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COMPREHENSIVE SITE ASSESSMENT REPORT

Ilco Unican Corporation
2941 Indiana Avenue
Winston-Salem, North Carolina
North Carolina Incident No. 9920

PREPARED BY:

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April 17, 1997

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EXECUTIVE SUMMARY

A comprehensive site assessment (CSA) report has been compiled for the Ilco Unican, Winston-Salem facility from site assessment activities conducted between June 1987 and February 1996. These activities included the completion of multiple phases of soil sampling/analysis, multiple phases of monitoring well installations and groundwater sampling/analysis, aquifer testing, and a potential receptor survey.

The facility was operated from 1945 to 1988 by Stewart-Warner Corp., Bassick-Sack Division, who conducted furniture hardware metal finishing. Wastes generated by Stewart-Warner at the facility included electroplating sludges; foundry baghouse dust; wastewater treatment sludge; spent chlorinated solvents and sludges from degreasing operations; chromic and nitric acids; and waste paint, lacquer, and thinner.

The facility was purchased by Ilco Unican in 1988 to manufacturer zinc die-cast locks. Wastes generated through Ilco Unican's processes include flammable waste (D001), electroplating waste (F006), petroleum based waste, buffing waste, scrap metals, and assorted domestic wastes.

Results of soil sampling/analysis of facility soils conducted between June 1987 and May 1993 indicated the presence of metals (primarily arsenic, lead, nickel, and zinc) and cyanide in surficial soils at concentrations above preliminary soil remediation goals (PSRGs) or maximum concentration levels (MCLs) for toxicity. Two phases of soil excavation/disposal, conducted by Stewart-Warner in 1988 and Ilco Unican in 1996, respectively, were completed to reduce surficial soil metals and cyanide concentrations below PSRGs and MCLs.

Results of groundwater sampling/analysis conducted between March 1995 and February 1996 indicate the presence of a plume of dissolved volatile organic compounds (VOCs) in groundwater that originates from the facility and extends off site in the apparent downgradient direction. Based on the analysis of groundwater samples collected from off-site water table monitoring wells, and on-site vertical delineation monitoring wells, both the horizontal and vertical extent of dissolved VOCs in groundwater has been delineated.

Sources of dissolved VOCs in groundwater include former sumps in the facility courtyard area and a former disposal pit in the southern side yard area of the facility. Three former disposal pits in the

southern side yard area that contained drums, crucibles, and other assorted debris were excavated by Stewart-Warner in 1988. An additional disposal pit in the southern side yard area was excavated by Ilco Unican in May 1996.

The facility is located within the city limits of Winston-Salem, North Carolina in an area of mixed industrial, commercial, and residential use. No potable water wells have been identified within a 1,500 foot radius of the facility. The nearest potential receptor point of groundwater from the Ilco Unican facility is a perennial stream (tributary of Peters Creek) located approximately 2,000 feet south of the facility.

Based on the results of soil and groundwater sampling/analysis and the preliminary evaluation of potential receptors at and around the facility, it is recommended that site specific target levels (SSTLs) be developed for the facility for source area VOC concentrations in soil and groundwater at the facility. The developed SSTLs will be used as the basis of *alternate concentration limits* (ACLs) for groundwater remediation in accordance with the provisions of 15A NCAC 2L .0106k.

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1.0 INTRODUCTION

This report presents the results of a Comprehensive Site Assessment (CSA) conducted at the Ilco Unican Corp. facility located at 2941 Indiana Ave., Winston-Salem, North Carolina (a.k.a. the former Stewart Warner Corp., Bassick-Sack Division facility). The CSA was conducted in response to the *Notice of Violation* (NOV) from the North Carolina Department of Environment, Health, and Natural Resources (NCDEHNR), Winston-Salem Regional Office, that was issued to Ilco Unican and Stewart Warner on August 18, 1994. This report presents information collected during site assessment activities conducted between June 1987 and June 1996 and is compiled in a format that is compatible with the CSA outline presented in the *Groundwater Section Guidelines for the Investigation and Remediation of Soils and Groundwater* (NCDEHNR, 1993).

This document provides background facility information, methods and results of soil/groundwater sampling and analysis, results of aquifer testing, the results of a potential receptor survey, and recommendations for corrective action at the facility. Supporting information and documentation are provided in the appendices. Due to the large volume of laboratory documentation associated with the activities being reported (10 years of data), Ilco Unican is not binding copies of the laboratory documentation with this report. Ilco Unican maintains dedicated files of the laboratory documentation at the Winston-Salem facility, and these files will be made available to the NCDEHNR upon request.

2.0 SITE HISTORY AND SOURCE CHARACTERIZATION

2.1 Site Description

The Ilco Unican, Winston-Salem facility is located at 2941 Indiana Ave., in Winston-Salem, Forsythe County, North Carolina at approximately 36° 07' 43" north latitude and 80° 14' 14" west longitude (Figure 1). The facility occupies approximately 10 acres between Indiana Ave. and a Norfolk Southern Co. railroad right-of-way (Figure 2). Structures at the facility include a main building used for manufacturing, office, and warehouse purposes, a foundry building, a wastewater treatment building, and assorted outbuildings. An asphalt parking area is situated between the main building and Indiana Ave. Formerly undeveloped open ground (the "southern side yard") is situated between the main building/foundry building and the southeast property perimeter (Figure 2). Ilco Unican has recently developed the southern side yard to an employee park.

Area land use is shown in Figure 3. The facility is located within the city limits of Winston-Salem in an area characterized by mixed residential, industrial, and commercial uses. Southern Norfolk rail lines lie directly adjacent to the northeast facility perimeter, beyond which lies the IMC Rainbow Fertilizer, Inc. facility. An asphalt plant operated by APAC, Inc. is situated directly adjacent to the southeast facility perimeter and a Martin Motor Lines terminal is located directly adjacent to the northwest facility perimeter.

The local area across (i.e., southwest of) Indiana Ave. is characterized by mixed residential, commercial, and institutional usage. Lowrance Elementary School is situated directly across Indiana Ave. from the southern portion of the Ilco Unican facility and several small commercial establishments are located directly across Indiana Ave. from the northern portion of the Ilco Unican facility. The area southwest of the school and commercial establishments contains primarily residential properties with scattered commercial properties (Figure 3). According to NCDEHNR (1994), 10,527 persons reside within 1 mile of the facility.

The facility is located along the western flank of a low, northwest trending ridge that parallels Indiana Ave. (Figure 1). The ground surface at the facility slopes from the highest ground points along the north-northeast property perimeter toward both Indiana Ave. and the south-southeast property perimeters. Approximately 20 feet of vertical relief exists between these high and low areas at the facility.

The local topographic slope is generally south-southeast toward an unnamed tributary of Peters Creek, the headwaters of which are located approximately 2,000 feet south of the Ilco Unican facility. Local stormwater drainage is directed via a subsurface storm drainage system toward the tributary.

2.2 Facility History

It is believed that the facility dates back to the mid to late 1800s, when it was originally used as a cotton mill. The oldest structure on site (part of the manufacturing building) is believed to be associated with this original usage.

Stewart-Warner Corp., Bassick-Sack Division, purchased the property in 1945 and converted the facility to furniture hardware metal finishing. Processes used by Stewart-Warner included metal foundry operations, vibratory finishing, electroplating, oxidizing, buffing, lacquering, painting, and degreasing (Greenhorne and O'Mara, Inc., 1991). Wastes generated by Stewart-Warner at the facility included electroplating sludges (containing metals and cyanide); foundry baghouse dust (containing metals); wastewater treatment sludge (containing heavy metals and cyanide); spent chlorinated solvents and sludges from degreasing operations; chromic and nitric acids; and waste paint, lacquer, and thinner (flammable waste containing xylene, acetone, ethyl acetate, n-butyl alcohol, methanol, toluene, and 2-butanone (MEK))(Greenhorne and O'Mara, Inc., 1991). Prior to the construction of the on-site wastewater treatment plant in 1974, wastes generated by Stewart-Warner were discharged to the City of Winston-Salem municipal sanitary sewer system. According to depositions and testimony given by former Stewart-Warner employees (from Ilco Unican legal files), and as determined through multiple phases of site subsurface investigations conducted between the late 1980s and early 1990s (discussed further below), waste management practices conducted by Stewart-Warner also included disposal of wastes onto the ground surface and into shallow excavations on site. Areas where dumping occurred included portions of the southern side yard.

In February 1988, Ilco Unican purchased the facility to manufacturer zinc die-cast locks, and facility processes were converted over a two year period between 1988 and 1990. Wastes generated through Ilco Unican's new processes include flammable waste (D001), electroplating waste (F006), petroleum based waste, buffing waste, scrap metals, and assorted domestic wastes. All wastes generated by Ilco Unican are treated and discharged via the on-site wastewater treatment plant and/or transported off-site for recycling and treatment/disposal.

Four areas have been identified as possible sources of dissolved chlorinated volatile organic compounds (VOCs) in groundwater beneath the Ilco Unican, Winston-Salem facility. These areas are listed and described as follows.

- Disposal "pits" in the southern side yard;
- Former drum wash sump within the manufacturing building;
- Chrome plating sump in the wastewater treatment facility;
- Courtyard cooling water sump.

Potential source areas at the facility are shown in Figure 4. Disposal pits "A", "B", and "C" were reportedly used by Stewart-Warner during the late 1950s to dispose of empty solvent drums and solid wastes from die casting, plating residues, and zinc trimmings. Stewart-Warner excavated the pits and disposed of the pit contents along with excavated soils in July 1988. The former drum wash sump was used by Stewart-Warner and Ilco Unican for cleaning drums not containing solvents. This sump was decommissioned and filled with concrete in 1988.

The chrome plating sump, located in the wastewater treatment plant, received water from floor drains in the plating area and overflow from the courtyard cooling water sump. The latter handled cooling water from a vapor degreaser formerly located on the second floor of the manufacturing building. The vapor degreaser and courtyard cooling water sump were taken out of service in 1988.

Additional areas of the facility have been identified as containing elevated concentrations of cyanide and/or metals in soil that could represent potential sources of dissolved inorganic constituents to groundwater. These areas include the following.

- Spill sites 1 and 2;
- Waste piles 1 and 2;
- Areas associated with manufacturing building roof runoff;
- Areas associated with foundry baghouse dust.

Spill sites 1 and 2 are related to cyanide spills that occurred adjacent to the wastewater treatment plant in 1987. Waste piles 1 and 2 refer to two surface soil/sludge impoundments that were created by Stewart-Warner in the southern side yard area of the facility. The roof runoff areas contain surficial soils with metals concentrations resulting from buffing exhaust dust on the manufacturing building roof. The foundry baghouse dust areas contain surficial soils with metals concentrations resulting from foundry baghouse dust accumulations.

2.3 Summary of Release Incidents and Environmental Assessment/Remediation Activities

Following is an overview of known environmental incidents and activities at the Ilco Unican, Winston-Salem facility. Detailed descriptions of media sampling/analysis that occurred during the various phases of site activities are described in Sections 4.0 and 5.0.

The first reported release at the facility occurred on May 5, 1982, when an unreported volume of cyanide plating solution was spilled along the railroad right-of-way adjacent to the wastewater treatment facility. In response, Stewart-Warner treated approximately 200 cubic yards of contaminated soil in place using lime and chlorine in accordance with an Emergency Hazardous Waste Permit issued by the State of North Carolina Department of Human Resources, Solid & Hazardous Waste Management Branch (SHWMB). Soils were reportedly treated until cyanide levels in soil were below 6 mg/kg.

Additional cyanide solution spills occurred at the facility on April 17, 1986 and February 27 1987. Both spills occurred at the wastewater treatment plant and were contained along the adjacent railroad right-of-way. The April 17, 1986 spill involved 100-200 gallons of cyanide solution that overflowed from an outside tank adjacent to the wastewater treatment facility. In response, Stewart-Warner excavated an unreported volume of soil from the spill area for treatment/disposal and treated the excavated area with chlorine. Post-excavation soil samples collected from adjacent to the tank and from the railroad property indicated concentrations of cyanide of 230 mg/kg and 50 mg/kg, respectively. In response, soils were re-treated with chlorine and re-sampled. Reported cyanide concentrations in the soil samples collected after the second treatment were less than 0.05 mg/kg.

The February 27, 1987 spill reportedly involved less than 50 gallons of 3% cyanide solution that spread along an approximately 150 foot section of the railroad right-of-way. In response, Stewart-Warner excavated approximately 570 gallons of mixed dirt and cyanide solution from the spill area and treated the excavated material on site with lime and chlorine.

Two reported wastewater spills occurred at the facility on April 23 and May 27, 1987. The former spill involved an undisclosed volume of wastewater that flowed along an approximately 600 foot section of the adjacent railroad right-of-way. The spill area was diked, and 60 gallons of wastewater were reportedly recovered. The latter spill involved an undisclosed volume of wastewater that was released to a facility storm drain and flowed along an approximately 800 foot section of the adjacent railroad right-of-way. Approximately 600 gallons from the second wastewater spill were recovered.

On May 21, 1987, Stewart-Warner was issued a *Notice of Violation* (NOV) from the North Carolina Department of Human Resources for the 1986 and 1987 cyanide spills described above. The NOV mandated the execution of a comprehensive sampling/analysis plan to characterize soil contamination at and beyond the facility. In response, Stewart-Warner retained Research & Analytical Laboratories, Inc. (RAL) to develop and implement a sampling and analysis plan to address the 1986 and 1987 releases (designated "spill sites 1 and 2").

The results of the sampling/analysis activities for spill sites 1 and 2 are documented in a series of reports issued by RAL between June 1987 and August 1988 (i.e., RAL, 1987a, 1987b, 1988a, 1988b, 1988c). Spill sites 1 and 2 were each divided into five quadrants. Depth-dependent composite samples were collected from each quadrant to a depth of 1 foot below grade. The composite samples were analyzed for total and extractable copper, chromium, nickel, zinc, and cyanide. In August 1987, the SHWMB established cleanup limits for chromium, nickel, and cyanide based on federal groundwater maximum concentration levels (MCLs) and EP Toxicity analytical procedures (0.05 mg/L, 0.35 mg/L, and 0.2 mg/L, respectively). In addition, RAL established guideline limits for copper and zinc of 10 mg/L and 50 mg/L, respectively (RAL, 1987c). The results of the composite soil sampling in spill sites 1 and 2 indicated concentrations of copper, nickel, zinc, and cyanide above the cleanup limits to depth of 1 foot below grade in both quadrants.

Following sampling of spill sites 1 and 2, RAL conducted additional composite soil sampling in 1987 in additional quadrants outside of the spill sites, in the southern side yard area. Composite soil samples from the additional quadrants were analyzed for extractable copper, chromium, lead, nickel, zinc, and cyanide. The results of analysis indicated that constituent concentrations exceeded the cleanup limits in soil samples collected from 17 of the 20 quadrants investigated. RAL concluded that the detected concentrations of metals and cyanide in the areas outside spill sites 1 and 2 were the result of Stewart-Warner's industrial waste management practices. Suspected sources included previous unreported releases/spills and inadequate buffing exhaust systems that caused dust accumulation on the manufacturing building roof. In support of the latter theory, RAL collected and analyzed several air emission samples near the building roof stacks, which were found to contain elevated concentrations of metals and cyanide.

In January and February 1988, soil excavation activities were conducted in spill sites 1 and 2 in response to the previous results of soil sampling and analysis. Soils within each spill site were removed to a depth of 1.5 feet below grade, and post-excavation soil samples were collected in each spill site. The results of the laboratory analysis indicated reductions in metals and cyanide concentrations between the pre- and post-excavation samples.

In February 1988, a Stewart-Warner employee reported the existence of buried drums (from the late 1950s) in the southern side yard. In response, RAL conducted a metal detector survey of the southern side yard (quadrants 6 through 25, discussed above), and the existence of subsurface metallic material was detected in two of the quadrants (6 and 21). Ten drums were removed from one of two test pits dug to a depth of 3 feet below grade in the suspected burial areas. Composite soil samples were collected from each of the test pits and analyzed for extractable RCRA metals (EP Toxicity procedures), VOCs, and semivolatile organic compounds (SVOCs). The results of the analysis indicated the detection of various VOCs and SVOCs, including tetrachloroethene (PCE), 1,1,2-trichloroethene (1,1,2-TCE), benzene, ethylbenzene, xylenes, and naphthalene, in both of the test pit composite soil samples at concentrations ranging from <1 mg/kg to 15 mg/kg.

In July 1988, Stewart-Warner excavated soil and debris from three disposal pits identified as pits "A", "B", and "C", which included the test pit areas excavated in February 1988. Excavated material from pits A, B, and C included drums, metal scraps, crucibles, and contaminated soil. The excavations continued to an unreported horizontal and vertical extent until apparent native soils (i.e., non-discolored soils) were encountered and composite samples collected from the base and sidewalls of each excavation indicated <0.020 mg/kg total VOCs. Once these criteria were met, the excavations were backfilled with clean fill obtained from an off-site source, and the excavated soils/materials were transported and disposed off site.

From May to November 1988, Ilco Unican conducted a series of internal environmental audits in response to the results of the soil assessment activities conducted by RAL. In addition to spill sites 1 and 2 and pits A, B, and C, the following pre-existing environmental issues were identified from Stewart-Warner's operations at the facility.

- Foundry wastes in the existing and out-of-service baghouses and soils around baghouses;
- Buffing exhaust dust remaining on the roof and in the soils in roof runoff areas;
- Electroplating wastes in soils below electroplating lines in the manufacturing building;
- Contaminated soils from dumping of plating and wastewater treatment sludges in two piles in the southern side yard ("waste piles #1 and #2").

In October 1990, Roy F. Weston, Inc. was retained by Stewart-Warner to collect confirmatory soil samples from pits A, B, and C, which were excavated in July 1988, and to collect dust samples from the manufacturing roof/gutters and foundry baghouse area (identified by RAL as possible sources of elevated metals and cyanide in quadrant areas investigated outside spill sites 1 and 2). Two soil borings were drilled in each of pits A, B, and C. Soil samples were collected over continuous 2 foot intervals to depths ranging from 19 to 24 feet below grade in the soil borings, and selected soil samples were analyzed for VOCs by EPA Method 8240. The results of the laboratory analysis of the soil samples indicated the detection of methylene chloride and/or acetone in all of the soil samples. However, these compounds were attributed to laboratory cross contamination. 2-Butanone (MEK) was detected at a concentration of 0.021 mg/kg in one soil sample collected from pit C at a depth of 14 feet below grade. No other concentrations of VOCs were detected in any of the soil samples (Roy F. Weston, 1990).

Dust samples were collected from four locations at the facility; 1) the foundry baghouse; 2) the gutter of the manufacturing building; 3) the rooftop of the main mill building; and 4) the rooftop of building E. The dust samples were analyzed for extractable RCRA metals using EP Toxicity procedures. The results of the laboratory analysis indicated an extractable cadmium concentration above the EPA MCL for hazardous waste characteristics (40 CFR 261.24) in one rooftop sample (Roy F. Weston, 1990).

In June 1991, Groundwater Technology, Inc. was retained by Ilco Unican to conduct additional soil sampling/analysis in spill sites #1 and #2, the baghouse and roof runoff areas, and in waste piles #1 and #2 (Groundwater Technology, Inc., 1991). A total of 42 soil samples were collected to depths up to 2 feet below grade and analyzed for extractable cadmium, chromium, copper, lead, nickel, and zinc by the EPA Toxicity Characteristics Leachate Procedure (TCLP), and total cyanide. Soil samples from all four areas contained extractable lead concentrations that exceeded the EPA MCL for toxicity. Cadmium was detected at concentrations above the MCL in one soil sample from spill site #1, two samples from the foundry baghouse area, and seven samples from waste piles #1 and #2. Soil samples from spill sites #1 and #2, the baghouse and roof runoff areas, and waste piles #1 and #2 also contained concentrations of nickel above the cleanup levels established by the SHWMB in August 1987.

In addition to the above inorganics analysis, two soil samples from the roof runoff area that exhibited elevated VOC vapor concentrations were analyzed for VOCs by EPA Method 8240 and SVOCs by EPA Method 8270. Methylene chloride, xylenes, bis (2-ethylhexyl) phthalate, 2-methylnaphthalene, and phenanthrene were detected in either one or both of the soil samples at concentrations ranging from 0.91 mg/kg to 5.8 mg/kg.

In November 1991, Ilco Unican discovered the presence of an inactive groundwater production well at the facility in the courtyard area (Figure 5). The well is cased (6 inch I.D. galvanized steel) through the overburden and open in bedrock to a depth of approximately 162 ft below grade. A groundwater sample was collected from the production well on November 26, 1991 and analyzed for VOCs by EPA Method 8240, total metals by EPA Method 6010, and cyanide by EPA Method 9010. The results of laboratory analysis indicated concentrations of TCE (14 ug/L), PCE (200 ug/L), cadmium (11 ug/L), chromium (180 ug/L), copper (2,000 ug/L), nickel (5,000 ug/L), zinc (4,100 ug/L), and cyanide (0.51 ug/L) at concentrations above groundwater action levels listed in 15A NCAC 2L .0202g (2L standards).

162 ft Defunct Production well Sampling

In December 1991 and January 1992, Ilco Unican undertook remedial actions to remove buffing exhaust dust waste from the roof of the manufacturing building. A total of 75, 55-gallon drums of buffing exhaust waste (hazardous waste) were removed and disposed off site at a permitted facility as hazardous waste.

In January 1992, Geraghty & Miller re-sampled several of the former soil sample locations evaluated by Groundwater Technology, Inc. (1991). Soil samples collected by Geraghty & Miller were analyzed for total metals by EPA Method 6000/7000 and total cyanide (EPA Method 9010). In conjunction with these activities, Geraghty & Miller developed health-based preliminary soil remediation goals (PSRGs) in accordance with EPA guidance for federal superfund cleanups (Geraghty & Miller, 1992). PSRGs were developed for a variety of inorganic constituents, including cyanide, arsenic, chromium copper, lead, and zinc, based on both residential and non-residential exposures. Final facility PSRGs, which incorporated North Carolina Inactive Sites Branch guidelines, were presented to Ilco Unican via a letter from Geraghty & Miller, dated January 3, 1993. Arsenic, chromium, copper, lead, and zinc were detected in several of the January 1992 soil samples at concentrations above residential PSRGs, and arsenic and lead were detected in several of the soil samples at concentrations above industrial PSRGs.

In April 1992, Type II monitoring well MW-1 was installed directly downgradient of pit C by Geraghty & Miller (Figure 5). An initial groundwater sample was collected from MW-1 on April 9, 1992 and analyzed for VOCs by EPA Method 8240, total metals by EPA Method 6010, and cyanide by EPA Method 9010. The results of laboratory analysis indicated concentrations of several chlorinated VOCs (1,1-DCE, 1,1,1-TCA, TCE, PCE, 1,1-DCA, and cis/trans 1,2-DCE) at concentrations above the 2L standards. In addition, barium, cobalt, and mercury were detected at concentrations above the 2L standards.

In August 1992, ESE Biosciences, Inc. (EBIO) conducted additional soil sampling at the facility for Stewart-Warner in response to the results of soil sampling/analysis conducted previously for Ilco Unican by Groundwater Technology and Geraghty & Miller (EBIO, 1992). Surficial soil samples were collected from waste piles #1 and #2, two foundry baghouse areas, and the roof runoff area and analyzed for total metals by EPA Method 7000. The results of the analysis indicated elevated levels of copper, lead, nickel, and zinc in the waste piles, and elevated levels of copper, lead, and zinc in the foundry baghouse and roof runoff areas.

From November 1992 to January 1993, Ilco Unican excavated four underground storage tanks (USTs) from the facility. Two of the USTs (500 gallons and 10,000 gallon) were previously used to store kerosene and two of the USTs (16,000 gallons each) were previously used to store No. 2 fuel oil. The 500 and 10,000 gallon kerosene USTs were located between the foundry building and pit C, and the 16,000 gallon fuel oil USTs were located north and east of the wastewater treatment building. One of the latter tanks was also located on the adjacent Norfolk Southern railroad right-of-way.

Results of the UST removal activities are summarized in a report prepared by Ilco Unican (1993), which was submitted to the NCDEHNR, Winston-Salem Regional Office in 1993. In response to contamination detected in the UST excavations, approximately 1,560 tons of soil were removed and disposed off site.

In May 1993, Geraghty & Miller conducted additional confirmatory soil sampling/analysis in the southern side yard quadrants outside spill sites #1 and #2 that were originally evaluated by RAL in 1987. The 1987 soil samples collected by RAL in the selected quadrants contained metals (lead, nickel, and zinc) above the facility PSRGs developed in 1992. A total of 48 soil samples, collected from depths of 0 to 6 inches below grade and 12 to 18 inches below grade, were collected by Geraghty & Miller and analyzed for hazardous substance list (HSL) metals (EPA Method 6000/7000) and cyanide (EPA Method 9010). Two additional soil samples were collected from an area of soil quadrants 17-B and 17-C at depths of 24 to 30 inches and 62 to 68 inches below grade and analyzed for VOCs by EPA Method 8240. The results of the laboratory analysis indicated several soil samples with concentrations of lead, nickel, and zinc above facility PSRGs. In addition, the soil samples collected from quadrants 17-B/17-C at depths of 24 to 30 inches and 62 to 68 inches below grade contained concentrations of various VOCs and SVOCs, including methylene chloride, ethylbenzene, xylenes, 2-4-dimethylphenol, and 3,4-dimethylphenol (Geraghty & Miller, 1993b). Geraghty & Miller (1993b) also reported the presence of "buried materials" in the soil boring from quadrants 17-B/17-C.

In response to the detection of VOCs and SVOCs in the soil samples from soil quadrants 17-B/17-C, Geraghty & Miller conducted a soil gas survey and drilled additional soil borings in September 1993 (Geraghty & Miller, 1994). Soil gas was sampled from six soil sampling probes installed to depths of 3 feet below grade and analyzed in the field using an organic vapor meter (OVM). Elevated VOC vapor concentrations (above background levels) were detected at five of the sampling locations. Soil borings were drilled at these locations to depths ranging from 5 to 14 feet below grade, and select soil samples collected from the soil borings were analyzed for VOCs by EPA Method 8240 and SVOCs by EPA Method 8270. Xylenes and 2,3-dimethylphenol were detected in one of the soil samples. No VOCs or SVOCs were detected in any of the other soil samples. However, several VOCs (including TCE, PCE, MEK, 1,1-DCA, 1,1-DCE, and 1,1,1-TCA) were detected in one soil gas sample retained for VOC analysis by gas chromatography/mass spectrometry (GC/MS).

In December 1993, Type II monitoring wells MW-2, MW-3, MW-4, and MW-5 were installed at the facility by Bain, Palmer & Associates, Inc. (BPA) for Stewart-Warner. Monitoring well MW-2 was installed adjacent to pit C, near previously installed monitoring well MW-1 (Figure 5). Monitoring wells MW-3 and MW-4 were installed at the southeast and southern facility perimeters, respectively, in the apparent downgradient direction from the southern side yard. Monitoring well MW-5 was installed in the apparent upgradient area at the facility, near the northwest property perimeter (BPA, 1994).

Initial sampling of groundwater from Type II monitoring wells MW-2 through MW-4 was conducted on December 20, 1993. The initial groundwater samples were analyzed for VOCs by EPA Method 624, SVOCs by EPA Method 625, and metals by EPA Method 6000. The results of analysis indicated concentrations of TCE and PCE above the 2L standards in the groundwater samples from MW-2, MW-3, MW-4, and concentrations of 1,1-DCE, 1,1,1-TCA, and lead above the 2L standards in the groundwater sample from MW-2. Monitoring well MW-5 was dry during the initial sampling event (BPA, 1994).

Concurrent with the December 1993 monitoring well installations, four additional soil borings were drilled by BPA in the area of soil quadrants 17-B/17-C, where previous soil sampling/analysis conducted by Geraghty & Miller (discussed above) indicated concentrations of VOCs in soil. Each of the December

1993 soil borings were drilled to depths of approximately 7 to 7.5 feet below grade. According to BPA (1994), "debris and void spaces" were observed in each soil boring. Soil samples were split between BPA and Geraghty & Miller, and soil samples from the base of each boring were analyzed for RCRA metals (EPA Method 6000/7000), VOCs (EPA Method 8240), and SVOCs (EPA Method 8270). The results of laboratory analysis indicated concentrations of VOCs (acetone, ethylbenzene, and xylenes) and SVOCs (4-methylphenol, 2,4-dimethylphenol) in one or more of the soil samples. Arsenic (43 mg/kg), cadmium (8.7 mg/kg), chromium (85 mg/kg), and lead (1,100 mg/kg) were detected in one of the soil samples (BPA, 1994).

On June 30, 1994, one monitoring well (MW-6) was installed by Ensci Engineering Group, P.A. adjacent to the 500 gallon kerosene UST that was removed from the facility in 1992 (Figure 5). An initial groundwater sample was collected by Ensci Engineering Group, P.A. from MW-6 on July 1, 1994 and analyzed for aromatic hydrocarbons by EPA Method 602, semivolatiles by EPA Method 625, and lead by EPA Methods 7421/3030C. Bis (2-ethylhexyl) phthalate and lead were detected in the groundwater sample at concentrations of 10 ug/L and 0.023 mg/L, respectively. No other method analytes were detected.

On August 18, 1994, the NCDEM, Winston-Salem Regional Office, issued a *Notice of Violation* (NOV) jointly to Ilco Unican and Stewart-Warner. The NOV, based on the initial sampling/analysis of monitoring well MW-1 conducted in April 1992, requires the completion of a CSA and corrective action plan (CAP) for the facility.

Between September 1994 and February 1996, Ilco Unican conducted additional Type II and Type III monitoring well installations (MW-7 through MW-30) to complete the horizontal and vertical delineation of dissolved contaminants in groundwater at the facility, and conducted additional tasks intended to satisfy NCDEM requirements for a CSA. Completion of horizontal delineation of the groundwater contaminant plume required multiple phases of off-site monitoring well installations, including execution of off-site access agreements and procurement of North Carolina monitoring well construction permits. Downgradient delineation of the groundwater contaminant plume was deemed complete with the sampling/analysis of Type II monitoring well MW-30 in February 1996.

In May 1996, Ilco Unican conducted soil excavation in soil quadrants 17-B and 17-C (called "pit D"), where the results of soil sampling/analysis conducted by Geraghty & Miller and BPA in 1993 indicated the presence of VOCs and assorted debris in soil. Soil was excavated from the soil quadrants to a depth of approximately 12 feet below grade, and approximately 818 tons of excavated materials were transported off site and disposed at a permitted disposal facility.

In October and November 1996, Ilco Unican undertook voluntary corrective actions with respect to shallow soils in spill sites #1 and #2, the roof runoff areas, the foundry baghouse areas, waste piles #1 and #2, and the soil quadrants in the southern side yard outside spill sites #1 and #2 discussed above. These actions were undertaken in response to previous results of soil sampling/analysis which indicated concentrations of arsenic, chromium, lead, nickel, and zinc above facility PSRGs. The corrective actions included sampling/analysis of composite soil samples from each area for TCLP metals, excavation of soils in each area to depths ranging from approximately 12 inches to 47 inches below grade, and post excavation soil sampling/analysis. Additional excavation, to a depth of approximately 9 feet below grade, was conducted beneath waste pile #1 in response to the discovery of discolored soils during the excavation activities. The results of laboratory analysis of the post excavation soil samples indicated that concentrations of metals remaining in the unexcavated soils were below PSRGs. A total of 2,295 tons of soil were excavated and transported off site for disposal at a permitted facility. A detailed report of the soil excavation activities is provided by Piedmont Geologic (1997).

3.0 POTENTIAL RECEPTOR SURVEY

An area land use map for the Ilco Unican, Winston-Salem facility is presented as Figure 3. Names and addresses of property owners within a 1,500 foot radius of the site, compiled from Forsythe County tax records are provided in Appendix A. As discussed in Section 2.1, the facility is located within the city limits of Winston-Salem in an area characterized by mixed residential, industrial, and commercial uses.

Forsythe County tax records indicate whether properties are served potable water by the municipal water supply or private wells. Forsythe County tax records indicate whether properties contain private wells and/or are connected to the city water supply system. The records for the properties within a 1,500 foot radius of the Ilco Unican facility indicate that none of the properties contain private water wells and that all of the properties except six are connected to the city water system (Appendix A). City water billing records for the six properties were checked for water accounts, and two of these six properties have city water accounts. The remaining properties are either vacant or appear to share water service with adjacent properties. An automobile reconnaissance of the 1,500 foot radius area did not reveal the presence of any water supply wells not listed in tax records.

Forsythe County Public Health Department, Environmental Health Division files were checked for records concerning private water supply wells within a 1,500 foot radius of the Ilco Unican facility. Water supply wells that were constructed following February 1, 1988 are required to be registered with the county. No records for water supply wells within a ½ mile radius of the facility were found. In addition, Environmental Health Division personnel knew of no older (i.e., pre February 1, 1988) water supply wells within the search radius. In addition, no public water supply wells within a 3 mile radius of the Ilco Unican facility are registered with the Public Water Supply Section of the NCDEHNR, Winston-Salem Regional office.

According to the City of Winston-Salem Records Department, and the Forsythe County Environmental Health Division, scattered residences built prior to 1988 exist in Winston-Salem that are connected to the city water supply but still have old water supply wells on the premises. Some of these wells are reportedly used for domestic outdoor purposes (i.e., irrigation). According to the city and county authorities, there are no records concerning these wells, and the presence of such wells may only be made by an area reconnaissance and/or door-to-door survey. No apparent water supply wells were observed during the area reconnaissance of the Ilco Unican facility. According to the Forsythe County Environmental Health Division, once a property is connected to the city water supply, any old water supply wells are required to be abandoned in accordance with North Carolina regulations. There are no county restrictions (with the exception of set-back rules) on future water well development in Winston-Salem; however, Forsythe County and City of Winston-Salem authorities know of no recent instances where new water supply wells were installed in Winston-Salem.

Based on the apparent direction of groundwater flow beneath the Ilco Unican facility (discussed in Section 5.6), the apparent discharge point of groundwater flowing beneath the facility is an unnamed tributary of Peters Creek, the headwaters of which are located approximately 2,000 feet south of the facility (Figure 1). According to 15A NCAC 2B .0309 (*Classifications and Water Quality Standards Assigned to the Waters of the Yadkin-Pee Dee River Basin*), Peters Creek downgradient of the Ilco Unican facility is designated as a Class C surface water. Class C is the default classification for all surface waters in North Carolina. Best usages of Class C surface water include aquatic life propagation and maintenance of biological integrity (including fish and fishing), wildlife, secondary recreation, agriculture, and any other usage except for primary recreation or as a source of water supply for drinking, culinary, or food processing purposes.

According to the City of Winston-Salem Engineering Records Department, city water is available to all properties within the 1,500 foot radius of the Ilco Unican facility. The source of Winston-Salem's public water supply are two surface water bodies; 1) Salem Lake, an impounded segment of Salem Creek located approximately 3 miles east of the Ilco Unican facility; and 2) the Yadkin River. The water supply intake on the Yadkin River is located approximately 12 miles southwest of the Ilco Unican facility. The water intake on Salem Lake is located upstream of the confluence of Peters Creek and Salem Creek.

The locations of known subsurface utilities at the Ilco Unican facility are shown in Figure 6. The facility receives city water and sewer service from main lines located along Indiana Ave. Service lines circumscribe the facility along the eastern, western, and southern building perimeters. Depths of subsurface utility lines beneath the facility (2 to 6 feet below grade) are well above observed depths to groundwater at the facility (40+ feet). Utilities in subsurface

Surface water in the area of the Ilco Unican facility is directed to the tributary of Peters Creek downgradient of the facility via a storm drain system. An underground storm drain, which discharges to a surface ditch, is located south of the facility across Indiana Ave. (Figure 2), within the area of dissolved VOCs in groundwater (discussed in Section 6.1).

Based on 15A NCAC 2L .0201, groundwater beneath the Ilco Unican facility is classified as Class GA. This classification specifies existing or potential sources of drinking water supply for humans. The Class GA specification is intended for groundwater in which chloride concentrations are equal to or less than 250 mg/L, which is considered suitable for drinking in its natural state, but which may require treatment to improve quality related to natural conditions.

4.0 SOIL ASSESSMENT

4.1 Regional Geology

The Ilco Unican, Winston-Salem facility is located within the Piedmont physiographic province, which is characterized by moderately level interstream areas separated by broad valleys. Bedrock in Winston-Salem is mapped within the Milton Belt lithologic division of the Piedmont. According to the *Geologic Map of North Carolina* (North Carolina Geological Survey, 1985), bedrock in the area of the Ilco Unican facility consists of biotite gneiss and schist.

Competent bedrock in the Piedmont province in North Carolina is typically overlain by variable thicknesses of saprolite and soil, collectively referred to as "overburden." Saprolite is bedrock that has decomposed in place due to differential physical and chemical alteration (i.e., the transformation of feldspars to clay minerals) but has retained relict bedrock structures (i.e., fractures, foliations, etc.), which are absent in the more highly weathered overlying soil. Thicknesses of the overburden in the Piedmont in North Carolina typically range from 10 to 75 feet, depending on rock composition and topographic setting.

According to LeGrand (1988), the nature of saprolite at any specific location may provide key insights to the characteristics of the underlying bedrock at that location. Light colored saprolite is indicative of underlying felsic (i.e., granitic) rock, whereas, dark colored saprolite is indicative of underlying mafic (i.e., dioritic) rock. A thick saprolite zone suggests that the underlying rock is fractured, whereas a thin saprolite zone suggests less than normal fracturing. The water table tends to occur at depths directly proportional to the saprolite thickness. The presence of groundwater seeps along the slopes of ridges and hilltops may indicate a shallow water table and corresponding poorly fractured bedrock (LeGrand, 1988). Bedrock fractures tend to be open at shallower depths in bedrock and closed at depths greater than 400 feet in the bedrock (LeGrand, 1988).

4.2 Site Soils Investigation

Following is a summary of the various phases of site soils investigation, compiled from the draft and final site documents listed in Section 8.0. Sampling methods and results are presented as described in the original reports of investigation. Whenever possible, results of investigation (including tabulated results of laboratory analysis and site plans with sample locations) have been reproduced from the original reports of investigation to retain the precision and accuracy of the original investigators.

4.2.1 June 1987 to July 1988 Soil Sampling and Analysis

Several phases of soil sampling/analysis was conducted by RAL between June 1987 and July 1988 related to spill sites #1 and #2, areas of surficial soil contamination in the southern side yard outside spill sites #1 and #2, and disposal pits A, B, and C.

The locations soil samples collected in the area of spill sites #1 and #2 in July 1987 are shown in Figure 7 (from RAL, 1987a). Each spill site was divided into five quadrants to produce sampling areas less than 150 ft by 50 ft. Five soil borings were drilled to a depth of 1 foot below grade in each quadrant. Four composite samples representing the 0 to 3 inch, 3 to 6 inch, 6 to 9 inch, and 9 to 12 inch depth intervals were retained from the borings in each quadrant. The composite samples were analyzed by RAL for total and extractable copper, chromium, nickel, zinc, and cyanide.

The results of analysis are presented in Appendix B.1 (from RAL, 1987a). The results of analysis indicated extractable concentrations of nickel and cyanide above MCLs established by the SHWMB (discussed in Section 2.2) in the composite soil samples representing each depth interval from both spill sites, and extractable concentrations of chromium above MCLs in the 0 to 3 inch composite sample from spill site #1.

Concurrent with sampling of spill sites #1 and #2, RAL conducted additional composite soil sampling in July and August 1987 in additional quadrants outside of the spill sites in the southern side yard. The locations of these soil samples (quadrants 6 through 25) are shown in Figure 7. Soil samples were collected to a depth of 1 foot below grade, composited as described above, and analyzed for extractable copper, chromium, lead, nickel, zinc, and cyanide.

The results of analysis of soil samples collected from quadrants 6 through 25 are presented in Appendix B.2 (from RAL, 1987b). Concentrations of lead, nickel, and cyanide were detected at concentrations above SHWMB MCLs, and concentrations of copper and zinc were detected at concentrations above cleanup levels proposed by RAL (1987c)(10 mg/L and 50 mg/L), in 17 of the 20 quadrants sampled.

In January and February 1988, soils within spill sites #1 and #2 were excavated by Stewart-Warner to a depth of 1.5 feet below grade. Post excavation grab soil samples were collected at random locations from each spill site using a stainless steel trowel. Three duplicate samples from each sample location were analyzed by RAL for extractable chromium, copper, cyanide, lead, nickel, and zinc. The results of analysis of the post-excavation soil samples are provided in Appendix B.3 (from RAL, 1988a).

As part of the initial excavations (test pits) in drum pits 1 and 2 (subsequently re-designated as pits A, B, and C) conducted by Stewart-Warner in January and February 1988, composite soil samples were collected from each of the test pits and analyzed for extractable metals, VOCs, and semivolatile organic compounds (SVOCs). The locations of the test pits, which were discovered in quadrants 16 and 21, are shown in Figure 4. The results of the soil sample are summarized in Appendix B.4 analysis (from RAL, 1988b). Various VOCs and SVOCs, including tetrachloroethene (PCE), 1,1,2-trichloroethene (1,1,2-TCE), benzene, ethylbenzene, xylenes, and naphthalene, were detected in both of the test pit composite soil samples at concentrations ranging from <1 mg/kg to 15 mg/kg.

As part of the subsequent excavation of drum pits A, B, and C in July 1988, soil samples were collected from the bottom and sidewalls of the excavations after each excavation showed no visible signs of contamination. The composite soil samples were analyzed for VOCs, as well as extractable metals and cyanide. The results of analysis are summarized in Appendix A.5 (from RAL, 1988c). PCE and TCE were detected in the first composite sample from Pit C at concentrations of 0.203 mg/kg and 0.070 mg/kg, respectively. Total VOC concentrations were reportedly less than 0.020 mg/kg in the first post-excavation composite samples from pits A and B. In response to these results, additional soils were excavated from pit C, and a second set of post-excavation soil samples was collected/analyzed by RAL (final pit dimensions and depths were not reported). The results of the second analysis (Appendix B.5) reportedly indicated total VOC concentrations less than 0.020 mg/kg in the composite sample. In addition, reductions in metal concentrations were observed between the initial and secondary post-excavation soil samples (RAL, 1988c).

4.2.2 October 1990 Soil and Dust Sampling/Analysis

Confirmational soil sampling was conducted by Roy F. Weston in pits A, B, and C in October 1990. Two soil borings were drilled in each former pit at the locations shown in the site map in Appendix B.6. The borings were drilled using 3¼ inch I.D. hollow-stem augers, which were steam cleaned on site prior to each use. The soil borings were advanced to total depths ranging from 19 feet to 24 feet below grade, and soil samples were collected over continuous 2 foot intervals in each boring using split spoon samplers. Prior to collecting each sample, the split spoon samplers were washed using a soap and water wash and distilled water rinse.

Upon collection, each split spoon sample was screened for VOC vapors using an OVM (calibrated to isobutylene standard), and a portion of each split spoon sample was packed into a laboratory container and placed on ice in a cooler. Select soil samples from each boring were analyzed by Weston for VOCs by EPA Method 8240.

The results of analysis of the October 1990 soil samples from pits A, B, and C are presented in Appendix B.6 (from Roy F. Weston, 1990). Methylene chloride and/or acetone were detected in all of the soil samples (retained from depths ranging from 12 to 16 feet below grade), as well as in a trip blank retained during the sampling event, at concentrations ranging from 0.005 mg/kg to 0.048 mg/kg. MEK was detected in one soil sample from pit C at a concentration of 0.021 ug/kg. No other VOCs were detected in the soil samples. Based on the results of trip and method blank analysis, the detection of methylene chloride and acetone in the soil samples was attributed to laboratory cross contamination (Roy F. Weston, 1990).

