTs are shown on Figure 3.

1.3 Site Background

A description of the Site and surrounding area is presented in this section. In addition, pertinent features, history, operations, and release sources are described. Information contained in this section was obtained from several sources, including governmental records and previous consultant reports. A list of abbreviated terms used in this RI Report is presented in Appendix I.

Previous environmental assessments conducted at the Site are documented in the following reports and were reviewed to evaluate Site conditions.

- ***Underground Storage Tank Closure Assessment***, North Carolina Finishing, Pyramid Environmental, Inc. ("Pyramid"), December, 1990;
- ***Initial Abatement Measures and Site Check***, North Carolina Finishing, Pyramid, February 26, 1991;
- *Groundwater Analytical Data*, Pyramid, June 26, 1991;
- ***Subsurface Investigation Two Underground Storage Tank Areas***, North Carolina Finishing, Pyramid, September 8, 1991;
- ***Subsurface Investigation Underground Storage Tank Area – 3,000 Gallon***, North Carolina Finishing, Pyramid, September 14, 1991;
- *Quarterly Monitoring Well Sampling Results, Monitoring Wells #1, #2 and #3*, North Carolina Finishing, Pyramid, November 8, 1991;
- *Quarterly Monitoring Well Sampling Results, Monitoring Well #4*, North Carolina Finishing, Pyramid, November 8, 1991;
- *Groundwater Monitoring Well Sampling, Quarterly Results*, North Carolina Finishing Plant, Pyramid Environmental, Inc. December 10, 1991;
- *Groundwater Monitoring Well Sampling, Quarterly Results*, North Carolina Finishing Plant, Pyramid, February 28, 1992;

- *Groundwater Monitoring Well Sampling, Quarterly Results*, North Carolina Finishing Plant, Pyramid Environmental, Inc. June 22, 1992;
- *Groundwater Monitoring Well Sampling, Quarterly Results*, North Carolina Finishing Plant, Pyramid, December 17, 1992;
- *Groundwater Monitoring Well Sampling, Quarterly Results*, North Carolina Finishing Plant, Pyramid, August 5, 1993;
- *Groundwater Monitoring, Quarterly Sampling Results*, North Carolina Finishing Plant, Pyramid, November 15, 1993;
- *Groundwater Monitoring, Quarterly Sampling Results*, North Carolina Finishing Plant, Pyramid Environmental, Inc. February 28, 1994;
- ***Soil Sampling Investigation Stockpiled Soil-Sludge Application Area***, Pyramid, April 15, 1994;
- *Groundwater Monitoring Well Sampling, Quarterly Results*, North Carolina Finishing Plant, Pyramid, August 31, 1994;
- ***Stockpiled Soil Sampling Investigation, Waste Water Treatment Facility***, North Carolina Finishing, Pyramid, October 20, 1994;
- ***UST Closure Report***, North Carolina Finishing, Pyramid, November 3, 1994;
- ***Site Assessment Report***, North Carolina Finishing, Engineering Tectonics, P.A. April 19, 1995;
- ***Initial Site Characterization and Free Product Recovery***, North Carolina Finishing, Pyramid, April 28, 1995;
- *Groundwater Monitoring Well Sampling, Monitoring Well MW-3 Quarterly Results*, North Carolina Finishing Plant, Pyramid, June 30, 1995;
- *Free Product Recovery Report*, North Carolina Finishing, Pyramid, November 21, 1995;
- ***Comprehensive Site Assessment For 20,000 Gallon Fuel-Oil UST Area***, North Carolina Finishing, Pyramid, January 18, 1996;
- *Free Product Recovery Report*, North Carolina Finishing Plant, Pyramid, September 30, 1996;

- *Comprehensive Site Assessment*, North Carolina Finishing Plant – Garage Area, Pyramid, April 15, 1997;

- ***Corrective Action Plan, 20,000 Gallon Fuel-Oil UST Area Report***, North Carolina Finishing, Pyramid, June 5, 1997;

- ***Addendum to Comprehensive Site Assessment*** – *Garage Area*, North Carolina Finishing Plant, Pyramid, October 14, 1997;

- ***Environmental Site Assessment Pillowtex Corporation***, North Carolina Finishing Company, Maxim Technologies, Inc. ("Maxim"), January 8, 1998;

- *Natural Attenuation Monitoring Report, 20,000 Gallon Fuel-Oil UST Area*, North Carolina Finishing, Pyramid, January 29, 1998;

- ***Environmental Site Assessment Pillowtex Corporation North Carolina Finishing Company***, Maxim, January 8, 1998;

- ***Phase II Environmental Investigation Report***, North Carolina Finishing Company, Arcadis Geraghty & Miller, May 1998;

- *Semi-Annual Natural Attenuation Monitoring Report 20,000 Gallon Fuel-Oil UST Area*, North Carolina Finishing, Pyramid, August 12, 1998;

- ***Phase II Environmental Investigation Report Response***, North Carolina Finishing Company, Maxim, November 5, 1998;

- *Semi-Annual Natural Attenuation Monitoring Report, 20,000 Gallon Fuel-Oil UST Area*, North Carolina Finishing, Pyramid, January 19, 1999;

- ***NC Finishing Plant 3, 000 Gallon Kerosene UST, Soil Sampling Report***, North Carolina Finishing, Pyramid, March 1, 1999;

- ***North Carolina Finishing 200,000 Gallon Fuel-Oil AST***, Pyramid, April 19, 1999;

- *Semi-Annual Natural Attenuation Monitoring Report, North Carolina Finishing, 20,000 Gallon Fuel Oil UST Area*, Pyramid, August 24, 1999; and

- ***Comprehensive Site Assessment, 200,000 Gallon Fuel-Oil AST***, North Carolina Finishing, Pyramid, September 23, 1999.