Concurrent with the October 1990 soil sampling, the following dust samples were collected at the facility.

- Samples RF-2 and RF-3, composited from two dust piles on the manufacturing building roof;
- Sample RF-1; collected from a roof gutter; and
- Sample BH-1; collected from a baghouse duct.

Locations of the dust samples are shown in Appendix B.6 (from Roy F. Weston, 1990). Clean plastic scoops were used to collect grab dust samples from each location. Samples RF-2 and RF-3 were composited from 6 to 7 grab samples collected from two dust piles on the manufacturing building roof.

The dust samples were analyzed by Weston for EP Toxicity metals. The results of the analysis are presented in Appendix B.6 (from Roy F. Weston, 1990). The results of the analysis indicated concentrations of metals less than the EPA MCL for toxicity in all of the soil samples except sample RF-2. This sample had a leachable cadmium concentration of 16.4 mg/L, above the toxicity MCL for this analyte.

Based on the results of the dust sample analysis, Ilco Unican undertook roof dust cleanup operations in December 1991 to January 1992. These activities are discussed in Section 2.2.

4.2.3 June 1991 Soil Sampling/Analysis

Additional soil sampling and analysis was conducted by Groundwater Technology, Inc. in June 1991. This event included confirmational sampling in spill sites #1 and #2, as well as soil sampling in the baghouse and roof runoff areas and in waste piles #1 and #2.

Locations of the June 1991 soil samples are shown in Appendix B.7 (from Groundwater Technology, 1991). A total of 42 soil samples were collected. Soil samples from spill sites #1 and #2 were collected from the 1.5 to 2 foot depth interval at each sample location. Soil samples from the baghouse and roof runoff areas and waste piles #1 and #2 were collected from the 0 to 0.5 foot and 1.5 to 2 foot depth intervals at each sample location.

The soil samples were collected with a stainless steel hand trowel and hand auger. Prior to collecting each sample, the sampling tools were cleaned using a soap/water wash and distilled water rinse. Decontaminated neoprene sampling gloves were used to collect each soil sample.

Upon collection, each soil sample was screened for VOC vapors using an OVM, transferred to laboratory containers, and placed on ice in a cooler. The soil samples were analyzed by Industrial & Environmental Analysts, Inc. (IEA) for TCLP metals (cadmium, chromium, copper, lead, nickel, and zinc) and total cyanide by EPA Method 9010. In addition, two soil samples from the roof runoff area (RR-1-1B and RR-2-2A) that exhibited elevated VOC vapor concentrations were analyzed for volatile and semivolatile organics by EPA Methods 8240 and 8270, respectively.

The results of laboratory analysis of the June 1991 soil samples are presented in Appendix B.7 (from Groundwater Technology, 1991). All of the soil samples except eight contained extractable lead concentrations that exceeded the EPA MCL for toxicity. Cadmium was detected at concentrations above the MCL in one soil sample from spill site #1, two samples from the foundry baghouse area, and seven samples from waste piles #1 and #2. Four soil samples from spill sites #1 and #2, and most of the soil samples from the baghouse and roof runoff areas and waste piles #1 and #2, also contained concentrations of nickel above the cleanup level established by the SHWMB in August 1987. Cyanide was detected at concentrations above the SHWMB cleanup level in one soil sample from spill site #1, two soil samples from the foundry baghouse area, and seven soil samples from waste piles #1 and #2.

Methylene chloride was detected in soil samples RR-1-1B and RR-2-2A at concentrations of 0.92 mg/kg and 0.91 mg/kg, respectively. Xylenes, bis (2-ethylhexyl) phthalate, 2-methylnaphthalene, and phenanthrene were detected in soil sample RR-1-1B at concentrations ranging from 1.3 mg/kg to 5.8 mg/kg (Appendix B.7).

4.2.4 January 1992 Soil Sampling/Analysis

Additional soil sampling/analysis was conducted by Geraghty & Miller in January 1992 at the locations of soil samples collected in June 1991 by Groundwater Technology, Inc. The purpose of this sampling event was to evaluate total metals concentrations (for health-based risk assessment purposes) at selected soil sample locations that previously contained elevated concentrations of extractable metals and total cyanide (total metals were not analyzed during the previous sampling event).

A list of the soil samples, with sample depths, is provided in Appendix B.8 (from Geraghty & Miller, 1992) along with a map showing the soil sample locations (from Groundwater Technology, 1991). Soil samples were collected from 6 inch depth intervals to total depths ranging from 6 to 36 inches below grade using a stainless steel hand auger and hand trowel. Prior to collecting each sample, all sampling equipment was cleaned using a soap/water wash and distilled water rinse.

Upon collection, each soil sample was mixed in a stainless steel bowl, transferred to laboratory containers, and placed on ice in a cooler. For quality assurance/quality control, a rinsate blank and field blank were collected during the sampling event. The soil and QA/QC samples were analyzed for Savannah Laboratories for Hazardous Substance List (HSL) metals (EPA Method 6000/7000) and total cyanide (EPA Method 9010).

Concurrent with the January 1992 soil sampling/analysis event, Geraghty & Miller developed health-based preliminary soil remediation goals (PSRGs) in accordance with EPA guidance (1991) for federal superfund cleanups (Geraghty & Miller, 1992). PSRGs were developed for a variety of inorganic constituents, including cyanide, arsenic, chromium copper, lead, and zinc, based on both residential and non-residential exposures. Final facility PSRGs, which incorporated North Carolina Inactive Sites Branch guidelines, were presented to Ilco Unican via a letter from Geraghty & Miller, dated January 3, 1993. Documentation of the PSRG development process is provided in Appendix C.

The results of laboratory analysis of the January 1992 soil samples are listed and summarized graphically in Appendix B.8 (from Geraghty & Miller, 1992). Arsenic, chromium, copper, lead, and zinc were detected in several of the January 1992 soil samples at concentrations above residential PSRGs, and arsenic and lead were detected in several of the soil samples at concentrations above industrial PSRGs.

4.2.5 August 1992 Soil Sampling/Analysis

In August 1992, additional soil sampling was conducted at the facility by ESE Biosciences, Inc. (EBIO) to further evaluate total metals in waste piles #1 and #2, the roof runoff areas, and the baghouse areas. Locations and depths of the August 1992 soil samples are shown in Appendix B.9 (from EBIO, 1992). The soil samples were collected using a stainless steel hand auger. Prior to collecting each sample, the hand auger and associated tools were cleaned using a soap/water wash, tap water rinse, deionized water rinse, and final isopropanol rinse.

Upon collection, each sample was transferred to a laboratory container and placed on ice in a cooler. For QA/QC, field blank and rinsate blank samples were included with the sampling event. The soil and QA/QC samples were submitted to Burlington Research and analyzed for total metals (arsenic, chromium, copper, lead, nickel, and zinc) by EPA Method 6000/7000 and total cyanide by EPA Method 9010.

The results of laboratory analysis of the August 1992 soil samples are provided in Appendix B.9 (from EBIO, 1992). Concentrations of total copper above the facility PSRG were detected in four soil samples from waste pile #1, four samples from the foundry baghouse area, and two samples from the roof runoff area; concentrations of total lead above the facility PSRG were detected in one soil sample collected from waste piles #1 and six soil samples from the foundry baghouse area; and concentrations of zinc above the facility PSRG was detected in five soil samples collected from the roof runoff areas and four soil samples from the foundry baghouse area (Appendix B.9).

4.2.6 May 1993 Soil Sampling/Analysis

Geraghty & Miller conducted additional soil sampling/analysis for soil quadrants 6, 12, 16, 17, 18, and 19 (Figure 7) in May 1993. Previous sampling/analysis conducted in these soil quadrants by RAL in 1987 indicated concentrations of total metals (lead, nickel, or zinc) above the facility PSRGs developed in 1992.

Soil samples were collected from four discrete locations (subquadrants) within each quadrant from the 0 to 6 inch and 12 to 18 inch depth intervals (48 samples total). Two additional samples were collected from an area of quadrants 17-B/17-C at the 24 to 30 inch and 62 to 68 inch depth intervals. Samples were collected in accordance with Geraghty & Miller's (1993a) standard QA/QC procedures (Appendix B.10) and analyzed by Savannah Laboratories for HSL metals by EPA Method 6000/7000 and cyanide (EPA Method 9010). Soil samples from quadrants 17-B/17-C (12 to 18 inch, 24 to 30 inch, and 62 to 68 inch depth intervals) were also analyzed for VOCs and SVOCs by EPA Methods 8240 and 8270, respectively. It is noted that Geraghty & Miller (1993b) mistakenly reported these latter samples as collected from soil quadrant 16-C. Ilco Unican confirms that these samples were actually collected from an area of quadrants 17-B/17-C.

The results of laboratory analysis of the May 1993 soil samples are presented in Appendix B.10 (from Geraghty & Miller, 1993b). Four soil samples (quadrants 12-C, 16-C, 18-A, and 18-D) contained lead concentrations above the facility PSRG, and one additional sample (quadrant 16-D) contained concentrations of nickel and zinc above the facility PSRGs.

Results of laboratory analysis of the soil samples from quadrants 17-B/17-C for VOCs indicated the presence of carbon disulfide, ethylbenzene, methylene chloride, and/or xylenes in all three samples collected between 12 and 68 inches below grade at concentrations ranging from 0.011 mg/kg to 4.1 mg/kg (Appendix B.10). Only xylenes (0.011 mg/kg) were detected in the deepest of these soil samples (62 to 68 inch depth interval). Results of laboratory analysis for SVOCs indicated the presence of several SVOCs in all three samples at concentrations ranging from 0.55 mg/kg to 49 mg/kg (Appendix B.10). Only 2,4-dimethylphenol (4.2 mg/kg) and 3,4-methylphenol (0.62 mg/kg) were detected in the deepest soil sample samples (62 to 68 inch depth interval). In addition, according to Geraghty & Miller (1993) "buried material" was encountered in the soil boring from quadrants 17-B/17-C at a depth of approximately 30 inches below grade (Geraghty & Miller, 1993b).

4.2.7 September 1993 Soil Gas Survey and Soil Sampling/Analysis

In response to the detection of VOCs in the soil sample from quadrants 17-B/17-C in May 1993, Geraghty & Miller conducted additional sampling/analysis activities in this area in September 1993. The additional activities consisted of a soil gas survey and additional soil boring sampling/analysis.

Locations of the soil gas sampling locations and the soil borings are shown in Appendix B.11 (from Geraghty & Miller, 1994). Soil gas samples were collected from six sample probes installed in the area of quadrants 17-B/17-C. Each probe was installed to a depth of 3 feet below grade. Soil gas was evacuated from each probe and collected using a tedlar bag. The soil gas samples were analyzed in the field using an OVM, and one soil gas sample (SG-3) was analyzed by Acurex Laboratory for VOCs by gas chromatography/mass spectrometry (GC/MS).

The results of field and laboratory analysis of the soil gas samples are provided in Appendix B.11 (from Geraghty & Miller, 1994). VOC vapor concentrations measured in the field ranged from 12.5 ppm to 5,000 ppm. Several VOCs (including MEK, 1,1-DCA, 1,1-DCE, 1,1,1-TCA, TCE, and PCE) were detected in the air sample from soil gas sampling point SG-3 at concentrations ranging from 1.3 ug/L to 438 ug/L (Appendix B.11).

In response to the results of the soil gas field screening, five soil borings were drilled near selected soil gas sampling points to depths ranging from approximately 5 to 14 feet below grade using 4¼ inch I.D. hollow stem augers. Soil samples were collected over continuous 2 foot intervals to the base of each boring using split spoon samplers. Select soil samples from each boring (retained from depth intervals between 4 and 14 feet below grade) were analyzed by Savannah Laboratories for VOCs and SVOCs by EPA Methods 8240 and 8270, respectively.

The results of laboratory analysis of the September 1993 soil samples are presented in Appendix B.11 (from Geraghty & Miller, 1994). Xylenes and 2,4-dimethylphenol were detected in one soil sample (SB-1-10, 8 to 10 feet below grade) at concentrations of 0.032 mg/kg and 1.7 mg/kg, respectively. No VOCs and/or SVOCs were detected in the remaining soil samples.

4.2.8 December 1993 Soil Sampling/Analysis

Four soil borings were drilled in the area of soil quadrants 17-B/17-C in December 1993 by BPA (on behalf of Stewart-Warner) to evaluate the conditions observed during the previous soil sampling activities (May and September 1993) conducted by Geraghty & Miller. Each boring was drilled using 4¼ inch I.D. hollow stem augers to a total depth of approximately 7 to 7.5 feet below grade. Soil samples were collected over continuous 2 foot intervals to the base of each boring using split spoon samplers (BPA, 1994). Upon collection, each soil sample was screened using an OVM, transferred to laboratory containers, and stored on ice in a cooler.

According to BPA (1994), "debris and void spaces" were observed near the base of each soil boring. Soil samples retained for laboratory analysis represented soil intervals directly beneath the debris and void spaces. The retained samples were analyzed by Orlando Laboratories, Inc. for RCRA metals (EPA Method 6000/7000) plus VOCs and SVOCs by EPA Methods 8240 and 8270, respectively.

The results of laboratory analysis of the December 1993 soil samples are presented in Appendix B.12 (from BPA, 1994). Arsenic and lead were detected at concentrations above the facility PSRGs in one soil sample (TB-3) collected from a depth of 5.5 to 7 feet below grade. Acetone, ethylbenzene, and xylenes were also detected in this soil sample at concentrations ranging from 0.3 mg/kg to 1.6 mg/kg. 2,4-dimethylphenol was detected in two soil samples (TB-3, 5.5 to 7 feet below grade; and TB-1, 6 to 7.5 feet below grade) at concentrations of 2.1 mg/kg and 0.421 mg/kg, respectively, and 4-methylphenol was detected in one soil sample (TB-1) at a concentration of 0.574 mg/kg (Appendix B.12).

4.2.9 March through May 1996 Soil Sampling/Analysis

Five soil borings were drilled by Geraghty & Miller between March and May 1996 to evaluate soil conditions in the following suspected source areas of VOCs in groundwater; 1) the chrome plating sump (BH-1); 2) a storm water drain (BH-2); 3) the courtyard sump (BH-3); and 4) the former drum wash sump (BH-4 and BH-5). Boring BH-2 was also installed near several above ground storage tanks located north of the wastewater treatment system. The locations of these soil borings, located in the manufacturing building and courtyard area, are shown in Appendix B.13 (from Geraghty & Miller, 1996).

The soil borings were drilled using stainless steel hand augers and/or hollow-stem augers. Soil samples were collected from the hollow-stem auger borings over continuous 2 foot intervals using split-spoon samplers, and soil samples were composited from the hand auger borings over continuos 2 foot intervals, to the completion depth of each soil boring. Prior to collecting each soil sample, the downhole tools were cleaned using a soap/water wash, tap water rinse, distilled water rinse, isopropanol rinse, and deionized water rinse.

Upon collection, each soil sample was divided into two equivalent portions, transferred to air-tight plastic bags, and placed on ice in a cooler. VOC vapor concentrations in the sample bag headspace were measured in the field using an OVM, and the sample interval from each boring exhibiting the highest OVM reading was submitted to Savannah Laboratories and analyzed for VOCs by EPA Method 8240. In addition, the soil samples retained from borings BH-1, BH-2, and BH-3 (Appendix A.14) were analyzed for priority pollutant metals (EPA Method 6000/7000), and the soil samples retained from borings BH-4 and BH-5 were analyzed for total petroleum hydrocarbons (TPH) as gasoline by EPA Method 8015/5030 and TPH as diesel by EPA Method 8015/3550.

The results of laboratory analysis of the March to May 1996 soil samples are presented in Appendix B.13 (from Geraghty & Miller, 1996). PCE was detected in the soil samples from boring BH-1 (5 to 6 feet below grade), BH-3 (9 to 11 feet below grade), BH-4 (4 to 5 feet below grade), and BH-5 (4.5 to 5.5 feet below grade) at concentrations of 62 mg/kg, 22 mg/kg, 0.14 mg/kg, and 0.32 mg/kg, respectively. Additional VOCs (methylene chloride, MEK, toluene, xylenes, and chloromethane) were detected in the soil samples from BH-3, BH-4, and BH-5 at concentrations ranging from 0.037 mg/kg to 1.26 mg/kg.

TPH as gasoline was detected in the soil samples from borings BH-4 and BH-5 at estimated concentrations of 0.26 mg/kg and 0.28 mg/kg, respectively. TPH as diesel was detected in both of these samples at concentrations of 2,200 mg/kg and 38 mg/kg, respectively. Total metals were detected in the soil samples from BH-1, BH-2, and BH-3; however, detected concentrations were all below the facility PSRGs (Appendix B.13).

4.3 Facility Geology

Facility geologic cross sections are presented in Figures 8 through 10. These were compiled from soil boring and monitoring well logs compiled during the various phases of site assessment activities conducted from October 1990 to February 1996. Copies of these logs are provided in Appendix D.

The overburden at the facility has been described as saprolite, consisting of varying mixtures of micaceous silty/clayey sand and sandy silt/clay with visible color/textural laminations, occasional sand/gravel layers, and zones of residual bedrock. Hardness of the saprolite generally increases with depth. Bedrock (gneiss) was encountered beneath the facility at depths ranging from approximately 55 to 100 feet below grade.

5.0 GROUNDWATER ASSESSMENT

5.1 Regional Hydrogeology

Groundwater in the Piedmont province occurs in the overburden under unconfined (i.e., water table) conditions, and in the underlying bedrock under both unconfined and confined conditions. Groundwater in the overburden occurs within pore spaces of the unconsolidated medium, including relict bedrock structures (i.e., fractures and foliations). Due to the typical fine grained nature of saprolite, the formation normally possesses a relatively low permeability and is not generally utilized for groundwater production. The overburden is recharged by the infiltration of precipitation where the formation is exposed and acts as a storage medium for groundwater that is slowly released to surface water bodies and the underlying bedrock.

Groundwater in the underlying bedrock occurs along zones of secondary permeability, such as fractures, bedding planes, foliations, solution voids, etc. Most water supply wells in the Piedmont are completed in bedrock with casings extending through the overburden into bedrock. Although the bedrock is recharged by the overlying overburden, leakage (upward) from the bedrock into the overburden also occurs in response to local topographic/geologic influences.

Groundwater in the Piedmont moves from areas of high hydraulic head (recharge areas) to areas of low hydraulic head (discharge areas). Overburden groundwater flow patterns usually follow surface topographic gradients, and the water table surface usually mimics the overlying terrain. Groundwater movement in the bedrock is controlled by the distribution and orientation of bedrock structures; however, bulk groundwater flow patterns in the bedrock usually follow patterns in the overburden. Groundwater flow velocities in the overburden are typically low due to the low permeability of the unit. Groundwater flow velocities in the bedrock are dependent on the number and interconnection of bedrock structures. In zones of sparse or poorly connected structures, groundwater flow velocities in the bedrock will approximate overburden groundwater flow velocities. However, where fracture zones occur, groundwater flow velocities may be much higher, especially in response to local hydrogeologic effects (e.g., pumping wells).

5.2 Site Hydrogeological Investigations

Following is a summary of the various phases of site hydrogeological investigation, compiled from the draft and final site documents listed in Section 8.0. Sampling methods and results are presented as described in the original reports of investigation.

A total of 27 Type II (i.e., water table) monitoring wells and 3 Type III (i.e., vertical delineation) monitoring wells have been installed to delineate the horizontal and vertical extent of dissolved contaminants in groundwater at the Ilco Unican, Winston-Salem facility. A former production well is also located at the facility. Locations of the monitoring and production wells are shown in Figure 5, monitoring well construction details are listed in Table 1, and monitoring well logs are provided in Appendix D. Following is a description of the monitoring well installation procedures, which were conducted between April 1992 and February 1996.

5.2.1 March 1992 Monitoring Well Installation

The first monitoring well at the facility (MW-1) was installed under the direction of Geraghty & Miller in April 1992 to provide initial groundwater data directly adjacent to former pit C. No monitoring well installation report for MW-1 is available. However, based on the monitoring well log, MW-1 (2-inch I.D. Schedule 40 PVC) was installed to a total depth of approximately 51 feet below grade, and was constructed with 10 feet of well screen (41 to 51 feet below grade) to intercept the water table.

5.2.2 December 1993 Monitoring Well Installations

Type II monitoring wells MW-2, MW-3, MW-4, and MW-5 were installed by BPA in December 1993 (BPA, 1994). Monitoring well MW-2 was installed near the location of monitoring well MW-1; monitoring wells MW-3 and MW-4 were installed near the southeast and southwest property corners, in the apparent downgradient area of the southern side yard; and MW-5 was installed in the apparent upgradient area of the facility (Figure 5).

Monitoring wells MW-2, MW-3, MW-4, and MW-5 were installed to total depths ranging from approximately 38 to 51 feet below grade (Table 1). The well borings for monitoring wells MW-2 and MW-4 were installed using 6¼ inch I.D. hollow stem augers, and the well borings for monitoring wells MW-3 and MW-5 were installed using 4¼ inch I.D. hollow stem augers. Prior to drilling each monitoring well boring, the hollow stem augers and downhole equipment were steam cleaned on site.

Soil samples were collected from the borings for logging purposes using split spoon samplers (BPA, 1994).

Type II monitoring wells MW-2, MW-3, MW-4, and MW-5 were constructed using 2 inch I.D. Schedule 40 PVC well screen and casing. A 10 or 15 foot length of well screen (0.010 inch slots) was emplaced at the base of each monitoring well boring, above which solid riser casing was flush threaded to grade. A sand pack was installed in each monitoring well annulus from the base of the boring to at least 1 foot above the top of the well screen. A minimum 1 foot thick bentonite seal was installed on top of the sand pack, above which a portland cement slurry was emplaced to grade. The monitoring wells were completed with either stick-up (locking) protective casings or flush-mounted manholes set within concrete pads, and the top of each well casing was completed with either a vented well cap (stick-up casings) or locking expansion plugs (flush-mounted casings).

5.2.3 June 1994 Monitoring Well Installation

Type II monitoring well MW-6 (originally designated as monitoring well "MW-1A") was installed by Ensci Engineering Group, P.A. in June 1994 adjacent to the former location of the 500 gallon UST in the southern side yard (Figure 5). The monitoring well boring was drilled using hollow stem augers, and soil samples were collected on 5 foot centers using split spoon samplers.

Type II monitoring well MW-6 was installed to a total depth of approximately 48 feet below grade and was constructed using 2 inch I.D. Schedule 40 well screen and casing. A 10 foot length of well screen (0.010 inch slots) was installed to the base of the monitoring well boring, above which solid riser casing was flush threaded to grade. A sand pack was installed in the well annulus from the bottom of the boring to approximately 3 feet above the top of the well screen. A 2.5 foot bentonite seal was installed on top of the sand pack, above which a cement slurry was emplaced to grade. The monitoring well was completed with a protective, locking stick-up casing set in a concrete pad.

5.2.4 March 1995 to February 1996 Monitoring Well Installations

Type II monitoring wells MW-7 through MW-26, Type III monitoring wells DMW-27, DMW-28, and DMW-29, and Type II monitoring well MW-30 were installed by Geraghty & Miller at on-site and off-site locations between March 1995 and February 1996. Well locations are shown in Figure 5, and rationale behind the additional monitoring well locations are described as follows.

- MW-7 was installed in the apparent sidegradient/downgradient direction from the manufacturing building adjacent to Indiana Ave.;
- MW-8 was installed adjacent to the downgradient perimeter of the manufacturing building;
- MW-9 was installed in the courtyard area near the wastewater treatment facility;
- MW-10 was installed adjacent to the courtyard sump;
- MW-11 was installed adjacent to the railroad right-of-way, behind the manufacturing building, to provide upgradient monitoring coverage;
- MW-12 was installed between the manufacturing building and monitoring well MW-7 to provide monitoring coverage between the manufacturing building and Indiana Ave.;
- MW-13 was installed upgradient of MW-12 for upgradient monitoring coverage;
- MW-14 was installed in the southern side yard downgradient of former pits A and B;
- MW-15 was installed on the adjacent IMC Fertilizer property in the apparent downgradient/sidegradient direction from the manufacturing building and southern side yard;
- MW-16 was installed at the northwest facility corner to provide upgradient monitoring coverage;
- MW-17 was installed near the location of upgradient Type II monitoring well MW-5 (which was dry following installation in December 1993) to provide upgradient monitoring well coverage;
- MW-18 through MW-26 were installed at downgradient properties east, west, and south of the facility to provide off-site characterization/delineation of dissolved VOCs;
- DMW-27, DMW-28, and DMW-29 (Type III monitoring wells) were installed near the locations of Type II monitoring wells MW-7 (adjacent to Indiana Ave.), MW-9/MW-10 (courtyard area), and MW-1/MW-2, respectively, where the highest concentrations of dissolved VOCs were detected; and
- MW-30 was installed approximately 1,300 feet south of the southern facility perimeter to provide final downgradient delineation of dissolved VOCs in shallow groundwater at the facility.

The Type II monitoring well borings were drilled using either 4¼ inch I.D. or 6¼ inch I.D. hollow stem augers. Air hammer drilling (6 inch diameter bit) was used to complete the borings for Type II monitoring wells MW-11, MW-16, and MW-25 in response to auger refusal above the target well completion depths. Prior to drilling each monitoring well boring, all downhole tools and equipment were steam cleaned on site. Split spoon samples were collected over 2 foot intervals on 5 foot centers in the hollow stem auger borings for logging purposes and OVM screening (Appendix D).

Type II monitoring wells MW-7 through MW-26 and MW-30 were installed to total depths ranging from 25 to 58 feet below grade and were constructed using 2 inch I.D. Schedule 40 PVC well screen and casing. A 10 foot length of well screen (0.010 inch slots) was installed at the base of each Type II monitoring well boring to intercept the water table, above which solid riser casing was flush threaded to grade. A sand pack was installed within each Type II monitoring well annulus from the base of the well boring to approximately 2 feet above the top of well screen. A 2 foot thick bentonite seal was emplaced on top of the sand pack, above which portland cement was emplaced to grade. The Type II monitoring wells were completed with either stick-up protective casings (locking) or flush-mounted manholes set within concrete pads, and the top of each well casing was completed with a locking expansion plug.

Type III monitoring wells DMW-27 through DMW-29 were installed using combined hollow-stem auger and air hammer drilling. Prior to drilling each monitoring well boring, all downhole tools and equipment were steam cleaned on site. Split spoon samples were collected over 2 foot intervals on 5 foot centers in the hollow stem auger borings for logging purposes and OVM screening (Appendix D).

Type III monitoring wells were installed to total depths of 130 feet below grade, 101 feet below grade, and 175 feet below grade, respectively, and were double cased to limit the potential for cross contamination between shallow and deeper groundwater zones at the facility. The outer borings (15 inch diameter) were drilled to depths of 80 feet below grade for monitoring wells DMW-27 and DMW-28 and 116 feet below grade for DMW-29 (i.e., between 2 and 15 feet into bedrock). Outer casing (6 inch I.D. galvanized steel) was set to the base of each outer borehole, and the outer casing annulus was grouted to grade with a cement slurry. Following more than 48 hours curing time of the outer casing grout seal, the inner borings (6 inch diameter) were drilled to the completion depth of each Type III well using air rotary drilling. The Type III monitoring wells were constructed as open rock wells with either stick-up protective casings (locking) or flush-mounted manholes set within concrete pads, and the top of each well casing was completed with a locking expansion plug (Geraghty & Miller, 1996).

5.3 Monitoring Well Development and Surveying

The Type II and Type III monitoring wells were developed as part of each phase of monitoring well installations using bailing, surging, and pumping techniques to remove sediment from the well casings and to facilitate hydraulic communication between the well screen and surrounding formations. Top of casing elevations of the monitoring wells were surveyed to the nearest 0.1 feet by McNally Land Surveying, P.C. relative to a site datum point that was tied into the National Geodetic Vertical Datum (NGVD)(Geraghty & Miller, 1996). In addition, the horizontal positions of the monitoring wells were surveyed to the nearest 1 foot.

5.4 Groundwater Sampling/Analysis

Groundwater sampling/analysis was conducted as part of each phase of monitoring well installations conducted between April 1992 and February 1996. In addition, groundwater from the former facility production well was sampled/analyzed on two occasions (November 1991 and April 1995). A summary of the facility groundwater sampling/analysis activities is provided in Table 2. As part of each groundwater sampling event, groundwater levels were measured in the facility monitoring wells relative to the site datum using an electronic water level meter.

The most recent round of groundwater sampling/analysis was conducted by Geraghty & Miller between March 1995 and February 1996. Prior to collecting the groundwater samples, a minimum of three standing volumes of groundwater was purged from each monitoring well until field readings of discharge water temperature, specific conductance, pH, and turbidity stabilized. Purging was conducted using a submersible pump that was cleaned prior to use at each well. New pump tubing was used to purge each monitoring well during each sampling event. It is noted that Type III monitoring wells DMW-27 and DMW-29 were not sampled during the most recent round of sampling/analysis activities because these wells were dry following installation (Geraghty & Miller, 1996).

Upon collection, the groundwater samples were promptly transferred to laboratory containers and placed on ice in a cooler. For quality assurance/quality control (QA/QC), trip blanks, equipment rinsate blanks, and duplicate samples were analyzed as part of the groundwater sampling events. Analytical laboratories and methodologies used as part of each groundwater sampling event are referenced in Table 2.

5.5 Monitoring Well Slug Testing and Recovery Well Pump Testing

Slug tests were conducted on monitoring wells MW-2, MW-3, MW-4, MW-7, MW-8, and MW-9 on March 29, 1995 by Geraghty & Miller to estimate the average hydraulic conductivity of the shallow saturated overburden at the facility. Each test was conducted by inserting a solid cylinder (slug) of known volume into the well to quickly raise the water level in the well (falling head test). Once the water level returned to the static level, the slug was removed to quickly lower the water level in the well (rising head test). Water levels versus time during each test were monitored/recorded using a digital data logger connected to a pressure transducer in the well. The pressure transducer was cleaned prior to use in each well using a soap/water wash and rinse (Geraghty & Miller, 1996).

In support of the evaluation of groundwater pump and treat remedial strategies for the facility (discussed further in Section 7.0), Ilco Unican installed one 6 inch I.D. recovery well (RW-1), and two 2 inch I.D. observation wells (OW-1 and OW-2), near the location of Type II monitoring well MW-7 in May 1996. Monitoring well logs and construction records for the recovery/observation wells are provided in Appendix D. Recovery well RW-1 was installed to a total depth of approximately 55 feet below grade, approximately 20 feet below the water table.

A recovery well pump test was conducted by Piedmont Geologic, P.C. on June 11 and 12, 1996 (Piedmont Geologic, 1996). The test was conducted by pumping recovery well RW-1 at a rate of approximately 3 gallons per minute (gpm) for a 24 hour period. The optimal pump rate (3 gpm) was selected based on the results of a step-drawdown test conducted prior to the pump test. Water levels were monitored in the recovery well and the observation wells (OW-1, OW-2, and MW-7) using an electronic depth to water probe. Measurements were collected in accordance with a quasi-logarithmic schedule such that the rate of measurements was greatest during the initial stages of the test when the most change in water levels occurred.

Results of the monitoring well slug testing and recovery well pump testing are summarized in the following section.

5.6 Facility Hydrogeology

Groundwater level data for gauging events conducted between December 1993 and June 1996 are listed in Table 3. Observed depths to groundwater in the facility Type II monitoring wells have ranged from approximately 30 to 45 feet below grade in monitoring wells on the Ilco Unican property to approximately 15 to 40 feet below grade in the off-site monitoring wells. Depths to groundwater are generally consistent with the area topography, and are greatest in the area of the manufacturing building (i.e., the area with the highest topographic elevations).

A water table contour map based on the February 9, 1996 groundwater level data (the most recent gauging event) is provided as Figure 11. The water table contour map indicates a south-southeasterly apparent direction of groundwater flow in the overburden. The water table potentiometric gradient in the centralsouthern portion of the Ilco Unican facility calculated from the February 9, 1996 water table contour map is 0.022 (Figure 11).

The apparent discharge point of groundwater flowing beneath the Ilco Unican facility is a tributary of Peters creek located approximately 2,000 feet south of the facility. The surface water elevation at the nearest downgradient point from the Ilco Unican facility (approximately 890 feet NGVD) is consistent with groundwater discharge (groundwater elevations in the facility monitoring wells range from approximately 905 to 954 feet NGVD).

Hydrogeologic cross section A-A' is presented as Figure 12. Based on the February 9, 1996 groundwater levels observed in Type III monitoring well DMW-28 and nearby Type II monitoring well MW-10, a downward potentiometric gradient exists between the overburden and bedrock in the area of the manufacturing plant, which is consistent with the area topography. Cross-section potentiometric contours (Figure 12) suggest a transition from a downward gradient (i.e., recharge zone) to an upward gradient (discharge zone) between the bedrock and overburden in the area of off-site monitoring well MW-30. This relationship is also consistent with discharge to the tributary of Peters Creek, which is located approximately 700 feet south of MW-30.

Slug test graphs generated by Geraghty & Miller (1996) are provided in Appendix E. The rising head slug test data were analyzed by the Bouwer and Rice (1976) methodology using AQTESOLV™ Version 1.10 software (Geraghty and Miller, 1988) to estimate the hydraulic conductivity (K) of the overburden.

The slug test curves show a similar three segment effect that is typical of rising head slug tests on wells with screens that straddle the water table (Bouwer, 1989). The first segment is the steepest straight line formed by the earliest test data. The second segment is also straight but less steep than the first segment. The third segment curves in an asymptotic manner from the second straight line segment. The first segment is due to rapid drainage of the gravel pack around the monitoring well after the water level is lowered. As the water level in the gravel pack drains to the level of the water in the well, the flow into the well slows, and the resulting data points form a second, less steep, slope. The third segment deviates asymptotically from the second straight line segment as drawdown of the water table becomes significant relative to the water level in the well. The second line is indicative of flow from the undisturbed aquifer into the well (Bouwer, 1989). In accordance with Bouwer (1989), Geraghty & Miller analyzed the second portion of each curve to estimate the hydraulic conductivity of the saturated overburden. The resulting estimates of hydraulic conductivity are listed as follows.

Well I.D.	Hydraulic Conductivity (K) ft/min	Hydraulic Conductivity (K) ft/day
MW-2	1.6×10^{-3}	2.3
MW-3	3.3×10^{-3}	4.7
MW-4	2.7×10^{-3}	3.9
MW-7	1.2×10^{-3}	1.7
MW-8	1.5×10^{-4}	0.2
MW-9	1.2×10^{-3}	1.7
Mean	1.7×10^{-3}	2.4
Median	1.4×10^{-3}	2.0

from Geraghty & Miller (1996)

Graphs of depth to water versus elapsed time from the June 1996 pump/recovery test are presented in Appendix G (from Piedmont Geologic, 1996). The drawdown versus time data for observation wells MW-7, OW-1, and OW-2 were analyzed using the Theis (1935) and Cooper and Jacob (1946) methodologies, modified for unconfined aquifers, and the Neuman (1975) methodology to estimate the transmissivity (T) and hydraulic conductivity (K) of the saturated overburden at the facility. The analysis was facilitated using *Aquifer Test™ Version 1.99* software (Waterloo Hydrogeologic, Inc., 1996). Graphical and tabular output of the pump-test data analysis are provided in Appendix F.

Estimates of the shallow overburden transmissivity (T) based on the pump test data analysis are listed in Table 4. Included are estimated values of hydraulic conductivity (K) based on a saturated-overburden thickness in the pump test area of 25 feet (delineated through auger refusal at a depth of approximately 55 feet in the borehole for recovery well RW-1). Estimated mean and median T and K values are listed as follows.

Data/Analysis Method	Mean T ft^2/day	Median T ft^2/day	Mean K ft/day	Median K ft/day
Pump test data; Theis (1935) methodology	199.3	223.2	8.0	9.6
Pump test data Cooper and Jacob (1946) method.	232.7	276.5	9.3	11.1
Recovery test data Neuman (1975) methodology	199.3	223.2	8.0	8.9

The mean and median hydraulic conductivity (K) values delineated through the pump test data are approximately 3 to 5 times more than the range of mean and median K values delineated through the pump test data analysis. The higher K values delineated through the pump test data analysis may be a reflection of aquifer heterogeneity in the pump test area (discussed further in Section 6.1).

The groundwater flow velocity in the overburden at the facility was estimated using the linear flow relationship V = Ki/n, where V is the groundwater flow velocity, K is the hydraulic conductivity, i is the hydraulic gradient, and n is the effective overburden porosity. A range of groundwater flow velocity was estimated, using the range of mean hydraulic conductivity values estimated from the slug and pump testing, the hydraulic gradient delineated from the February 1996 water table contour map, and an estimated range of effective overburden porosity of 30%, as follows.

Low-End Groundwater Flow Velocity Estimate

K = 2.4 ft/day

i = 0.022 ft/ft

n = 0.3

V = Ki/n = (2.4 ft/day)(0.022 ft/ft)/(0.3) = 0.18 ft/day = 66 ft/year

High-End Groundwater Flow Velocity Estimate

K = 9.3 ft/day

i = 0.022 ft/ft

n = 0.3

V = Ki/n = (9.3 ft/day)(0.022 ft/ft)/(0.3) = 0.68 ft/day = 248 ft/year

It is noted that the higher groundwater flow velocity estimate may be valid only for the area of the pump test (i.e., at MW-7), and that the groundwater flow velocity estimate derived through the slug test data analysis may be more representative of overall average groundwater flow velocities in the area of the facility.

5.7 Results of Groundwater Sampling/Analysis

Summarized results of laboratory analysis of all rounds of groundwater sampling/analysis conducted between November 1991 and February 1996 are summarized in Tables 5 through 10. The following compounds were detected in one or more groundwater samples collected during the March 1995 through

February 1996 sampling event (the most recent round of sampling/analysis) at concentrations above the groundwater action levels listed in 15A NCAC 2L .0202g.

- PCE;
- TCE;
- 1,1-DCE;
- 1,1,1-TCA;
- Chloroform;
- Chromium;
- Lead; and
- Nickel.

Of the inorganic analytes listed above, lead was detected at a concentration above the 2L standard only in the groundwater sample from MW-17 (upgradient monitoring well), chromium was detected at a concentration above the 2L standard only in the groundwater sample from MW-8, and nickel was detected at a concentration above the 2L standard only in the groundwater samples from MW-8 and the former facility production well (PW-1). Of the organic analytes listed above, 1,1,1-TCA was detected at a concentration above the 2L standard only in the groundwater sample from MW-2.

For comparison, results of all rounds of groundwater analysis are summarized in Table 11. Analytes listed in Table 11 have been detected in one or more groundwater samples from the facility at concentrations above 2L standards. PCE, TCE, 1,1-DCE, and chloroform are the only constituents that have been consistently detected at concentrations above the 2L standards in groundwater samples collected from the facility.

6.0 DISTRIBUTION/SOURCES OF CONTAMINANTS IN GROUNDWATER AND SOIL

6.1 Distribution of Contaminants in Groundwater

Isoconcentration contour maps for PCE, TCE, 1,1-DCE, and chloroform are presented as Figures 13 through 16, respectively. Isoconcentration contour cross sections for PCE, TCE, 1,1-DCE, and chloroform are presented in Figures 17 through 24. As discussed in Section 5.7, these constituents represent the only organic and/or inorganic compounds that have been consistently detected in groundwater samples from the facility monitoring/production wells.

The isoconcentration contour maps and cross sections all show similar distributions of PCE, TCE, 1,1-DCE, and chloroform that are centered at the courtyard area and/or pit C (Figure 4). The results of analysis of groundwater collected from Type III monitoring well DMW-28 (in the courtyard area) indicate that the dissolved VOCs are primarily contained within the saturated overburden at the facility. The downgradient distribution of dissolved VOCs from the courtyard and southern side yard areas is generally consistent with the south-southeast apparent direction of groundwater flow in the overburden at the facility. However, the isoconcentration contour maps for PCE, 1,1-DCE, and chloroform all show apparent southwesterly preferential migration of these constituents between the courtyard area and Indiana Ave. (i.e., at monitoring well MW-7) that is at an acute angle to the apparent direction of groundwater flow. This apparent preferential migration pathway may be due to; 1) natural structural heterogeneities in the overburden (regional geological structures trend northeast in the Winston-Salem area) that induce preferential migration of released contaminants in the unsaturated zone (i.e., from surface/subsurface releases); 2) natural structural heterogeneities in the overburden/bedrock that induce preferential migration of dissolved VOCs in groundwater; and/or 3) manmade structural heterogeneities (i.e., utility lines) in the shallow overburden that induce preferential migration of released contaminants in the unsaturated zone.

The presence of PCE, TCE, and 1,1,1-TCA in groundwater at the facility is consistent with documented past usage of these solvents by Stewart-Warner. The presence of 1,1-DCE may be related to the abiotic chemical transformation of 1,1,1-TCA in groundwater. Chloroform has no documented use at the facility. However, this compound (a trihalomethane) is commonly produced in chlorinated water that contains organic compounds. By this manner, the presence of chloroform in groundwater at the facility is probably due to Stewart-Warner's previous in-situ treatment of surface soils following spills with chlorine (discussed in Section 2.2).

6.2 Distribution of Contaminants in Soil and Sources of Contaminants in Groundwater

Contaminants detected in soil samples collected at the Ilco Unican, Winston-Salem facility between 1987 and 1996 may be divided into two general categories based on chemical and source area characteristics. These categories are; 1) metals and cyanide; and 2) VOCs/SVOCs.

Metals and Cyanide

Metals, primarily chromium, lead, nickel, and zinc, and cyanide, have been detected at concentrations above facility PSRGs in surficial soil samples collected from spill sites #1 and #2 (quadrants 1 and 2); the additional soil quadrants in the side yard area (quadrants 6 through 25); waste piles #1 and #2; and the roof runoff and baghouse areas (Figure 4). Concentrations of extractable metals above EPA toxicity MCLs were detected in select soil samples from these areas.

In 1987, Stewart-Warner conducted soil excavation activities in spill sites #1 and #2 to a depth of 1.5 feet below grade. Confirmational soil sampling following these activities indicated that remaining total and extractable metals concentrations in soil in spill sites #1 and #2 are below the facility PSRGs and EPA toxicity MCLs.

In October and November 1996, Ilco Unican undertook voluntary cleanup actions in response to concentrations of total and extractable metals above the facility PSRGs and EPA toxicity MCLs in surficial soils in the side yard soil quadrants, waste piles #1 and #2, and the roof runoff areas. The results of these activities are described by Piedmont Geologic (1997). Soils from affected areas within each quadrant were excavated to depths ranging from 12 to 22 inches below grade. Additional soils were excavated from waste pile #2 to a total depth of 9 feet below grade in response to discolored soils observed during the excavation activities. The results of post-excavation soil sampling/analysis indicated concentrations of total metals below the facility PSRGs (Piedmont Geologic, 1997).

The results of the most recent round of groundwater sampling/analysis at the facility (March 1995 and February 1996) indicated concentrations of metals (nickel, chromium and/or lead) above the North Carolina 2L standards in groundwater samples from only two monitoring wells (MW-8 and MW-17), as well as the former facility production well. Detected concentrations of these constituents were less than or equal to two times the associated 2L standard, and may be associated with background groundwater conditions. Based on these data, the former metal and cyanide concentrations in soil at the Ilco Unican facility has not resulted in significant groundwater impact with respect to these constituents.

VOCs/SVOCs

VOCs and SVOCs have been detected in soil samples collected between 1987 and 1996 from pits A, B, C, and D; and the former chrome plating, drum wash, and courtyard sumps. Stewart-Warner excavated drums, crucible, assorted debris, and soils from pits A, B, and C, and Ilco Unican excavated soil and debris from pit D in 1996. The results of laboratory analysis (VOCs/SVOCs) of soil samples collected from the facility following the 1987 excavation activities are summarized in Figure 25. Concentrations of individual VOCs ranging from 0.004 mg/kg to 62 mg/kg, and concentrations of individual SVOCs ranging from 0.4 mg/kg to 5.8 mg/kg, have been detected in soil samples collected from former pit C, pit D (prior to excavation), and the former courtyard area sumps at depths ranging from 0.5 to 11 feet below grade. The highest concentrations of individual VOCs, ranging from 22 mg/kg to 62 mg/kg, were detected in soil samples collected from the former chrome plating sump and courtyard sump (Figure 25).

The results of the most recent round of groundwater sampling/analysis at the Ilco Unican facility (March 1995 through February 1996), indicated concentrations of SVOCs (isophorone and 2-nitrophenol) above the 2L standards in only one groundwater sample (MW-2). Based on these data, remaining concentrations of SVOCs in soil do not represent a significant source of dissolved SVOCs to groundwater.

As discussed in Section 6.1, the results of the most recent round of groundwater sampling/analysis at the Ilco Unican facility indicate a plume of dissolved VOCs at concentrations above 2L standards (PCE, TCE, 1,1-DCE, and chloroform) that extends from the facility manufacturing building to off-site properties in the downgradient direction. Based on VOC isoconcentration contour maps for March 1995 through February 1996 (Figures 13 through 16), source areas of dissolved VOCs are the courtyard area (i.e., the former chrome plating and courtyard sump areas) and former pit C in the southern side yard. As discussed in Section 2.3, pit C was excavated by Stewart-Warner in July 1988.

7.0 RECOMMENDATIONS

Based on the detection of VOCs in groundwater at the Ilco Unican, Winston-Salem facility at concentrations above North Carolina 2L standards, preparation of a Corrective Action Plan (CAP) for the facility in accordance with 15A NCAC 2L .0106 is warranted. At this time, a two-tiered strategy toward site remediation is recommended, described as follows.

- Development of site specific target levels (SSTLs) for concentrations of VOCs in soil and groundwater at the facility based on complete exposure pathways at, and downgradient of, the facility (discussed below);
- Evaluation of engineering alternatives to reduce concentrations of VOCs in soil and groundwater to levels below the facility SSTLs. Applicable strategies for soil and groundwater treatment may include, but would not necessarily be limited to; 1) groundwater pump and treat; 2) soil vapor extraction; 3) air sparging; and 4) bioremediation.

Based on the absence of drinking water supply wells between the facility and the downgradient discharge point of groundwater beneath the Ilco Unican facility (i.e., the tributary of Peters Creek), it is recommended that corrective action for the facility be implemented in accordance with the provisions for *alternate concentration limits* (ACLs) presented in 15A NCAC 2L .0106k. ACLs for source area groundwater concentrations would be represented by the facility SSTLs. The ACLs/SSTLs would be established to prevent source area and downgradient human and environmental exposures above regulatory and/or health-based standards. Such exposure based criteria may include, but would not necessarily be limited to:

- Reduction of source area soil and groundwater concentrations to prevent discharge of groundwater to surface water at concentrations above North Carolina surface water standards (15A NCAC 2B).
- Reduction of source area soil and groundwater concentrations to prevent volatilization of VOCs from the water table to indoor air spaces on site and downgradient of the site at concentrations above industrial exposure standards and/or health-based exposure criteria.
- Reduction of source area soil concentrations to prevent dermal/ingestion exposures by construction workers at concentrations above risk-based health exposure criteria.

In conjunction with the CAP development described above, it is recommended that the former facility production well (PW-1) be decommissioned in accordance with 15A NCAC 2C. Reasons for this recommended activity are listed as follows.

- Because no drilling log or construction information is available for the well, its usefulness as a valid monitoring point is questionable;
- If the outer well casing is not properly sealed, the well could serve as a conduit for contaminant migration between the overburden and bedrock at the facility;
- Due to the concerns listed above, permanent abandonment of the well is required under the Forsythe Co. *Regulations Governing Construction, Repair and Abandonment of Wells in Forsythe County, North Carolina.*

8.0 REFERENCES

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FIGURES

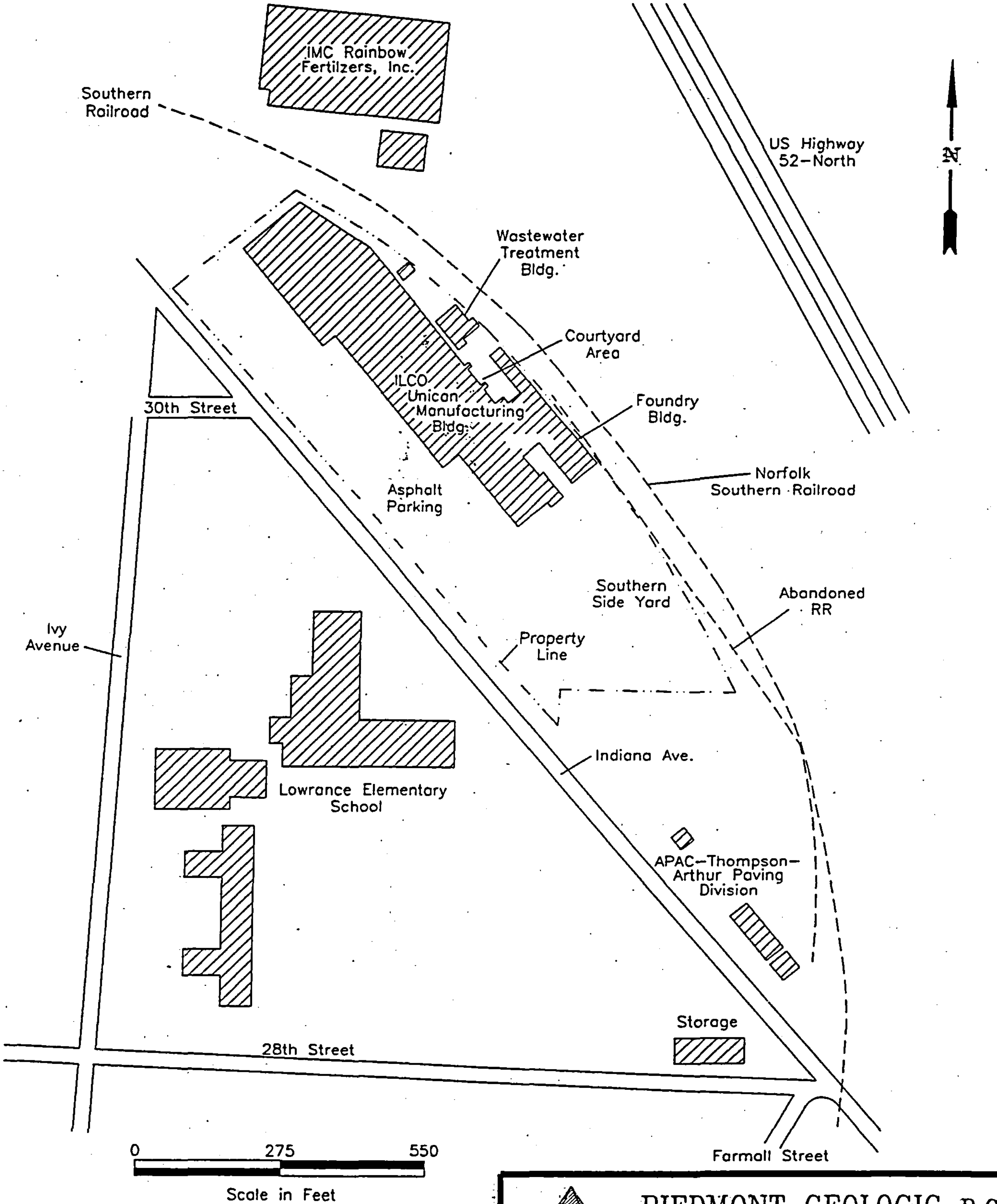
N

SOURCE: USGS Winston-Salem East, Winston-Salem West, Walkertown, Rural Hall, NC 7.5-min. quadrangle maps; 1 in. = 2000 ft. Contour interval = 10 ft.

PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

FACILITY LOCATION MAP
Ilco Unican Corporation
Winston-Salem, NC

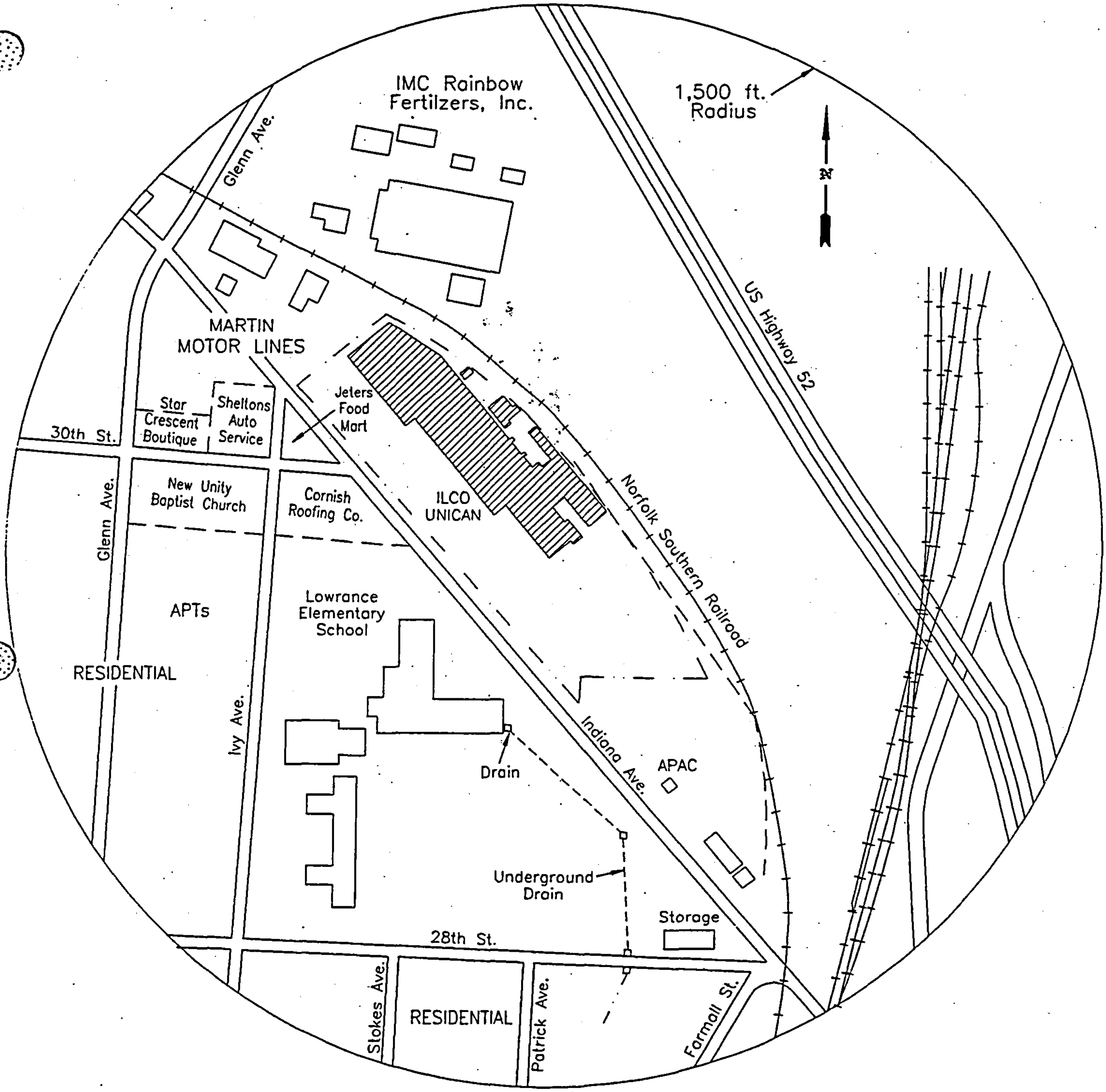
Designed by:	Drawn by:	Reviewed by:	Drawing #: 9614 / Drawing Date: 7-22-96	Figure 1



PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

Gauging Date:	Drawing Date: 4/26/96	ACAD File: ILCO.DWG

Designed: PD	Facility Map ILCO Unican Corporation	
Detailed: DD	Client: ILCO Unican Corporation	Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina	Figure: 2



LEGEND

1500-FT RADIUS

0 400 800

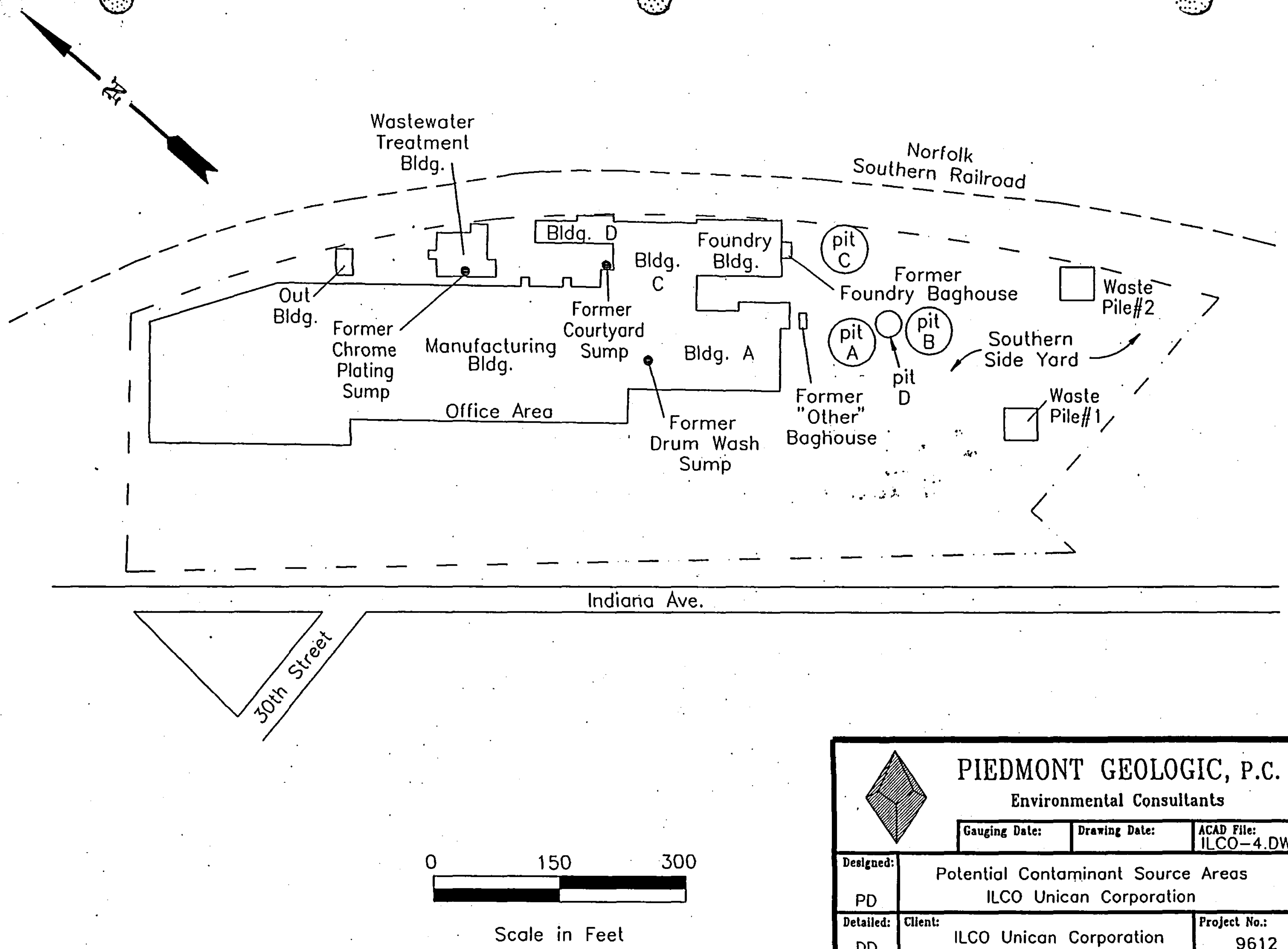
Scale in Feet

PIEDMONT GEOLOGIC, P.C.

Environmental Consultants

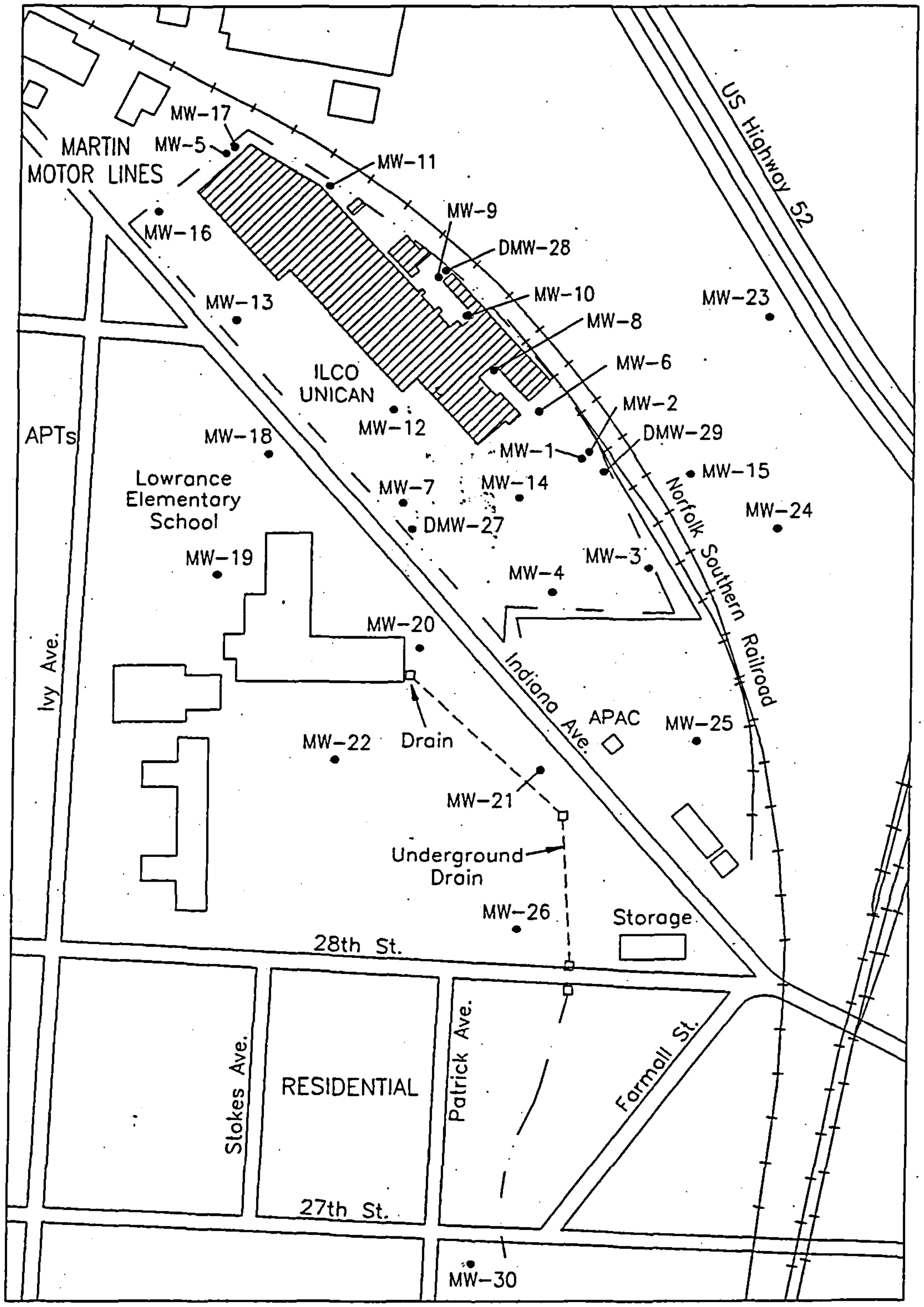
Gauging Date:	Drawing Date:	ACAD File: ILCO-3.DWG

Designed: PD	Area Map ILCO Unican Corporation	
Detailed: DD	Client: ILCO Unican Corporation	Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina	Figure: 3



PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

	Gauging Date:	**Drawing Date:**	**ACAD File:** ILCO-4.DWG
Designed: PD	Potential Contaminant Source Areas ILCO Unican Corporation		
Detailed: DD	**Client:** ILCO Unican Corporation		**Project No.:** 9612
Checked: PD	**Location:** 2941 Indiana Avenue Winston-Salem, North Carolina		**Figure:** 4



0 350 700

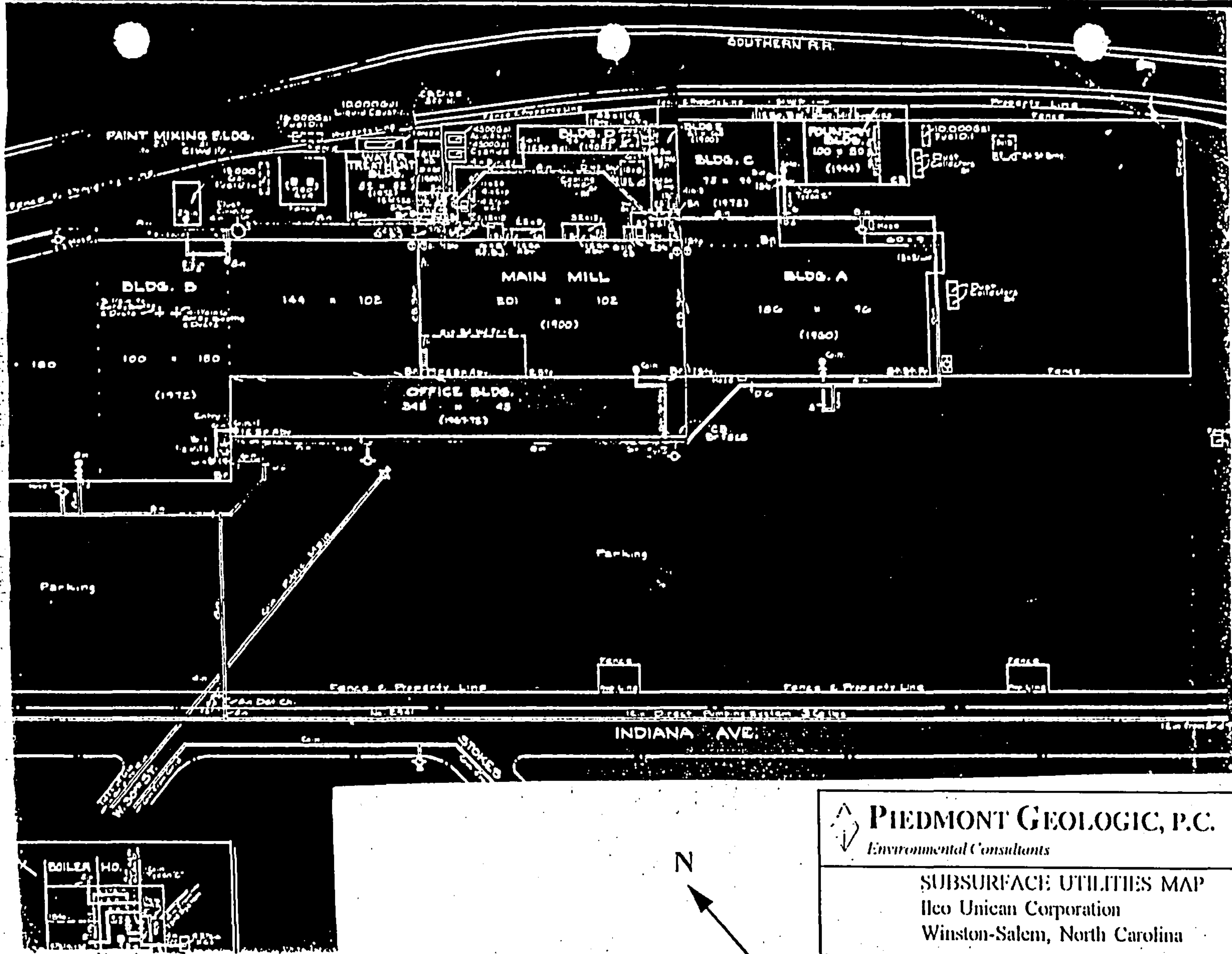
Scale in Feet

PIEDMONT GEOLOGIC, P.C.

Environmental Consultants

Gauging Date:	Drawing Date:	ACAD File: ILCO-5.DWG

Designed: PD	Locations Of Monitoring and Production Wells ILCO Unican Corporation	
Detailed: DD	Client: ILCO Unican Corporation	Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina	Figure: 5

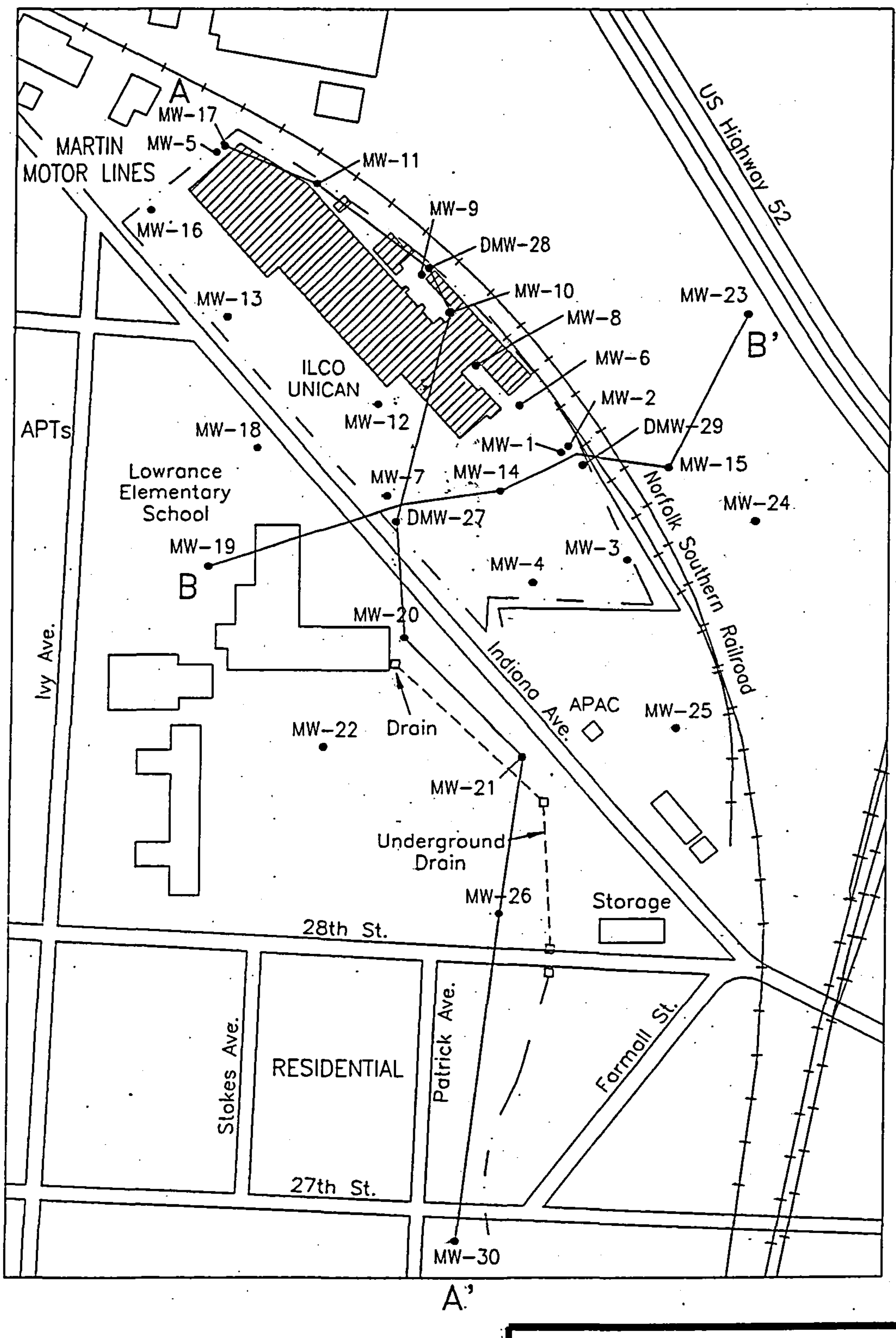


Source: Ileo Unican Records

PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

SUBSURFACE UTILITIES MAP
Ileo Unican Corporation
Winston-Salem, North Carolina

Designed by:	Drawn by:	Reviewed by:	Drawing # 9701-06	Figure 6
PJD		PJD	Drawing Date: 3-17-97	



LEGEND

MW-1 • MONITORING WELL

A— A' GEOLOGIC CROSS SECTION LINE

0 350 700

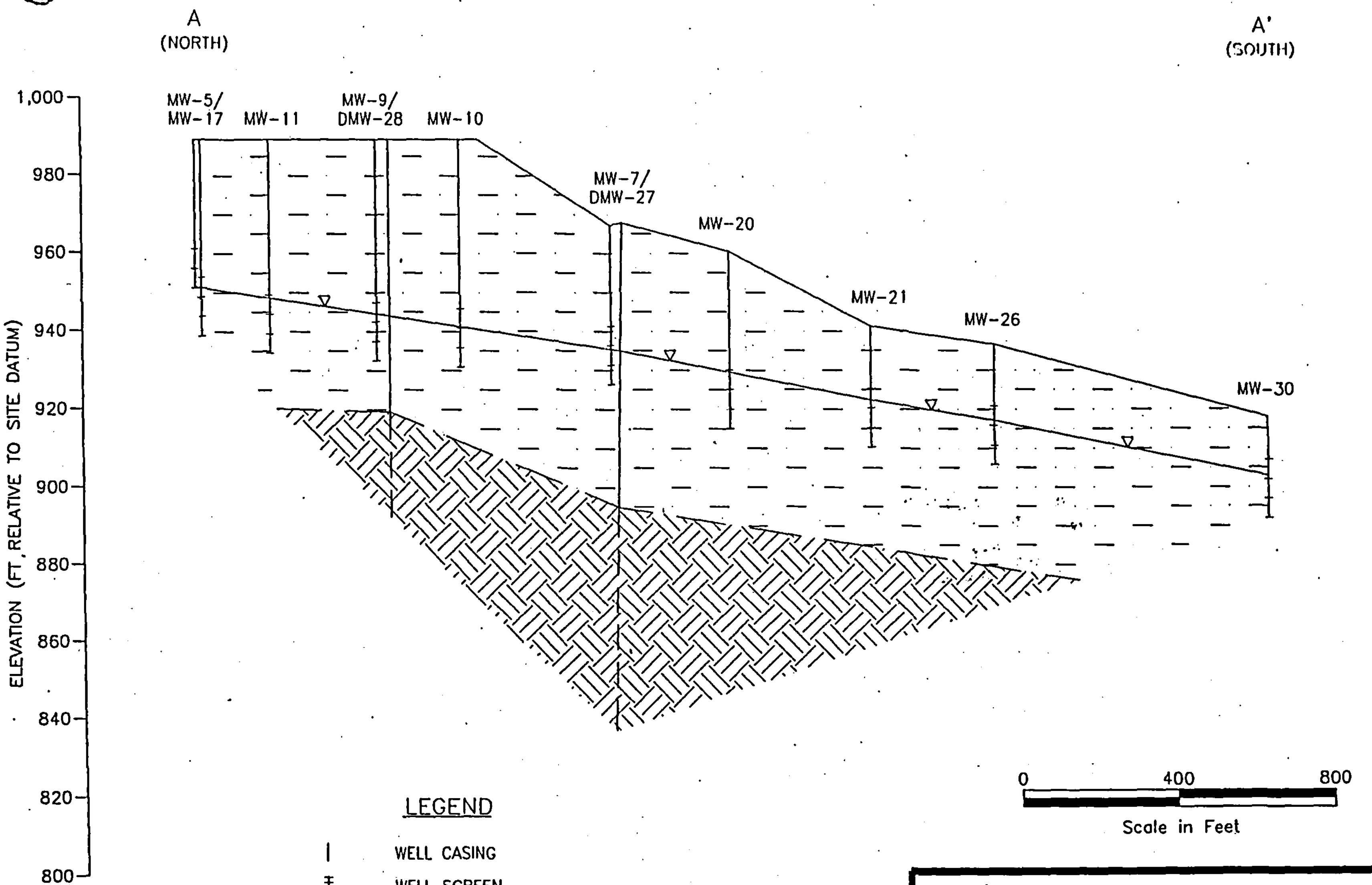
Scale in Feet

920.68
290.57

PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

Gauging Date:	Drawing Date:	ACAD File: ILCO-8.DWG

Designed: PD	Locations of Geologic Cross Sections ILCO Unican Corporation	
Detailed: DD	Client: ILCO Unican Corporation	Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina	Figure: 8



LEGEND

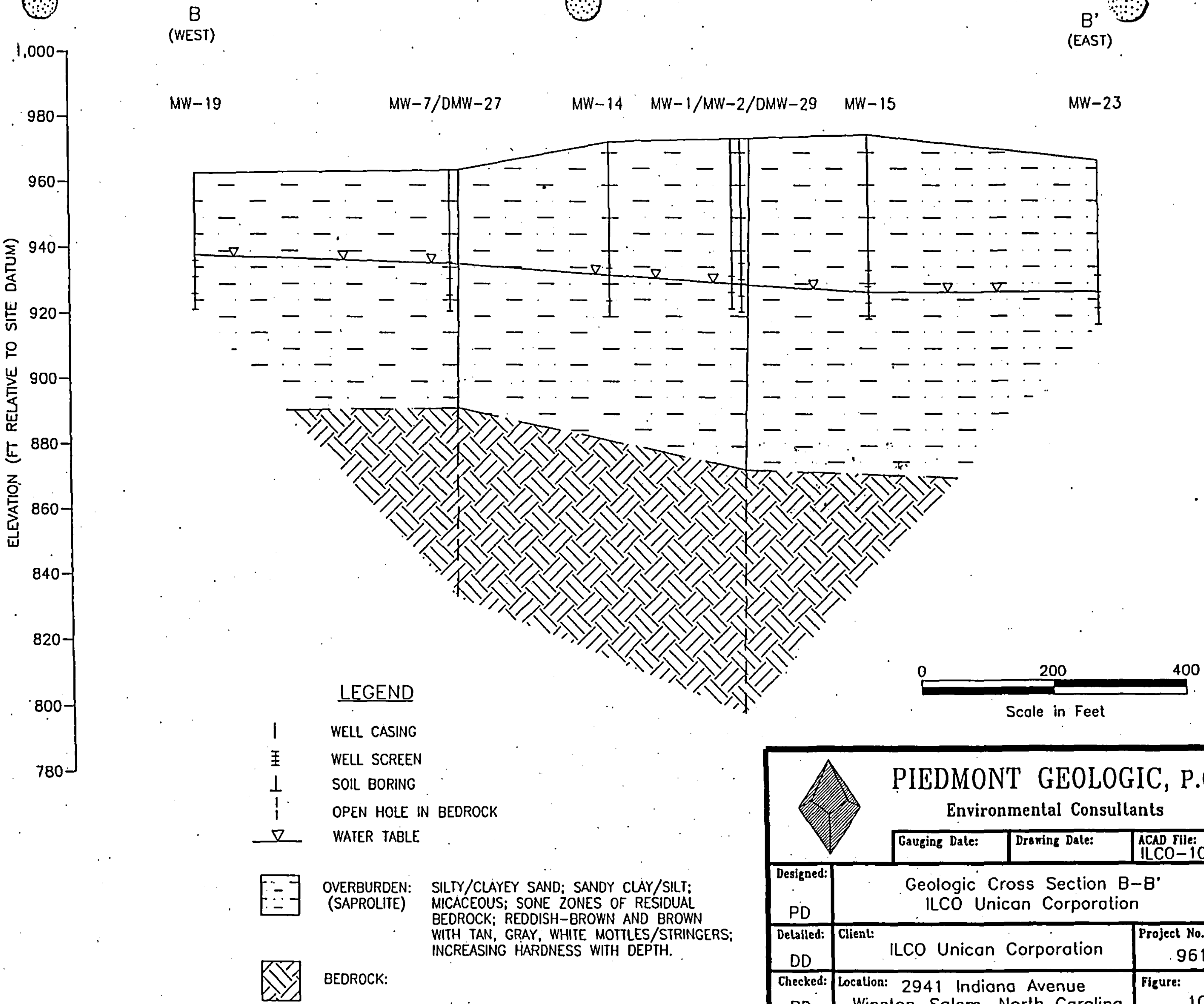
- WELL CASING
- WELL SCREEN
- OPEN HOLE IN BEDROCK
- SOIL BORING
- WATER TABLE

OVERBURDEN: (SAPROLITE) SILTY/CLAYEY SAND; SANDY CLAY/SILT; MICACEOUS; SONE ZONES OF RESIDUAL BEDROCK; REDDISH-BROWN AND BROWN WITH TAN, GRAY, WHITE MOTTLES/STRINGERS; INCREASING HARDNESS WITH DEPTH.

BEDROCK:

PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

	Gauging Date:	**Drawing Date:**	**ACAD File:** ILCO-9.DWG
Designed: PD	Geologic Cross Section A-A' ILCO Unican Corporation		
Detailed: DD	**Client:** ILCO Unican Corporation		**Project No.:** 9612
Checked: PD	**Location:** 2941 Indiana Avenue Winston-Salem, North Carolina		**Figure:** 9

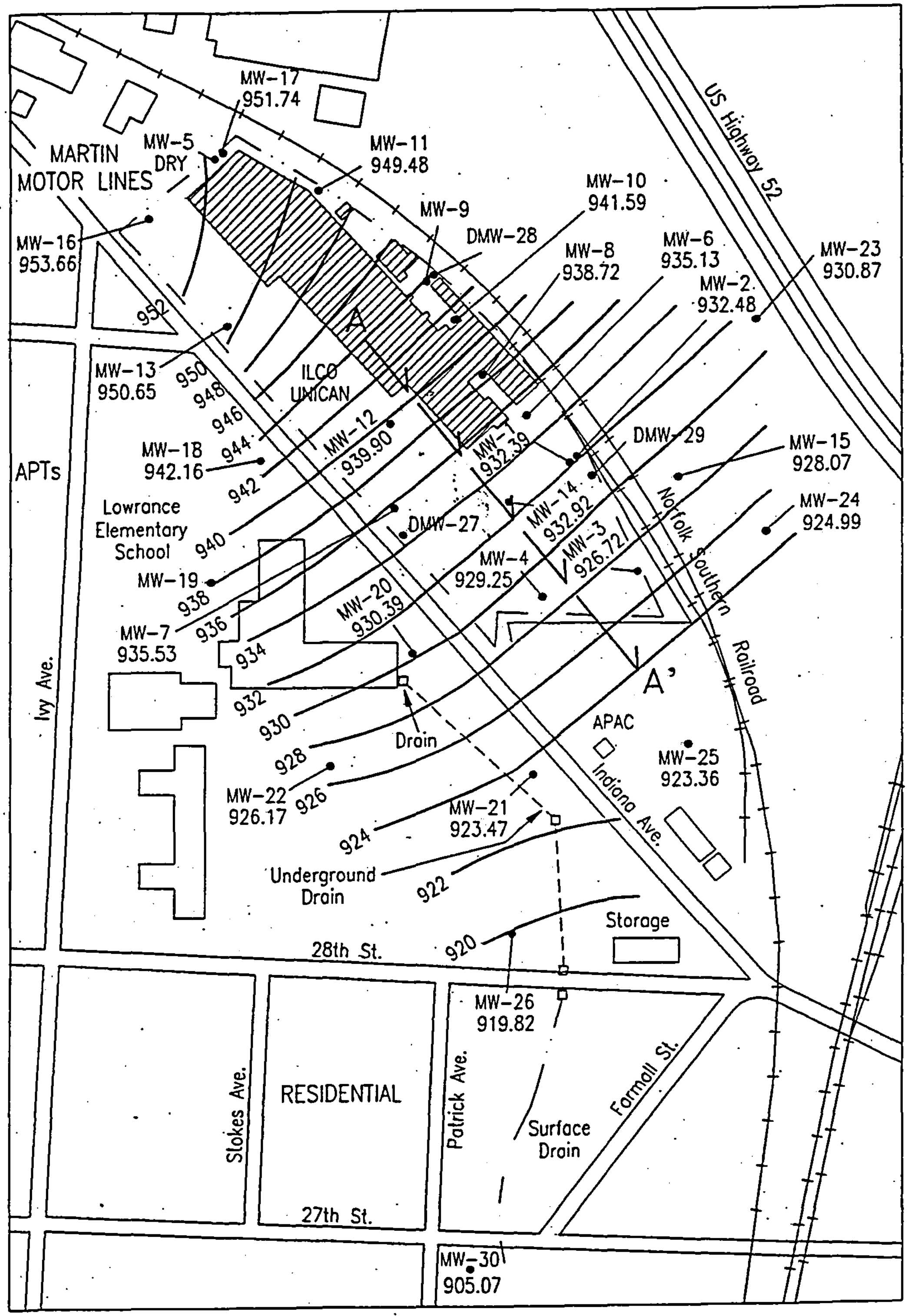


PIEDMONT GEOLOGIC, P.C.