A summary of the referenced documents is described in the following sections. Documents in bold are contained in Appendix I of the RI Work Plan. A summary of the significant environmental findings of these assessments is presented in Section 4.0.

1.3.1 Preliminary Assessment – September 1985

In September 1985, the North Carolina Department of Human Resources ("NCDHR"), Division of Health Services ("DHS") performed a *Preliminary Assessment* ("PA") at the Site. The PA consisted of a review of the facility's waste-disposal practices.

1.3.2 Screening Site Inspection - December 1991

As a follow up to the September 1985 PA, NCDENR Solid Waste Management Division, Superfund Section conducted a *Screening Site Inspection* ("SSI") at the Site in December 1991. As part of the SSI, sediment samples were collected from three locations in the Yadkin River. Water samples were collected at the influent discharge to the WWTP and at a residential well located within 500 feet ("ft") from the Site. These samples were analyzed for volatile organic compounds ("VOCs"), semi-volatile organic compounds ("SVOCs"), pesticides/polychlorinated biphenyls ("PCBs"), and metals.

1.3.3 Garage Area UST

The facility's Garage is located in the southwestern part of the Site and has been used for the repair and maintenance of plant vehicles since the 1950s. Two gasoline/diesel-fuel USTs and one kerosene UST were located on the south side of the garage (Figure 4).

Hydrocarbon compounds were initially detected at the Garage Area in 1990 during the removal of the gasoline/diesel-fuel USTs. A petroleum release from the USTs and associated piping system was the apparent source of the hydrocarbon compounds; the quantity of the release was unknown.

During previous investigations conducted by others, a total of 11 Type II and one Type III monitoring wells were installed at the Garage Area to assess environmental conditions. Fieldcrest submitted a Comprehensive Site Assessment ("CSA"), dated April 15, 1997, to NCDENR UST Section for this incident (Groundwater Incident Number 17467). The NCDENR UST Section issued this incident (incident number 17467) a "Notice of No Further Action" and the wells associated with this incident were abandoned.

During March and April 1998, Arcadis Geraghty & Miller ("AG&M") conducted a *Phase II Environmental Investigation* ("Phase II EI") at the Site as part of the property transfer between Fieldcrest and Colortex. At the Garage Area, the Phase II EI included the drilling of five soil test boreholes (SB-1 through SB-5), and chemical analysis of groundwater, and soil samples (refer to Figure 4).

1.3.4 Former 20,000-Gallon UST Area

The Former 20,000-Gallon UST Area is located at the southeastern corner of the Site adjacent to U.S. Highway 29 (Figure 4). Hydrocarbon compounds were detected in this area in 1994 during the removal of the UST. A petroleum release from the UST and associated piping

system was the apparent source of the hydrocarbon compounds; the quantity of the release was unknown.

During previous investigations, a total of 17 Type II (MW-1 through MW-17) and two Type III (VE-1 and VE-3) monitoring wells were installed to assess environmental conditions (refer to Figure 4). In addition, chemical analysis of groundwater and soil samples was performed. Fieldcrest subsequently submitted a CSA, dated January 18, 1996 and a Corrective Action Plan ("CAP"), dated June 5, 1997, to NCDENR for this incident (Groundwater Incident Number 16198).

1.3.5 Chemic Area

The Chemic Area is located in the open-space between the Fabric Dye and Finishing Production Buildings in the eastern part of the Site (Figure 4). Eleven ASTs containing caustic, peroxide, sulfuric acid, and hot water are located in the Chemic Area (Figure 3).

An unused railroad spur runs the length of the north side of the Chemic Area. A conveyor belt and forklift bridge cross the railroad spurin the Chemic Area. Reportedly during the installation of the conveyor belt, a 550-gallon diesel-fuel UST was removed. However, documentation dealing with the diesel-fuel UST removal activities could not be located.

During March and April 1998, AG&M conducted a Phase II EI in the Chemic Area. The Phase II EI included the drilling of five soil test boreholes (SB-21 through SB-24, and SB-32), the installation of one Type II monitoring well (CMW-1), and chemical analysis of groundwater, and soil samples.

The soil samples were analyzed for RCRA metals, sodium, chloride, TPH for gasoline and diesel, and oil and grease. In addition, a composite surficial-soil sample was collected and analyzed for RCRA Metals, sodium, and chloride.

One shallow monitoring well (CMW-1) was installed adjacent to the railcar-tank area to a depth of approximately 30 feet below land surface ("BLS"). A groundwater sample was collected from the well and analyzed for VOCs, SVOCs, RCRA metals, nitrate, sodium, and chloride.

1.3.6 Former Burn Pit/Clarifier Area

The Clarifier (water filter) is located at the northern end of the Site, and is used to filter fines from surface water prior to use in various processes. Reportedly, the Clarifier is located over an abandoned former burn pit (Figure 4).

During excavation activities for the construction of the Clarifier, buried solid-waste materials (construction debris, wood, shop rags, and black ash) were encountered. The types of waste materials that were burned and subsequently buried are unknown. The use of the Former Burn Pit was discontinued in approximately 1968. Reportedly, the Former Burn Pit was used

to dispose of paper, cardboard, and remnant cloth materials for the Site and the surrounding community.

During March and April 1998, AG&M conducted a Phase II EI at the Former Burn Pit/Clarifier Area. The Phase II EI included the drilling of eight soil test boreholes (SB-6 though SB-10), installation of three temporary monitoring wells (SB-25/MW, SB-26/MW, and SB-27/MW), and chemical analysis of groundwater, and soil samples (Figure 4).

The soil samples were analyzed for VOCs, SVOCs, RCRA metals, and pesticides/PCBs. Two soil samples, SB-8 and SB-27, were also submitted for analysis of dioxin. The groundwater samples were analyzed for VOCs, SVOCs, RCRA metals, TPH for gasoline and diesel, and oil and grease.

1.3.7 Machine Shop Area

Two resin, one softener, one catalyst, one silicate, one varsol, and one waste-oil AST are located adjacent to the Machine Shop Area (Figure 3). The varsol AST is connected to a spigot inside the Machine Shop.

During March and April 1998, AG&M conducted a Phase II EI in the Machine Shop Area. The Phase II EI included the drilling of ten soil test boreholes (SB-11 through SB-20), collection of a composite surface soil sample adjacent to the coal storage pits and pond, installation of four temporary monitoring wells (SB-12/MW, SB-13/MW, SB-15/MW, and SB-17/MW), and chemical analysis of groundwater and soil samples (Figure 4).

The soil samples were analyzed for VOCs, SVOCs, RCRA metals, TPH, and oil and grease. The composite surface soil sample was analyzed for VOCs, SVOCs, and RCRA metals. The groundwater samples were analyzed for VOCs and SVOCs.

1.3.8 Waste Water Treatment Plant/Inactive Debris Landfill Areas

The WWTP, located across U.S. Highway 29 form the plant, has a total storage capacity of 4.25-million gallons of wastewater and sewage. The WWTP contains a mixing basin, aeration basin, clarifiers, and sludge removal basins. The WWTP also contains several, concrete lined, sludge drying beds (Figure 4).

The NC Finishing Plant contains numerous floor drains within the manufacturing buildings for the collection of wash water and spillage. The WWTP received wastewater from the NC Finishing Plant, adjusted the wastewater for pH, and discharged the effluent into the Yadkin River under NPDES Permit No. NC0005487.

The WWTP Sludge Application Area is located south of the WWTP. Processed organic sludge from the WWTP is applied to the acreage by the injection and tilling method. Subsequent to sludge application, the acreage was seeded for erosional control. In addition, WWTP sludge is applied to approximately 500 acres located at several off-Site farms.

Two inactive debris landfills were identified in the area of the WWTP. One former debris landfill, less than 1 acre in size, is located west and adjacent to the WWTP. The second former debris landfill is located south of the WWTP. Both debris landfills were reportedly used for the disposal of construction debris including bricks and wood.

During March and April 1998, AG&M conducted a Phase II EI at the WWTP/Former Debris Landfill Area to assess environmental conditions. The Phase II EI included the excavation of four test pits, installation of one temporary monitoring well (LTMW), and chemical analysis of groundwater and soil samples (refer to Figure 4).

Mr. C. Rick Doby, Sr. of the NC Division of Waste Management was reported present during the landfill investigations. Four test pits were excavated at the two former debris landfills and

soil samples were collected from the bottom of the excavations. In addition, a piece of transite board was sampled for asbestos.

The soil samples were analyzed for VOCs, SVOCs, RCRA metals. The groundwater sample was analyzed for VOCs, SVOCs, TPH, and oil and grease.

1.3.9 Fly Ash and Coal Storage Area

Coal fly ash and coal were once stored near the former schoolhouse on the western side of the Site. This area is no longer used for storage and is grass covered (Figure 4). During the Phase II EI conducted by AG&M in March and April 1998, three composite soil samples were collected in this area. The composite soil samples were analyzed for VOCs, SVOC, and RCRA Metals.

1.4 Nature and Extent

On-Site soils beneath and adjacent to portions of the former production building and former USTs have been affected by the release of (1) organic chemicals containing chlorinated and non-chlorinated volatile organic compounds ("VOCs") and semi-volatile organic compounds ("SVOCs"), and (2) petroleum hydrocarbons.

Chlorinated and non-chlorinated organic compounds are present in groundwater in the on-Site Shallow and Bedrock aquifers at the former production building. Contaminated groundwater in both aquifers has migrated eastward to the Yadkin River. Surface water in the Yadkin River, however, has not been measurably affected by the discharge of groundwater from the Shallow Aquifer.

1.5 Historical Release Sources

Other than releases associated with USTs, there have been no documented historical releases at the plant. Based on our review of the documents list in Section 1.2, the following potential source areas were identified:

- South Production Building Area (former 20,000-Gallon UST Area); portions of the South Production Building;
- Chemic Area;
- Machine Shop Area; and
- Clarifier/former Burn Pit Area.

2.0 Remedial Investigation Summary

A summary of the RI is presented in this section. The summary includes a description of the RI Work Plan, and RI sampling activities.

2.1 Purpose and Structure

The purpose of this section is to give a brief overview of the events and activities of the RI and the documents that were produced in support thereof. Section 2.2 discusses the RI Work Plan and its components. Section 2.3 describes Site maps that have been developed. Section 2.4 discusses the RI Report Appendix organization.

Sampling procedures and analysis methods are described in Section 2.5. Section 2.6 discusses the various Site investigations that have occurred during the RI.