Environmental Consultants

Gauging Date:	Drawing Date:	ACAD File: ILCO-10.DWG

Designed: PD	Geologic Cross Section B-B' ILCO Unican Corporation	
Detailed: DD	Client: ILCO Unican Corporation	Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina	Figure: 10



0 350 700

Scale in Feet

LEGEND

MW-1 932.39 — TYPE II MONITORING WELL WITH GROUNDWATER ELEVATION

952 — WATER TABLE CONTOUR

→ → APPARENT GROUNDWATER FLOW DIRECTION

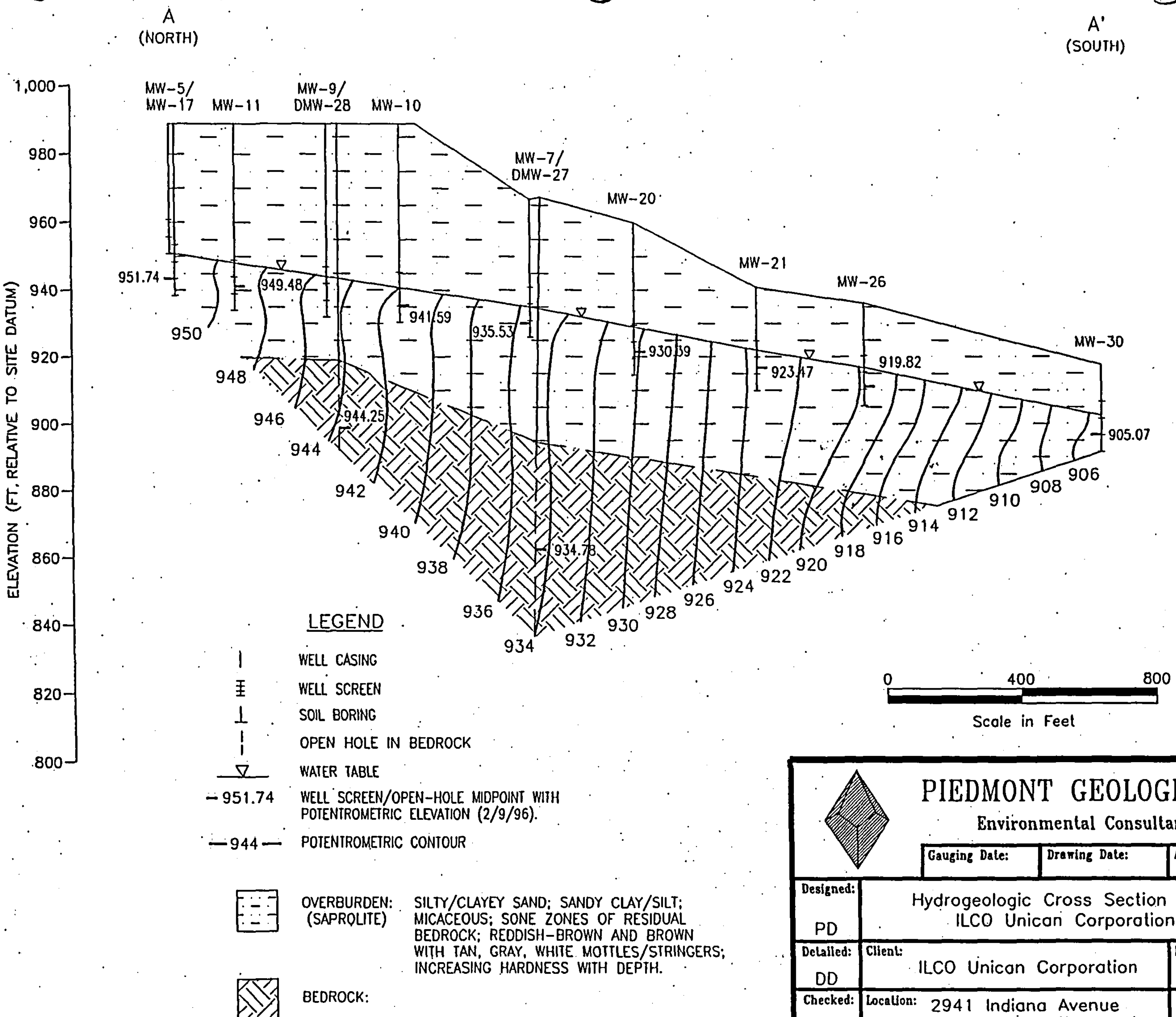
POTENTIOMETRIC GRADIENT A–A'

$$i = \frac{\text{Ft(head)}}{\text{Ft(horizontal)}} = \frac{20 \text{ ft.}}{910 \text{ ft.}} = 0.022$$

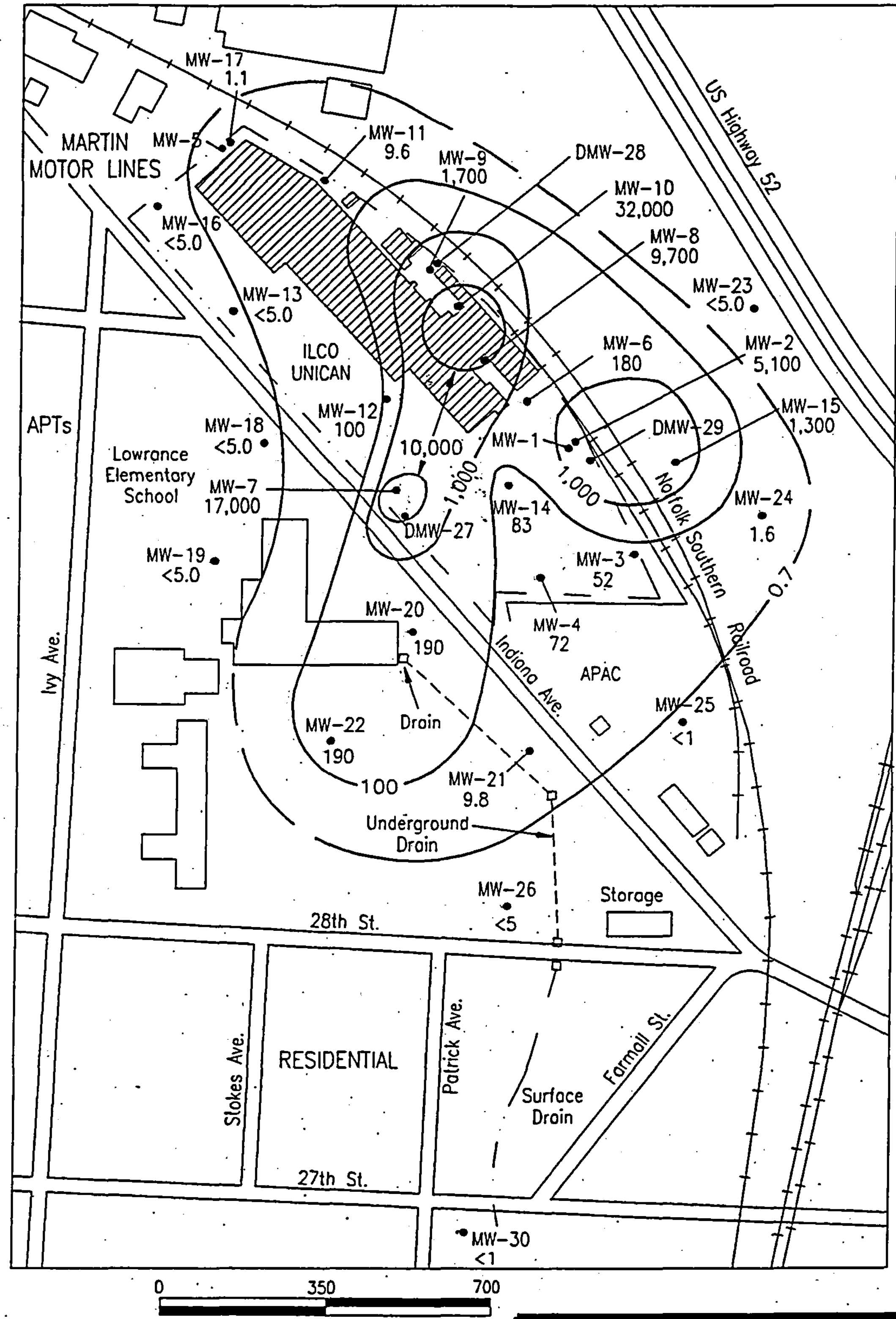
PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

Gauging Date:	Drawing Date:	ACAD File: ILCO-11.DWG

Designed: PD	Water Table Contour Map: 2/9/96 ILCO Unican Corporation	
Detailed: DD	Client: ILCO Unican Corporation	Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina	Figure: 11



PIEDMONT GEOLOGIC, P.C. Environmental Consultants		
Gauging Date:	Drawing Date:	ACAD File: ILCO-12.DWG
Designed: PD	Hydrogeologic Cross Section A-A' ILCO Unican Corporation	
Detailed: DD	Client: ILCO Unican Corporation	Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina	Figure: 12



LEGEND

MW-2 / 5,100 — TYPE II MONITORING WELL WITH DISSOLVED PCE CONCENTRATION (ug/L)

—100— DISSOLVED PCE ISOCONCENTRATION CONTOUR (ug/L)

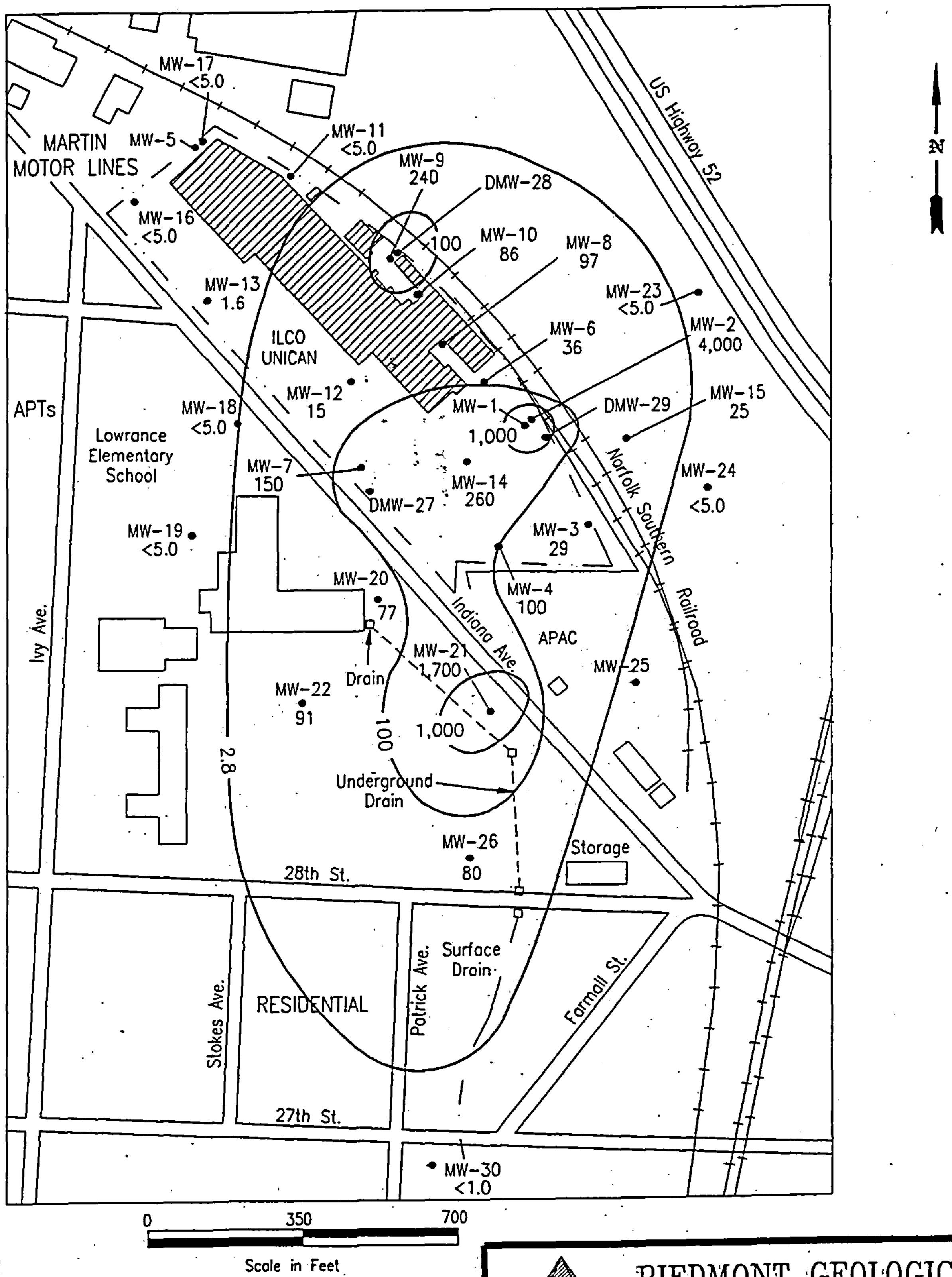
PCE TETRACHLOROETHENE

NOTE: GROUNDWATER SAMPLES FROM MW-2,MW-3,MW-4,MW-6,MW-8,MW-9 COLLECTED 3/30-31/95. GROUNDWATER SAMPLES FROM MW-7,MW-10,MW-11, MW-12,MW-13,MW-14,MW-15,MW-17 COLLECTED 5/17-18/95. GROUNDWATER SAMPLES FROM MW-16,MW-18,MW-19,MW-20,MW-21,MW-22,MW-23,MW-24 COLLECTED 7/17/95. GROUNDWATER SAMPLES FROM MW-25,MW-26 COLLECTED 12/13/95. GROUNDWATER SAMPLES FROM MW-30 COLLECTED 2/9/96.

PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

Gauging Date:	Drawing Date:	ACAD File:
SEE NOTE		ILCO-13.DWG

Designed: PD	Groundwater PCE Isoconcentration Contour Map ILCO Unican Corporation	
Detailed: DD	Client: ILCO Unican Corporation	Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina	Figure: 13



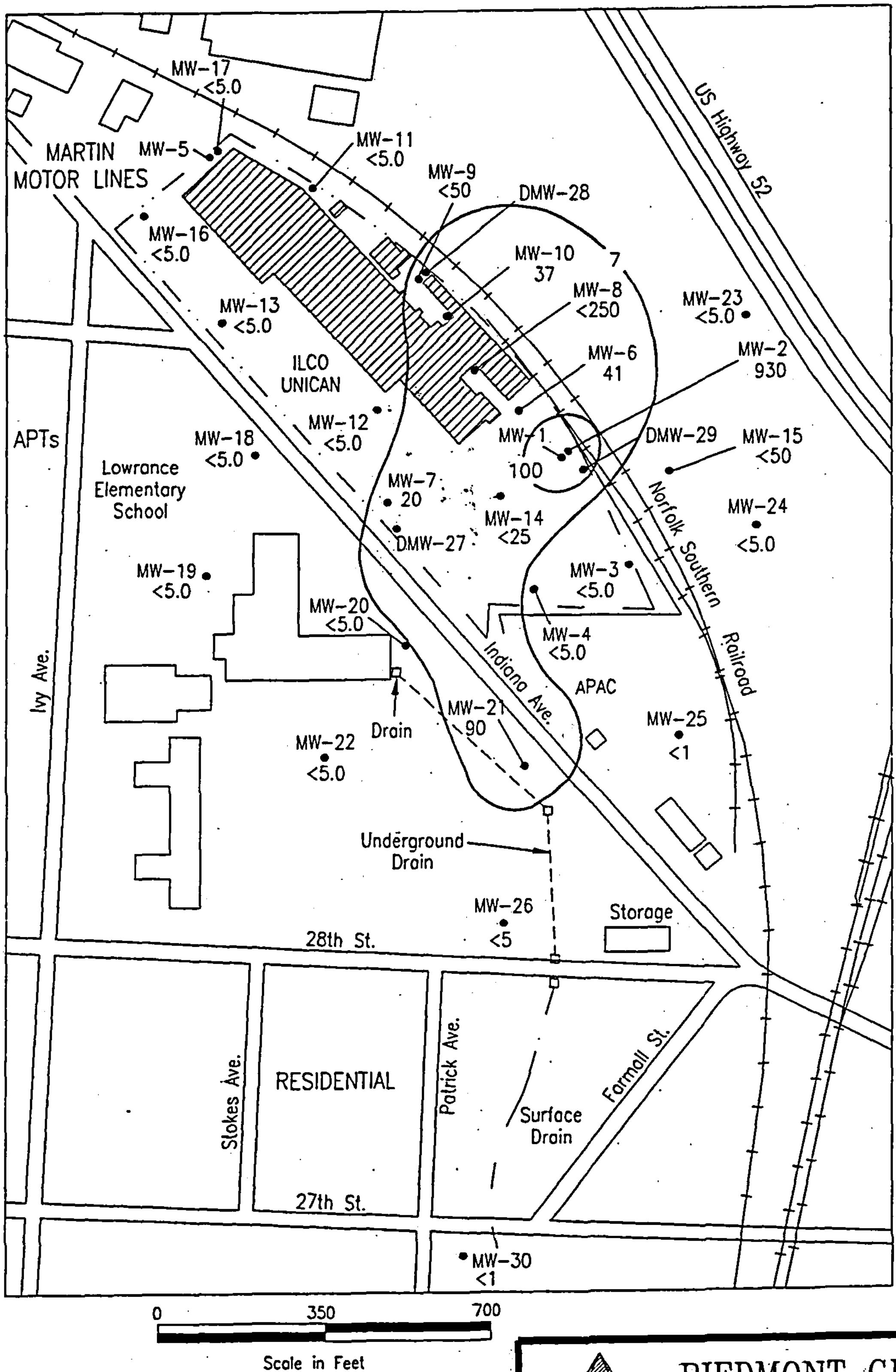
LEGEND

MW-2 • 4,000	TYPE II MONITORING WELL WITH DISSOLVED TCE CONCENTRATION (ug/L)
—100—	DISSOLVED TCE ISOCONCENTRATION CONTOUR (ug/L)
TCE	TRICHLOROETHENE

NOTE: GROUNDWATER SAMPLES FROM MW-2,MW-3,MW-4,MW-6,MW-8,MW-9 COLLECTED 3/30-31/95. GROUNDWATER SAMPLES FROM MW-7,MW-10,MW-11, MW-12,MW-13,MW-14,MW-15,MW-17 COLLECTED 5/17-18/95. GROUNDWATER SAMPLES FROM MW-16,MW-18,MW-19,MW-20,MW-21,MW-22,MW-23,MW-24 COLLECTED 7/17/95. GROUNDWATER SAMPLES FROM MW-25,MW-26 COLLECTED 12/13/95. GROUNDWATER SAMPLES FROM MW-30 COLLECTED 2/9/96.

PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

Gauging Date: SEE NOTE	Drawing Date:	ACAD File: ILCO-14.DWG	
Designed: PD	Groundwater TCE Isoconcentration Contour Map ILCO Unican Corporation		
Detailed: DD	Client: ILCO Unican Corporation		Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina		Figure: 14



LEGEND

MW-2
4,000 — TYPE II MONITORING WELL WITH DISSOLVED 1,1-DCE CONCENTRATION (ug/L)

—100— DISSOLVED 1,1-DCE ISOCONCENTRATION CONTOUR (ug/L)

1,1-DCE — 1,1- DICHLOROETHENE

NOTE: GROUNDWATER SAMPLES FROM MW-2,MW-3,MW-4,MW-6,MW-8,MW-9 COLLECTED 3/30-31/95. GROUNDWATER SAMPLES FROM MW-7,MW-10,MW-11, MW-12,MW-13,MW-14,MW-15,MW-17 COLLECTED 5/17-18/95. GROUNDWATER SAMPLES FROM MW-16,MW-18,MW-19,MW-20,MW-21,MW-22,MW-23,MW-24 COLLECTED 7/17/95. GROUNDWATER SAMPLES FROM MW-25,MW-26 COLLECTED 12/13/95. GROUNDWATER SAMPLES FROM MW-30 COLLECTED 2/9/96.

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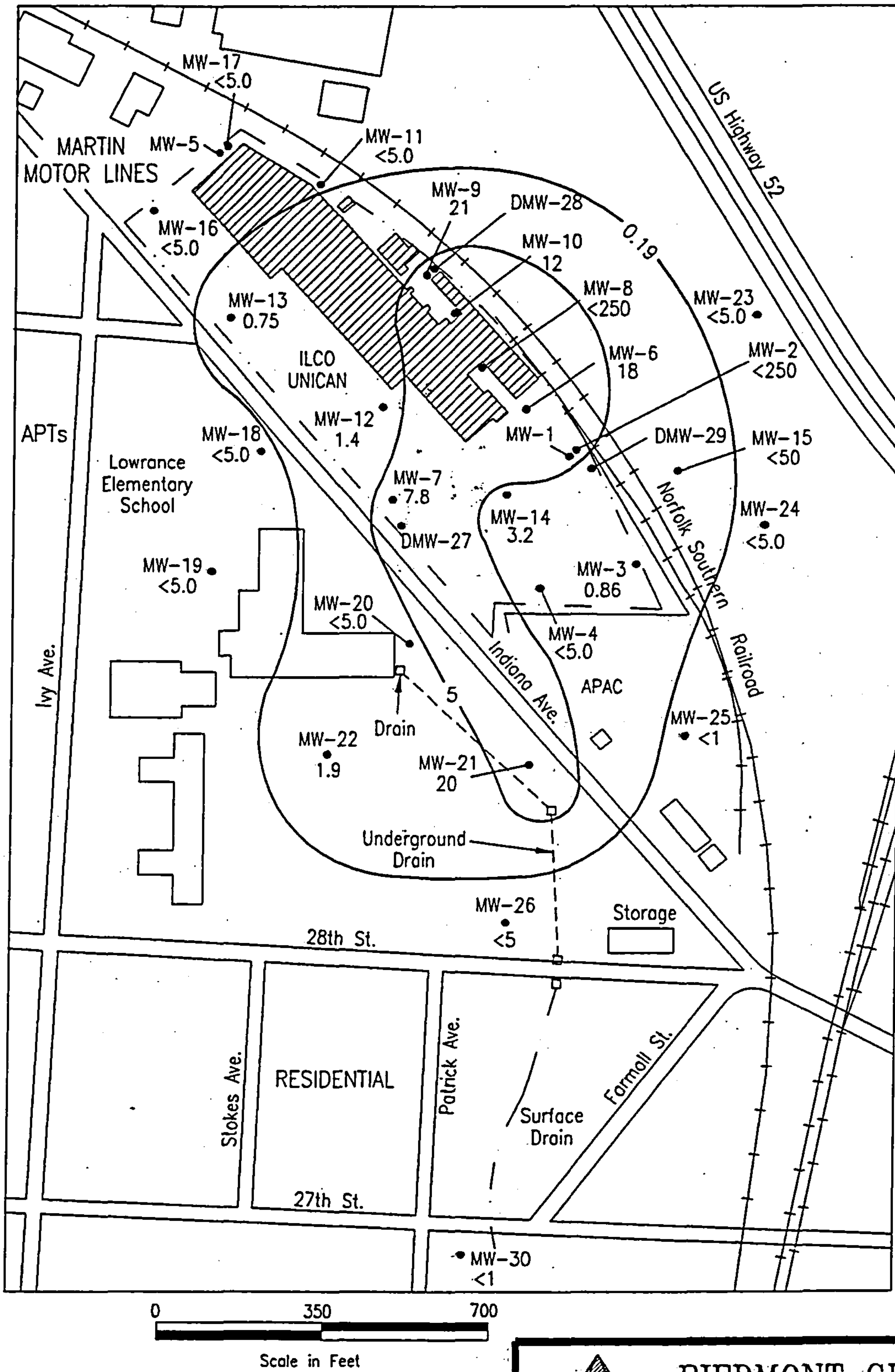
Environmental Consultants

Gauging Date: SEE NOTE	Drawing Date:	ACAD File: ILCO-15.DWG
Designed: PD	Groundwater 1,1-DCE Isoconcentration Contour Map ILCO Unican Corporation	
Detailed: DD	Client: ILCO Unican Corporation	Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina	Figure: 15



LEGEND

MW-2 <250 — TYPE II MONITORING WELL WITH DISSOLVED CHLOROFORM CONCENTRATION (ug/L)

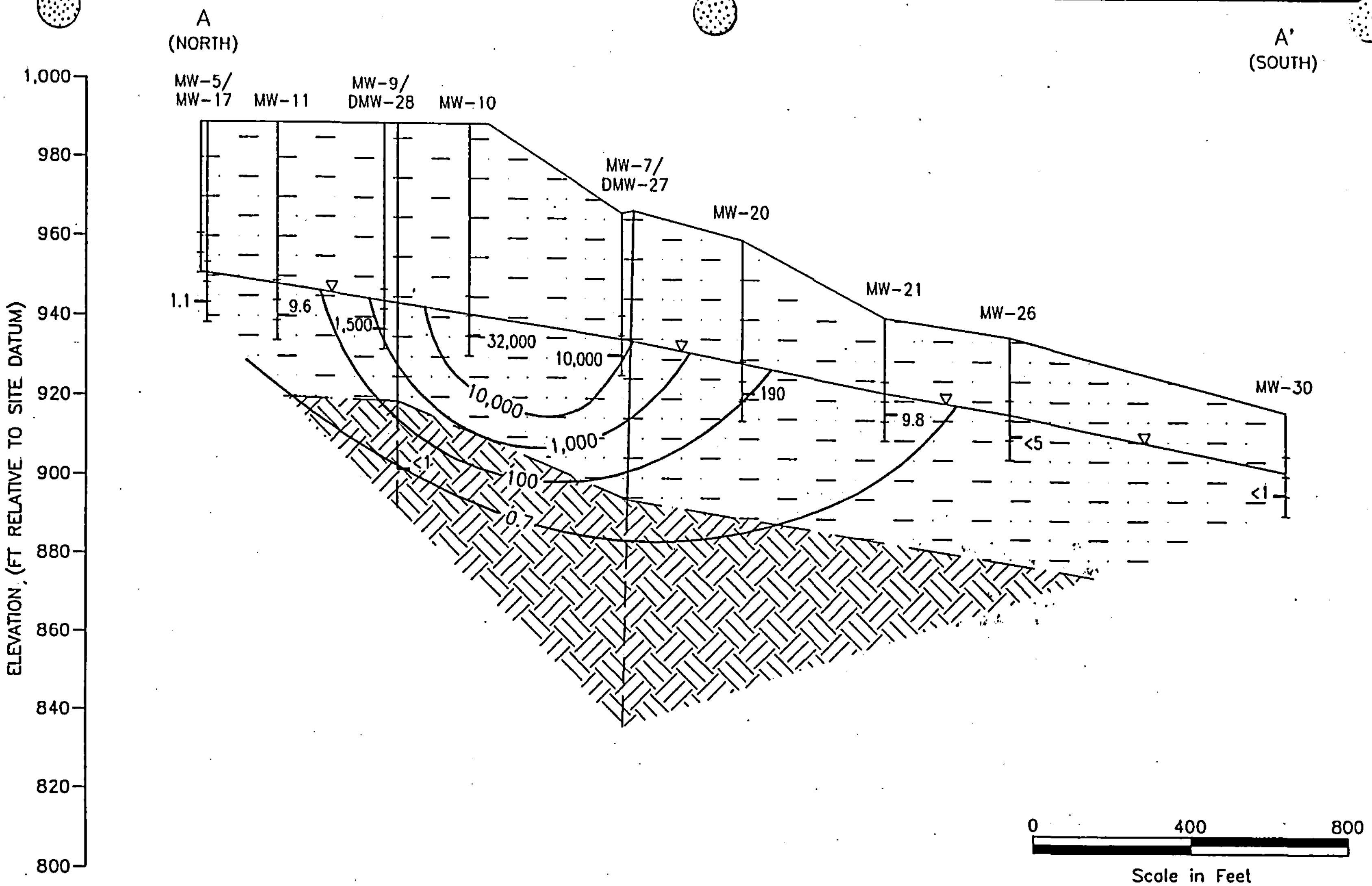
0.19 — DISSOLVED CHLOROFORM ISOCONCENTRATION CONTOUR (ug/L)

NOTE: GROUNDWATER SAMPLES FROM MW-2,MW-3,MW-4,MW-6,MW-8,MW-9 COLLECTED 3/30-31/95. GROUNDWATER SAMPLES FROM MW-7,MW-10,MW-11, MW-12,MW-13,MW-14,MW-15,MW-17 COLLECTED 5/17-18/95. GROUNDWATER SAMPLES FROM MW-16,MW-18,MW-19,MW-20,MW-21,MW-22,MW-23,MW-24 COLLECTED 7/17/95. GROUNDWATER SAMPLES FROM MW-25,MW-26 COLLECTED 12/13/95. GROUNDWATER SAMPLES FROM MW-30 COLLECTED 2/9/96.

PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

Gauging Date:	Drawing Date:	ACAD File:
SEE NOTE		ILCO-16.DWG

Designed: PD	Groundwater Chloroform Isoconcentration Contour Map ILCO Unican Corporation	
Detailed: DD	Client: ILCO Unican Corporation	Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina	Figure: 16



LEGEND

	WELL CASING
	WELL SCREEN
	OPEN HOLE IN BEDROCK
	WATER TABLE
— 1.1	DISSOLVED PCE CONCENTRATION AT SATURATED SCREEN/OPEN-HOLE MIDPOINT (ug/L)
— 0.7 —	DISSOLVED PCE CONCENTRATION CONTOUR (ug/L)
PCE	TETRACHLOROETHENE

OVERBURDEN: (SAPROLITE) SILTY/CLAYEY SAND; SANDY CLAY/SILT; MICACEOUS; SONE ZONES OF RESIDUAL BEDROCK; REDDISH-BROWN AND BROWN WITH TAN, GRAY, WHITE MOTTLES/STRINGERS; INCREASING HARDNESS WITH DEPTH.

BEDROCK:

NOTE: GROUNDWATER SAMPLE FROM MW-9 COLLECTED 3/31/95. GROUNDWATER SAMPLES FROM MW-7, MW-10, MW-11, MW-17 COLLECTED 5/17/95. GROUNDWATER SAMPLES FROM MW-20, MW-21, COLLECTED 7/17/95. GROUNDWATER SAMPLES FROM MW-26 COLLECTED 12/13/95. GROUNDWATER SAMPLES FROM MW-30 COLLECTED 2/9/96.

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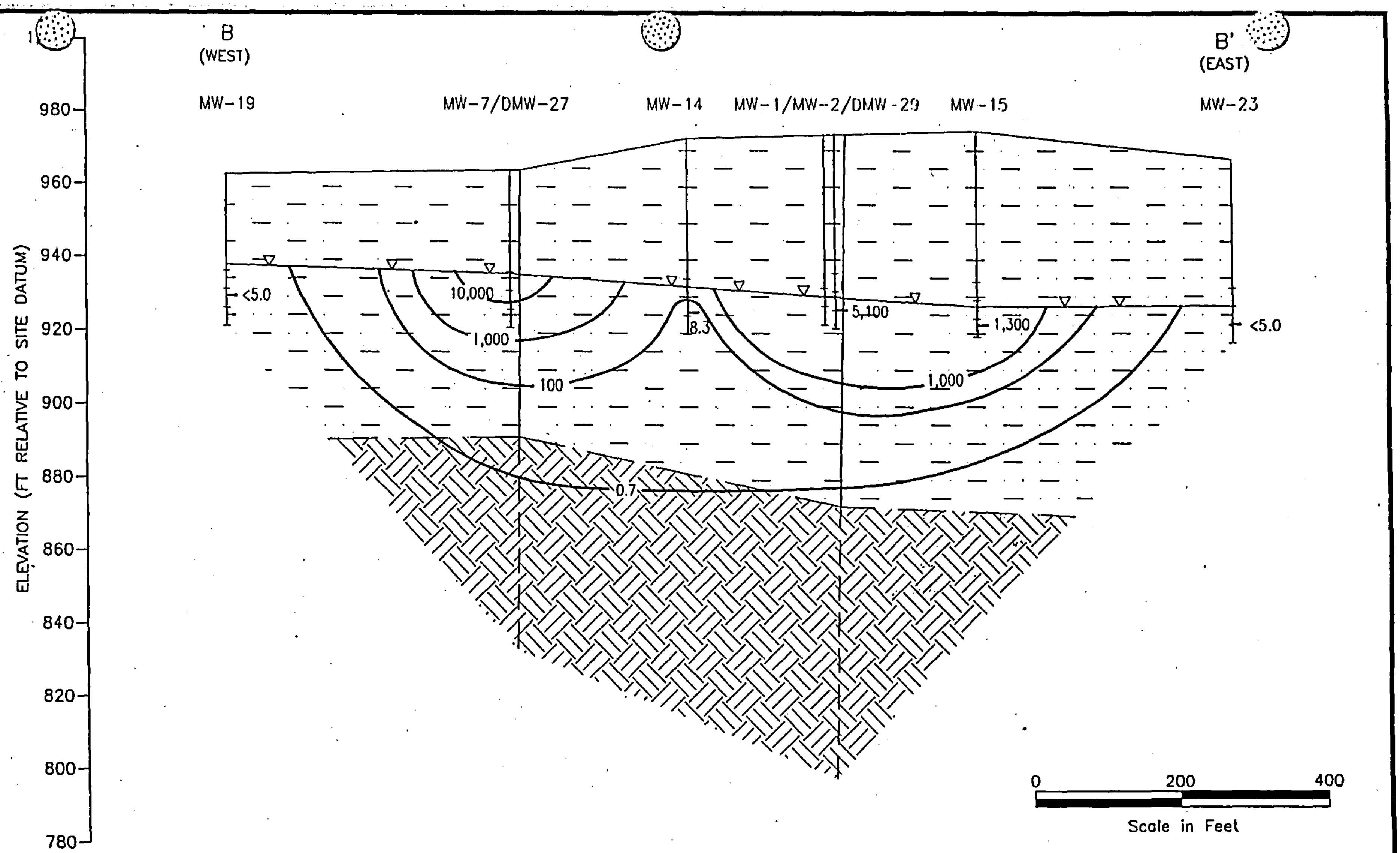
Environmental Consultants

	Gauging Date: SEE NOTE	Drawing Date:	ACAD File: ILCO-17.DWG
Designed: PD	Groundwater PCE Isoconcentration Cross Section A-A' ILCO Unican Corporation		
Detailed: DD	Client: ILCO Unican Corporation		Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina		Figure: 17



LEGEND

|	WELL CASING
	WELL SCREEN
	OPEN HOLE IN BEDROCK
▽	WATER TABLE
— 1.1	DISSOLVED PCE CONCENTRATION SATURATED SCREEN/OPEN-HOLE MIDPOINT (ug/L)
—0.7—	DISSOLVED PCE CONCENTRATION CONTOUR (ug/L)
PCE	TETRACHLOROETHENE

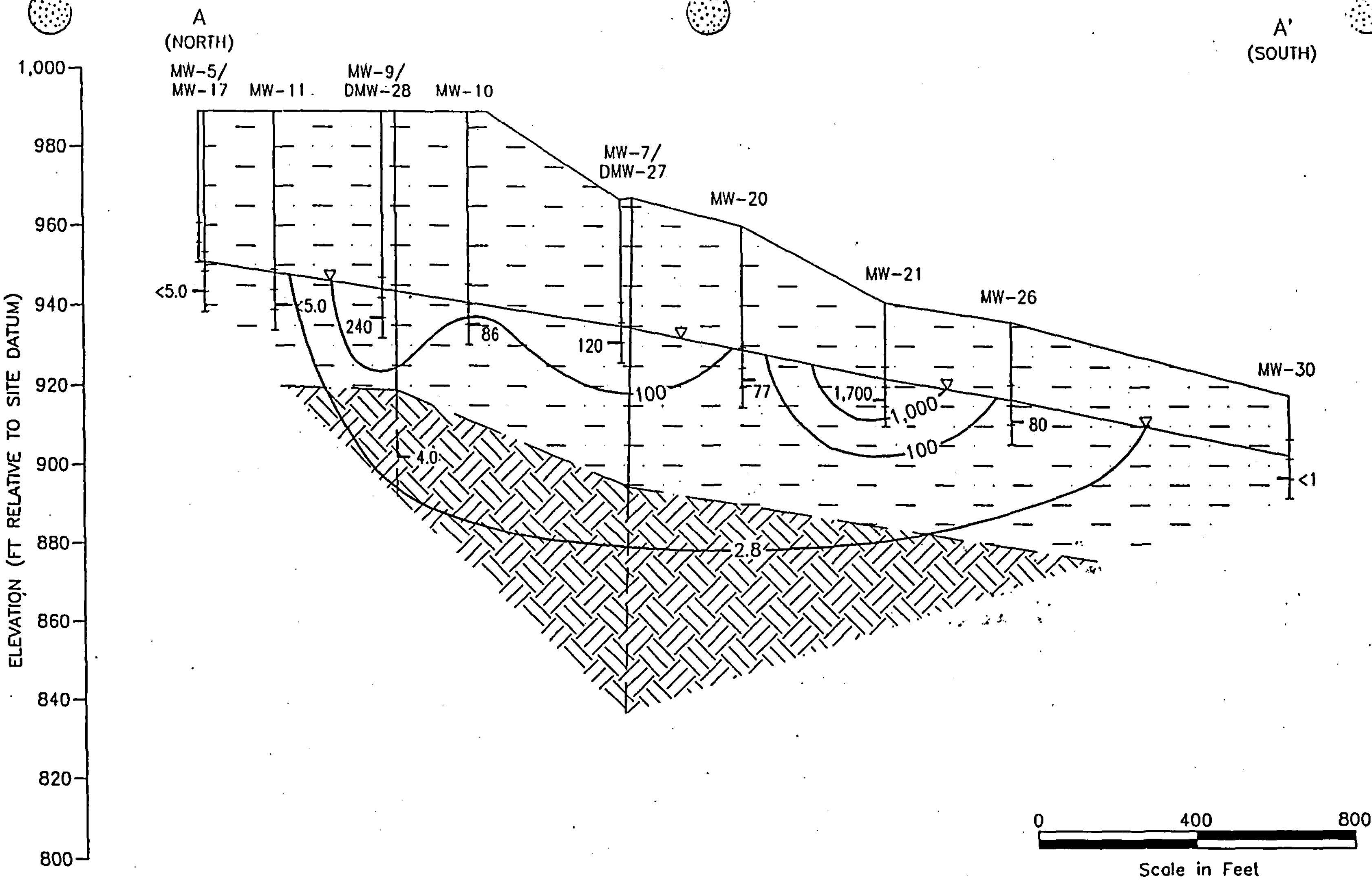
OVERBURDEN: (SAPROLITE) — SILTY/CLAYEY SAND; SANDY CLAY/SILT; MICACEOUS; SONE ZONES OF RESIDUAL BEDROCK; REDDISH-BROWN AND BROWN WITH TAN, GRAY, WHITE MOTTLES/STRINGERS; INCREASING HARDNESS WITH DEPTH.

BEDROCK:

NOTE: GROUNDWATER SAMPLE FROM MW-9 COLLECTED 3/31/95. GROUNDWATER SAMPLES FROM MW-7, MW-10, MW-11, MW-17 COLLECTED 5/17/95. GROUNDWATER SAMPLES FROM MW-20, MW-21, COLLECTED 7/17/95. GROUNDWATER SAMPLES FROM MW-26 COLLECTED 12/13/95. GROUNDWATER SAMPLES FROM MW-30 COLLECTED 2/9/96.

PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

Gauging Date: SEE NOTE	**Drawing Date:**	**ACAD File:** ILCO-18.DWG	
Designed: PD	Groundwater PCE Isoconcentration Cross Section B-B' ILCO Unican Corporation		
Detailed: DD	**Client:** ILCO Unican Corporation		**Project No.:** 9612
Checked: PD	**Location:** 2941 Indiana Avenue Winston-Salem, North Carolina		**Figure:** 18



LEGEND

ǀ	WELL CASING
ǂ	WELL SCREEN
¦	OPEN HOLE IN BEDROCK
▽	WATER TABLE
– <5.0	DISSOLVED TCE CONCENTRATION AT SATURATED SCREEN/OPEN-HOLE MIDPOINT (ug/L)
— 2.8 —	DISSOLVED TCE ISOCONCENTRATION CONTOUR (ug/L)
TCE	TRICHLOROETHENE

OVERBURDEN: (SAPROLITE) SILTY/CLAYEY SAND; SANDY CLAY/SILT; MICACEOUS; SONE ZONES OF RESIDUAL BEDROCK; REDDISH-BROWN AND BROWN WITH TAN, GRAY, WHITE MOTTLES/STRINGERS; INCREASING HARDNESS WITH DEPTH.

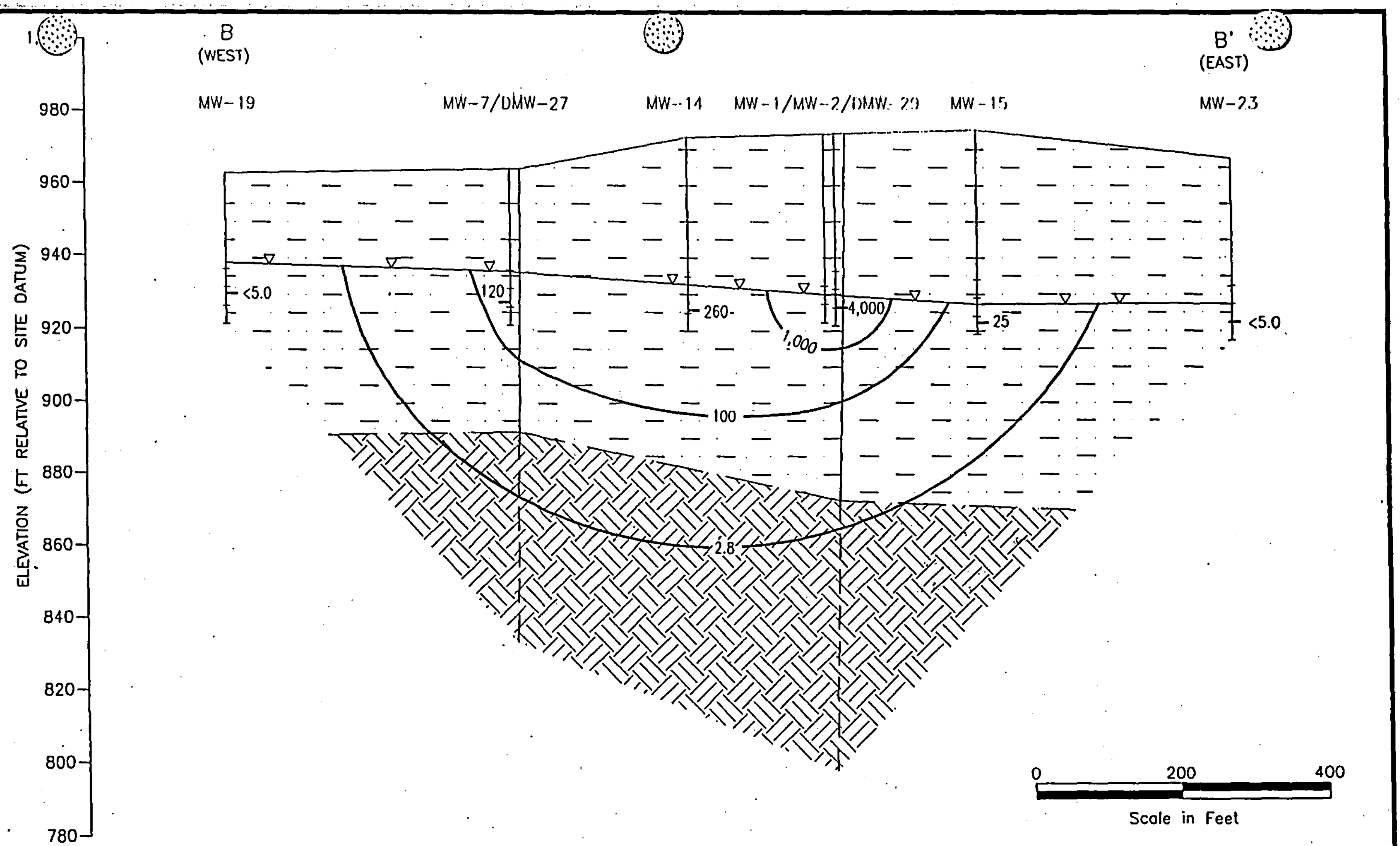
BEDROCK:

NOTE: GROUNDWATER SAMPLE FROM MW-9 COLLECTED 3/31/95. GROUNDWATER SAMPLES FROM MW-7, MW-10, MW-11, MW-17 COLLECTED 5/17/95. GROUNDWATER SAMPLES FROM MW-20, MW-21, COLLECTED 7/17/95. GROUNDWATER SAMPLES FROM MW-26 COLLECTED 12/13/95. GROUNDWATER SAMPLES FROM MW-30 COLLECTED 2/9/96.

PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

Gauging Date:	Drawing Date:	ACAD File:
SEE NOTE		ILCO-19.DWG

Designed: PD	Groundwater TCE Isoconcentration Contour Cross Section A-A' ILCO Unican Corporation	
Detailed: DD	Client: ILCO Unican Corporation	Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina	Figure: 19



LEGEND

|	WELL CASING
⌶	WELL SCREEN
¦	OPEN HOLE IN BEDROCK
▽	WATER TABLE
– <5.0	DISSOLVED TCE CONCENTRATION AT SATURATED SCREEN/OPEN-HOLE MIDPOINT (ug/L)
— 2.8 —	DISSOLVED TCE ISOCONCENTRATION CONTOUR (ug/L)
TCE	TRICHLOROETHENE

OVERBURDEN: (SAPROLITE) SILTY/CLAYEY SAND; SANDY CLAY/SILT; MICACEOUS; SONE ZONES OF RESIDUAL BEDROCK; REDDISH-BROWN AND BROWN WITH TAN, GRAY, WHITE MOTTLES/STRINGERS; INCREASING HARDNESS WITH DEPTH.

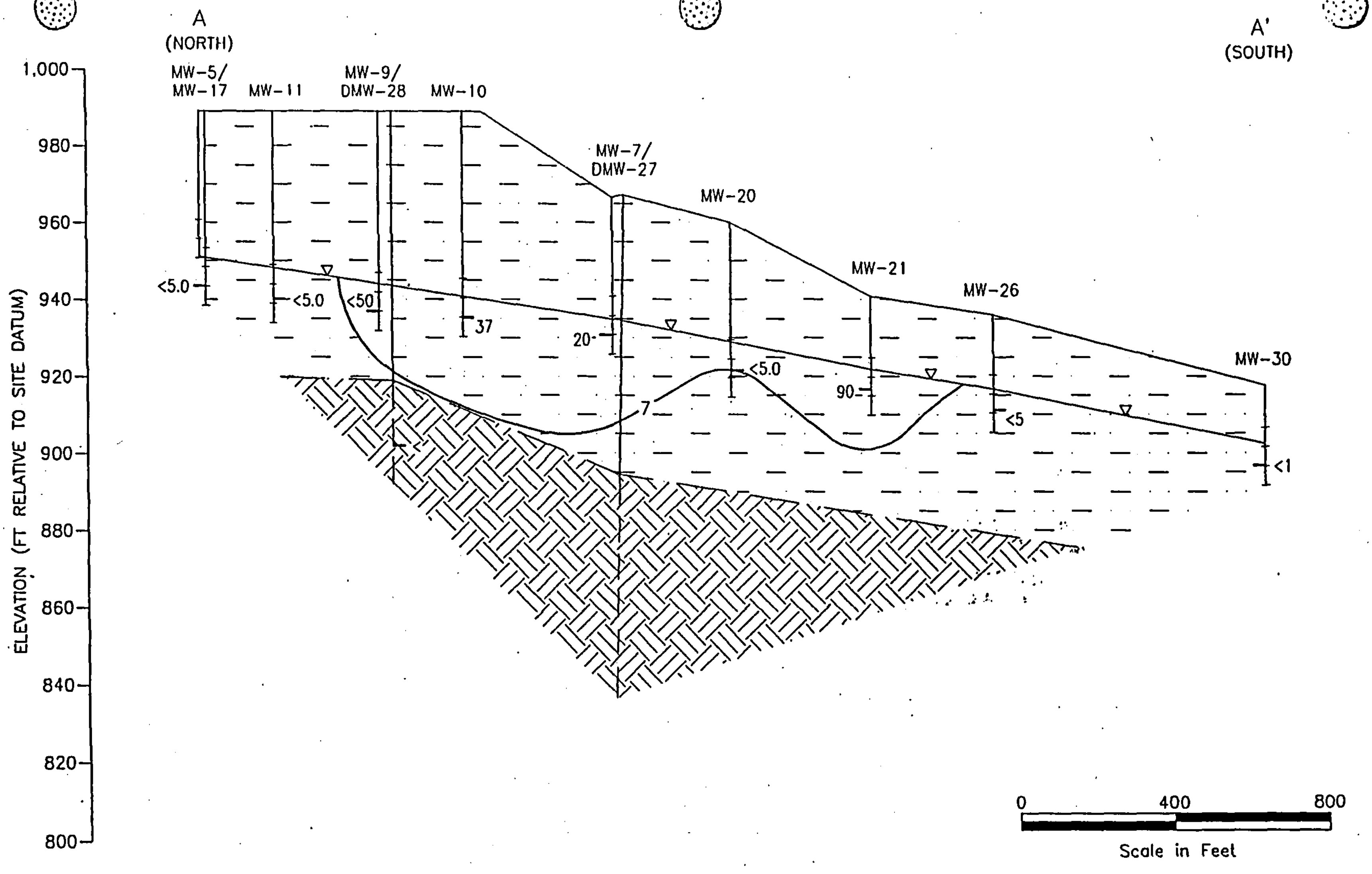
BEDROCK:

NOTE: GROUNDWATER SAMPLE FROM MW-9 COLLECTED 3/31/95. GROUNDWATER SAMPLES FROM MW-7, MW-10, MW-11, MW-17 COLLECTED 5/17/95. GROUNDWATER SAMPLES FROM MW-20, MW-21, COLLECTED 7/17/95. GROUNDWATER SAMPLES FROM MW-26 COLLECTED 12/13/95. GROUNDWATER SAMPLES FROM MW-30 COLLECTED 2/9/96.

PIEDMONT GEOLOGIC, P.C.

Environmental Consultants

Gauging Date: SEE NOTE	Drawing Date:	ACAD File: ILCO-20.DWG	
Designed: PD	Groundwater TCE Isoconcentration Contour Cross Section B-B' ILCO Unican Corporation		
Detailed: DD	Client: ILCO Unican Corporation		Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina		Figure: 20



LEGEND

WELL CASING	
WELL SCREEN	
OPEN HOLE IN BEDROCK	
WATER TABLE	
– <5.0	DISSOLVED 1,1-DCE CONCENTRATION AT SATURATED SCREEN/OPEN-HOLE MIDPOINT (ug/L)
–– 7 ––	DISSOLVED 1,1-DCE ISOCONCENTRATION CONTOUR
1,1-DCE	1,1-DICHLOROETHENE

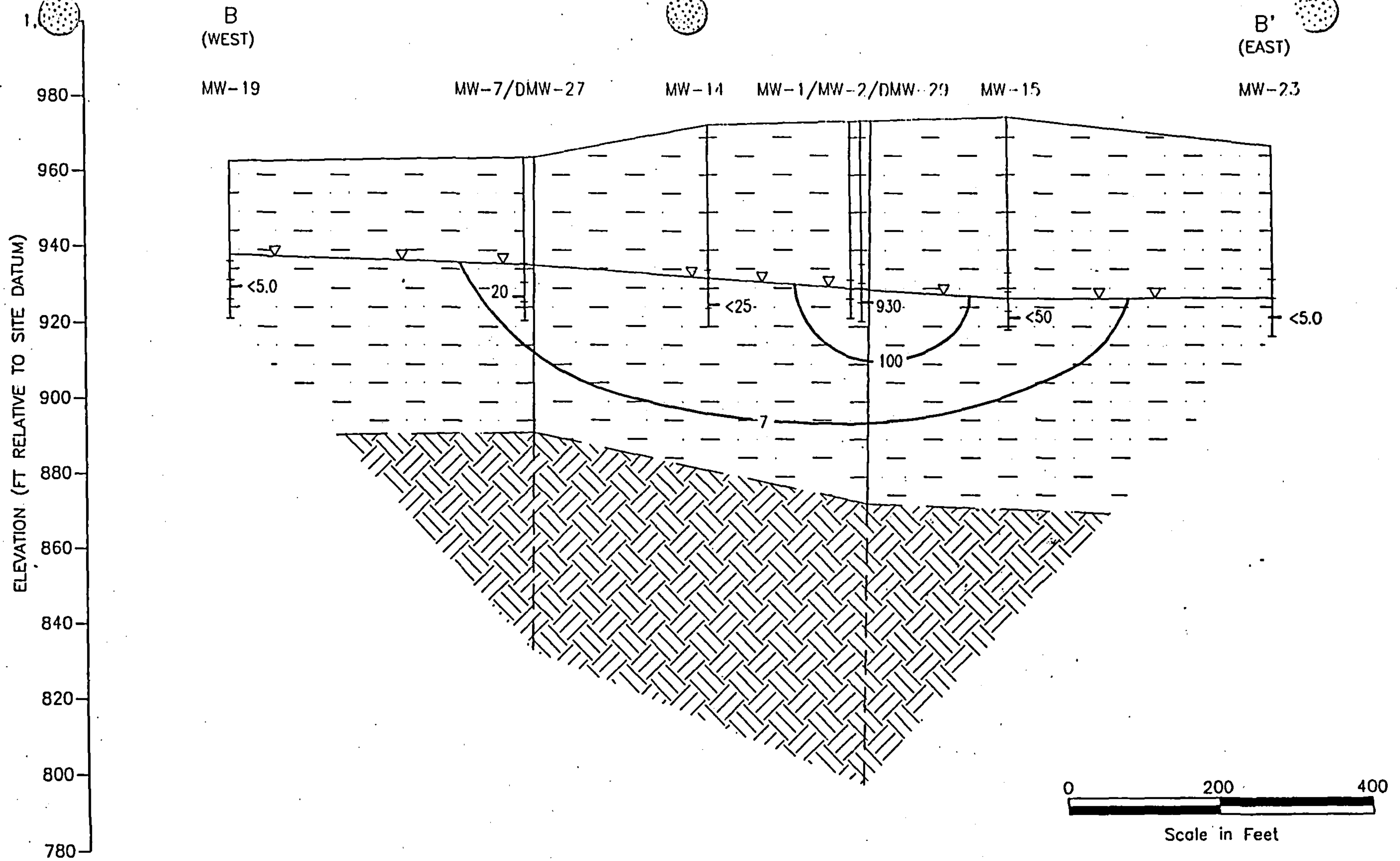
OVERBURDEN: (SAPROLITE) SILTY/CLAYEY SAND; SANDY CLAY/SILT; MICACEOUS; SONE ZONES OF RESIDUAL BEDROCK; REDDISH-BROWN AND BROWN WITH TAN, GRAY, WHITE MOTTLES/STRINGERS; INCREASING HARDNESS WITH DEPTH.

BEDROCK:

NOTE: GROUNDWATER SAMPLE FROM MW-9 COLLECTED 3/31/95. GROUNDWATER SAMPLES FROM MW-7, MW-10, MW-11, MW-17 COLLECTED 5/17/95. GROUNDWATER SAMPLES FROM MW-20, MW-21, COLLECTED 7/17/95. GROUNDWATER SAMPLES FROM MW-26 COLLECTED 12/13/95. GROUNDWATER SAMPLES FROM MW-30 COLLECTED 2/9/96.

PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

Gauging Date: SEE NOTE	Drawing Date:	ACAD File: ILCO-21.DWG	
Designed: PD	Groundwater 1,1-DCE Isoconcentration Contour Cross Section A-A' ILCO Unican Corporation		
Detailed: DD	Client: ILCO Unican Corporation		Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina		Figure: 21



LEGEND

Symbol	Description
|	WELL CASING
(screen symbol)	WELL SCREEN
¦	OPEN HOLE IN BEDROCK
▽	WATER TABLE
<5.0	DISSOLVED 1,1-DCE CONCENTRATION AT SATURATED SCREEN/OPEN-HOLE MIDPOINT (ug/L)
—7—	DISSOLVED 1,1-DCE ISOCONCENTRATION CONTOUR
1,1-DCE	1,1-DICHLOROETHENE

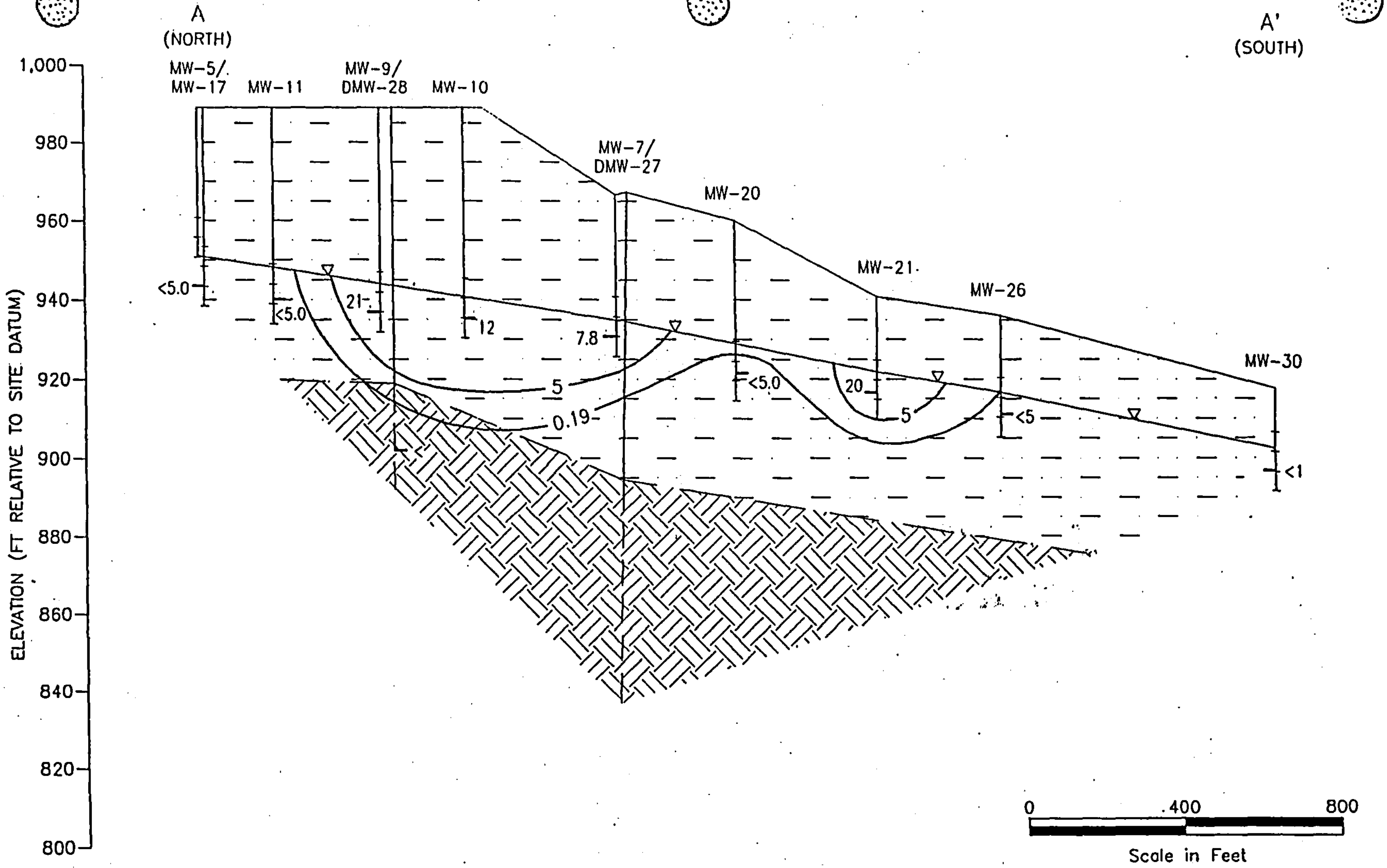
OVERBURDEN: (SAPROLITE) SILTY/CLAYEY SAND; SANDY CLAY/SILT; MICACEOUS; SONE ZONES OF RESIDUAL BEDROCK; REDDISH-BROWN AND BROWN WITH TAN, GRAY, WHITE MOTTLES/STRINGERS; INCREASING HARDNESS WITH DEPTH.

BEDROCK:

NOTE: GROUNDWATER SAMPLE FROM MW-9 COLLECTED 3/31/95. GROUNDWATER SAMPLES FROM MW-7, MW-10, MW-11, MW-17 COLLECTED 5/17/95. GROUNDWATER SAMPLES FROM MW-20, MW-21, COLLECTED 7/17/95. GROUNDWATER SAMPLES FROM MW-26 COLLECTED 12/13/95. GROUNDWATER SAMPLES FROM MW-30 COLLECTED 2/9/96.

PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

Gauging Date: SEE NOTE	Drawing Date:	ACAD File: ILCO-22.DWG
Designed: PD	Groundwater 1,1-DCE Isoconcentration Contour Cross Section B-B' ILCO Unican Corporation	
Detailed: DD	Client: ILCO Unican Corporation	Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina	Figure: 22



LEGEND

WELL CASING

WELL SCREEN

OPEN HOLE IN BEDROCK

WATER TABLE

<5.0 DISSOLVED CHLOROFORM CONCENTRATION SATURATED SCREEN/OPEN-HOLE MIDPOINT (ug/L)

0.19 DISSOLVED CHLOROFORM ISOCONCENTRATION CONTOUR (ug/L)

OVERBURDEN: (SAPROLITE) SILTY/CLAYEY SAND; SANDY CLAY/SILT; MICACEOUS; SONE ZONES OF RESIDUAL BEDROCK; REDDISH-BROWN AND BROWN WITH TAN, GRAY, WHITE MOTTLES/STRINGERS; INCREASING HARDNESS WITH DEPTH.

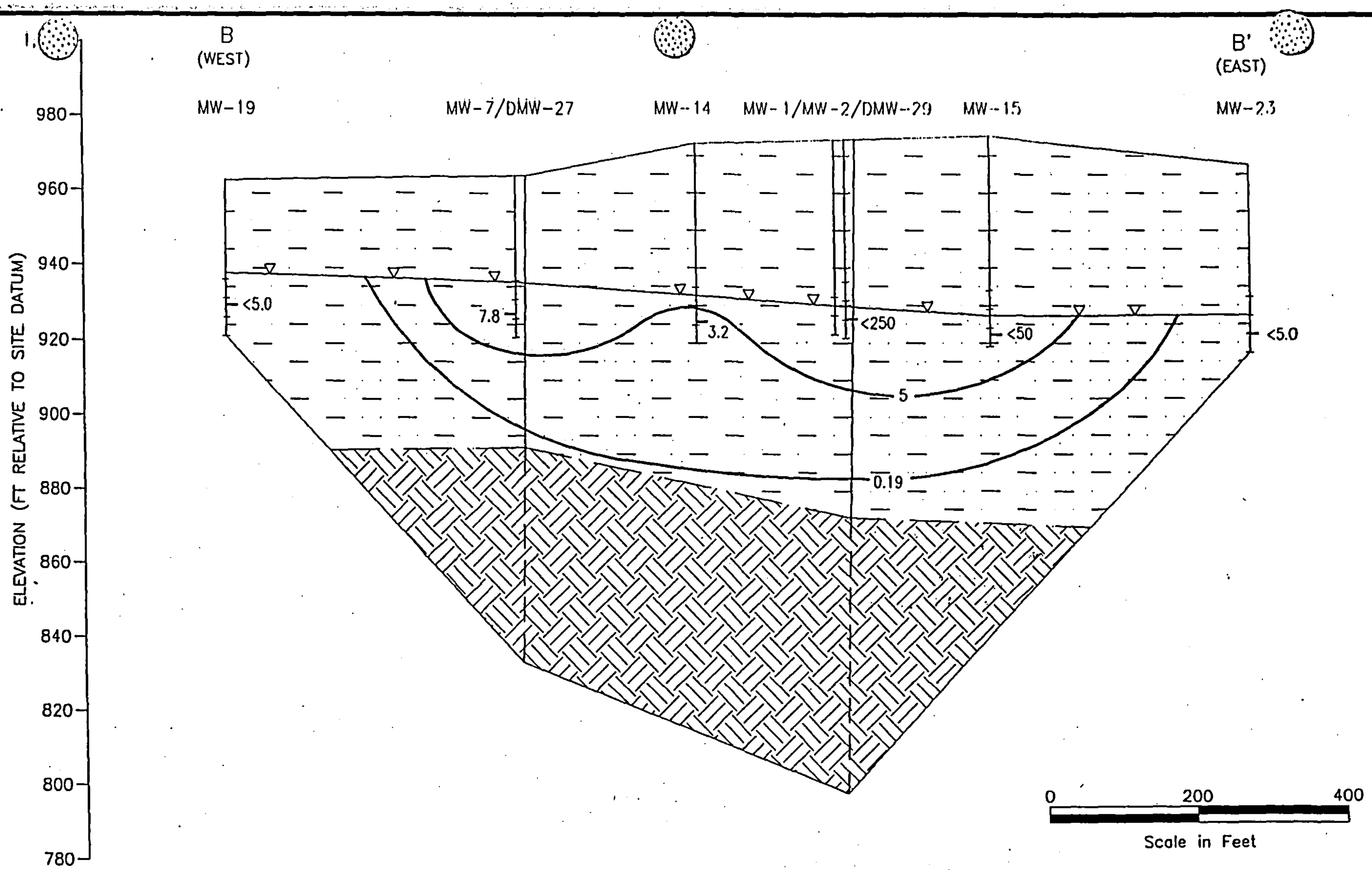
BEDROCK:

NOTE: GROUNDWATER SAMPLE FROM MW-9 COLLECTED 3/31/95. GROUNDWATER SAMPLES FROM MW-7, MW-10, MW-11, MW-17 COLLECTED 5/17/95. GROUNDWATER SAMPLES FROM MW-20, MW-21, COLLECTED 7/17/95. GROUNDWATER SAMPLES FROM MW-26 COLLECTED 12/13/95. GROUNDWATER SAMPLES FROM MW-30 COLLECTED 2/9/96.

PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

Gauging Date: SEE NOTE	Drawing Date:	ACAD File: ILCO-23.DWG

Designed: PD	Groundwater Chloroform Isoconcentration Contour Cross Section A-A' ILCO Unican Corporation	
Detailed: DD	Client: ILCO Unican Corporation	Project No.: 9612
Checked: PD	Location: 2941 Indiana Avenue Winston-Salem, North Carolina	Figure: 23



LEGEND

I	WELL CASING
Ŧ	WELL SCREEN
⊥	SOIL BORING
¦	OPEN HOLE IN BEDROCK
▽	WATER TABLE
- <5.0	DISSOLVED CHLOROFORM CONCENTRATION SATURATED SCREEN/OPEN-HOLE MIDPOINT (ug/L)
—0.19—	DISSOLVED CHLOROFORM ISOCONCENTRATION CONTOUR (ug/L)

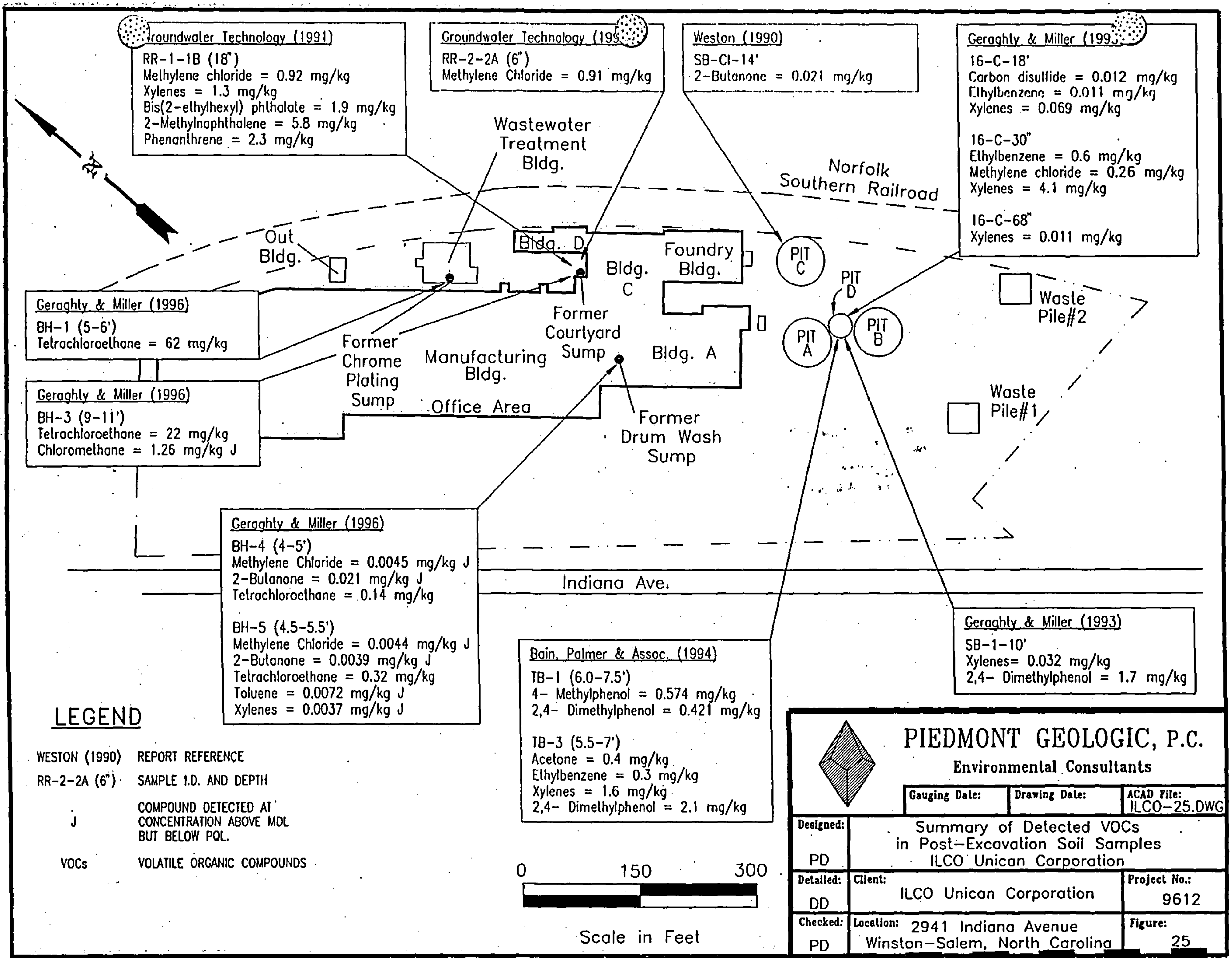
OVERBURDEN: (SAPROLITE) SILTY/CLAYEY SAND; SANDY CLAY/SILT; MICACEOUS; SONE ZONES OF RESIDUAL BEDROCK; REDDISH-BROWN AND BROWN WITH TAN, GRAY, WHITE MOTTLES/STRINGERS; INCREASING HARDNESS WITH DEPTH.

BEDROCK:

NOTE: GROUNDWATER SAMPLE FROM MW-9 COLLEXTED 3/31/95. GROUNDWATER SAMPLES FROM MW-7, MW-10, MW-11, MW-17 COLLECTED 5/17/95. GROUNDWATER SAMPLES FROM MW-20, MW-21, COLLECTED 7/17/95. GROUNDWATER SAMPLES FROM MW-26 COLLECTED 12/13/95. GROUNDWATER SAMPLES FROM MW-30 COLLECTED 2/9/96.

PIEDMONT GEOLOGIC, P.C.
Environmental Consultants

	Gauging Date: SEE NOTE	**Drawing Date:**	**ACAD File:** ILCO-24.DWG
Designed: PD	Groundwater Chloroform Isoconcentration Cross Section B-B' ILCO Unican Corporation		
Detailed: DD	**Client:** ILCO Unican Corporation		**Project No.:** 9612
Checked: PD	**Location:** 2941 Indiana Avenue Winston-Salem, North Carolina		**Figure:** 24


Groundwater Technology (1991)
RR-1-1B (18")
Methylene chloride = 0.92 mg/kg
Xylenes = 1.3 mg/kg
Bis(2-ethylhexyl) phthalate = 1.9 mg/kg
2-Methylnaphthalene = 5.8 mg/kg
Phenanthrene = 2.3 mg/kg
Groundwater Technology (199
RR-2-2A (6")
Methylene Chloride = 0.91 mg/kg
Weston (1990)
SB-CI-14'
2-Butanone = 0.021 mg/kg
Geraghty & Miller (199
16-C-18'
Carbon disulfide = 0.012 mg/kg
Ethylbenzene = 0.011 mg/kg
Xylenes = 0.069 mg/kg
16-C-30"
Ethylbenzene = 0.6 mg/kg
Methylene chloride = 0.26 mg/kg
Xylenes = 4.1 mg/kg
16-C-68"
Xylenes = 0.011 mg/kg
Wastewater Treatment Bldg.
Norfolk Southern Railroad
Out Bldg.
Bldg. D
Bldg. C
Foundry Bldg.
PIT C
PIT D
PIT A
PIT B
Waste Pile#2
Waste Pile#1
Geraghty & Miller (1996)
BH-1 (5-6')
Tetrachloroethane = 62 mg/kg
Former Chrome Plating Sump
Manufacturing Bldg.
Former Courtyard Sump
Bldg. A
Office Area
Geraghty & Miller (1996)
BH-3 (9-11')
Tetrachloroethane = 22 mg/kg
Chloromethane = 1.26 mg/kg J
Former Drum Wash Sump
Geraghty & Miller (1996)
BH-4 (4-5')
Methylene Chloride = 0.0045 mg/kg J
2-Butanone = 0.021 mg/kg J
Tetrachloroethane = 0.14 mg/kg
BH-5 (4.5-5.5')
Methylene Chloride = 0.0044 mg/kg J
2-Butanone = 0.0039 mg/kg J
Tetrachloroethane = 0.32 mg/kg
Toluene = 0.0072 mg/kg J
Xylenes = 0.0037 mg/kg J
Indiana Ave.
Geraghty & Miller (1993)
SB-1-10'
Xylenes= 0.032 mg/kg
2,4- Dimethylphenol = 1.7 mg/kg
Bain, Palmer & Assoc. (1994)
TB-1 (6.0-7.5')
4- Methylphenol = 0.574 mg/kg
2,4- Dimethylphenol = 0.421 mg/kg
TB-3 (5.5-7')
Acetone = 0.4 mg/kg
Ethylbenzene = 0.3 mg/kg
Xylenes = 1.6 mg/kg
2,4- Dimethylphenol = 2.1 mg/kg
LEGEND
WESTON (1990) REPORT REFERENCE
RR-2-2A (6") SAMPLE I.D. AND DEPTH
J COMPOUND DETECTED AT CONCENTRATION ABOVE MDL BUT BELOW PQL.
VOCs VOLATILE ORGANIC COMPOUNDS
0 150 300
Scale in Feet
PIEDMONT GEOLOGIC, P.C.
Environmental Consultants
Gauging Date:
Drawing Date:
ACAD File: ILCO-25.DWG
Designed: PD
Summary of Detected VOCs in Post-Excavation Soil Samples ILCO Unican Corporation
Detailed: DD
Client: ILCO Unican Corporation
Project No.: 9612
Checked: PD
Location: 2941 Indiana Avenue Winston-Salem, North Carolina
Figure: 25

TABLES

TABLE 1
GROUNDWATER MONITORING WELL CONSTRUCTION DETAILS[1]

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well No.	Date Completed	Total Depth[2]	Outer Casing Depth[2]	Outer Casing I.D. (in.)	Well I.D. (in.)	Screen Interval[2]	TOC Elev.[3]
MW-1	4/1/92	51	15	6	2	41-51	978.74
MW-2	12/11/93	53	n/a	n/a	2	37.5-52.5	979.10
MW-3	12/14/93	51	n/a	n/a	2	33-48	967.63
MW-4	12/14/93	54	n/a	n/a	2	37-52	974.73
MW-5	12/15/93	38	n/a	n/a	2	28-38	988.47
MW-6	6/30/94	48.5	n/a	n/a	2	38.5-48.5	980.78
MW-7	3/15/95	44	n/a	n/a	2	27-42	967.44
MW-8	3/16/95	54.5	n/a	n/a	2	39-54	984.79
MW-9	3/16/95	63	n/a	n/a	2	42-57	988.77
MW-10	5/11/95	59	n/a	n/a	2	42-57	991.74
MW-11	5/10/95	55.5	n/a	n/a	2	40-55	988.37
MW-12	5/9/95	55	n/a	n/a	2	39-54	981.70
MW-13	5/9/95	39.5	n/a	n/a	2	24-39	978.97
MW-14	5/8/95	52	n/a	n/a	2	37-52	974.35
MW-15	5/11/95	58.5	n/a	n/a	2	40-55	977.89
MW-16	7/11/95	45	n/a	n/a	2	28-43	985.21
MW-17	5/10/95	55	n/a	n/a	2	35-50	988.32
MW-18	7/11/95	38	n/a	n/a	2	23-38	972.94
MW-19	7/11/95	40	n/a	n/a	2	25-40	965.02
MW-20	7/12/95	45	n/a	n/a	2	30-45	962.64
MW-21	7/13/95	30	n/a	n/a	2	15-30	942.66
MW-22	7/12/95	45	n/a	n/a	2	30-45	964.84
MW-23	7/14/95	50	n/a	n/a	2	35-50	970.68
MW-24	7/14/95	52	n/a	n/a	2	36.5-51.5	966.09
MW-25	12/14/95	41	n/a	n/a	2	25-40	956.48
MW-26	12/5/95	31	n/a	n/a	2	15-30	939.30
DMW-27	12/11/95	130	80	6	6*	80-130*	967.26
DMW-28	12/11/95	101	80	6	6*	80-101*	989.60
DMW-29	12/11/95	175	116	6	6*	116-175*	973.86
MW-30	2/8/96	26	n/a	n/a	2	10-25	919.42
PW-1**	unk	162	unk	6	6	unk	989.76

[1] Monitoring wells MW-1. and MW-7 through MW-30 installed by Geraghty & Miller.
Monitoring wells MW-2 through MW-5 installed by Bain, Palmer & Associates.
Monitoring well MW-6 installed by Ensci.

[2] Measured in feet below ground.

[3] Measured in feet relative to site datum.

* Open rock well. Well I.D. refers to open hole diameter and screen interval refers to open hole interval.

** PW-1 is facility production well.

TOC = Top of casing.

unk = Unknown.

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL PROGRAM

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Date of Sampling Event	Wells Sampled	Sampled By/ Analyzed By	Analysis Conducted
11/26/91	PW-1 (former facility production well)	Geraghty & Miller/ Savannah Laboratories	1) Volatiles by EPA Method 8240; 2) Metals by EPA Method 6000/7000; 3) Cyanide by EPA Method 9010.
4/9/92	MW-1	Geraghty & Miller/ Savannah Laboratories	1) Volatiles by EPA Method 8240; 2) Metals by EPA Method 6000/7000; 3) Cyanide by EPA Method 9010.
12/20/93	MW-2, MW-3, MW-4	Bain, Palmer & Assoc. and Geraghty & Miller/ Orlando Laboratories and Savannah Laboratories	1) Volatiles by EPA Methods 624/8240; 2) Semivolatiles by EPA Methods 625/8270; 3) Metals by EPA Methods 200 and 6000/7000.
4/28/94	MW-5	Bain, Palmer & Assoc. and Ilco Unican/ Pace, Inc. and IEA	1) Volatiles by EPA Methods 624/8240; 2) Semivolatiles by EPA Methods 625/8270; 3) Metals by EPA Methods 6000/7000.
7/1/94	MW-6	Ensci Engineering Group/ Envirotech Mid-Atlantic	1) Aromatic hydrocarbons by EPA Method 602; 2) Semivolatiles by EPA Method 625; 3) Total lead by EPA Method 7421/3030C.
3/30/95 to 4/5/95	MW-2, MW-3, MW-4, MW-6, MW-7, MW-8, MW-9, PW-1	Geraghty & Miller/ Savannah Laboratories	1) Volatiles by EPA Method 8260; 2) Semivolatiles by EPA Method 8270; 3) Metals by EPA Method 200; 4) Cyanide by EPA Method 335.2; 5) Suspended solids by EPA Method 160.2
5/17-18/95	MW-7, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-17	Geraghty & Miller/ Savannah Laboratories	1) Volatiles by EPA Method 8260; 2) Semivolatiles by EPA Method 8270; 3) Metals by EPA Method 200; 4) Cyanide by EPA Method 335.2; 5) Susp. solids by EPA Method 160.2
7/17/95	MW-16, MW-18, MW-19, MW-20, MW-21, MW-22, MW-23, MW-24	Geraghty & Miller/ Savannah Laboratories	1) Volatiles by EPA Method 8260; 2) Susp. solids by EPA Method 160.2
12/13/95	MW-25, MW-26, DMW-28	Geraghty & Miller/ Paradigm Analytical Laboratories	1) Volatiles by EPA Method 8260.
12/13/95	DMW-28	Geraghty & Miller/ Paradigm Analytical Laboratories	1) Metals by EPA Method 200.
2/9/96	MW-30	Geraghty & Miller/ Paradigm Analytical Laboratories	1) Volatiles by EPA Method 8260.

TABLE 3
GROUNDWATER LEVEL DATA[1]

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well	Date	TOC Elevation (2)	Depth to Groundwater (ft. below TOC)	Groundwater Elevation (2)
MW-1	3/29/95	978.74	46.28	932.46
	5/17/95	978.74	46.27	932.47
	7/17/95	978.74	46.34	932.40
	7/25/95	978.74	46.40	932.34
	8/22/95	978.74	46.39	932.35
	12/13/95	978.74	45.87	932.87
	2/9/96	978.74	46.35	932.39
MW-2	12/20/93	979.10	45.00	934.10
	3/29/95	979.10	46.53	932.57
	5/17/95	979.10	46.52	932.58
	7/17/95	979.10	46.58	932.52
	7/25/95	979.10	46.64	932.46
	8/22/95	979.10	46.65	932.45
	12/13/95	979.10	46.18	932.92
	2/9/96	979.10	46.62	932.48
MW-3	12/20/93	967.63	39.00	928.63
	3/29/95	967.63	40.42	927.21
	5/17/95	967.63	40.18	927.45
	7/17/95	967.63	40.53	927.10
	7/25/95	967.63	40.58	927.05
	8/22/95	967.63	40.65	926.98
	12/13/95	967.63	41.04	926.59
	2/9/96	967.63	40.91	926.72
MW-4	12/20/93	974.73	43.70	931.03
	3/29/95	974.73	45.14	929.59
	5/17/95	974.73	44.94	929.79
	7/17/95	974.73	45.21	929.52
	7/25/95	974.73	45.26	929.47
	8/22/95	974.73	45.34	929.39
	12/13/95	974.73	45.56	929.17
	2/9/96	974.73	45.48	929.25
MW-5	12/20/93	988.47	dry	n/a
	3/29/95	988.47	36.44	952.03
	5/17/95	988.47	dry	n/a
	7/17/95	988.47	dry	n/a
	7/25/95	988.47	dry	n/a
	8/22/95	988.47	37.22	951.25
	12/13/95	988.47	dry	n/a
	2/9/96	988.47	dry	n/a

(continued)

TABLE 3 (continued)
GROUNDWATER LEVEL DATA[1]

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well	Date	TOC Elevation (2)	Depth to Groundwater (ft. below TOC)	Groundwater Elevation (2)
MW-6	3/29/95	980.78	45.43	935.35
	5/17/95	980.78	45.46	935.32
	7/17/95	980.78	45.54	935.24
	7/25/95	980.78	45.57	935.21
	8/22/95	980.78	45.54	935.24
	12/13/95	980.78	45.72	935.06
	2/9/96	980.78	45.65	935.13
MW-7	3/29/95	967.44	31.75	935.69
	5/17/95	967.44	31.67	935.77
	7/17/95	967.44	31.90	935.54
	7/25/95	967.44	31.94	935.50
	8/22/95	967.44	31.98	935.46
	12/13/95	967.44	32.12	935.32
	2/9/96	967.44	31.91	935.53
	6/11/96	967.44	31.02	936.42
MW-8	3/29/95	984.79	46.15	938.64
	5/17/95	984.79	46.00	938.79
	7/17/95	984.79	40.44	944.35
	7/25/95	984.79	46.20	938.59
	8/22/95	984.79	46.16	938.63
	12/13/95	984.79	40.31	944.48
	2/9/96	984.79	46.07	938.72
MW-9	3/29/95	988.77	45.17	943.60
	5/17/95	988.77	44.92	943.85
	7/17/95	988.77	45.15	943.62
	7/25/95	988.77	45.20	943.57
	8/22/95	988.77	45.17	943.60
	12/13/95	988.77	45.10	943.67
MW-10	5/17/95	991.74	50.17	941.57
	7/17/95	991.74	50.30	941.44
	7/25/95	991.74	50.38	941.36
	8/22/95	991.74	50.23	941.51
	12/13/95	991.74	50.38	941.36
	2/9/96	991.74	50.15	941.59
MW-11	5/17/95	988.37	39.46	948.91
	7/17/95	988.37	39.80	948.57
	7/25/95	988.37	39.63	948.74
	8/22/95	988.37	39.65	948.72
	12/13/95	988.37	38.91	949.46
	2/9/96	988.37	38.89	949.48
MW-12	5/17/95	981.70	41.69	940.01
	7/17/95	981.70	41.91	939.79
	7/25/95	981.70	41.97	939.73
	8/22/95	981.70	42.01	939.69
	12/13/95	981.70	42.04	939.66
	2/9/96	981.70	41.80	939.90

(continued)

TABLE 3 (continued)
GROUNDWATER LEVEL DATA[1]

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well	Date	TOC Elevation (2)	Depth to Groundwater (ft. below TOC)	Groundwater Elevation (2)
MW-13	5/17/95	978.97	26.59	952.38
	7/17/95	978.97	28.55	950.42
	7/25/95	978.97	28.58	950.39
	8/22/95	978.97	28.59	950.38
	12/13/95	978.97	28.73	950.24
	2/9/96	978.97	28.32	950.65
MW-14	5/17/95	974.35	41.16	933.19
	7/17/95	974.35	41.28	933.07
	7/25/95	974.35	41.32	933.03
	8/22/95	974.35	41.36	932.99
	12/13/95	974.35	41.41	932.94
	2/9/96	974.35	41.43	932.92
MW-15	5/17/95	977.89	48.59	929.30
	7/17/95	977.89	48.74	929.15
	7/25/95	977.89	48.80	929.09
	8/22/95	977.89	48.82	929.07
	12/13/95	977.89	49.02	928.87
	2/9/96	977.89	49.82	928.07
MW-16	7/17/95	985.21	31.71	953.50
	7/25/95	985.21	31.74	953.47
	8/22/95	985.21	31.70	953.51
	12/13/95	985.21	31.75	953.46
	2/9/96	985.21	31.55	953.66
MW-17	5/17/95	988.32	36.85	951.47
	7/17/95	988.32	37.00	951.32
	7/25/95	988.32	37.02	951.30
	8/22/95	988.32	37.05	951.27
	12/13/95	988.32	36.71	951.61
	2/9/96	988.32	36.58	951.74
MW-18	7/17/95	972.94	31.16	941.78
	7/25/95	972.94	31.22	941.72
	8/22/95	972.94	31.23	941.71
	12/13/95	972.94	31.07	941.87
	2/9/96	972.94	30.78	942.16
MW-19	7/17/95	965.02	27.25	937.77
	7/25/95	965.02	27.33	937.69
	8/22/95	965.02	27.47	937.55
	12/13/95	965.02	27.00	938.02
MW-20	7/17/95	962.64	32.08	930.56
	7/25/95	962.64	32.12	930.52
	8/22/95	962.64	32.20	930.44
	12/13/95	962.64	32.35	930.29
	2/9/96	962.64	32.25	930.39

(continued)

TABLE 3 (continued)
GROUNDWATER LEVEL DATA[1]

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well	Date	TOC Elevation (2)	Depth to Groundwater (ft. below TOC)	Groundwater Elevation (2)
MW-21	7/17/95	942.66	19.85	922.81
	7/25/95	942.66	19.90	922.76
	8/22/95	942.66	20.06	922.60
	12/13/95	942.66	20.05	922.61
	2/9/96	942.66	19.19	923.47
MW-22	7/17/95	964.84	38.78	926.06
	7/25/95	964.84	38.86	925.98
	8/22/95	964.84	39.02	925.82
	12/13/95	964.84	39.04	925.80
	2/9/96	964.84	38.67	926.17
MW-23	7/17/95	970.68	40.20	930.48
	7/25/95	970.68	40.16	930.52
	8/22/95	970.68	40.25	930.43
	12/13/95	970.68	39.88	930.80
	2/9/96	970.68	39.81	930.87
MW-24	7/17/95	966.09	41.42	924.67
	7/25/95	966.09	41.22	924.87
	8/22/95	966.09	41.34	924.75
	12/13/95	966.09	41.30	924.79
	2/9/96	966.09	41.10	924.99
MW-25	12/13/95	956.48	33.43	923.05
	2/9/96	956.48	33.12	923.36
MW-26	12/13/95	939.30	21.07	918.23
	2/9/96	939.30	19.48	919.82
DMW-27	12/13/95	967.26	127.80	839.46
	2/9/96	967.26	32.48	934.78
	6/11/96	967.26	31.93	935.33
DMW-28	12/13/95	989.60	70.58	919.02
	2/9/96	989.60	45.35	944.25
DMW-29	12/13/95	973.86	171.50	802.36
	2/9/96	973.86	92.38	881.48
MW-30	2/9/96	919.42	14.35	905.07
PW-1	3/29/95	989.76	45.00	944.76
	12/13/95	989.76	45.00	944.76

[1] 12/13/93 data from Bain, Palmer & Assoc.; 3/29/95 through 2/9/96 data from Geraghty & Miller; 6/11/96 data from Piedmont Geologic, P.C.
[2] Measured in feet relative to site datum.
TOC = Top of casing
n/a = Not applicable.