2.2 Remedial Investigation Work Plan

The RI Work Plan discussed the scope of work for Phase I of the RI. The objectives of the RI were to assess the nature and extent of contamination at the Site. Included in the Work Plan were: (1) Appendix I - Sampling and Analysis Plan ("SAP") which includes a Quality Assurance Project Plan ("QAPP"); and (2) Appendix II - Health and Safety Plan ("HASP").

2.2.1 Quality Assurance Project Plan

The Quality Assurance Project Plan ("QAPP") was prepared to comply with the U.S. Environmental Protection Agency ("US EPA") guidance for RIs. The QAPP documents the procedures to be used to ensure that the work performed is of high quality.

2.2.2 Site Health and Safety Plan

The Site-Specific Health and Safety Plan provided a description of the known existing Site conditions as they could potentially affect health and safety; described what activities would be taking place at the Site as part of the project; reiterated health and safety requirements; described levels of personal protective equipment ("PPE") that may have been required and the criteria for such protection; and provided contingency planning for Site communication, emergency equipment, and emergency planning. In addition, the plan provided mechanisms for amending the plan and for assuring that project personnel had read the plan and had met its health and safety requirements such as medical surveillance, respirator fit testing, and training.

2.2.3 Data Management Plan

The data management procedures for the RI were designed to control, inventory, and track data and documents. After data were generated by field and laboratory operations, the data were handled to maintain integrity, the integrity of subsequent reports, and for future enforcement or legal proceedings.

2.2.4 Sampling and Analysis Plan

This document, together with the QAPP, was prepared to comply with the Inactive Sites guidance for RIs. The procedures contained in this plan are Site specific and are designed to allow the collection of representative samples for chemical analysis of organic compounds. The procedures also address the collection of soil and water samples for field screening. The sample-collection procedures in the plan are intended to be in accordance with applicable federal and state requirements.

2.2.5 Phase II Work Plan

The scope of work for the RI Phase II expanded the Geoprobe™ assessment, added three wells to the Shallow Aquifer, and called for the drilling of four Bedrock Aquifer test boreholes. A sampling schedule was described and included video logging and discrete interval sampling of the new Bedrock Aquifer test boreholes.

2.3 Site Maps

Various Site maps have been developed for the RI Report. Most maps were designed on two basic layouts. The first is a 1:100 scale Site map of the main facility to the property fence-line. The second is a 1:150 scale study area map and includes those areas of the production facility along U.S. Highway 29 that are pertinent to the project. Site maps are geo-referenced and licensed North Carolina land surveyors have surveyed well locations.

2.4 RI Report Appendix Organization

A significant amount of RI data is contained in the appendices of this report. Data include sample analyses of multiple samples of soil and groundwater, hydrogeologic characterization, testing, and evaluations, and field water-quality and hydrogeologic data.

The following appendices has been developed to contain the selected RI data in an organized manner.

Appendix I – Abbreviations used in the RI Report.

Appendix II – In-Situ Hydraulic Conductivity Test Data and Analyses.

Appendix III – Test Borehole Geologic Logs and Monitoring Well Construction Diagrams.

Appendix IV – Shealy Laboratory Analytical Reports.

Appendix V – Field Notes.

Appendix V – IDW Disposal Manifest.

2.5 Sample Chemical Analyses

Sample chemical analysis was performed in accordance with the SAP and the QAPP. Samples were primarily analyzed for VOCs, SVOCs and 8 RCRA Metals.

2.5.1 Screening Analyses

Field-screening analyses were performed on selected soil and groundwater samples and included the measurement of organic vapor using a Foxboro Organic Vapor Analyzer ("OVA") or Toxic Vapor Analyzer ("TVA") using a headspace method. The headspace method involves containerizing samples by partially filling the sample container with sample, allowing time (approximately 15 minutes) for chemical compounds to volatilize, and then reading organic vapors contained in the "headspace" of the sample container.

2.5.2 VOCs, SVOCs and Metals Analyses

Analysis of soil and water samples for VOCs and SVOCs by US EPA Methods 8260 and 8270, respectively, with identification/quantification of tentatively identified compounds ("TICs"), and 8 RCRA Metals by US EPA Method 6010 were performed by Shealy Industrial Services, Inc ("Shealy"), of Columbia, South Carolina (NCDENR Certified Lab No. 329). These methods will be identified in later sections of the report as Method 8260 VOCs, Method 8270 SVOCs, and RCRA Metals.

2.6 Site Investigations

This section describes the activities that have occurred at the Site during the RI.

2.6.1 Overview

Site investigations have been ongoing since S&ME's initial involvement at the Site. Site investigations include shallow on-Site soil sampling by hand-auger, on-Site Geoprobe™ assessments involving the collection of soil and groundwater samples, on-Site surface water and sediment sampling in the Yadkin River, and on-Site assessment of the Shallow and Bedrock aquifers including geologic test drilling, well installation, groundwater sampling, and hydrogeologic data collection.

RI field activities were performed during the period of June 2000 to November 2002. A summary of activities performed during the Phase I RI include:

- A total of 46 soil samples, and 10 groundwater samples were collected for chemical analysis from 23 Geoprobe™ holes;

- A total of 10 soil samples were collected for chemical analysis from 5 hand auger holes;
- Eleven Shallow Aquifer monitoring wells (RI Wells) were installed and developed including wells in the upper and basal portions of the Shallow Aquifer;
- Groundwater samples were collected for chemical analysis from the 11 RI wells and 12 existing monitoring wells;
- Four geologic test boreholes were drilled to a maximum of 300 feet below land surface (BLS) using nominal six-inch-diameter, air-hammer drilling methods;
- Groundwater samples were collected for chemical analysis from discrete intervals in the bedrock wells;
- In-situ hydraulic testing was performed in the new monitoring wells;
- Six surface water samples and six sediment samples were collected for chemical analysis from the Yadkin River.

2.6.2 Shallow Soil Sampling

Shallow soils (less than 1.5 ft) were sampled on several occasions during the RI investigations. The sample locations were based on the review of previous documents and as potential source areas as previously discussed (Figure 5). Samples were collected on at least one occasion at the following locations:

- in the area of the Chemic area along the railroad spur and near ASTs in the area;
- inside the Machine Shop area near floor drains and adjacent areas, and
- inside the South Production Building at the chemical wash station near floor drains.

2.6.2.1 Chemic Area

Collection of four, shallow soil samples (FPH-101, FPH-102, FPH-103 and FPH-104) was performed on June 26, 2000. The soil samples were collected near the ASTs along the railroad spur at the Chemic Area (Figure 5).

The shallow soil samples were collected with a decontaminated stainless-steel hand-auger. The samples were collected from the depth interval of 0 to 1.5 feet below land surface ("BLS"). The three soil samples were analyzed by Shealy for Method 8260 VOCs and Method 8270 SVOCs with TIC identification and for eight RCRA Metals.

2.6.2.2 Machine Shop

Collection of four shallow soil samples (FPH-107, FPH-109, FPH-110 and FPH-116) was performed on June 20-21, 2000. The soil samples were collected in the vicinity of the Machine Shop and adjacent to drain lines located west of the Machine Shop area (Figure 5).

The shallow soil samples were collected with a decontaminated stainless-steel hand auger. The samples were collected from the depth interval of 0 to 1.5 feet below land surface ("BLS"). The three soil samples were analyzed by Shealy for Method 8260 VOCs and Method 8270 SVOCs with TIC identification and for eight RCRA Metals.

2.6.2.3 Clarifier - Former Burn Pit Area

Collection of five shallow soil samples (FPH-111, FPH-112, FPH-113, FPH-114 and FPH-115) was performed on June 22 through 26, 2000. The soil samples were collected in the vicinity of the former Burn Pit area (Figure 5).

The shallow soil samples were collected with a decontaminated stainless-steel hand auger. The samples were collected from the depth interval of 0 to 1.5 feet below land surface ("BLS"). The soil samples were analyzed by Shealy for Method 8260 VOCs and Method 8270 SVOCs with TIC identification and for eight RCRA Metals.

2.6.2.4 South Production Building

One shallow soil sample (FPH-106) was collected on June 21, 2000. The soil sample was collected adjacent to the production facility at US Highway 29 (Figure 5).

The shallow soil sample was collected with a decontaminated stainless-steel hand auger. The sample was collected from the depth interval of 0 to 1.5 feet below land surface ("BLS"). The soil sample was analyzed by Shealy for Method 8260 VOCs and Method 8270 SVOCs with TIC identification and for eight RCRA Metals.

2.6.3 Geoprobe™ and Additional Hand-Auger Soil Sampling

Geoprobe™ sampling and hand-auger sampling of deeper (greater than 1.5 ft) soils were performed at the Site on June 20-26, 2000 and on August 8-10, 2002. The locations of the 23 on-site probe holes are shown in Figure 5.

Sampling was performed at the Site during three separate events to collect soil and Shallow Aquifer groundwater samples. The sampling events included:

- June 20-26, 2002 – Geoprobe™ holes FPH-101 through FPH-118;
- August 8-10, 2002 – Geoprobe™ holes GP-1 through GP-5 and hand auger holes HA-1 through HA-3; and
- November 8, 2002 – hand-auger holes HA-4 and HA-5.

2.6.3.1 Soil Sampling

Soil samples were collected during the Geoprobe™ and soil sampling events. Thirty-two soil samples were collected. Geoprobe samples (FPH-series and GP-series) were collected using a decontaminated, two-inch, stainless steel MacroCore sampling tube. The sampling tube was four feet long and was sleeved with polyethylene sampling liners. The hand-auger soil samples (HA-series) were collected with a decontaminated stainless-steel hand auger. Shealy Labs analyzed the soil samples for Method 8260 VOCs, Method 8270 SVOCs and eight RCRA Metals.

2.6.3.2 Groundwater Sampling

Groundwater samples were collected during the June 20-26, 2000 and August 8-10, 2002 Geoprobe™ sampling events. Ten groundwater samples were collected from the upper and/or lower portions of the Shallow Aquifer. Samples were collected using a one-inch diameter, steel, 0.004" slotted screen, poly tubing, and a peristaltic pump.

Shealy labs analyzed the groundwater samples for Method 8260 VOCs, Method 8270 SVOCs and eight RCRA Metals.

2.6.4 Surface-Water and Sediment Sampling

Surface water and sediment samples were collected from the Yadkin River on two occasions. The locations of the surface water and sediment samples are shown on Figure 5.

Sampling locations and dates were:

- June 20-26, 2002 – surface water samples were collected from locations YSW-01 through YSW-04 and sediment samples were collected at locations YSD - 01 through YSD-04; and

- April 13, 2001 - surface water samples YSW-05 and YSW-06 and sediment samples were collected at locations YSD-05 and YSD-06.

Shealy Lab analyzed the surface-water and sediment samples for Method 8260 VOCs, Method 8270 SVOCs, and eight RCRA Metals.