TABLE 4
ESTIMATED TRANSMISSIVITY AND HYDRAULIC CONDUCTIVITY
FROM PUMP TEST DATA

Ilco Unican Corporation
2941 Indiana Avenue
Winston-Salem, North Carolina

	Pump Test Data											
	Theis (1935) Methodology				Cooper and Jacob (1946) Methodology				Neuman (1975) Methodology			
	T		K		T		K		T		K	
Well I.D.	ft^2/min	ft^2/day	ft/min	ft/day	ft^2/min	ft^2/day	ft/min	ft/day	ft^2/min	ft^2/day	ft/min	ft/day
MW-7	9.43E-02	135.8	3.77E-03	5.43	9.48E-02	136.5	3.79E-03	5.46	9.43E-02	135.8	3.77E-03	5.43
OW-1	1.66E-01	239.0	6.64E-03	9.56	1.98E-01	285.1	7.92E-03	11.40	1.66E-01	239.0	6.64E-03	9.56
OW-2	1.55E-01	223.2	6.20E-03	8.93	1.92E-01	276.5	7.68E-03	11.06	1.55E-01	223.2	6.20E-03	8.93
Mean	1.38E-01	199.3	5.5E-03	7.97	0.162	232.7	6.5E-03	9.31	1.38E-01	199.3	3.30E-04	7.97
Median	1.55E-01	223.2	6.2E-03	8.93	0.192	276.5	7.7E-03	11.06	1.55E-01	223.2	6.20E-03	8.93

T = Transmissivity.
K = Hydraulic Conductivity = T/b.
b = Aquifer Thickness, assumed to be 25 ft.

TABLE 5
SUMMARIZED RESULTS OF LABORATORY ANALYSIS[1]
GROUNDWATER SAMPLE FROM PRODUCTION WELL PW-1; 11/26/91

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Sample I.D.: / Sample Date:	PW-1 11/26/91	TRIP-1[2] 11/26/91	FB-1[3] 11/26/91	NC Action Level[4]
Analysis (Units)				
EPA Method 8240 (ug/L)[5]				
Chloroform	4.5 J	<5.0	<5.0	0.19
Tetrachloroethene	**200**	<5.0	<5.0	0.7
Trichloroethene	**14**	<5.0	<5.0	2.8
EPA Method 6000/7000 (mg/L)				
Aluminum	0.53	na	na	nl
Antimony	<0.050	na	na	nl
Barium	0.16	na	na	2.1
Beryllium	<0.0050	na	na	nl
Cadmium	**0.011**	na	na	0.005
Calcium	20	na	na	nl
Chromium	**0.18**	na	na	0.05
Cobalt	0.023	na	na	nl
Copper	**2.0**	na	na	1.0
Iron	**76**	na	na	0.3
Magnesium	6.9	na	na	nl
Manganese	**2.6**	na	na	0.05
Nickel	**5.0**	na	na	0.1
Potassium	6.3	na	na	nl
Silver	<0.010	na	na	0.018
Sodium	19	na	na	nl
Vanadium	0.10	na	na	nl
Zinc	**4.1**	na	na	2.1
Arsenic	<0.010	na	na	0.05
Lead	**0.18**	na	na	0.015
Mercury	0.00022	na	na	0.0011
Selenium	<0.010	na	na	0.05
Thallium	<0.010	na	na	nl
EPA Method 9010 (mg/L)				
Cyanide	0.51	na	na	0.154
EPA Method 160.2 (mg/L)				
Total Suspended Solids	280	na	na	nl

[1] Samples collected by Geraghty & Miller; analyzed by Savannah Laboratories.
[2] Trip Blank.
[3] Field Blank.
[4] Groundwater standards listed in 15A NCAC 2L .0202g.
[5] Method compounds detected in one or more samples are listed in table.
na = Not analyzed.
nl = No action level listed in 15A NCAC 2L .0202 g.
Bold type indicates concentrations above 15A NCAC 2L .0202g action levels.

TABLE 6
SUMMARIZED RESULTS OF LABORATORY ANALYSIS[1]
GROUNDWATER SAMPLE FROM MONITORING WELL MW-1; 4/9/92

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Sample I.D.: Sample Date:	MW-1 4/9/92	TRIP BLANK 4/9/92	NC Action Level[2]
Analysis (Units)			
EPA Method 8240 (ug/L)[3]			
1.1-Dichloroethene	**1,500**	<5.0	7
1.1-Dichloroethane	440 J	<5.0	700
cis/trans-1.2-Dichloroethene	**180 J**	<5.0	70
1.1.1-Trichloroethane	**5,700**	<5.0	200
Trichloroethene	**6,300**	<5.0	2.8
Tetrachloroethene	**7,400**	<5.0	0.7
EPA Method 6000/7000 (mg/L)			
Antimony	<0.050	na	nl
Arsenic	<0.010	na	0.05
Barium	1.5	na	2.1
Beryllium	<0.0050	na	nl
Cadmium	<0.0050	na	0.005
Chromium	<0.010	na	0.05
Cobalt	0.026	na	nl
Copper	<0.025	na	1.0
Lead	0.010	na	0.015
Mercury	**0.0080**	na	0.0011
Nickel	<0.040	na	0.1
Selenium	<0.010	na	0.05
Silver	<0.010	na	0.018
Thallium	<0.050	na	nl
Vanadium	<0.010	na	nl
Zinc	0.13	na	2.1
EPA Method 9010 (mg/L)			
Cyanide	<0.010	na	0.154
EPA Method 160.2 (mg/L)			
Total Suspended Solids	1,300	na	nl

[1] Samples collected by Geraghty & Miller; analyzed by Savannah Laboratories.
[2] Groundwater standards listed in 15A NCAC 2L .0202g.
[3] Method compounds detected in one or more samples are listed in table.
na = Not analyzed.
nl = No action level listed in 15A NCAC 2L .0202 g.
J = Compound detected at concentration above method detection limit but below practical quantitation limit.
Bold type indicates concentrations above 15A NCAC 2L .0202g action levels.

TABLE 7
SUMMARIZED RESULTS OF LABORATORY ANALYSIS[1]
GROUNDWATER SAMPLE FROM MONITORING WELLS; 12/20/93

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well I.D.:	MW-2		MW-3		MW-4		NC Action Level[3]
Analysis (Units)	(1)	(2)	(1)	(2)	(1)	(2)	
EPA Method 624/8240 (ug/L)[4]							
Acetone	290	<250	<10	<50	<10	<50	0.7
1.1-Dichloroethane	160	<25	<5	<5.0	<5	<5.0	700
1.1-Dichloroethene	470	<25	<5	<5.0	<5	<5.0	7
cis/trans-1.2-Dichloroethene	<50	10 J	<5	6.5	<5	25	70
Methylene Chloride	<5	1.4 J	<5	<5.0	<5	<5.0	5
Tetrachloroethene	1,870	<25	20.0	26	45	59	0.7
1.1.1-Trichloroethane	900	2.1 J	<5	<5.0	<5	<5.0	200
1.1.2-Trichloroethane	100	<25	<5	<5.0	<5	<5.0	nl
Trichloroethene	2,000	390	21.0	23	92	100	2.8
EPA Method 625/8270 (ug/L)[4]							
Isophorone	64	73	<10	<10	<10	<10	nl
2-Nitrophenol	<20	19	<10	<10	<10	<10	nl
EPA Method 200/6000/7000 (mg/L)							
Arsenic	<0.005	<0.010	<0.005	<0.010	<0.005	<0.010	0.05
Barium	0.80	1.1	<0.1	0.066	0.13	0.11	2.0
Cadmium	<0.005	<0.0050	<0.005	<0.0050	<0.0050	<0.005	0.005
Chromium	0.020	0.039	<0.01	<0.010	0.029	0.015	0.05
Lead	0.026	0.056	<0.005	<0.0050	0.0071	0.0053	0.015
Mercury	<0.00010	<0.00020	<0.0001	<0.00020	<0.00010	<0.00020	0.0011
Selenium	<0.0050	<0.050	<0.005	<0.010	<0.0050	<0.010	0.05
Silver	<0.010	<0.010	<0.01	<0.010	<0.01	<0.010	0.018
Aluminum	na	70	na	0.77	na	4.4	nl
Iron	na	130	na	17	na	<0.050	0.3
EPA Method 160.1 (mg/L)							
Total Dissolved Solids	na	300	na	51	na	90	0.154
EPA Method 160.2 (mg/L)							
Total Suspended Solids	na	2.000	na	130	na	240	0.154
EPA Method 180.1 (mg/L)							
Turbidity	na	1.400	na	20	na	170	0.154

[1] Samples collected by Bain. Palmer & Assoc.; analyzed by Orlando Laboratories using EPA Methods 624. 625. and 200.
[2] Samples collected by Geraghty & Miller; analyzed by Savannah Laboratories using EPA Methods 8240. 8270, 6000/7000, 160.1, 160.2, 180.1.
[3] Groundwater standards listed in 15A NCAC 2L .0202g.
[4] Method compounds detected in one or more samples are listed in table.
na = Not analyzed.
nl = No action level listed in 15A NCAC 2L .0202 g.
J = Compound detected at concentration above practical quantitation limit but below method detection limit.
Bold type indicates concentrations above 15A NCAC 2L .0202g action levels.
NOTE: Trip/field blanks collected by Bain, Palmer & Assoc. and Geraghty & Miller were analyzed by EPA Methods 624/8240, 625/8270, and 200/6000/7000. No method analytes were detected in the field/trip blanks.

TABLE 8
SUMMARIZED RESULTS OF LABORATORY ANALYSIS[1]
GROUNDWATER SAMPLE FROM MONITORING WELL MW-5; 4/28/94

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well I.D.:	**MW-5**		**NC Action Level[3]**
Analysis (Units)	**(1)**	**(2)**	
EPA Method 624/8240 (ug/L)[4]			
Volatile organics	nd	nd	n/a
EPA Method 625/8270 (ug/L)[4]			
Di-n-butylphthalate	11	<5.0	700
EPA Method 200/6000/7000 (mg/L)			
Arsenic	<0.010	0.037	0.05
Barium	0.53	0.498	2.0
Cadmium	**0.01**	**0.010**	0.005
Chromium	0.03	0.031	0.05
Lead	**0.63**	**0.83**	0.015
Mercury	<0.0002	<0.0002	0.0011
Selenium	<0.005	<0.005	0.05
Silver	<0.01	<0.005	0.018

[1] Samples collected by Ilco Unican: analyzed by IEA using EPA Methods 8240, 8270, and 6000/7000.
[2] Samples collected by Bain, Palmer & Assoc.; analyzed by Pace, Inc. using EPA Methods 624, 625, and 200.
[3] Groundwater standards listed in 15A NCAC 2L .0202g.
[4] Method compounds detected in one or more samples are listed in table.
nd = No method compounds detected.
n/a = Not applicable.
Bold type indicates concentrations above 15A NCAC 2L .0202g action levels.

TABLE 9
SUMMARIZED RESULTS OF LABORATORY ANALYSIS[1]
GROUNDWATER SAMPLE FROM MONITORING WELL MW-6; 7/1/94

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well I.D.:	MW-6	NC Action Level[2]
Analysis (Units)		
EPA Method 602 (ug/L)[3]		
Benzene	<1	1
Toluene	<1	50
Ethylbenzene	<1	29
Xylenes	<1	530
Chlorobenzene	<1	50
1,2-Dichlorobenzene	<1	620
1,3-Dichlorobenzene	<1	620
1,4-Dichlorobenzene	<1	75
EPA Method 625/8270 (ug/L)[3]		
Bis (2-ethylhexyl) phthalate	10	3
EPA Method 7421/3030C (mg/L)		
Total Lead	0.023	0.015

[1] Samples collected by Ensci Engineering Group, P.A.; analyzed by Envirotech Mid-Atlantic.
[2] Groundwater standards listed in 15A NCAC 2L .0202g.
[3] Method compounds detected in one or more samples are listed in table.
Bold type indicates concentrations above 15A NCAC 2L .0202g action levels.

TABLE 10
SUMMARIZED RESULTS OF LABORATORY ANALYSIS
GROUNDWATER SAMPLES FROM MONITORING AND PRODUCTION WELLS; 3/95 through 2/96

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well I.D.:	MW-2	MW-3	MW-4	MW-6	MW-7	MW-7	MW-8	NC Action
Sample Date:	3/30/95	3/30/95	3/30/95	3/31/95	3/30/95	5/18/95	3/31/95	Level[2]
Analysis (Units)								
EPA Method 8260 (ug/L)[3]								
Acetone	<1.200	<25	<25	<50	<2.500	<25	<1.200	700
2-Butanone (MEK)	<1.200	<25	<25	<50	<2.500	<25	<1.200	170
Carbon disulfide	<250	<5.0	<5.0	<10	<500	<5.0	<250	700
Carbon tetrachloride	<250	<5.0	<5.0	<10	<500	<5.0	<250	0.3
Chloroform	<250	0.86 J	<5.0	18	<500	7.8	<250	0.19
1.1-Dichloroethene	930	<5.0	<5.0	41	<500	20	<250	7
1.1-Dichloroethane	250 J	<5.0	<5.0	5.9 J	<500	24	<250	700
trans-1.2-Dichloroethene	<250	<5.0	<5.0	<10	<500	2.8 J	<250	70
2-Hexanone	<1.200	<25	<25	<50	<2.500	<25	<1.200	nl
Methylene chloride	<250	<5.0	<5.0	<10	<500	<5.0	<250	5
4-Methyl-2-pentanone	<1.200	<25	<25	<50	<2.500	<25	<1.200	nl
1.1.1-Trichloroethane	2,000	<5.0	<5.0	60	<500	8.8	<250	200
1.1.2-Trichloroethane	77 J	<5.0	<5.0	<10	<500	3.2 J	<250	nl
Trichloroethene	4,000	29	100	36	150 J	120	97 J	2.8
Tetrachloroethene	5,100	52	72	180	17,000	10,000 d	9,700	0.7
EPA Method 625 (ug/L)[3]								
Acenaphthene	<10	<10	<10	na	<10	na	<10	80
Fluorene	<10	<10	<10	na	<10	na	<10	nl
Isophorone	54	<10	<10	na	<10	na	<10	nl
Naphthalene	<10	<10	<10	na	<10	na	<10	21
2-Nitrophenol	11	<10	<10	na	<10	na	<10	nl
Phenanthrene	<10	<10	<10	na	<10	na	<10	nl
EPA Method 200 (mg/L)								
Antimony	<0.050	<0.050	<0.050	na	<0.050	na	<0.050	nl
Arsenic	<0.010	<0.010	<0.010	na	<0.010	na	<0.010	0.05
Beryllium	<0.0050	<0.0050	<0.0050	na	<0.0050	na	<0.0050	nl
Cadmium	<0.0050	<0.0050	<0.0050	na	<0.0050	na	<0.0050	0.005
Copper	<0.025	<0.025	<0.025	na	0.033	na	<0.025	1.0
Chromium	<0.010	<0.010	<0.010	na	<0.010	na	0.10	0.05
Lead	<0.0050	<0.0050	<0.0050	na	<0.0050	na	0.011	0.015
Mercury	<0.00020	<0.00020	<0.00020	na	<0.00020	na	<0.00020	0.0011
Nickel	<0.040	<0.040	<0.040	na	<0.040	na	0.14	0.1
Selenium	<0.010	<0.010	<0.010	na	<0.010	na	<0.010	0.05
Silver	<0.010	<0.010	<0.010	na	<0.010	na	<0.010	0.018
Thallium	<0.010	<0.010	<0.010	na	<0.010	na	<0.010	nl
Zinc	0.071	0.097	0.032	na	0.28	na	0.20	2.1
EPA Method 335.2 (mg/L)								
Cyanide	<0.010	<0.010	<0.010	na	0.043	na	<0.010	0.154
EPA Method 160.2 (mg/L)								
Total Suspended Solids	28	6.0	11	na	14	na	120	nl

(continued)

TABLE 10 (continued)
SUMMARIZED RESULTS OF LABORATORY ANALYSIS
GROUNDWATER SAMPLES FROM MONITORING AND PRODUCTION WELLS; 3/95 through 2/96

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well I.D.:	MW-9	MW-9D	PW-1	MW-10	MW-11	MW-12	MW-12D	NC Action
Sample Date:	3/31/95	3/31/95	4/5/95	5/17/95	5/17/95	5/18/95	5/18/95	Level[2]
Analysis (Units)								
EPA Method 8260 (ug/L)[3]								
Acetone	<50	<100	<25	<25	<25	<25	<25	700
2-Butanone (MEK)	<250	<500	<25	<25	<25	<25	<25	170
Carbon disulfide	<50	<100	<5.0	<5.0	<5.0	<5.0	<5.0	700
Carbon tetrachloride	<50	<100	<5.0	<5.0	<5.0	<5.0	<5.0	0.3
Chloroform	**20 J**	**21 J**	<5.0	**12**	<5.0	**1.4 J**	**1.2 J**	0.19
1,1-Dichloroethene	<50	<100	<5.0	**37**	<5.0	<5.0	<5.0	7
1,1-Dichloroethane	<50	<100	<5.0	6.6	<5.0	<5.0	<5.0	700
trans-1,2-Dichloroethene	<50	<100	<5.0	<5.0	<5.0	<5.0	<5.0	70
2-Hexanone	<250	<500	<25	<25	<25	<25	<25	nl
Methylene chloride	<50	<100	<5.0	<5.0	<5.0	<5.0	<5.0	5
4-Methyl-2-pentanone	<250	<500	<25	<25	<25	<25	<25	nl
1,1,1-Trichloroethane	<50	<100	<5.0	140	<5.0	<5.0	<5.0	200
1,1,2-Trichloroethane	<50	<100	<5.0	6.2	<5.0	<5.0	<5.0	nl
Trichloroethene	**220**	**240**	**5.3**	**86**	<5.0	**15**	**13**	2.8
Tetrachloroethene	**1,500**	**1,700**	**10**	**32,000 d**	**9.6**	**100**	**86**	0.7
EPA Method 625 (ug/L)[3]								
Acenaphthene	<10	<10	<10	1.9 J	<10	<10	<10	80
Fluorene	<10	<10	<10	2.3 J	<10	<10	<10	nl
Isophorone	<10	<10	<10	<10	<10	<10	<10	nl
Naphthalene	<10	<10	<10	8.6 J	<10	<10	<10	21
2-Nitrophenol	<10	<10	<10	<10	<10	<10	<10	nl
Phenanthrene	<10	<10	<10	2.2 J	<10	<10	<10	nl
EPA Method 200 (mg/L)								
Antimony	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	nl
Arsenic	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.05
Beryllium	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	nl
Cadmium	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.005
Copper	<0.025	<0.025	<0.010	<0.010	<0.025	<0.025	<0.025	1.0
Chromium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.05
Lead	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.015
Mercury	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0011
Nickel	0.077	0.079	**0.12**	<0.040	<0.040	<0.040	<0.040	0.1
Selenium	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	<0.010	0.05
Silver	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.018
Thallium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	nl
Zinc	0.057	0.043	0.10	0.24	0.038	0.038	0.038	2.1
EPA Method 335.2 (mg/L)								
Cyanide	<0.010	<0.010	0.044	<0.010	<0.010	<0.010	<0.010	0.154
EPA Method 160.2 (mg/L)								
Total Suspended Solids	<5.0	<5.0	<5.0	9.0	10	11	12	nl

(continued)

TABLE 10 (continued)
SUMMARIZED RESULTS OF LABORATORY ANALYSIS
GROUNDWATER SAMPLES FROM MONITORING AND PRODUCTION WELLS; 3/95 through 2/96

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well I.D.:	MW-13	MW-14	MW-15	MW-16	MW-17	MW-18	MW-19	NC Action
Sample Date:	5/18/95	5/17/95	5/17/95	7/17/95	5/17/95	7/17/95	7/17/95	Level[2]
Analysis (Units)								
EPA Method 8260 (ug/L)[3]								
Acetone	39	<120	<250	<25	<25	<25	<25	700
2-Butanone (MEK)	110	71 J	<250	<25	<25	<25	<25	170
Carbon disulfide	<5.0	<25	<50	<5.0	<5.0	<5.0	<5.0	700
Carbon tetrachloride	<5.0	<25	<50	<5.0	<5.0	<5.0	<5.0	0.3
Chloroform	**0.75 J**	**3.2 J**	<50	<5.0	<5.0	<5.0	<5.0	0.19
1,1-Dichloroethene	<5.0	<25	<50	<5.0	<5.0	<5.0	<5.0	7
1,1-Dichloroethane	<5.0	<25	<50	<5.0	<5.0	<5.0	<5.0	700
trans-1,2-Dichloroethene	<5.0	<25	<50	<5.0	<5.0	<5.0	<5.0	70
2-Hexanone	7.4 J	<120	<250	<25	<25	<25	<25	nl
Methylene chloride	<5.0	<25	<50	<5.0	<5.0	<5.0	<5.0	5
4-Methyl-2-pentanone	7.2 J	<120	<250	<25	<25	<25	<25	nl
1,1,1-Trichloroethane	<5.0	<25	<50	<5.0	<5.0	<5.0	<5.0	200
1,1,2-Trichloroethane	<5.0	<25	<50	<5.0	<5.0	<5.0	<5.0	nl
Trichloroethene	1.6 J	**260**	**25 J**	<5.0	<5.0	<5.0	<5.0	2.8
Tetrachloroethene	<5.0	**83**	**1,300**	<5.0	**1.1 J**	<5.0	<5.0	0.7
EPA Method 625 (ug/L)[3]								
Acenaphthene	<10	<10	<10	na	<10	na	na	80
Fluorene	<10	<10	<10	na	<10	na	na	nl
Isophorone	<10	<10	<10	na	<10	na	na	nl
Naphthalene	<10	<10	<10	na	<10	na	na	21
2-Nitrophenol	<10	<10	<10	na	<10	na	na	nl
Phenanthrene	<10	<10	<10	na	<10	na	na	nl
EPA Method 200 (mg/L)								
Antimony	<0.050	<0.050	<0.050	na	<0.050	na	na	nl
Arsenic	<0.010	<0.010	<0.010	na	<0.010	na	na	0.05
Beryllium	<0.0050	<0.0050	<0.0050	na	<0.0050	na	na	nl
Cadmium	<0.0050	<0.0050	<0.0050	na	<0.0050	na	na	0.005
Copper	<0.025	<0.025	<0.025	na	<0.025	na	na	1.0
Chromium	<0.010	<0.010	<0.010	na	<0.010	na	na	0.05
Lead	<0.0050	<0.0050	<0.0050	na	**0.016**	na	na	0.015
Mercury	<0.00020	<0.00020	<0.00020	na	<0.00020	na	na	0.0011
Nickel	<0.040	<0.040	<0.040	na	<0.040	na	na	0.1
Selenium	<0.010	<0.010	<0.010	na	<0.010	na	na	0.05
Silver	<0.010	<0.010	<0.010	na	<0.010	na	na	0.018
Thallium	<0.010	<0.010	<0.010	na	<0.010	na	na	nl
Zinc	0.032	0.036	0.076	na	0.032	na	na	2.1
EPA Method 335.2 (mg/L)								
Cyanide	<0.010	<0.010	13	na	<0.010	na	na	0.154
EPA Method 160.2 (mg/L)								
Total Suspended Solids	19	<5.0	10	82	22	22	30	nl

(continued)

TABLE 10 (continued)
SUMMARIZED RESULTS OF LABORATORY ANALYSIS
GROUNDWATER SAMPLES FROM MONITORING AND PRODUCTION WELLS; 3/95 through 2/96

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well I.D.:	MW-20	MW-21	MW-22	MW-23	MW-24	MW-25	MW-26	NC Action
Sample Date:	7/17/95	7/17/95	7/17/95	7/17/95	7/17/95	12/13/95	12/13/95	Level[2]
Analysis (Units)								
EPA Method 8260 (ug/L)[3]								
Acetone	<25	<25	<25	<25	<25	<5	<25	700
2-Butanone (MEK)	<25	<25	<25	<25	<25	<5	<25	170
Carbon disulfide	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5	700
Carbon tetrachloride	<5.0	1.8 J	<5.0	<5.0	<5.0	<1	<5	0.3
Chloroform	<5.0	20	1.9 J	<5.0	<5.0	<1	<5	0.19
1,1-Dichloroethene	<5.0	90	<5.0	<5.0	<5.0	<1	<5	7
1,1-Dichloroethane	1.4 J	6.7	<5.0	<5.0	<5.0	<1	<5	700
trans-1,2-Dichloroethene	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5	70
2-Hexanone	<25	<25	<25	<25	<25	<5	<25	nl
Methylene chloride	<5.0	<5.0	<5.0	3.2 J	3.2 J	<5	<25	5
4-Methyl-2-pentanone	<25	<25	<25	<25	<25	<5	<25	nl
1,1,1-Trichloroethane	<5.0	78	<5.0	<5.0	<5.0	<1	<5	200
1,1,2-Trichloroethane	<5.0	2.9 J	<5.0	<5.0	<5.0	<1	<5	nl
Trichloroethene	77	1,700 d	91	<5.0	<5.0	<1	80	2.8
Tetrachloroethene	190	9.8	190	<5.0	1.6 J	<1	<5	0.7
EPA Method 625 (ug/L)[3]								
Acenaphthene	na	na	na	na	na	na	na	80
Fluorene	na	na	na	na	na	na	na	nl
Isophorone	na	na	na	na	na	na	na	nl
Naphthalene	na	na	na	na	na	na	na	21
2-Nitrophenol	na	na	na	na	na	na	na	nl
Phenanthrene	na	na	na	na	na	na	na	nl
EPA Method 200 (mg/L)								
Antimony	na	na	na	na	na	na	na	nl
Arsenic	na	na	na	na	na	na	na	0.05
Beryllium	na	na	na	na	na	na	na	nl
Cadmium	na	na	na	na	na	na	na	0.005
Copper	na	na	na	na	na	na	na	1.0
Chromium	na	na	na	na	na	na	na	0.05
Lead	na	na	na	na	na	na	na	0.015
Mercury	na	na	na	na	na	na	na	0.0011
Nickel	na	na	na	na	na	na	na	0.1
Selenium	na	na	na	na	na	na	na	0.05
Silver	na	na	na	na	na	na	na	0.018
Thallium	na	na	na	na	na	na	na	nl
Zinc	na	na	na	na	na	na	na	2.1
EPA Method 335.2 (mg/L)								
Cyanide	na	na	na	na	na	na	na	0.154
EPA Method 160.2 (mg/L)								
Total Suspended Solids	58	20	650	5,300	330	na	na	nl

(continued)

TABLE 10 (continued)
SUMMARIZED RESULTS OF LABORATORY ANALYSIS
GROUNDWATER SAMPLES FROM MONITORING AND PRODUCTION WELLS; 3/95 through 2/96

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well I.D.:	DMW-28	DMW-28D	MW-30	NC Action Level[2]
Sample Date:	12/13/95	12/13/95	2/9/96	
Analysis (Units)				
EPA Method 8260 (ug/L)[3]				
Acetone	<5	<5	<5	700
2-Butanone (MEK)	<5	<5	<5	170
Carbon disulfide	<1	1	<1	700
Carbon tetrachloride	<1	<1	<1	0.3
Chloroform	<1	<1	<1	0.19
1.1-Dichloroethene	<1	<1	<1	7
1.1-Dichloroethane	<1	<1	<1	700
trans-1.2-Dichloroethene	<1	<1	<1	70
2-Hexanone	<5	<5	<5	nl
Methylene chloride	<5	<5	<5	5
4-Methyl-2-pentanone	<5	<5	<5	nl
1.1.1-Trichloroethane	<1	<1	<1	200
1.1.2-Trichloroethane	<1	<1	<1	nl
Trichloroethene	4	4	<1	2.8
Tetrachloroethene	<1	<1	<1	0.7
EPA Method 625 (ug/L)[3]				
Acenaphthene	na	na	na	80
Fluorene	na	na	na	nl
Isophorone	na	na	na	nl
Naphthalene	na	na	na	21
2-Nitrophenol	na	na	na	nl
Phenanthrene	na	na	na	nl
EPA Method 200 (mg/L)				
Antimony	na	na	na	nl
Arsenic	na	na	na	0.05
Beryllium	na	na	na	nl
Cadmium	na	na	na	0.005
Copper	na	na	na	1.0
Chromium	<0.05	<0.05	na	0.05
Lead	<0.01	<0.01	na	0.015
Mercury	na	na	na	0.0011
Nickel	0.066	<0.05	na	0.1
Selenium	na	na	na	0.05
Silver	na	na	na	0.018
Thallium	na	na	na	nl
Zinc	na	na	na	2.1
EPA Method 335.2 (mg/L)				
Cyanide	na	na	na	0.154
EPA Method 160.2 (mg/L)				
Total Suspended Solids	23.5	20	na	nl

[1] Samples collected by Geraghty & Miller; analyzed by Savannah Laboratories (3/95 to 7/95) and and Paradigm Analytical Laboratories (12/95 to 2/96).
[2] Groundwater action level listed in 15A NCAC 2L .0202g.
[3] Method compounds detected in one or more samples are listed in table.
na = Not analyzed. nl = No action level listed in 15A NCAC 2L .0202g.
J = Compound detected at concentration above method detection limit but below practical quantitation limit.
d = Compound concentration quantified using a secondary dilution.
D = Duplicate groundwater sample.

TABLE 11
OVERALL SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well	Date	PCE (ug/L)	TCE (ug/L)	1,1-DCE (ug/L)	1,1,1-TCA (ug/L)	Chloroform (ug/L)	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Mercury (mg/L)	Nickel (mg/L)	Zinc (mg/L)	Cyanide (mg/L)
PW-1	11/26/91	200	14	<5.0	<5.0	<5.0	0.011	0.18	0.18	0.00022	5.0	4.1	0.51
	4/5/95	10	5.3	<5.0	<5.0	<5.0	<0.005	<0.010	<0.005	<0.0002	0.12	0.10	0.044
MW-1	4/9/92	7,400	6,300	1,500	5,700	<1,000	<0.005	<0.010	<0.010	0.0080	<0.040	0.13	<0.010
MW-2	12/20/93[1]	1,870	2,000	470	900	<5	<0.005	0.020	0.026	<0.00010	na	na	na
	12/20/93[1]	<25	390	<25	2.1 J	<25	<0.005	0.039	0.056	<0.00020	na	na	na
	3/30/95	5,100	4,000	930	2,000	<250	<0.0050	<0.010	<0.005	<0.00020	<0.040	0.071	<0.010
MW-3	12/20/93[1]	20	21	<5	<5	<5	<0.005	<0.01	<0.005	<0.00010	na	na	na
	12/20/93[1]	26	23	<5.0	<5.0	<5.0	<0.005	<0.01	<0.005	<0.00020	na	na	na
	3/30/95	52	29	<5.0	<5.0	0.86 J	<0.0050	<0.010	<0.005	<0.00020	<0.040	0.097	<0.010
MW-4	12/20/93[1]	45	92	<5	<5	<5	<0.005	0.029	0.0071	<0.00010	na	na	na
	12/20/93[1]	59	100	<5.0	<5.0	<5.0	<0.005	0.015	0.0053	<0.00020	na	na	na
	3/30/95	72	100	<5.0	<5.0	<5.0	<0.0050	<0.010	<0.005	<0.00020	<0.040	0.032	<0.010
MW-5	4/28/94[1]	<5	<5	<5	<5	<5	0.01	0.03	0.63	<0.0002	na	na	na
	4/28/94[1]	<5.0	<5.0	<5.0	<5.0	<5.0	0.010	0.031	0.83	<0.0002	na	na	na
MW-6	7/1/94	na	na	na	na	na	na	na	0.023	na	nna	na	na
	3/31/95	180	36	41	60	18	na	na	na	na	na	na	na
MW-7	3/30/95	17,000	150 J	20	<500	<500	<0.005	<0.010	<0.0050	<0.00020	<0.040	0.28	0.043
	5/18/95	10,000 d	120	20	8.8	7.8	na	na	na	na	na	na	na
MW-8	3/31/95	9,700	97 J	<250	<250	<250	<0.005	0.10	0.011	<0.00020	0.14	0.20	<0.010
MW-9	3/31/95[1]	1,500	220	<50	<50	20 J	<0.005	<0.010	<0.0050	<0.00020	0.077	0.057	<0.010
	3/31/95[1]	1,700	240	<100	<100	21 J	<0.005	<0.010	<0.0050	<0.00020	0.079	0.043	<0.010
MW-10	5/17/95	32,000 d	86	37	140	12	<0.005	<0.010	<0.0050	<0.00020	<0.040	0.24	<0.010
NC Action Level		0.7	2.8	7	200	0.19	0.005	0.05	0.015	0.0011	0.1	2.1	0.154

(continued)

TABLE 11 (continued)
OVERALL SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Ilco Unican Corporation
2941 Indiana Ave.
Winston-Salem, North Carolina

Well	Date	PCE (ug/L)	TCE (ug/L)	1,1-DCE (ug/L)	1,1,1-TCA (ug/L)	Chloroform (ug/L)	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Mercury (mg/L)	Nickel (mg/L)	Zinc (mg/L)	Cyanide (mg/L)
MW-11	5/17/95	9.6	<5.0	<5.0	<5.0	<5.0	<0.0050	<0.010	<0.0050	<0.00020	<0.040	0.038	<0.010
MW-12	5/18/95[1]	100	15	<5.0	<5.0	1.4 J	<0.0050	<0.010	<0.0050	<0.00020	<0.040	0.038	<0.010
	5/18/95[1]	86	13	<5.0	<5.0	1.2 J	<0.0050	<0.010	<0.0050	<0.00020	<0.040	0.038	<0.010
MW-13	5/18/95	<5.0	1.6 J	<5.0	<5.0	0.75 J	<0.0050	<0.010	<0.0050	<0.00020	<0.040	0.032	<0.010
MW-14	5/17/95	83	260	<25	<25	3.2 J	<0.0050	<0.010	<0.0050	<0.00020	<0.040	0.036	<0.010
MW-15	5/17/95	1,300	25 J	<50	<50	<50	<0.0050	<0.010	<0.0050	<0.00020	<0.040	0.076	<0.010
MW-16	7/17/95	<5.0	<5.0	<5.0	<5.0	<5.0	na	na	na	na	na	na	na
MW-17	5/17/95	1.1 J	<5.0	<5.0	<5.0	<5.0	<0.0050	<0.010	0.016	<0.00020	<0.040	0.032	<0.010
MW-18	7/17/95	<5.0	<5.0	<5.0	<5.0	<5.0	na	na	na	na	na	na	na
MW-19	7/17/95	<5.0	<5.0	<5.0	<5.0	<5.0	na	na	na	na	na	na	na
MW-20	7/17/95	190	77	<5.0	<5.0	<5.0	na	na	na	na	na	na	na
MW-21	7/17/95	9.8	1,700 d	90	78	20	na	na	na	na	na	na	na
MW-22	7/17/95	190	91	<5.0	<5.0	1.9 J	na	na	na	na	na	na	na
MW-23	7/17/95	<5.0	<5.0	<5.0	<5.0	<5.0	na	na	na	na	na	na	na
MW-24	7/17/95	1.6 J	<5.0	<5.0	<5.0	<5.0	na	na	na	na	na	na	na
MW-25	12/13/95	<1	<1	<1	<1	<1	na	na	na	na	na	na	na
MW-26	12/13/95	<5	80	<5	<5	<5	na	na	na	na	na	na	na
DMW-28	12/13/95[1]	<1	4	<1	<1	<1	na	na	na	na	0.066	na	na
	12/13/95[1]	<1	4	<1	<1	<1	na	na	na	na	<0.05	na	na
MW-30	2/9/96	<1	<1	<1	<1	<1	na	na	na	na	na	na	na
NC Action Level		0.7	2.8	7	200	0.19	0.005	0.05	0.015	0.0011	0.1	2.1	0.154

[1] Split/duplicate sample.
PCE = tetrachlorothene; TCE = trichloroethene; 1,1-DCE = 1,1-dichlorothene; 1,1,1-TCA = 1,1,1-trichloroethane.
J = Compound detected at concentration above practical quantitation limit but below method detection limit.
d = Compound concentration was quantitated using a secondary dilution.