2.6.5 Shallow Aquifer Assessment

The Shallow Aquifer is present in the unconsolidated material overlying bedrock in the study area. The Shallow Aquifer appears to be separated from the bedrock aquifer in areas where the saprolite layer thickens. The aquifer is under water table aquifer conditions. The assessment evaluated the upper portion and lower ("basal") portion of the Shallow Aquifer. The Shallow Aquifer assessment included

- Installation and development of 14, two-inch-diameter, PVC monitoring wells;

- In-situ hydraulic conductivity tests;

- Measurement of static water levels;
- Collection of groundwater samples for chemical analysis on several occasions; and
- Measurement of field water-quality parameters during sample collection.

2.6.5.1 Monitoring Well Installation

Fourteen monitoring wells were installed during the RI Investigation to evaluate groundwater quality in the Shallow Aquifer. Five monitoring wells, the FMW-200 series, were completed in the basal portion of the Shallow Aquifer. Nine wells, the FMW-100 series, were completed in the upper portion of the Shallow Aquifer. The locations of the monitoring wells are shown in Figure 5. Construction details for all new and existing wells are presented in Table 2. Soil drill cuttings were containerized and temporarily stored in an on-Site roll-off prior to off-Site disposal. Disposal Manifests for the investigative derived waste ("IDW") are contained in Appendix II.

2.6.5.2 In Situ Hydraulic Conductivity Testing

In-situ hydraulic conductivity tests (slug tests) were performed in all the new Shallow Aquifer monitoring wells except FMW-103, FMW-104 and FMW-108 through FMW-110. In addition, slug tests were performed in wells MW-8, MW-9, MW-16, VE-1 and VE-2 installed by others for the 20,000-gallon UST investigations. Specific Capacity tests were also performed in wells FMW-101, FMW-102, FMW-103 and FMW-202. Multiple groundwater-level measurements from all wells were collected during the period. A 14-psi pressure transducer and a Hermit 1000 datalogger, both manufactured by InSitu, Inc., were used to record test data. Test data were analyzed according to the Bouwer and Rice method for slug tests in unconfined aquifers. Test data and analyses are contained in Appendix III.

2.6.5.3 Well Development and Sampling

Shallow Aquifer monitoring wells have been sampled on several occasions. Monitoring Wells were developed after installation and prior to the first sampling event. Well development consisted of surging and over pumping. Prior to sampling, wells were purged of at least three well volumes where field water-quality parameters had stabilized, or until the well was dry. Wells were sampled with disposable polyethylene bailers. Purged groundwater was containerized and temporarily stored in an on-Site tank prior to off-Site disposal. Disposal Manifests are contained in Appendix II. Boring logs and monitoring well construction details are contained in Appendix IV.

2.6.6 Bedrock Aquifer Assessment

The Bedrock Aquifer assessment included

- Drilling four geologic test boreholes using air rotary methods;

- Geophysical logging and borehole inspection using a down-hole video camera;
- In-situ discrete-interval hydraulic conductivity testing using a dual-packer system;
- Measurement of static water levels;
- Collection of discrete-interval and composite-borehole groundwater samples for chemical analysis; and
- Measurement of field water-quality parameters during sample collection.

2.6.6.1 Geologic Test Drilling

Four test boreholes (FMW-300 series) were drilled into bedrock by McCall Brothers, Inc ("McCall Brothers") of Charlotte, North Carolina using air-rotary drilling methods. Nominal six-inch-diameter, steel surface casing was grouted a minimum of 3 feet into bedrock prior to advancing the borehole.

Boreholes FMW-302, FMW-304, FMW-305, and FMW-306 were drilled during the period of August 20- 27, 2002. All boreholes were advanced to a depth of 300 feet except FMW-302 that was terminated at a depth of 250 feet BLS. Construction details are presented in Table 2. Drill soil cuttings were containerized and temporarily stored in an on-Site roll-off prior to off-Site disposal.

2.6.6.1.1 Test Borehole Development

McCall Brothers developed bedrock test boreholes by over-pumping until the well discharge became clear. Purged water was containerized and was stored temporarily on Site prior to off-Site disposal.

2.6.6.2 Geophysical Logging and Borehole Video Inspection

S&ME contracted Environmental and Geologic Information Systems, Inc ("EGIS") of Raleigh, North Carolina to perform geophysical logging and borehole video-camera inspection. Geophysical logging and video inspection were performed in all bedrock test boreholes to identify fracture zones and bedrock hydrogeologic characteristics. Boreholes FMW-302, FMW-305, and FMW-306 were logged on August 28-31, 2002. Borehole FMW-304 was logged on October 16, 2002. Field notes from the borehole video-camera inspection are included in Appendix V.

2.6.6.3 Discrete-Interval Hydraulic Testing and Sampling

Discrete-interval hydraulic testing was performed in the bedrock boreholes using an inflatable, dual-packer assembly; the packer string was either Schedule-80 galvanized steel or 2-inch polyvinylchloride (PVC) well riser with a 10-foot galvanized-steel screen section between the packers. Fracture zones were chosen based on the geophysical logging and borehole video inspection.

On September 24 through October 9, 2002, discrete-interval hydraulic testing was performed in boreholes FMW-302, FMW-304, FMW-305, and FMW-306. Five intervals were tested in boreholes FMW-302, FMW-304 and FMW-306; six intervals were tested in Borehole FMW-305.

On September 20, 2002 to October 22, 2002, discrete-interval groundwater samples were collected from four test boreholes; FMW-302, FMW-304 and FMW-306 (five zones), and FMW-305 (six zones).

3.0 Area Features

3.1 Land Use

The Site is zoned industrial and the Yadkin River forms the boundaries of the Site along the eastern to northwestern quadrants. Property across the river is residential, agricultural, or undeveloped.

A former school is located along the western border of the Site on property owned by Colortex, Inc (Figure 2). The Yadkin United Methodist Church is located adjacent to the southwestern border of the Site. A residential area is located southwest of the Site. The nearest occupied residence is located approximately ¼-mile away.

3.2 Topography

The topography in this portion of the Piedmont is characterized by rolling hills with topographic elevations ranging from approximately 630 to 750 feet above National Geodetic Vertical Datum ("NGVD") (Figure 1). However, the topography of the Site is generally level (elevation of approximately 650 feet NGVD) where land surface has been altered by grading and filling. Topography is steeper along the banks of the Yadkin River where elevations descend rapidly to approximately 625 to 630 feet NGVD.

The Yadkin River is the major surface-water drainage system in the area and the Site is located on the south bank of the river. Headwaters of High Rock Lake on the Yadkin are located just east and downstream of the Site and have a normal pool elevation of 624 feet NGVD.

3.3 Climate

The average annual rainfall in the region is 43.32 inches. Precipitation is well distributed throughout the year with average monthly precipitation ranging from a minimum of 3.0 inches in November to a maximum of 4.28 inches in March.

The average annual temperature is approximately 59.7° Fahrenheit ("F") with average monthly temperatures ranging from 39.7°F in January to 79.0 °F in July. Information for Salisbury, NC, 1969-1998, was provided by the State Climate Office of North Carolina at NC State University.

3.4 Surface-Water Hydrology

The Yadkin River is the major surface-water feature in the area and flows predominately west to east at the Site. The river is, however, mostly ponded at the Site by High Rock Lake to the east (Figure 1). Wetlands form a portion of floodplain of the river in the area.

Some stormwater from the Site was discharged to the Yadkin River under General Permit No. NCG170000 at two outfalls (01and 02) (Figure 3). The majority of stormwater flows to the WWTF (Figures 2 and 3).

A number of small, unnamed tributaries flow to the Yadkin River from the north and south. Many of these smaller tributaries are generally oriented in an almost north-south direction indicating potential bedrock joint control.

Additional intrusive investigation for the Garage Area is not warranted during this RI because the Garage Area received a "No Further Action" from DENR in 1998, and the groundwater monitoring wells have been abandoned. The reader is referred to the aforementioned documents (Section 1.2) for a detailed discussion of the Garage Area. The AG&M Phase II EI historical soil and groundwater analytical results are presented in Tables 3 and 4, respectively. The AG&M Phase II EI historical soil and groundwater sampling locations are shown on Figure 4.

4.2.1 Historical Soil Sample Analytical Results

Based on review of the AG&M soil-analytical data, the following conclusions were developed:

- Ethylbenzene, naphthalene, phenanthrene, n-propylbenzene, toluene, 1,2,3-trimethylbezene, 1,3,5-trimethylbenzene, and xylene were detected above the NCDENR Soil to Groundwater, Maximum Soil Contaminant Concentrations ("MSCCs") in the soil sample collected from test borehole SB-1 (located adjacent to the former dispenser islands).

- Naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and 2-methylnaphthalene were detected above the NCDENR, Division of Waste Management, Superfund Section, Inactive Hazardous Sites Branch, Remediation Goals ("RGs") in the soil sample collected from test borehole SB-5.

- TPH (diesel-fuel range) was detected above the NCDENR Groundwater Section, Guidelines for the Investigation and Remediation of Soil and Groundwater, Reportable Concentrations ("RCs") in the soil sample collected from test borehole SB-1.

- Chromium and lead were detected above their respective RGs in the soil samples collected from test borehole SB-5.

The historical Garage Area soil analyses are summarized in Table 3.

4.2.2 Historical Groundwater Sample Analytical Results

Benzene, methyl tert-butyl ether, bis (2-ethylhexyl) phthalate, 2-methylnaphthalene, and naphthalene were detected above the North Carolina Administrative Code ("NCAC") Title 15A Subchapter 2L Groundwater Quality Standards ("2L Standards") in the groundwater samples collected from former Monitoring Well MW-5, also naphthalene was detected above the 2L in a groundwater sample (SB-30W) collected from soil boring SB-30. The concentrations were not, however, above the Gross Contaminant Level ("GCL") established for UST sites. The monitoring wells, including MW-5, associated with the former Garage UST Area, were closed subsequent to NFA notification. The historical Garage Area groundwater analyses are summarized in Table 4.

4.0 Review of Existing (Pre-RI) Data

4.1 Results of Historical Soil and Groundwater Analyses

Information gained from the Site's background and history, hydrogeologic and analytical data from previous investigations, and current Site conditions were important in formulating the Work Plan for the RI. This section provides an overview of the existing analytical database.

4.1.1 Preliminary Assessment – September 1985

In September 1985, the NCDHR, DHS performed a PA of the Site's waste-disposal methods. The PA concluded that a "low priority" for the Site was warranted.

4.1.2 Screening Site Inspection - December 1991

As a followup to the September 1985 PA, NCDENR Solid Waste Management Division, Superfund Section, conducted a SSI in December 1991. As part of the inspection, sediment samples were collected from three locations in the Yadkin River. Water samples were collected from the influent of the WWTP and from a residential well located approximately 500 ft from the Site; this well is reported to no longer exist.