APPENDIX A

NAMES/ADDRESSES OF AREA PROPERTY OWNERS

AREA PROPERTY OWNERS
Ilco Unican Corp.
Winston-Salem, North Carolina

Map No.	Lot No.	Address	Property Owner/Address	Water Supply Well? (Y/N)	City Water Service (Y/N)
960	1	2847 N. Glenn Ave.	Barbara D. Kelly 3311 Cumberland Rd. Winston-Salem, NC 27105	N	Y
	2	2849 N. Glenn Ave.	Ellen G. McCloud 2849 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	3	2901 N. Glenn Ave.	Nathaniel Little 2901 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	4, 5	2911 N. Glenn Ave.	Ronald C. Pickens 907 Cedarbranch Trail Winston-Salem, NC 27105	N	Y
	6	2915 N. Glenn Ave.	Isiah Chandler 2915 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	7	2919 N. Glenn Ave.	Artanzia R. Jones 2919 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	8	2923 N. Glenn Ave.	Secretary for Veterans Affairs 251 Main St. Winston-Salem, NC 27101	N	Y
	9	2927 N. Glenn Ave.	Habitat for Humanity (Angela Joyce Robinson) 502 N. Broad St. Winston-Salem, NC 27101	N	Y
	10A, 10B	2933 N. Glenn Ave.	Thomas & Rhonda Gould 2615 Oak Ridge Rd. Oak Ridge, NC 27310	N	Y
	11, 12	2935 N. Glenn Ave.	Reynolds Christian Methodist Ch. 2935 Glenn Ave. Winston-Salem, NC 27105	N	Y
	13	2939 N. Glenn Ave.	Reynolds Christian Methodist Ch. 2935 Glenn Ave. Winston-Salem, NC 27105	N	Y
	26, 27	2946 Ivy Ave.	New Unity Missionary Bapt. Ch. 2946 Ivy Ave. Winston-Salem, NC 27105	N	Y
	28, 29A	2920 Ivy Ave.	Mark A. Godfrey 5214 Main St. Winston-Salem, NC 27105	N	Y
	29B, 30, 31A	2916 Ivy Ave.	Mark A. Godfrey 5214 Main St. Winston-Salem, NC 27105	N	Y
	31B-34A	2912 Ivy Ave.	Mark A. Godfrey 5214 Main St. Winston-Salem, NC 27105	N	Y

AREA PROPERTY OWNERS
Ilco Unican Corp.
Winston-Salem, North Carolina

Map No.	Lot No.	Address	Property Owner/Address	Water Supply Well? (Y/N)	City Water Service (Y/N)
960	34B, 35, 36, 101	2904 Ivy Ave.	Mark A. Godfrey 5214 Main St. Winston-Salem, NC 27105	N	Y
	37-43	Ivy Ave. (Lowrance Middle School)	Fosythe Co. Board of Education 725 E. 28th St. Winston-Salem, NC 27105	N	Y
	44, 45	2939 Ivy Ave.	Cornish Roofing Co. P.O. Box 16112 Winston-Salem, NC 27115	N	Y
	46-50	30th St.	Bob Cornish P.O. Box 16112 Winston-Salem, NC 27115	N	Y
	51, 52	2998 Indiana Ave.	Cornish Roofing Co. P.O. Box 16112 Winston-Salem, NC 27115	N	Y
	53-60	Stokes Ave. (Lowrance Middle School)	Fosythe Co. Board of Education 725 E. 28th St. Winston-Salem, NC 27105	N	Y
961	14A	3001 N. Glenn Ave.	Elmo Reece Linton, Jr. 3001 N. Glenn Ave. Winston-Salem, NC 27105-4412	N	Y
	14B	405 E. 30th St.	Charlie Tise Jr. 405 13th St. King, NC 27021	N	Y
	15	3007 N. Glenn Ave.	Richard Leonard & Edna Dunlap 1007 Nancy Ln. Winston-Salem, NC 27107-5403	N	Y
	16	3013 N. Glenn Ave.	Richard Leonard & Edna Dunlap 1007 Nancy Ln. Winston-Salem, NC 27107-5403	N	Y
	17	3015 N. Glenn Ave.	C. W. Myers Trading Post 2718 N. Liberty St. Winston-Salem, NC 27105-4438	N	Y
	18, 19	3044 Indiana Ave.	M. H. Huff Ventures 1205 Waughtown St. Winston-Salem, NC 27107	N	Y
	20	3034 Indiana Ave.	Chessie H. & J. W. Wilson 3034 Indiana Ave. Winston-Salem, NC 27105-4428	N	Y
	21	3032 Indiana Ave.	Edwin W. Mendenhall & K. W. Hunt 3398 Nottinham Rd. Winston-Salem, NC 27104-1841	N	Y

AREA PROPERTY OWNERS
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Map No.	Lot No.	Address	Property Owner/Address	Water Supply Well? (Y/N)	City Water Service (Y/N)
961	22	3022 Indiana Ave.	Edwin W. Mendenhall & K. W. Hunt 3398 Nottinham Rd. Winston-Salem, NC 27104-1841	N	Y
	23	3023 Indiana Ave.	Lura Sophia Dunigan 5810 Brookway Dr. Winston-Salem, NC 27105-1431	N	Y
	24, 25	3000 Ivy Ave.	John A. Shelton Sr. 315 Retruh Dr. Winston-Salem, NC 27105-2234	N	Y
	48	433 E. 30th St.	Carrie M. Weddle 645 Mount Hope Church Rd. Salisbury, NC 28146-8567	N	Y
	77-82A	2941 Indiana Ave.	Ilco Unican Corp. 2941 Indiana Ave. Winston-Salem, NC 27105-4425	N	Y
	82B-91	3001 Indiana Ave.	Paul F. Martin 3750 Konnoak Dr. Winston-Salem, NC 27127-6039	N	Y
	92	3081 Indiana Ave.	John W. Collins 207 Ridgehaven Dr. Winston-Salem, NC 27104-4404	N	Y
962	61-73	Indiana Ave. (Lowrance Middle School)	Forsythe Co. Board of Education 725 E. 28th St. Winston-Salem, NC 27105	N	Y
	74, 75, 101	2941 Indiana Ave.	Ilco Unican Corp. 2941 Indiana Ave. Winston-Salem, NC 27105-4425	N	Y
1164	1	700 E. 28th St.	Kathryn Sue Peatross 2848 Merry Acres Ln. Winston-Salem, NC 27106	N	Y
	2	704 E. 28th St.	Elmer O'Neil 704 E. 28th St. Winston-Salem, 27105	N	Y
	3	708 E. 28th St.	Theodore R. Fant, Jr. 708 E. 28th St. Winston-Salem, NC 27105	N	Y
	4	2715 Patrick Ave.	C.A. Bailey Jr. 2715 Patrick Ave. Winston-Salem, NC 27105	N	Y
	5	2711 Patrick Ave.	Artis Mock Crump 2711 Patrick Ave. Winston-Salem, NC 27105	N	Y

AREA PROPERTY OWNERS
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Map No.	Lot No.	Address	Property Owner/Address	Water Supply Well? (Y/N)	City Water Service (Y/N)
1164	6	2709 Patrick Ave.	Lula McCorkle 2709 Patrick Ave. Winston-Salem, NC 27105	N	Y
	7	2707 Patrick Ave.	C. W. Myers Trading Co. 2718 N. Liberty St. Winston-Salem, NC 27105	N	Y
1165	4	2725 Stokes Ave.	Ruth F. Brock 2725 Stokes Ave. Winston-Salem, NC 27105	N	Y
	5	2721 Stokes Ave.	Otis R. Sims 2721 Stokes Ave. Winston-Salem, NC 27105	N	Y
	6	2717 Stokes Ave.	Godosakahi Jordan 2717 Stokes Ave. Winston-Salem, NC 27105	N	Y
	7	2713 Stokes Ave.	Herman L. Gilliam 2713 Stokes Ave. Winston-Salem, NC 27105	N	Y
	11	612 E. 28th St.	C. W. Myers Trading Co. 2718 N. Liberty St. Winston-Salem, NC 27105	N	Y
	12	618 E. 28th St.	Mary C. Hairston 2503 Gilmer Ave. Winston-Salem, NC 27105	N	Y
	13	622 E. 28th St.	Elinor Wilson & Kathryn Peatross 2848 Merry Acres Ln. Winston-Salem, NC 27106	N	Y
	14	2714 Patrick Ave.	Willie E. Weaks 2714 Patrick Ave. Winston-Salem, NC 27105	N	Y
	15	2710 Patrick Ave.	Angel C. Powel 2709 Patrick Ave. Winston-Salem, NC 27105	N	Y
	16, 17	2706 Patrick Ave.	Malloy Bohannon 2706 Patrick Ave. Winston-Salem, NC 27105	N	Y
	104, 107	608 E. 28th St.	Bertha W. Revells 608 E. 28th St. Winston-Salem, NC 27105	N	Y
	105, 106	600 E. 28th St.	Waunzo A. Sherard 600 E. 28th St. Winston-Salem, NC 27105	N	Y

AREA PROPERTY OWNERS
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Map No.	Lot No.	Address	Property Owner/Address	Water Supply Well? (Y/N)	City Water Service (Y/N)
1166		Lowrance Middle School	Forsythe Co. Board of Education 725 E. 28th St. Winston-Salem. NC 27105	N	Y
1167		Lowrance Middle School	Forsythe Co. Board of Education 725 E. 28th St. Winston-Salem. NC 27105	N	Y
1168		Lowrance Middle School	Forsythe Co. Board of Education 725 E. 28th St. Winston-Salem. NC 27105	N	Y
1169	1	500 E. 28th St.	William & Marie Shelton 4978 Stonington Rd. Winston-Salem. NC 27103	N	Y
	2	504 E. 28th St.	John A. Lash 300 Burkewood Dr. Winston-Salem. NC 27104	N	Y
	3	508th E. 28th St.	Robert & Jennette Smart 508 E. 28th St. Winston-Salem. NC 27105	N	Y
	4	2725 Ivy Ave.	Willie J. O'Neal 2725 Ivy Ave. Winston-Salem. NC 27105	N	Y
	5	2721 Ivy Ave.	Forsythe Investment Properties, Inc. 102 S. Cherry St. Winston-Salem. NC 27105	N	Y
	11	512 E. 28th St.	Rhonda L. Martinez 512 E. 28th St. Winston-Salem. NC 27105	N	Y
	12	516 E. 28th St.	Christine Steward 516 E. 28th St. Winston-Salem. NC 27105	N	Y
	13	520 E. 28th St.	Virginia F. Williams Heirs, c/o Bertha Frost 608 E. 28th St. Winston-Salem. NC 27105	N	Y
	14	2724 Stokes Ave.	Marie H. Banner 2724 Stokes Ave. Winston-Salem. NC 27105	N	Y
	15	2720 Stokes Ave.	Ollie & Carrie Williams 2720 Stokes Ave. Winston-Salem. NC 27105	N	Y
	16	2716 Stokes Ave.	Mary J. Shuler 2716 Stokes Ave. Winston-Salem. NC 27105	N	Y

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Map No.	Lot No.	Address	Property Owner/Address	Water Supply Well? (Y/N)	City Water Service (Y/N)
1169	17	2712 Stokes Ave.	Edna T. Mumford 2712 Stokes Ave. Winston-Salem, NC 27105	N	Y
1171	1, 2	2845 N. Glenn Ave.	Janie C. Murray 2845 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	3	2839 N. Glenn Ave.	Doris M. Barr 2839 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	4	2835 N. Glenn Ave.	Sam C. Ogburn Real Estate Co. 2835 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	5	2829 N. Glenn Ave.	Junius T. Toney 2829 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	6	2823 N. Glenn Ave,	GLG Corp. P.O. Box 4011 Winston-Salem, NC 27115	N	Y
	7	2821 N. Glenn Ave.	Lonzo G. Funches 2821 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	8	2819 N. Glenn Ave.	Hubbard Realty of Winston-Salem 285 S. Stratford Rd. Winston-Salem, NC 27105	N	Y
	9	2815 N. Glenn Ave.	James W. Gaither 2815 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	10, 11, 12	401 E. 28th St.	Alice Johnson 401 E. 28th St, Winston-Salem, NC 27105	N	Y
	14, 15	Ivy Ave.	City of Winston-Salem	N	Y
	16	2832 Ivy Ave.	H. K. Ogburn P.O. Box 20188 Winston-Salem, NC 27120	N	Y
	17	2828 Ivy Ave.	E. V. Ferrel, Jr. 854 W. 5th St. Winston-Salem, NC 27101	N	Y
	18	2824 Ivy Ave.	Joe & Gray Walker 2338 N. Liberty St. Winston-Salem, NC 27105	N	Y
	19, 20, 21	2816 Ivy Ave.	Dorothy Timmons 2816 Ivy Ave. Winston-Salem, NC 27105	N	Y

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Map No.	Lot No.	Address	Property Owner/Address	Water Supply Well? (Y/N)	City Water Service (Y/N)
1171	22	415 E. 28th St.	Mary L. Webb 415 E. 28th St. Winston-Salem, NC 27105	N	Y
	23	417-419 E. 28th St.	Annie B. Cook 417/419 E. 28th St. Winston-Salem, NC 27105	N	Y
	24	421 E. 28th St.	William D. Roper 5801 Brookway Dr. Winston-Salem, NC 27105	N	Y
1172	1	2845 Patterson Ave.	Forsythe Investment Properties Inc. 102 S. Cherry St. Winston-Salem, NC 27105	N	Y
	13	2838 N. Glenn Ave.	Callie M. Brooks 2838 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	14	2832 N. Glenn Ave.	Joe E. McClellan 705 Aureole St. Winston-Salem, NC 27107	N	Y
	15	2830 N. Glenn Ave.	George J. Mitchell 2830 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	16	2828 N. Glenn Ave.	Beatrice C. S. Acker 2828 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	17	2824 N. Glenn Ave.	Chloe M. Walker 2338 N. Liberty St. Winston-Salem, NC 27105	N	Y
	18	2822 N. Glenn Ave.	James H. Lone 2822 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	19	2820 N. Glenn Ave.	Adams Family Ltd Partnership 691 Valley Brook Ln. Winston-Salem, NC 27104	N	Y
1174	1	2855 Patterson Ave.	Johnnie R. Gattison 2855 Patterson Ave. Winston-Salem, NC 27105	N	Y
	2, 3	2905 Patterson Ave.	Lizzie C. Littles 2825 Drewry Ln. Winston-Salem, NC 27105	N	Y
	4	2909 Patterson Ave.	Harold A. Jones 2909 Patterson Ave. Winston-Salem, NC 27105	N	Y

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Map No.	Lot No.	Address	Property Owner/Address	Water Supply Well? (Y/N)	City Water Service (Y/N)
1174	5	2915 Patterson Ave.	Albert L. Bingham 2915 Patterson Ave. Winston-Salem, NC 27105	N	Y
	6	2919 Patterson Ave.	Addie Jenkins 2919 Patterson Ave. Winston-Salem, NC 27105	N	Y
	7	2921 Patterson Ave.	Emma Hursh 2921 Patterson Ave. Winston-Salem, NC 27105	N	Y
	8, 9	2925 Patterson Ave.	Ted F. Holder 4600 Warner Rd. Pfafftown, NC 27040	N	Y
	10	2929 Patterson Ave.	Charles E. Butler 2929 Patterson Ave. Winston-Salem, NC 27105	N	Y
	11	2935 Patterson Ave.	Charles E. Eaton 2209 Gerald St. Winston-Salem, NC 27105	N	Y
	12	2941/2943 Patterson Ave.	Juadine H. Chambers, T. F. Holder 5148 Skylark Rd. Pfafftown, NC 27040	N	Y
	13	2945 Patterson Ave.	Derrick E. Slade 232 Montpelier Dr. Winston-Salem, NC 27105	N	Y
	48	2948 Glenn Ave.	Derrick E. Slade 232 Montpelier Dr. Winston-Salem, NC 27105	N	Y
	49	2944 N. Glenn Ave.	Bobbie Scriven, Jr. 2944 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	50	2940 N. Glenn Ave.	Harold L. Gentle 1422 Bretton St. Winston-Salem, NC 27107	N	Y
	51, 52	2934 N. Glenn Ave.	Wayne C. Shugart 1795 Robin Hood Rd. Winston-Salem, NC 27104	N	Y
	53	2920 N. Glenn Ave.	Florence C. Rice 2920 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	54	2918 N. Glenn Ave.	Willard L. McCloud 3737 Spaulding Dr. Winston-Salem, NC 27105	N	Y

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Map No.	Lot No.	Address	Property Owner/Address	Water Supply Well? (Y/N)	City Water Service (Y/N)
1174	55	2916 N. Glenn Ave.	George L. Robinson 2916 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	56	2912 N. Glenn Ave.	Meada Gibbs 2619 Pine Lake Dr. Winston-Salem, NC 27105	N	Y
	57	2910 N. Glenn Ave.	Clement Little & P. Vanderhall 1700 Cedarberry Ct. Winston-Salem, NC 27127	N	Y
	58	2848 N. Glenn Ave.	C. W. Myers Trading Co. 2718 N. Liberty St. Winston-Salem, NC 27105	N	Y
	59	2842 N. Glenn Ave.	Wayne Thomas P.O. Box 563 Lewisville, NC 27023	N	Y
	60	2840 N. Glenn Ave.	Ernestine Horne 2840 N. Glenn Ave. Winston-Salem NC 27105	N	Y
1175	14	3001 Patterson Ave.	Forsythe Investment Properties Inc. 102 S. Cherry St. Winston-Salem, NC 27101	N	Y
	15	3005 Patterson Ave.	Valeria Grafton 3005 Patterson Ave. Winston-Salem, NC 27105	N	Y
	16, 17	3011 Patterson Ave.	Minnie Hughes 132 Wheeler St. Winston-Salem, NC 27101	N	Y
	18	3015 Patterson Ave.	Hester T. Blassingame 3015 Patterson Ave. Winston-Salem, NC 27105	N	Y
	19	3017 Patterson Ave.	Paul E. Reid 3017 Patterson Ave. Winston-Salem, NC 27105	N	Y
	20	3019 Patterson Ave.	Daniel L. Alligood 3019 Patterson Ave. Winston-Salem, NC 27105	N	Y
	21	3021 Patterson Ave.	Walter F. Young 3021 Patterson Ave. Winston-Salem, NC 27105	N	Y
	35	3058 Patterson Ave.	Edward G. Vest 5551 Novack St. Winston-Salem, NC 27105	N	Y

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Map No.	Lot No.	Address	Property Owner/Address	Water Supply Well? (Y/N)	City Water Service (Y/N)
1175	36	3054 Patterson Ave.	Edward G. Vest 5551 Novack St. Winston-Salem, NC 27105	N	Y
	37, 101	3050 Patterson Ave.	Ricky Joe Snow RR 2 Box 90 Hamptonville. NC 27020	N	Y
	39, 40, 102	3024 N. Glenn Ave.	Frank R. Adams 3024 N. Glenn Ave. Winston-Salem. NC 27105	N	Y
	41,42	3022 N. Glenn Ave.	Pleas E. Strickland 3022 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	43	3018 N. Glenn Ave.	Alvin R. Smith 2025 School St. Winston-Salem, NC 27105	N	Y
	44	3012 N. Glenn Ave.	Olivia Evans 3012 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	45	3010 N. Glenn Ave.	James H. Davis 3010 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	46	3002 N. Glenn Ave.	Raiford L. Hairston 3002 N. Glenn Ave. Winston-Salem, NC 27105	N	Y
	47A	315 E. 30th St.	Sam C.Ogburn, Jr. P.O. Box 20189 Winston-Salem, NC 27120	N	Y
	47B	3000 N. Glenn Ave.	Stafford R. Peebles 3535 Buena Vista Rd. Winston-Salem, NC 27106	N	Y
1189	101	722 E. 28th St.	George Powell 1265 Reynolds Forest Dr. Winston-Salem, NC 27107	N	Y
	102	718 E. 28th St.	Earnest Johnson 718 E. 28th St. Winston-Salem, 27105	N	Y
	14B-17	Farmall St.	Benny M. Church 7810 Red Bank Rd. Germantown. NC 27019	N	N
1193A	101	E. 28th St. (Lowrance Elementary School)	Forsythe Co. Board of Education 725 E. 28th St. Winston-Salem. NC 27105	N	Y

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Map No.	Lot No.	Address	Property Owner/Address	Water Supply Well? (Y/N)	City Water Service (Y/N)
1193	9, 11	2723 Farmall St.	Robert E. Rousseau 219 Hemingway St. Winston-Salem, NC 27127	N	Y
	10B	E. 28th St.	Benny M. Church 7810 Red Bank Rd. Germantown, NC 27019	N	N
	201	738 E. 28th St.	Janice H. Powell 1265 Reynolds Forest Dr. Winston-Salem, NC 27107	N	N
1194	103, 107	10 E. 28th St.	C. W. Myers Trading Co. 2718 N. Liberty St. Winston-Salem, NC 27105	N	Y
1195	25-30, 103	2821/2801 N. Liberty St.	Richard D. Kelly 7960 Simmons Rd. Rural Hall, NC 27045	N	Y
	31, 32, 8A, 9A	2847 N. Liberty St.	Ansel J. Rakestraw 798 Polo Rd. Winston-Salem, NC 27106	N	Y
	33-37	2849 N. Liberty St.	Curtis R. Hanes 2849 N. Liberty St. Winston-Salem, NC 27105	N	Y
	38B-43B, 101	2853 N. Liberty St.	Capitol Real Estate LTD. P.O. Box 26006 Raleigh, NC 2761	N	Y
1481	1, 2	N. Liberty St.	City of Winston-Salem	N	Y
	3-13A, 102, 103	N. Liberty St.	C. W. Myers Trading Co. 2718 N. Liberty St. Winston-Salem, NC 27105	N	Y
	13B	Indiana Ave.	Norfolk & Western Railroad 546 The Main Bldg Houston, TX	N	Y
1482	5, 6, 7, 8, 101-107	N. Liberty St.	C. W. Myers Trading Co. 2718 N. Liberty St. Winston-Salem, NC 27105	N	Y
1964	19-43	N. Liberty St.	City of Winston-Salem Fire Dept.	N	Y
1965	201	3111 N. Liberty St.	National Realty Sales Corp. P.O. Box 31007 Charlotte, NC 28231	N	Y
	202	3001 N. Liberty St.	Trader Publishing Co. 100 W. Plume St. Norfolk, VA 23510	N	Y
1967	89	1000 30th St.	Meda C. Pearsal 432 Carolina Cr. Winston-Salem, NC 27104	N	Y

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Map No.	Lot No.	Address	Property Owner/Address	Water Supply Well? (Y/N)	City Water Service (Y/N)
1967	90	1004 30th St.	Annie L. Williams 1004 30th St. Winston-Salem, NC 27105	N	Y
	98, 99	1007 29th St.	Mid Huff Ventures, Inc. RR2 Box 137 King, NC 27021	N	Y
	100	1003 29th St.	E. A. Hobson 3149 Minart St. Winston-Salem, NC 27106	N	Y
	101	1001 29th St.	Patricia A. Hill 1001 29th St. Winston-Salem, NC 27105	N	Y
	102	2915 Woodland Ave.	Nancy G. Starbuck 3917 Southdale Ave. Winston-Salem, NC 27107	N	Y
	103, 104	2919 Woodland Ave.	Georgia S. Davis 2919 Woodland Ave. Winston-Salem, NC 27105	N	Y
	105	2927 Woodland Ave.	William M. Trawick, Jr. 201 Pinehall Dr. Clemmons, NC 27012	N	Y
1968	106, 107	Woodland Ave.	Housing Authority	N	Y
	108	1008 29th St.	William O. Harris 3889 Forest Valley Rd. Winston-Salem, NC 27105	N	Y
	109	1100 E. 29th St.	Housing Authority	N	Y
2430	67	3100 N. Glenn Ave.	Twin State Warehouse Corp. P.O. Box 241 Clemmons, NC 27012	N	Y
	68	3079 Indiana Ave.	John W. Collins 207 Ridgehaven Dr. Winston-Salem, NC 27104	N	Y
2432	3, 4B, 6	N. Liberty St.	Norfolk & Western Railroad 546 The Main Bldg Houston, TX	N	Y
	8D, 9D	3105 N. Glenn Ave.	Virgoro Industries 3105 N. Glenn Ave. Winston-Salem, NC 27115	N	Y
	9A	3100 N. Glenn Ave.	NC State Highway Commission	N	Y
	101	3415 N. Glenn Ave.	Brenner Companies, Inc. P.O. Box 76 Winston-Salem, NC 27102-0076	N	Y
	102	3301 N. Glenn Ave.	Waste Managment of the Carolinas, Inc. P.O. Box 122283 Fort Worth, TX 76121-2283	N	Y

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1170	11	414 E. 28th St.	Zelma J. Wolfe 104 N. Greenwood Ave. Winston-Salem, NC 27101	N	Y
	12	418 E. 28th St.	James T. Duckett 418 E. 28th St. Winston-Salem, NC 27105	N	Y
	13	422 E. 28th St.	May W. Johnson 422 E. 28th St. Winston-Salem, NC 27105	N	Y

Source: Forsythe County Tax Assessor Records and area reconnaissance (2/97).

TABLE 1 - Total and Extractable Zinc Results for Chemical Spill Site 1 Quadrant 2, Sections A-E and Quadrant 3, Sections A,B in Milligrams per Liter

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
2	A	Total	7/8/87	4,200	3,500	400	1,800
2	B	Total	7/8/87	9,200	660	81	46
2	C	Total	7/8/87	20,000	17,000	1,200	680
2	D	Total	7/8/87	36,000	38,000	11,000	6,500
2	E	Total	7/8/87	4,100	3,100	2,300	230
3	A	Total	7/9/87	3,000	3,000	3,000	5,700
3	B	Total	7/9/87	2,000	1,100	2,500	210
2	A-E	Extractable	7/8/87	350	350	110	10
3	A,B	Extractable	7/9/87	16	41	33	10

TABLE 2 - Total and Extractable Zinc Results for Chemical Spill Site 2 Quadrant 1, Sections A-E in Milligrams per Liter

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
1	A	Total	7/7/87	3,400	4,700	720	230
1	B	Total	7/7/87	6,100	11,000	3,600	730
1	C	Total	7/7/87	2,000	880	390	84
1	D	Total	7/7/87	2,700	1,100	130	140
1	E	Total	7/7/87	2,700	1,500	960	2,000
1	A-E	Extractable	7/7/87	57	49	13	6.2

Spill site #' 1 = 2

From EAL (1987)
"Comp Site inf"

TABLE 3 - Total and Extractable Copper Results for Chemical Spill Site 1 Quadrant 2, Sections A-E and Quadrant 3, Sections A,B in Milligrams per Liter

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
2	A	Total	7/8/87	1,700	1,600	320	810
2	B	Total	7/8/87	4,100	300	36	460
2	C	Total	7/8/87	8,400	6,800	2,900	340
2	D	Total	7/8/87	12,000	18,000	14,000	9,000
2	E	Total	7/8/87	3,700	4,000	3,900	930
3	A	Total	7/9/87	1,400	1,900	1,400	430
3	B	Total	7/9/87	1,100	440	1,500	58
2	A-E	Extractable	7/8/87	50	70	33	4.5
3	A,B	Extractable	7/9/87	2.7	6.3	5.6	1.4

TABLE 4 - Total and Extractable Copper Results for Chemical Spill Site 2 Quadrant 1, Sections A-E in Milligrams per Liter

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
1	A	Total	7/7/87	2,200	4,200	930	320
1	B	Total	7/7/87	2,800	2,700	2,000	1,300
1	C	Total	7/7/87	1,500	2,000	2,300	1,200
1	D	Total	7/7/87	1,300	750	440	310
1	E	Total	7/7/87	1,600	740	400	560
1	A-E	Extractable	7/7/87	16	14	5.6	3.5

TABLE 5 - Total and Extractable Nickel Results for Chemical Spill Site 1 Quadrant 2, Sections A-E and Quadrant 3, Sections A,B in Milligrams per Liter

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
2	A	Total	7/8/87	93	95	34	56
2	B	Total	7/8/87	83	36	20	26
2	C	Total	7/8/87	300	210	33	26
2	D	Total	7/8/87	580	350	590	230
2	E	Total	7/8/87	910	430	680	75
3	A	Total	7/9/87	58	35	34	25
3	B	Total	7/9/87	280	180	60	26
2	A-E	Extractable	7/8/87	4.4	3.6	2.0	0.5
3	A,B	Extractable	7/9/87	0.42	0.85	0.72	0.67

TABLE 6 - Total and Extractable Nickel Results for Chemical Spill Site 2 Quadrant 1, Sections A-E in Milligrams per Liter

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
1	A	Total	7/7/87	1,100	2,900	170	89
1	B	Total	7/7/87	2,800	2,900	1,400	530
1	C	Total	7/7/87	640	530	510	170
1	D	Total	7/7/87	700	270	66	40
1	E	Total	7/7/87	470	310	140	860
1	A-E	Extractable	7/7/87	4.3	6.0	- 1.4	1.4

TABLE 7- Total and Extractable Chromium Results for Chemical Spill Site 1 Quadrant 2, Sections A-E and Quadrant 3, Sections A,B in Milligrams per Liter

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
2	A	Total	7/8/87	27	21	18	26
2	B	Total	7/8/87	85	26	13	13
2	C	Total	7/8/87	32	32	16	8.5
2	D	Total	7/8/87	51	40	85	210
2	E	Total	7/8/87	87	61	36	10
3	A	Total	7/9/87	29	22	22	17
3	B	Total	7/9/87	39	20	41	13
2	A-E	Extractable	7/8/87	<0.017	<0.017	<0.017	<0.017
3	A,B	Extractable	7/9/87	<0.017	<0.017	<0.017	<0.017

TABLE 8 - Total and Extractable Chromium Results for Chemical Spill Site 2 Quadrant 1, Sections A-E in Milligrams per Liter

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
1	A	Total	7/7/87	100	230	28	20
1	B	Total	7/7/87	150	180	46	14
1	C	Total	7/7/87	41	21	20	15
1	D	Total	7/7/87	110	26	16	27
1	E	Total	7/7/87	49	25	24	37
1	A-E	Extractable	7/7/87	0.34	0.052	<0.017	<0.017

TABLE 9 - Total Cyanide Results for Chemical Spill Site 1, Quadrant 2, Sections A-E and Quadrant 3, Sections A,B in Milligrams per Liter

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
2	A	Total	7/8/87	15	7.2	4.0	7.3
2	B	Total	7/8/87	22	3.4	0.17	0.42
2	C	Total	7/8/87	53	4.3	11	1.8
2	D	Total	7/8/87	990	980	450	205
2	E	Total	7/8/87	37	37	12	0.79
3	A	Total	7/8/87	31	24	33	25
3	B	Total	7/8/87	63	330	544	2.4

TABLE 10 - Total Cyanide Results for Chemical Spill Site 2, Quadrant 1, Sections A-E in Milligrams per Liter

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
1	A	Total	7/7/87	32	39	29	27
1	B	Total	7/7/87	180	32	43	32
1	C	Total	7/7/87	20	37	26	8.3
1	D	Total	7/7/87	50	68	22	10
1	E	Total	7/7/87	26	22	16	60

TABLE 11 - Total pH Results for Chemical Spill Site 1, Quadrant 2, Sections A-E and Quadrant 3, Sections A,B in Standard Units

Quadrant	Section	Type	Date	Depth Intervals(inches) 0-3	3-6	6-9	9-12
2	A	Total	7/8/87	7.8	7.6	7.0	6.5
2	B	Total	7/8/87	7.7	7.6	6.5	5.9
2	C	Total	7/8/87	8.2	8.0	7.8	8.0
2	D	Total	7/8/87	8.2	8.2	8.6	8.1
2	E	Total	7/8/87	7.7	7.6	7.5	7.6
3	A	Total	7/8/87	8.2	8.4	8.4	8.1
3	B	Total	7/8/87	8.0	7.3	8.5	7.7

TABLE 12 - Total pH Results for Chemical Spill Site 2, Quadrant 1, Sections A-E in Standard Units

Quadrant	Section	Type	Date	Depth Intervals(inches) 0-3	3-6	6-9	9-12
1	A	Total	7/7/87	7.9	7.8	7.4	7.3
1	B	Total	7/7/87	7.9	7.9	7.6	7.7
1	C	Total	7/7/87	8.2	7.8	7.6	7.6
1	D	Total	7/7/87	8.2	8.3	7.6	7.4
1	E	Total	7/7/87	8.2	7.9	7.5	7.4

TABLE 13 - Total Percent Solids Results for Chemical Spill Site 1, Quadrant 2, Sections A-E and Quadrant 3, Sections A,B

Quadrant	Section	Type	Date	Depth Intervals(inches) 0-3	3-6	6-9	9-12
2	A	Total	7/8/87	84	79	80	86
2	B	Total	7/8/87	88	86	86	82
2	C	Total	7/8/87	79	76	85	86
2	D	Total	7/8/87	80	77	80	84
2	E	Total	7/8/87	86	79	83	83
3	A	Total	7/8/87	84	83	85	88
3	B	Total	7/8/87	86	86	83	90

TABLE 14 - Total Percent Solids Results for Chemical Spill Site 2, Quadrant 1, Sections A-E

Quadrant	Section	Type	Date	Depth Intervals(inches) 0-3	3-6	6-9	9-12
1	A	Total	7/7/87	76	79	82	83
1	B	Total	7/7/87	74	77	83	85
1	C	Total	7/7/87	80	78	83	87
1	D	Total	7/7/87	83	80	82	90
1	E	Total	7/7/87	85	80	83	81

TABLE 15 – Background Total and Extractable Zinc Results for Quadrant 5, Sections A-D in Milligrams per liter

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
5	A	Total	7/20/87	70	110	55	37
5	B	Total	7/20/87	170	120	160	150
5	C	Total	7/20/87	1,600	430	140	150
5	D	Total	7/20/87	270	41	41	39
5	A-D	Extractable	7/20/87	2.8	0.94	0.24	0.35

16- Background Total and Extractable Copper Results for Quadrant 5, Sections A-D in Milligrams per liter

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
5	A	Total	7/20/87	30	39	25	21
5	B	Total	7/20/87	52	47	40	23
5	C	Total	7/20/87	370	170	66	79
5	D	Total	7/20/87	76	33	40	39
5	A-D	Extractable	7/20/87	0.038	0.038	0.019	0.077

17- Background Total and Extractable Nickel Results for Quadrant 5, Sections A-D in Milligrams per liter

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
5	A	Total	7/20/87	25	25	22	18
5	B	Total	7/20/87	32	25	27	33
5	C	Total	7/20/87	74	73	60	51
5	D	Total	7/20/87	25	25	24	21
5	A-D	Extractable	7/20/87	<0.056	<0.056	<0.056	<0.056

18 - Background Total and Extractable Chromium Results for Quadrant 5, Sections A-D in Milligrams per liter

				Depth Interval(inches)			
Quadrant	Section	Type	Date	0-3	3-6	6-9	9-12
5	A	Total	7/20/87	34	31	23	20
5	B	Total	7/20/87	37	22	20	30
5	C	Total	7/20/87	96	100	87	64
5	D	Total	7/20/87	41	46	39	36
5	A-D	Extractable	7/20/87	<0.017	<0.017	<0.017	<0.017

19 - Background Total Cyanide Results for Quadrant 5, Sections A-D, in Milligrams per Liter

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
5	A	Total	7/20/87	<0.13	0.64	0.55	0.37
5	B	Total	7/20/87	0.53	0.34	0.73	0.11
5	C	Total	7/20/87	0.34	0.13	0.18	0.75
5	D	Total	7/20/87	0.12	0.20	0.39	0.59

TABLE 20 - Background Total pH Results for Quadrant 5, Sections A-D in Standard Units

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
5	A	Total	7/20/87	6.5	7.3	6.8	5.8
5	B	Total	7/20/87	6.3	6.6	6.8	6.9
5	C	Total	7/20/87	6.5	7.8	7.8	6.9
5	D	Total	7/20/87	6.0	5.7	5.6	5.5

TABLE 21 - Background Total Percent Solids Results for Quadrant 5, Sections A-D

Quadrant	Section	Type	Date	Depth Intervals(inches) 0-3	3-6	6-9	9-12
5	A	Total	7/20/87	89	89	88	89
5	B	Total	7/20/87	90	89	90	91
5	C	Total	7/20/87	89	90	89	91
5	D	Total	7/20/87	83	83	85	84

Appendix B.2

**Soil Sampling/Analysis; Southern Side Yard Quadrants
Outside Spill Sites #1 and #2;
from Research and Analytical Laboratories, Inc. (1987b)**

TABLE 1 - Extractable Zinc Results from Core Samples Collected Outside Chemical Spill Sites in Milligrams per Liter.

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
5	E	Extractable	7/16/87	43	5.3	---	---
6	A-D	Extractable	7/21/87	1000	240	150	57
11	A-D	Extractable	7/23/87	130	72	85	120
16	A-D	Extractable	7/24/87	1500	63	130	380
17	A-D	Extractable	7/24/87	1600	180	470	330
18	A-E	Extractable	8/10/87	1000	460	180	150
19	A-D	Extractable	8/12/87	390	13	40	13
20	A-D	Extractable	8/16/87	13	77	14	21
21	A-D	Extractable	8/18/87	48	64	20	1.5
7	A-D	Extractable	8/19/87	61	42	6.1	15
12	A-D	Extractable	8/27/87	330	16	23	18
8 A-D, 9 A-D, 10 A-B		Extractable	8/28/87	73	59	31	31
13 A-D, 14 A-D, 15 A-B		Extractable	8/28/87	1.6	3.9	---	---
22 A-E, 23 A-D, 24 A-B		Extractable	8/28/87	16	24	13	9.1
Dirt Pile		Extractable	8/18/87	2800	N/A		
26	50' N. of 2A	Extractable	9/11/87	3.4	0.97	0.59	0.42

From RAL (9/25/87) outside spill #1 and #2
- Final Report ...

TABLE 1 - Extractable Zinc Results from Core Samples Collected Outside Chemical Spill Sites in Milligrams per Liter.

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
5	E	Extractable	7/16/87	43	5.3	---	---
6	A-D	Extractable	7/21/87	1000	240	150	57
11	A-D	Extractable	7/23/87	130	72	85	120
16	A-D	Extractable	7/24/87	1500	63	130	380
17	A-D	Extractable	7/24/87	1600	180	470	330
18	A-E	Extractable	8/10/87	1000	460	180	150
19	A-D	Extractable	8/12/87	390	13	40	13
20	A-D	Extractable	8/16/87	13	77	14	21
21	A-D	Extractable	8/18/87	48	64	20	1.5
7	A-D	Extractable	8/19/87	61	42	6.1	15
12	A-D	Extractable	8/27/87	330	16	23	18
8 A-D, 9 A-D, 10 A-B		Extractable	8/28/87	73	59	31	31
13 A-D, 14 A-D, 15 A-B		Extractable	8/28/87	1.6	3.9	---	---
22 A-E, 23 A-D, 24 A-B		Extractable	8/28/87	16	24	13	9.1
Dirt Pile		Extractable	8/18/87	2800	N/A		
26	50' N. of 2A	Extractable	9/11/87	3.4	0.97	0.59	0.42

TABLE 2 - Extractable Copper Results from Core Samples Collected Outside Chemical Spill Sites in Milligrams per Liter.

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
5	E	Extractable	7/16/87	0.62	0.14	---	---
6	A-D	Extractable	7/21/87	24	2.9	2.9	5.4
11	A-D	Extractable	7/23/87	47	13	13	34
16	A-D	Extractable	7/24/87	69	8.4	15	18
17	A-D	Extractable	7/24/87	31	3.8	5.5	17
18	A-E	Extractable	8/10/87	62	100	100	180
19	A-D	Extractable	8/12/87	9.6	0.64	1.6	1.6
20	A-D	Extractable	8/16/87	1.1	1.5	0.59	3.8
21	A-D	Extractable	8/18/87	6.4	3.0	0.16	0.05
7	A-D	Extractable	8/19/87	1.6	1.6	0.34	0.43
12	A-D	Extractable	8/27/87	21	2.5	2.5	5.7
8 A-D, 9 A-D, 10 A-B		Extractable	8/28/87	1.5	2.0	0.77	2.1
13 A-D, 14 A-D, 15 A-B		Extractable	8/28/87	0.69	0.19	---	---
22 A-E, 23 A-D, 24 A-B		Extractable	8/28/87	5.0	1.9	2.5	1.5
Dirt Pile		Extractable	8/18/87	1.6	N/A		
26	50" N. of 2A	Extractable	9/11/87	0.13	0.12	0.02	0.02

TABLE 3 - Extractable Nickel Results from Core Samples Collected Outside Chemical Spill Sites in Milligrams per Liter.

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
5	E	Extractable	7/16/87	0.25	0.056	---	---
6	A-D	Extractable	7/21/87	1.3	0.58	0.70	1.4
11	A-D	Extractable	7/23/87	4.7	2.5	2.6	6.2
16	A-D	Extractable	7/24/87	4.5	0.39	1.3	1.3
17	A-D	Extractable	7/24/87	5.1	0.72	0.98	1.8
18	A-E	Extractable	8/10/87	2.7	1.4	0.86	0.89
19	A-D	Extractable	8/12/87	1.9	0.39	0.62	0.49
20	A-D	Extractable	8/16/87	0.61	0.68	0.38	0.54
21	A-D	Extractable	8/18/87	2.5	1.5	0.59	0.54
7	A-D	Extractable	8/19/87	0.69	0.47	0.14	0.16
12	A-D	Extractable	8/27/87	4.4	0.92	0.84	0.73
8 A-D, 9 A-D, 10 A-B		Extractable	8/28/87	0.51	0.39	0.32	0.30
13 A-D, 14 A-D, 15 A-B		Extractable	8/28/87	0.079	0.11	---	---
22 A-E, 23 A-D, 24 A-B		Extractable	8/28/87	3.1	12	2.7	1.4
Dirt Pile		Extractable	8/18/87	6.8	N/A		
26	50' N. of 2A	Extractable	9/11/87	0.29	0.17	0.03	0.11

TABLE 4 - Extractable Chromium Results from Core Samples Collected Outside Chemical Spill Sites in Milligrams per Liter

Quadrant	Section	Type	Date	Depth Interval (inches) 0-3	3-6	6-9	9-12
5	E	Extractable	7/16/87	<0.019	<0.017	---	---
6	A-D	Extractable	7/21/87	<0.019	<0.017	<0.02	<0.02
11	A-D	Extractable	7/23/87	0.037	<0.017	<0.02	<0.02
16	A-D	Extractable	7/24/87	0.037	<0.017	<0.02	<0.02
17	A-D	Extractable	7/24/87	0.019	<0.017	<0.02	<0.02
18	A-E	Extractable	8/10/87	<0.019	<0.033	<0.02	<0.02
19	A-D	Extractable	8/12/87	<0.019	<0.017	<0.02	<0.02
20	A-D	Extractable	8/16/87	<0.017	<0.017	<0.02	<0.02
21	A-D	Extractable	8/18/87	<0.017	<0.017	<0.02	<0.02
7	A-D	Extractable	8/19/87	<0.017	<0.017	<0.02	<0.02
12	A-D	Extractable	8/27/87	0.018	<0.017	<0.02	<0.02
8 A-D, 9 A-D, 10 A-B		Extractable	8/28/87	<0.017	<0.017	<0.02	<0.02
13 A-D, 14 A-D, 15 A-B		Extractable	8/28/87	<0.017	<0.017	---	---
22 A-E, 23 A-D, 24 A-B		Extractable	8/28/87	<0.017	<0.017	<0.02	<0.02
Dirt Pile		Extractable	8/18/87	<0.017	N/A		
26	50' N. of 2A	Extractable	9/11/87	<0.02	<0.02	<0.02	<0.02

TABLE 5 - Extractable Lead Results from Core Samples Collected Outside Chemical Spill Sites in Milligrams per Liter

Quadrant	Section	Type	Date	0-3	3-6	6-9	9-12
				Depth Interval(inches)			
5	B	Extractable	7/16/87	<0.05	<0.05	---	---
6	A-D	Extractable	7/21/87	8.2	0.5	0.21	0.088
11	A-D	Extractable	7/23/87	0.74	0.1	0.11	0.42
16	A-D	Extractable	7/24/87	3.1	0.2	0.21	0.84
17	A-D	Extractable	7/24/87	1.4	0.1	0.11	0.32
18	A-E	Extractable	8/10/87	3.6	3.1	2.3	4.9
19	A-D	Extractable	8/12/87	0.11	<0.05	<0.05	<0.05
20	A-D	Extractable	8/16/87	<0.05	<0.05	<0.05	<0.05
21	A-D	Extractable	8/18/87	<0.05	<0.05	<0.05	<0.05
7	A-D	Extractable	8/19/87	<0.05	<0.05	<0.05	<0.05
12	A-D	Extractable	8/27/87	0.4	<0.05	<0.05	<0.05
8 A-D, 9 A-D, 10 A-B		Extractable	8/28/87	<0.05	0.088	<0.05	<0.05
13 A-D, 14 A-D 15 A-B		Extractable	8/28/87	<0.05	<0.05	---	---
22 A-E, 23 A-D, 24 A-B		Extractable	8/28/87	<0.05	<0.05	<0.05	<0.05
Dirt Pile		Extractable	8/18/87	1.1	N/A		
26	50' N. of 2A	Extractable	9/11/87	<0.05	<0.05	<0.05	<0.05

TABLE 6 - Total Cyanide Results from Core Samples Collected Outside Chemical Spill Sites in Milligrams per Liter (Dry Weight)

Quadrant	Section	Type	Date	Depth Interval(inches) 0-3	3-6	6-9	9-12
5	B	Total	7/16/87	2.1	0.70	---	---
6	A	Total	7/21/87	3.8	3.8	2.2	2.4
6	B	Total	7/21/87	4.7	3.3	2.2	0.71
6	C	Total	7/21/87	28	11	31	20
6	D	Total	7/21/87	0.75	1.4	0.53	0.16
11	A	Total	7/23/87	1.5	2.4	2.0	0.74
11	B	Total	7/23/87	2.5	5.9	6.9	9.8
11	C	Total	7/23/87	20	27	6.9	7.7
11	D	Total	7/23/87	26	2.8	0.38	2.0
16	A	Total	7/24/87	3.2	0.40	0.79	0.36
16	B	Total	7/24/87	2.5	0.98	1.7	0.76
16	C	Total	7/24/87	4.9	0.34	1.1	1.2
16	D	Total	7/24/87	1.5	0.77	0.51	0.39
17	A	Total	7/24/87	6.3	0.54	0.38	<0.15
17	B	Total	7/24/87	13	1.3	1.1	3.2
17	C	Total	8/08/87	57	8.2	4.7	0.51
17	D	Total	8/08/87	16	1.5	6.3	3.2
18	A	Total	8/10/87	0.38	0.77	0.38	0.37
18	B	Total	8/10/87	5.0	0.53	0.17	<0.14
18	C	Total	8/10/87	1.1	0.52	0.96	0.51
18	D	Total	8/10/87	3.9	1.5	2.0	1.5
18	E	Total	8/10/87	17	5.3	3.4	0.52
19	A	Total	8/12/87	7.0	4.5	0.51	0.16
19	B	Total	8/12/87	7.7	27	5.3	4.0

TABLE 6 - Total Cyanide Results from Core Samples Collected Outside Chemical Spill Sites in Milligrams per Liter (Dry Weight) (Continued)

Quadrant	Section	Type	Date	Depth Interval (inches) 0-3	3-6	6-9	9-12
19	C	Total	8/12/87	7.8	2.5	8.4	1.1
19	D	Total	8/12/87	6.7	2.7	1.9	4.4
20	A	Total	8/16/87	2.3	0.62	<0.13	0.54
20	B	Total	8/16/87	3.6	8.4	3.9	3.8
20	C	Total	8/18/87	4.8	1.5	0.37	0.26
20	D	Total	8/18/87	4.4	0.52	3.3	1.2
21	A	Total	8/18/87	6.0	1.5	2.4	<0.15
21	B	Total	8/18/87	1.4	0.36	<0.13	<0.13
21	C	Total	8/18/87	5.6	12	2.0	<0.14
21	D	Total	8/18/87	3.1	15	<0.13	<0.15
7	A	Total	8/19/87	10	11	0.53	<0.14
7	B	Total	8/19/87	29	12	1.1	<0.15
7	C	Total	8/19/87	9.2	4.9	1.4	<0.14
7	D	Total	8/19/87	3.2	3.4	1.9	0.79
12	A	Total	8/19/87	3.7	2.2	4.3	2.4
12	B	Total	8/19/87	3.6	1.1	2.0	<0.13
12	C	Total	8/27/87	120	18	0.54	0.27
12	D	Total	8/27/87	7.8	3.5	19	0.15
8 A,D 9 A,D 10 A		Total	8/28/87	9.7	2.8	4.6	1.3
8 B,C 9 B,C 10 B		Total	8/28/87	0.52	<0.12	<0.13	0.16
13 A,D 14 A,D 15 A		Total	8/28/87	0.90	<0.13	---	---
13 B,C 14 B,C 15 B		Total	8/28/87	<0.14	2.7	---	---
22 A,D 23 A,D 24 A		Total	8/28/87	12	21	24	4.3
22 B,C,E 23 B,C 24 B		Total	8/28/87	12	1.4	0.77	2.7
Dirt Pile		Total	8/18/87	18	N/A		
26	50' N. of 2A	Total	9/11/87	1.9	0.18	0.17	0.18

TABLE 7 - Total pH Results from Core Samples Collected Outside Chemical Spill Sites in Standard Units

				Depth Interval(inches)			
Quadrant	Section	Type	Date	0-3	3-6	6-9	9-12
5	B	Total	7/16/87	6.4	6.6	---	---
6	A	Total	7/21/87	6.9	6.9	6.4	6.6
6	D	Total	7/21/87	6.5	6.8	6.4	6.3
6	C	Total	7/21/87	6.9	7.3	6.7	6.7
6	D	Total	7/21/87	6.3	6.0	5.4	5.6
11	A	Total	7/23/87	6.5	6.0	6.6	7.1
11	B	Total	7/23/87	5.9	5.7	6.0	7.2
11	C	Total	7/23/87	6.7	6.3	6.5	7.0
11	D	Total	7/23/87	6.8	6.8	7.2	7.2
16	A	Total	7/24/87	6.8	6.9	6.8	6.8
16	B	Total	7/24/87	7.7	8.4	7.0	7.6
16	C	Total	7/24/87	7.5	7.8	7.5	7.7
16	D	Total	7/24/87	7.0	6.6	6.4	5.7
17	A	Total	7/24/87	6.3	5.9	5.4	5.2
17	B	Total	7/24/87	7.2	7.1	7.0	6.3
17	C	Total	8/08/87	7.1	5.8	5.8	6.0
17	D	Total	8/08/87	7.1	6.5	6.4	5.4
18	A	Total	8/10/87	7.9	7.9	7.9	7.8
18	B	Total	8/10/87	7.6	7.3	7.5	7.3
18	C	Total	8/10/87	6.8	6.0	5.6	5.3
18	D	Total	8/10/87	7.8	7.8	7.9	7.3
18	E	Total	8/10/87	7.9	7.8	8.1	7.9
19	A	Total	8/12/87	6.8	6.6	6.4	5.7
19	B	Total	8/12/87	6.8	6.6	7.1	7.2

TABLE 7 - Total pH Results from Core Samples Collected Outside Chemical Spill Sites in Standard Units

Quadrant	Section	Type	Date	0-3	Depth Interval (inches) 3-6	6-9	9-12
19	C	Total	8/12/87	6.3	6.6	7.1	6.7
19	D	Total	8/12/87	7.7	6.2	6.4	5.0
20	A	Total	8/16/87	6.2	6.2	6.0	5.5
20	B	Total	8/16/87	7.0	6.0	6.2	5.9
20	C	Total	8/18/87	5.6	5.3	5.4	4.9
20	D	Total	8/18/87	6.6	6.1	6.3	6.9
21	A	Total	8/18/87	6.5	5.6	5.6	4.8
21	B	Total	8/18/87	4.8	5.0	5.2	4.8
21	C	Total	8/18/87	5.7	5.2	5.2	4.9
21	D.	Total	8/18/87	5.0	5.1	5.2	4.9
7	A	Total	8/19/87	6.1	6.2	6.2	6.3
7	B	Total	8/19/87	6.8	6.6	6.3	5.4
7	C	Total	8/19/87	6.0	5.9	6.1	5.7
7	D	Total	8/19/87	5.7	5.7	6.4	5.9
12	A	Total	8/19/87	6.6	6.9	7.4	7.2
12	B	Total	8/19/87	6.8	6.9	7.6	7.2
12	C	Total	8/27/87	7.0	7.1	7.6	7.3
12	D	Total	8/27/87	7.0	7.1	6.9	6.4
8 A,D 9 A,D 10 A		Total	8/28/87	7.3	7.9	7.7	7.4
8 B,C 9 B,C 10 B		Total	8/28/87	4.6	5.2	5.5	4.9
13 A,D 14 A,D 15 A		Total	8/28/87	4.9	4.8	---	---
13 B,C 14 B,C 15 B		Total	8/28/87	5.7	5.8	--	---
22 A,D 23 A,D 24 A		Total	8/28/87	5.3	5.5	5.6	5.3
22 B,C,E 23 B,C 24 B		Total	8/28/87	5.3	5.2	5.7	5.3
Dirt Pile		Total	8/18/87	6.6	N/A		
26 50' N. of 2A		Total	9/11/87	6.2	6.0	6.0	6.0

Table 1. Results of Partial Hazardous Substance List Metals and Cyanide Analyses of Soil Samples Collected at Ilco-Unican's Facility in Winston-Salem, N.C. on 1-15-92, 1-16-92, and 1-21-92.