The results of the SSI are presented below:

- Constituents of concern were not detected above laboratory method detection limits in the sediment samples collected from the Yadkin River;
- Chloroform, chlorobenzene, and xylenes were detected in the influent-discharge sample collected at the WWTF; and
- Chloroform was detected in the water sample collected from the residential well. The SSI attributed the detected chloroform concentration to well chlorination.

The SSI concluded that surface water and groundwater at the Site were not impacted. The North Carolina Superfund Section recommended "no further action" for the Site.

4.2 Garage Area

A petroleum release was discovered during the removal of two gasoline/diesel-fuel USTs and one kerosene UST (NC Groundwater Incident No. 17467). Subsequently, a CSA dated January 19, 1996 and a CAP dated June 5, 1997 were prepared.

In two letters dated July 28, 1998, and March 12, 1999, NCDENR DWM provided Fieldcrest a "Notice of No Further Action" for the USTs. Subsequently, the groundwater monitoring wells for the Garage Area were closed.

4.3 Former 20,000-Gallon UST and 200,00-Gallon AST Area

A petroleum release was discovered during the removal of a 20,000-gallon fuel-oil UST in 1994 (NC Groundwater Incident No. 16198). Subsequently, a CSA dated January 18, 1996 and a CAP dated June 5, 1997 were prepared.

In a letter dated September 2, 1997, Fieldcrest received "Final Approval" from NCDENR DWM for the former 20,000-gallon UST Area CAP. A schedule for performing natural-attenuation monitoring was outlined in the CAP and is currently underway by Pyramid.

During the development of the CSA, light non-aqueous phase liquids ("LNAPLs") were found in Wells MW-1, MW-2, MW-10 and MW-13 (Figure 4) and dissolved-phase hydrocarbon compounds were detected above 2L groundwater action levels. Among the sampling locations where dissolved phase hydrocarbons (and chlorinated hydrocarbons) were three wells located off-site in the median of U.S. Highway 29. Remediation of the LNAPL by Pyramid is being performed by AFVR approved by NCDENR UST Section.

In addition, adsorbed hydrocarbon compounds were detected in the vadose-zone soils above the NCDENR soil action levels of (1) 10 milligrams per kilogram (mg/kg) for Total Petroleum Hydrocarbons-Gasoline Range Organics ("TPH-GRO"), and (2) 40 mg/kg for TPH-Diesel Range Organics ("TPH-DRO").

During the refurbishing of the 200,000-gallon AST in 1996-1997, petroleum hydrocarbon impacted soil was reported. This information and the discovery of more than 30-inches of LNAPL in MW-10 led to the soil investigation at the 200,000-gallon AST. Currently, there is no measurable LNAPL in MW-10.

A CSA, dated September 23, 1999 was prepared for the 200,000-gallon AST by Pyramid. The CSA recommended that the two areas (former 20,000-gallon UST and 200,000-gallon AST) be treated as a single incident. The CSA also recommended the development of a new CAP, which would address the remediation of both sites. It is S&ME's understanding that a CAP Addendum is currently being prepared by Pyramid.

Additional intrusive investigation for this area was not warranted during this RI because the 20,000-Gallon UST Area received an approval for the CAP and is being managed by NCDENR Groundwater Section. The reader is referred to the aforementioned documents for a detailed discussion for the 20,000-Gallon UST and 200,000-Gallon AST Area. Some of the monitoring wells installed as part of the UST investigations by others were used during the RI investigation.

4.4 Chemic Area

Between March and April 1998, AG&M conducted a Phase II EI at the Chemic Area that included the drilling of five soil test boreholes (SB-21 through SB-24, and SB-32), installation of one Type II monitoring well (CMW-1), and chemical analysis of groundwater, and soil samples. These activities were performed to investigate a suspected UST. The AG&M Phase

II EI historical soil and groundwater analytical results are presented in Tables 5 and 6, respectively. The soil and groundwater sampling locations are shown on Figure 4.

4.4.1 Historical Soil Sample Analytical Results

Based on review of the historical soil analytical data, the following conclusions were developed by AG&M:

- 2-Hexanone, 1,1,2,2-tetrachloroethane, naphthalene, and 2-methylnaphthalene were detected above the MSCCs in the soil sample collected from Test Borehole SB-23.

- Oil and grease and TPH (diesel range) were detected above the RCs in the soil samples collected from test boreholes SB-23 and SB-32.

- 4-Isopropyltoluene, naphthalene, 2-methylnaphthalene, 4-methylnaphthalene, and 4-methylphenol were detected above the MSCCs in the soil sample collected from Test Borehole SB-32.

- N-Butylbenzene, n-propyl benzene, and 1,2,4-trimethylbenzene were detected below the MSCCs in the soil sample collected from test borehole SB-32.

- Barium was detected above the RG in the soil samples collected from the Chemic Area.

The Chemic Area soil analyses are summarized in Table 5.

4.4.2 Historical Groundwater Sample Analytical Results

Benzene and bis (2-ethylhexyl) phthalate were detected above the 2L Standards in the groundwater sample collected from Chemic Area Monitoring Well CMW-1. Naphthalene and lead were detected above the laboratory method detection level, but below the NCAC 2L Groundwater Quality Standards (Table 6).

4.5 Former Burn Pit/Clarifier area

During the Phase II EI by AG&M, soil and groundwater samples were collected in the vicinity of the Former Burn Pit to determine if past practices may have impacted the soil and groundwater (Figure 4). The existing Clarifier is reportedly constructed over the Former Burn Pit.