Sample ID	FB-1A	FB-1B	OB-2A	OB-2B	RS-1A	RS-1B	RS-4A
Depth in inches	0-6	18-24	0-6	18-24	0-6	18-24	0-6
Constituent - mg/kg dw*							
(USEPA Method in Parentheses)							
Antimony(6010)	<52*F65	<5.6	<5.7	6.6	<5.9	<5.2	<140*F65
Arsenic(7060)	3.2	8.0	9.4	4.2	4.9	1.1	16
Barium(6010)	25	48	60	18	19	73	230
Beryllium(6010)	<0.52	<0.56	<0.57	<0.62	<0.59	<0.52	<0.57
Cadmium(6010)	3.7	0.91	2.5	1.4	2.2	0.84	33
Chromium(6010)	9.1	5.5	64	21	21	4.2	390
Cobalt(6010)	4.1	1.5	3.5	1.5	<1.2	38	14
Copper(6010)	19000	82	1900	10	27	29	31000
Lead(7421)	1000	64	120	22	14	110	1500
Mercury(7471)	0.031	0.033	0.039	0.073	0.079	0.031	0.26
Nickel(6010)	81	7.6	59	<4.9	33	35	2900
Selenium(7740)	<1.1	<1.1	<1.2	<1.1	<1.2	<1.0	<1.1
Silver(6010)	4.0	<1.1	<1.1	<1.2	<1.2	<5.2*F65	25
Thallium(7841)	<1.1	<1.1	<1.2	<1.1	<1.2	<1.0	<1.1
Vanadium(6010)	11	9.3	22	55	36	8.8	12
Zinc(6010)	7200	380	4800	170	1.3	52	63000
Cyanide(9010)	<1.1	<1.2	<1.2	<1.3	<1.2	<1.1	98

* - Milligrams per kilogram on a dry-weight basis.

** - Milligrams per liter.

*F65 - Elevated detection limits were reported due to sample matrix interference which required sample dilution prior to analysis.

NA - Sample was not analyzed for this constituent.

Table 1. Results of Partial Hazardous Substance List Metals and Cyanide Analyses of Soil Samples Collected at Ilco-Unican's Facility in Winston-Salem, N.C. on 1-15-92, 1-16-92, and 1-21-92.

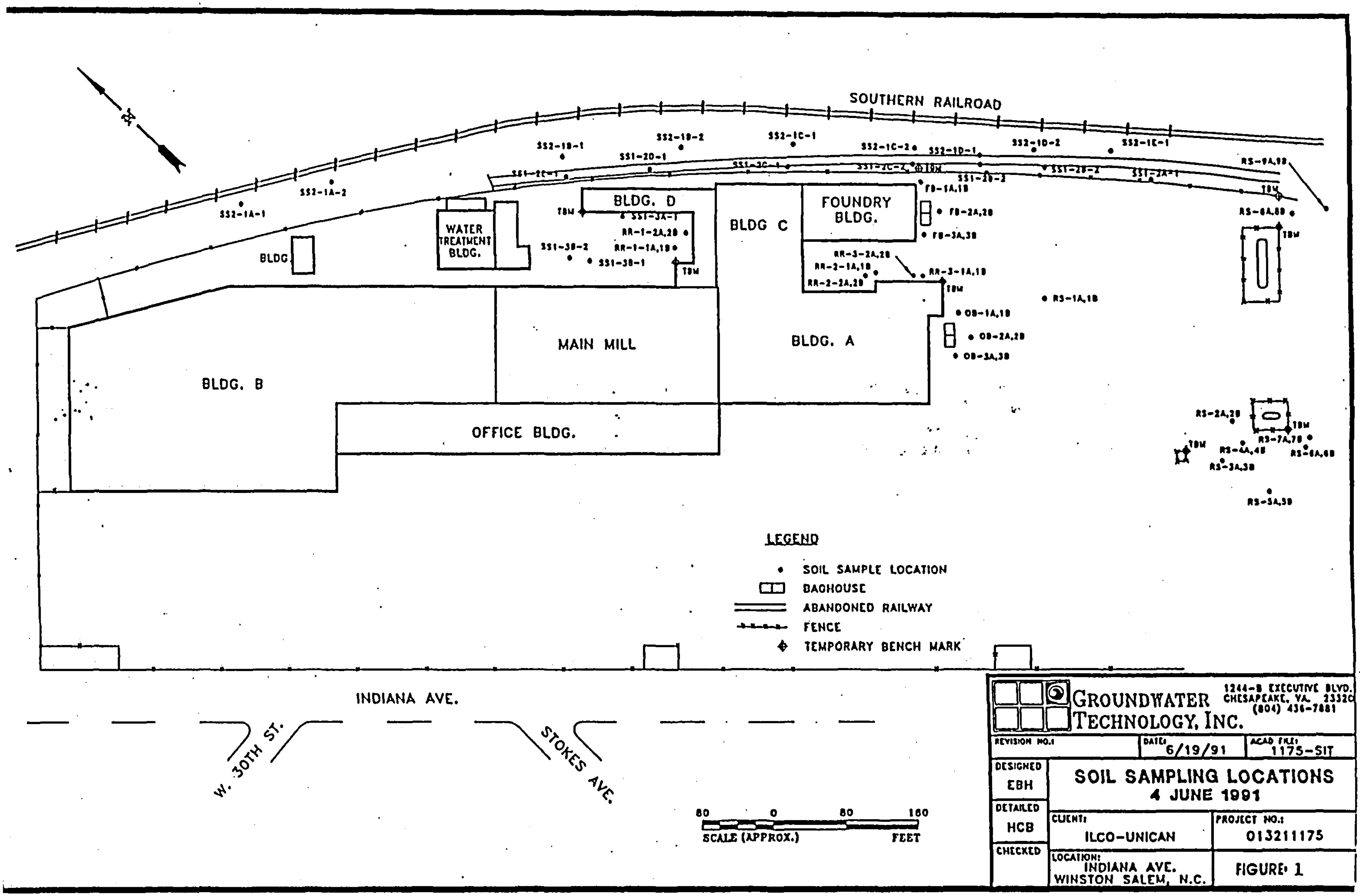
Sample ID	RS-4B	RS-7A	RS-7B	RS-8A	RS-8B	D-1	D-2
Depth in inches	18-24	0-6	18-24	0-6	18-24	0-6	0-6
Constituent - mg/kg dw* (USEPA Method in Parentheses)							
Antimony(6010)	<5.8	38	7.2	<28*F65	<5.6	<5.6	<6.0
Arsenic(7060)	<1.2	9.3	5.7	30	12	<1.1	<1.2
Barium(6010)	160	19	120	25	6.4	24	33
Beryllium(6010)	1.2	<0.63	0.80	<1.5*F65	1.2	<0.56	<0.60
Cadmium(6010)	3.1	7.0	3.1	<2.8*F65	<0.56	<0.56	1.0
Chromium(6010)	65	2100	94	41	9.8	8.1	8.8
Cobalt(6010)	13	24	15	13	2.6	<1.1	1.4
Copper(6010)	1100	37000	3000	390	81	150	610
Lead(7421)	85	250	150	79	47	8.5	10
Mercury(7471)	0.044	0.13	0.068	0.033	0.023	<0.011	0.016
Nickel(6010)	41	3600	770	130	56.0	8.2	190
Selenium(7740)	<1.2	4.7	<1.1	<1.1	<1.0	<1.1	<1.2
Silver(6010)	1.9	2.6	<1.2	<1.1	<1.1	<1.1	<1.2
Thallium(7841)	<1.2	<1.3	<1.1	<1.1	<1.0	<1.1	<1.2
Vanadium(6010)	58	27	41	25	23	7.2	9.0
Zinc(6010)	1400	24000	4800	900	410	140	86
Cyanide(9010)	<1.2	520	11	5.1	<1.1	8.6	<1.2

* - Milligrams per kilogram on a dry-weight basis.

** - Milligrams per liter.

*F65 - Elevated detection limits were reported due to sample matrix interference which required sample dilution prior to analysis.

NA - Sample was not analyzed for this constituent.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BLDG. B
MAIN MILL
OFFICE BLDG.
BLDG. A
BLDG C
BLDG. D
FOUNDRY BLDG.
WATER TREATMENT BLDG.
BLDG.
INDIANA AVE.
W. 30TH ST.
STOKES AVE.
LEGEND
SOIL SAMPLE LOCATION
BAGHOUSE
ABANDONED RAILWAY
FENCE
TEMPORARY BENCH MARK
80 0 80 160
SCALE (APPROX.) FEET
GROUNDWATER TECHNOLOGY, INC.
1244-B EXECUTIVE BLVD. CHESAPEAKE, VA. 23320 (804) 436-7881
REVISION NO.:
DATE: 6/19/91
ACAD FILE: 1175-SIT
DESIGNED EBH
DETAILED HCB
CHECKED
SOIL SAMPLING LOCATIONS
4 JUNE 1991
CLIENT: ILCO-UNICAN
PROJECT NO.: 013211175
LOCATION: INDIANA AVE. WINSTON SALEM, N.C.
FIGURE 1

Table 1. Results of Partial Hazardous Substance List Metals and Cyanide Analyses of Soil Samples Collected at Ilco-Unican Facility in Winston-Salem, N.C. on 1-15-92, 1-16-92, and 1-21-92.

Sample ID Depth in inches	BG-1 0-6	BG-2 0-6	BG-3 0-6	Average of selected BG constituents	RB-1/RB-2 Rinsate Blanks	FB-1/FB-2 Field Blanks
Constituent - mg/kg dw*					Liquid Samples - mg/l**	
(USEPA Method in Parentheses)						
Antimony(6010)	<6.1	<6.1	<6.0		<0.050	<0.050
Arsenic(7060)	4.6	3.4	6.6		<0.010	<0.010
Barium(6010)	29	55	62		<0.010	<0.010
Beryllium(6010)	<0.61	<0.61	<0.60		<0.0050	<0.0050
Cadmium(6010)	0.72	1.1	1.5		<0.0050	<0.0050
Chromium(6010)	14	20	16	16.7	<0.010	<0.010
Cobalt(6010)	3.8	9.6	5.5		<0.010	<0.010
Copper(6010)	36	500	310	282	<0.025	<0.025
Lead(7421)	53	250	120	141	<0.0050	<0.0050
Mercury(7471)	0.028	0.046	0.060		<0.00020	<0.00020
Nickel(6010)	7.6	22	25	18.2	<0.040	<0.040
Selenium(7740)	<1.1	<1.2	<1.1		<0.010	<0.010
Silver(6010)	<1.2	<1.2	<1.2		<0.010	<0.010
Thallium(7841)	<1.1	<1.2	<1.1		<0.010	<0.010
Vanadium(6010)	30	41	27		<0.010	<0.010
Zinc(6010)	110	560	1100	590	<0.020	<0.020
Cyanide(9010)	<1.2	<1.3	<1.2		NA	NA

* - Milligrams per kilogram on a dry-weight basis.

** - Milligrams per liter.

*F65 - Elevated detection limits were reported due to sample matrix interference which required sample dilution prior to analysis.

NA - Sample was not analyzed for this constituent.

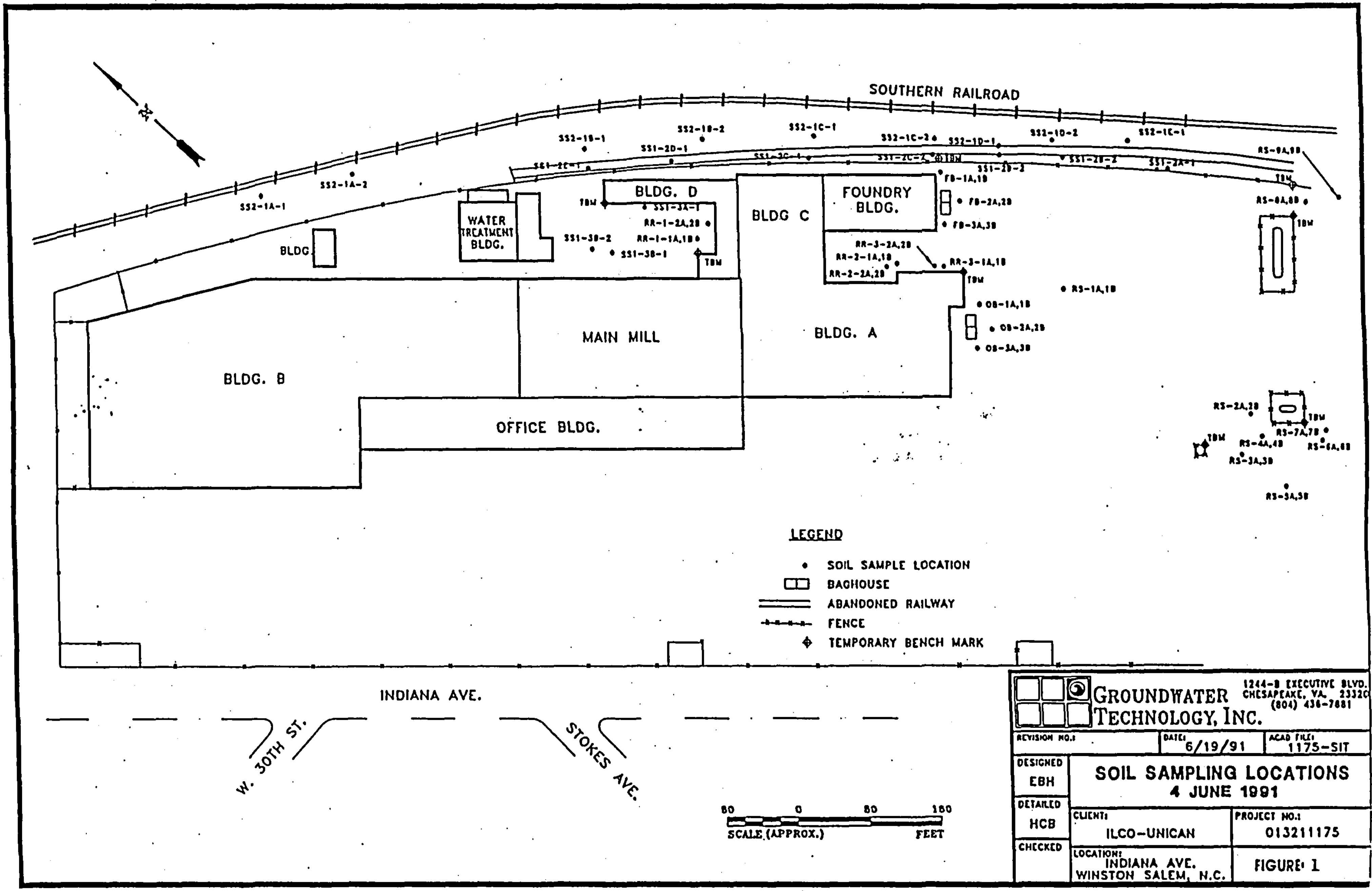

SOUTHERN RAILROAD
SS2-1A-1
SS2-1A-2
SS2-1B-1
SS2-1B-2
SS2-1C-1
SS2-1C-2
SS2-1D-1
SS2-1D-2
SS2-1E-1
SS1-2D-1
SS1-2B-2
SS1-2A-1
SS1-3A-1
SS1-3B-1
SS1-3B-2
RR-1-1A,1B
RR-1-2A,2B
RR-2-1A,1B
RR-2-2A,2B
RR-3-1A,1B
RR-3-2A,2B
FB-1A,1B
FB-2A,2B
FB-3A,3B
OB-1A,1B
OB-2A,2B
OB-3A,3B
RS-1A,1B
RS-2A,2B
TBM
BLDG.
WATER TREATMENT BLDG.
BLDG. D
BLDG C
FOUNDRY BLDG.
MAIN MILL
BLDG. A
BLDG. B
OFFICE BLDG.
LEGEND
SOIL SAMPLE LOCATION
BAGHOUSE
ABANDONED RAILWAY
FENCE
TEMPORARY BENCH MARK
INDIANA AVE.
W. 30TH ST.
STOKES AVE.
80 0 80 160
SCALE (APPROX.) FEET
GROUNDWATER TECHNOLOGY, INC.
1244-B EXECUTIVE BLVD.
CHESAPEAKE, VA. 23320
(804) 436-7681
REVISION NO.:
DATE: 6/19/91
ACAD FILE: 1175-SIT
DESIGNED EBH
DETAILED HCB
CHECKED
SOIL SAMPLING LOCATIONS
4 JUNE 1991
CLIENT: ILCO-UNICAN
PROJECT NO.: 013211175
LOCATION: INDIANA AVE. WINSTON SALEM, N.C.
FIGURE: 1

TABLE 8 - Total Solids Results from Core Samples Collected Outside Chemical Spill Sites Percent (%)

Quadrant	Section	Type	Date	0-3	Depth Interval(inches) 3-6	6-9	9-12
5	E	Total	7/16/87	86	94	---	---
6	A	Total	7/21/87	92	90	89	89
6	B	Total	7/21/87	91	92	90	90
6	C	Total	7/21/87	91	87	85	84
6	D	Total	7/21/87	93	91	88	88
11	A	Total	7/23/87	93	91	88	89
11	B	Total	7/23/87	91	89	88	87
11	C	Total	7/23/87	91	86	91	94
11	D	Total	7/23/87	91	90	91	89
16	A	Total	7/24/87	86	83	86	90
16	B	Total	7/24/87	93	91	89	89
16	C	Total	7/24/87	94	95	89	90
16	D	Total	7/24/87	88	87	89	89
17	A	Total	7/24/87	92	88	85	82
17	B	Total	7/24/87	93	91	91	92
17	C	Total	8/08/87	89	88	88	85
17	D	Total	8/08/87	88	89	92	89
18	A	Total	8/10/87	90	86	91	93
18	B	Total	8/10/87	90	93	88	87
18	C	Total	8/10/87	89	92	87	86
18	D	Total	8/10/87	90	88	87	90
18	E	Total	8/10/87	90	79	85	89
19	A	Total	8/12/87	91	93	94	90
19	B	Total	8/12/87	89	99	94	92

TABLE 8 - Total Solids Results from Core Samples Collected Outside Chemical Spill Sites in Percent (%) Continued)

Quadrant	Section	Type	Date	Depth Interval (inches) 0-3	3-6	6-9	9-12
19	C	Total	8/12/87	88	90	91	89
19	D	Total	8/12/87	91	98	91	93
20	A	Total	8/16/87	87	95	93	90
20	B	Total	8/16/87	81	88	91	91
20	C	Total	8/18/87	91	89	89	92
20	D	Total	8/18/87	91	91	92	92
21	A	Total	8/18/87	92	94	85	82
21	B	Total	8/18/87	97	91	90	91
21	C	Total	8/18/87	93	91	88	90
21	D	Total	8/18/87	93	89	84	81
7	A	Total	8/19/87	92	90	91	89
7	B	Total	8/19/87	84	82	83	84
7	C	Total	8/19/87	91	86	87	85
7	D	Total	8/19/87	93	90	87	87
12	A	Total	8/19/87	91	90	90	91
12	B	Total	8/27/87	93	94	90	90
12	C	Total	8/27/87	86	90	91	88
12	D	Total	8/27/87	92	92	92	91
8 A,D 9 A,D 10 A		Total	8/28/87	93	92	92	90
8 B,C 9 B,C 10 B		Total	8/28/87	95	93	91	87
13 A,D 14 A,D 15 A		Total	8/28/87	94	93	---	---
13 B,C 14 B,C 15 B		Total	8/28/87	90	95	---	---
22 A,D 23 A,D 24 A		Total	8/28/87	91	86	86	87
22 B,C,E 23 B,C 24 B		Total	8/28/87	92	91	90	92
Dirt Pile		Total	8/18/87	91	N/A		
26	50' N. of 2A	Total	9/11/87	83	83	82	82

Appendix B.3

**Post-Excavation Soil Sampling/Analysis;
Spill Sites #1 and #2;
from Research and Analytical Laboratories, Inc. (1988a)**

TABLE I - Remedial Sampling for Selected Parameters at Chemical Spill Site 1
Bassick-Sack, Winston-Salem, North Carolina (February 2-9, 1988)

Source	Zinc (mg/l)	Copper (mg/l)	Nickel (mg/l)	Chromium (mg/l)	Lead (mg/l)	Cyanide (mg/l)
$3A_1$	35.7	3.7	0.833	0.016	<0.110	0.068
$3A_2$	41.3	2.43	0.722	0.016	<0.110	0.164
$3A_3$	40.8	4.26	0.806	0.016	<0.110	0.055
AVG.	39.3	3.46	0.787	0.016	<0.110	0.091
$3B_1$	1.73	0.85	0.65	<0.017	<0.110	0.936
$3B_2$	9.40	1.4	1.60	<0.017	<0.110	0.936
$3B_3$	8.60	1.2	1.30	<0.017	<0.110	0.816
AVG.	6.58	1.15	1.18	<0.017	<0.110	0.896
$2A_1$	10.9	0.19	0.240	<0.017	<0.110	<0.005
$2A_2$	15.2	0.93	0.320	<0.017	<0.110	<0.005
$2A_3$	15.6	0.73	0.320	<0.017	<0.110	<0.005
AVG.	13.9	0.62	0.293	<0.017	<0.110	<0.005
$2B_1$	15.7	0.13	0.240	<0.017	<0.110	<0.005
$2B_2$	53.2	2.1	0.470	<0.017	<0.110	<0.005
$2B_3$	59.6	2.96	0.440	<0.017	<0.110	<0.005
AVG.	42.83	1.73	0.383	<0.017	<0.110	
$2C_1$	62.9	2.9	0.320	<0.017	<0.110	<0.005
$2C_2$	78.3	7.5	0.410	<0.017	<0.110	<0.005
$2C_3$	149	14.7	0.590	<0.017	<0.110	<0.005
AVG.	96.73	8.37	0.44	<0.017	<0.110	<0.005
$2D_1$	34.9	0.73	0.440	<0.017	<0.110	<0.005
$2D_2$	80.0	7.1	0.650	<0.017	<0.110	<0.005
$2D_3$	78.3	6.9	0.650	<0.017	<0.110	<0.005
AVG	64.4	4.91	0.58	<0.017	<0.110	<0.005
$2E_1$	18.4	0.96	2.0	<0.017	<0.110	<0.005
$2E_2$	33.6	5.0	2.0	<0.017	<0.110	<0.005
$2E_3$	40.0	7.1	3.1	<0.017	<0.110	<0.005
AVG.	30.67	4.35	2.37	<0.017	<0.110	<0.005

From RAL (3/88)
"Remedial Sampling"

TABLE II - Remedial Sampling for Selected Parameters at Chemical Spill Site 2 Bassick-Sack, Winston-Salem, North Carolina (January 28, 1988)

Source	Zinc (mg/l)	Copper (mg/l)	Nickel (mg/l)	Chromium (mg/l)	Lead (mg/l)	Cyanide (mg/l)
$1A_1$	5.2	0.982	0.556	<0.017	<0.110	<0.005
$1A_2$	8.4	0.91	1.08	<0.017	<0.110	<0.005
$1A_3$	8.63	0.37	1.03	<0.017	<0.110	<0.005
AVG.	7.41	0.754	0.889	<0.017	<0.110	<0.005
$1B_1$	57.8	4.6	2.67	<0.017	<0.110	<0.005
$1B_2$	38.7	2.0	1.58	<0.017	<0.110	<0.005
$1B_3$	22.0	0.65	1.19	<0.017	<0.110	<0.005
AVG.	39.5	2.42	1.81	<0.017	<0.110	<0.005
$1C_1$	29.8	1.86	1.89	<0.017	<0.110	<0.005
$1C_2$	15.2	0.65	1.0	<0.017	<0.110	<0.005
$1C_3$	10.0	0.44	0.47	<0.017	<0.110	<0.005
AVG.	18.3	0.983	1.12	<0.017	<0.110	<0.005
$1D_1$	20.8	3.12	2.05	<0.017	0.110	<0.005
$1D_2$	21.2	3.08	1.97	<0.017	0.110	<0.005
$1D_3$	15.6	1.57	1.27	<0.017	0.110	<0.005
AVG.	19.2	2.59	1.76	<0.017	0.110	<0.005
$1E_1$	9.3	0.89	0.64	0.017	<0.110	<0.005
$1E_2$	3.83	0.16	0.33	<0.017	<0.110	<0.005
$1E_3$	4.45	0.13	0.44	<0.017	<0.110	<0.005
AVG.	5.86	0.393	0.47	<0.017	<0.110	<0.005

TABLE III - RCRA Analyses of Backfill Soil for Selected Parameters for Chemical Spill Sites I and II at Bassick-Sack, Winston-Salem, North Carolina (February 11, 1988)

Parameter	Concentration (mg/l)
Zinc	0.124
Copper	0.019
Nickel	0.029
Chromium	<0.017
Cyanide	<0.125

TABLE IV - Remedial Sampling for Extractable Cyanide at Chemical Spill Site 1, Quadrant 3, Section B, Bassick-Sack, Winston-Salem, North Carolina (February 22, 1988)

Source	Cyanide(mg/l)
$3B_1$	0.16
$3B_2$	0.18
$3B_3$	0.17

Appendix B.4

Soil Sampling/Analysis in Disposal Test Pits; from Research and Analytical Laboratories, Inc. (1988b)

TABLE 1 - RCRA and Priority Pollutant Organic Analyses for Selected Parameters at Drum Pit 1 (Quadrant 21), Bassick-Sack, Winston-Salem, North, Carolina (January 29, 1988)

Parameter	Type	Unit	Pit #1 Concentration	Drum #1 Concentration
Zinc	RCRA	mg/l	41.3	89.7
Copper	RCRA	mg/l	6.96	12.4
Nickel	RCRA	mg/l	0.111	0.611
Chromium	RCRA	mg/l	<0.016	<0.016
Lead	RCRA	mg/l	0.3	0.3
Mercury	RCRA	mg/l	0.0004	0.0006
Arsenic	RCRA	mg/l	<0.011	<0.011
Selenium	RCRA	mg/l	<0.003	<0.003
Barium	RCRA	mg/l	0.286	0.857
Silver	RCRA	mg/l	<0.013	<0.013
Cadmium	RCRA	mg/l	0.022	0.037
Cyanide	Extractable	mg/l	<0.005	<0.005
Cyanide	RCRA	mg/kg	4.14	7.72
Sulfide	RCRA	mg/kg	<2.0	<2.0
Flash Point	RCRA	°F	>140	>140
Corrosivity	RCRA	pH Std. Units	8.2	8.6
Benzene	VOA*	µg/kg	31	7.0
Chloroform	VOA	µg/kg	12	4.0
Tetrachloroethene	VOA	µg/kg	35	13
Toluene	VOA	µg/kg	107	12
1,1,2-trichloroethene	VOA	µg/kg	BDL(<5)	9
Napthalene	BNA**	µg/kg	22	BDL(<5)
Pyrene	BNA	µg/kg	28	31
Bis(2-ethylhexyl)phthalate	BNA	µg/kg	BDL(<5)	47
BTU			WNB***	WNB
% Moisture		%	17.93	14.03
% Solvents		%	<0.1	<0.1

* VOA = Volatile Organic Analyses
** BNA = Base Neutral, Acid Extractable
*** WNB = Would Not Bomb

From HAL (3/88)
"Progress Rept ... Pit Area"

TABLE 2 - RCRA and Volatile Organic Analysis for Selected Parameters at Drum Pit 2 (Quadrant 16), Bassick-Sack, Winston-Salem, North Carolina (February 9, 1988)

Parameter	Type	Unit	Concentration
Zinc	RCRA	mg/l	96.9
Copper	RCRA	mg/l	1.49
Nickel	RCRA	mg/l	1.6
Chromium	RCRA	mg/l	<0.015
Lead	RCRA	mg/l	<0.1
Arsenic	RCRA	mg/l	<0.011
Selenium	RCRA	mg/l	<0.003
Barium	RCRA	mg/l	0.714
Silver	RCRA	mg/l	<0.13
Cadmium	RCRA	mg/l	0.083
Cyanide	Extractable	mg/l	<0.005
Cyanide	RCRA	mg/kg	9.64
Sulfide	RCRA	mg/kg	14.4
Ethyl benzene	VOA	µg/kg	1,500
Toluene	VOA	µg/kg	15,000
Trichloroethene	VOA	µg/kg	790
T. Xylenes	VOA	µg/kg	8,600
Flash Point	RCRA	°F	>140
Corrosivity	RCRA	pH Std. Units	6.1
BTU*			WNB**
% Moisture		%	16.23
% Solvents		%	<0.1

* BTU = British Thermal Units

** WNB = Would Not Bomb

Appendix B.5

Post-Excavation Soil Sampling/Analysis in Pits A, B, and C; from Research and Analytical Laboratories, Inc. (1988c)

2.0 Areas's A-C - Excavation and Sampling Verification

A map showing Area A-C in relationship to Chemical Spill Sites 1 and 2 is provided in the insert pocket of this report. Excavation of drums, metal debris, crucibles, and contaminated soils, etc. were completed in July 1988. Three (3) zones of contamination were identified in this area and were identified as Pit A, B, and C. Soil samples were collected and composited from each pit after excavation showed no visible signs of soil discoloration. Soil samples were collected from the bottom and sidewalls of each pit in order to assess the vertical and horizontal extent of any residual contamination. Excavation continued after initial sampling if volatile organics (VOA) were still presentand/or if RCRA copper, nickel, zinc, chromium, or cyanide showed significantly high concentrations. Tables 1 and 2 show the VOA and RCRA results for Pits A, B, and C during excavation. Table 3 identified the contaminated stock pile with respect to RCRA and VOA tests. Table 4 represents backfill analyses to verify that fill material was not contaminated.

Results of soil analysis from each pit was submitted to Mr. Brad DeVore who in turn reported this information to the North Carolina Solid and Hazardous Waste Section for approval to commence backfilling. The same procedure was followed for Chemical Spill Sites 1 and 2 which has been reported in the <u>Remedial Sampling and Analyses at Chemical Spill Sites 1 and 2, January 28, 1988 - February 22, 1988</u>

From RAL (9/88)
"Final report... A, B, C

TABLE 1 - RCRA and Volatile Organic Analyses for Selected Parameters at Area's A-C (Pit A, B, and C) on June 29, 1988 (Bassick-Sack, Winston-Salem, North Carolina)

Parameter	Type	Unit	Pit A	Pit B	Pit C
Chromium	RCRA	mg/l	<0.017	<0.017	<0.017
Copper	RCRA	mg/l	1.77	5.32	76
Nickel	RCRA	mg/l	0.47	0.529	1.32
Zinc	RCRA	mg/l	37.3	192	283
Cyanide	RCRA	mg/l	3.51	2.24	3.49
Cyanide	Extractable	mg/l	<0.005	<0.005	<0.005
Sulfide	RCRA	mg/l	<2.56	<2.88	<2.8
Lead	RCRA	mg/l	<0.10	<0.10	2.0
Corrosivity	RCRA	Std. Units	6.6	6.6	7.6
Flash Point	RCRA	°F	>140	>140	>140
VOA	VOA	µg/kg	<20*	<20*	**

*All volatile organics (Method 624) were reported less than 20 µg/kg

** Trichloroethene = 70 µg/kg

Tetrachloroethene = 203 µg/kg

All other VOA = < 20 µg/kg

TABLE 2 - RCRA and Volatile Organic Analyses for Selected Parameters at Area's A-C (Pit A,B,C) on July 7, 1988 (Bassick-Sack, Winston-Salem, North Carolina)

Parameter	Type	Unit	Pit A	Pit B	Pit C
Arsenic	RCRA	mg/l	<0.010	<0.010	<0.010
Barium	RCRA	mg/l	0.30	0.30	0.2
Cadmium	RCRA	mg/l	0.008	0.032	0.008
Chromium	RCRA	mg/l	<0.020	<0.020	0.04
Lead	RCRA	mg/l	<0.120	<0.120	<0.120
Mercury	RCRA	mg/l	<0.0002	<0.0002	<0.0002
Selenium	RCRA	mg/l	<0.002	<0.002	<0.002
Silver	RCRA	mg/l	<0.016	<0.016	<0.016
Cyanide	RCRA	mg/l	2.8	9.0	2.6
Cyanide	Extractable	mg/l	<0.005	<0.005	<0.005
VOA	VOA	µg/kg	*<20	*<20	*<20
Zinc	RCRA	mg/l	---	136	77
Nickel	RCRA	mg/l	---	0.47	0.47
Copper	RCRA	mg/l	---	4.7	9.2

*All volatile organics (Method 624) were reported less than 20 µg/kg

TABLE 3 - RCRA and Volatile Organic Analysis of Stock Pile from Area's A-C (Pit A, B, C) on July 8, 1988 (Bassick-Sack, Winston-Salem, North Carolina)

Parameter	Type	Unit	Concentration
Arsenic	RCRA	mg/l	<0.010
Barium	RCRA	mg/l	0.9
Cadmium	RCRA	mg/l	0.22
Chromium	RCRA	mg/l	<0.020
Lead	RCRA	mg/l	<0.120
Mercury	RCRA	mg/l	<0.0002
Selenium	RCRA	mg/l	<0.002
Silver	RCRA	mg/l	<0.016
Flash Point	RCRA	°F	>140
Corrosivity	RCRA	mg/l	6.6
Sulfide	RCRA	mg/l	<0.40
Cyanide	Estractable	mg/l	<0.025
VOA	VOA	µg/kg	*

* Trichloroethene = 78 µg/kg

Tetrachloroethene = 120 µg/kg

All other VOAs = <20 µg/kg

TABLE 4 - Backfill Analyses for Selected Parameters from Samples Collected on July 14, 1988 (Bassick-Sack, Winston-Salem, North Carolina)

Parameter	Type	Units	Concentration
Arsenic	RCRA	mg/l	<0.005
Barium	RCRA	mg/l	<0.083
Cadmium	RCRA	mg/l	0.008
Chromium	RCRA	mg/l	<0.010
Lead	RCRA	mg/l	<0.12
Mercury	RCRA	mg/l	<0.0002
Selenium	RCRA	mg/l	<0.002
Silver	RCRA	mg/l	<0.016
Copper	RCRA	mg/l	<0.02
Nickel	RCRA	mg/l	0.176
Zinc	RCRA	mg/l	0.021
Flash Point	RCRA	°F	>140
Sulfide	RCRA	mg/l	<0.4
Cyanide	RCRA	mg/kg	<0.039
Corrosivity	RCRA	Std. Units	4.6
Chromium	Total	mg/kg	23
Copper	Total	mg/kg	20
Lead	Total	mg/kg	12
Nickel	Total	mg/kg	25
Zinc	Total	mg/kg	80
VOA	VOA	µg/kg	*<20

*All volatile organics (Method 624) were reported less than 20 µg/kg

Appendix B.6

Confirmational Soil Sampling/Analysis in Pits A, B, C, and Dust Sampling/Analysis; from Roy F. Weston, Inc. (1990)

CONFIDENTIAL

SAMPLING AND ANALYSIS OF SOIL AND DUST AT THE ILCO-UNICAN FACILITY IN WINSTON-SALEM, NORTH CAROLINA

Submitted to:

Jones, Day, Reavis, & Pogue
1450 G Street, N.W.
Washington, DC 20005

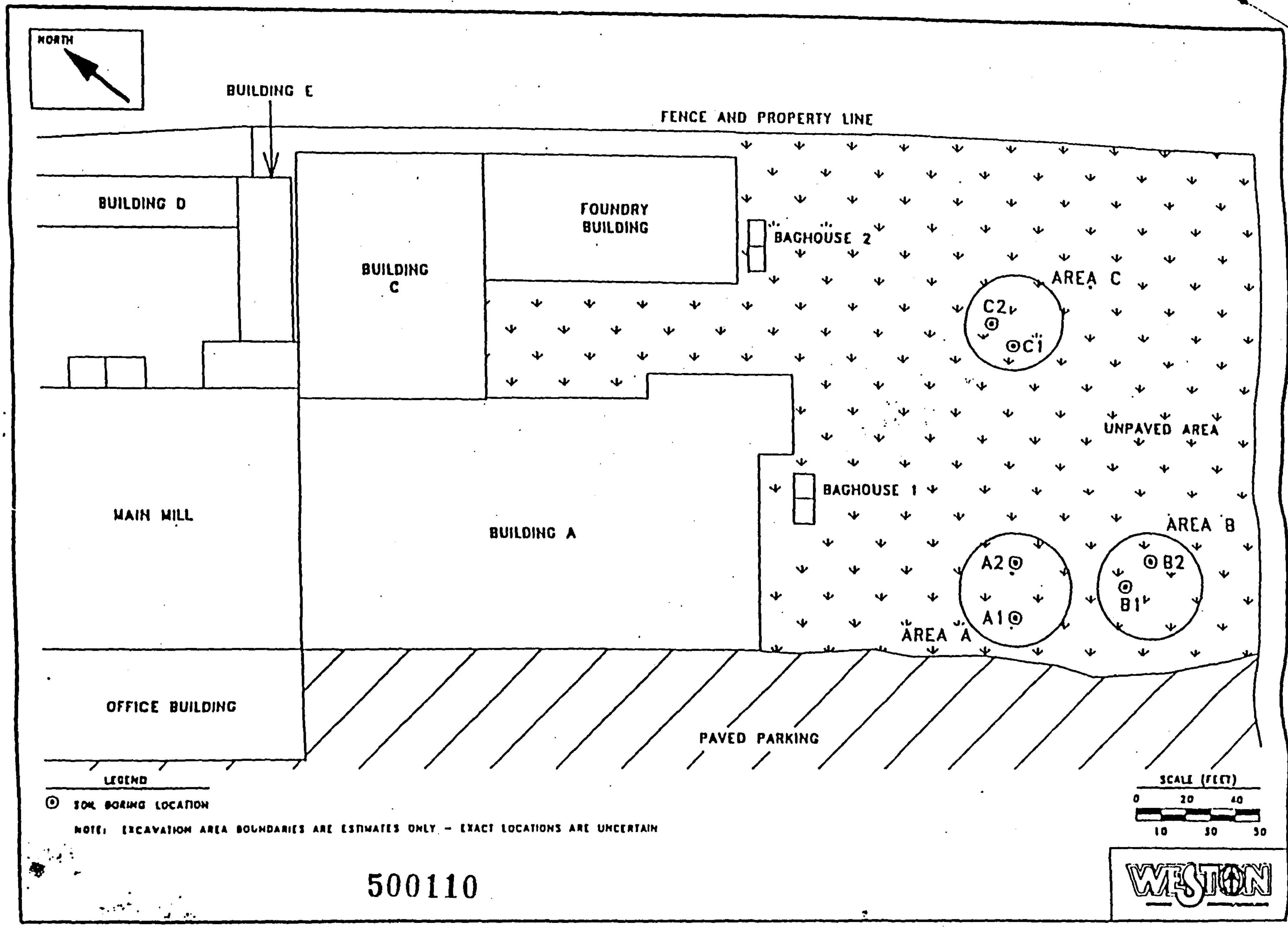
Prepared by:

Roy F. Weston, Inc.
4020 Westchase Boulevard, Suite 375
Raleigh, North Carolina 27607

December 27, 1990

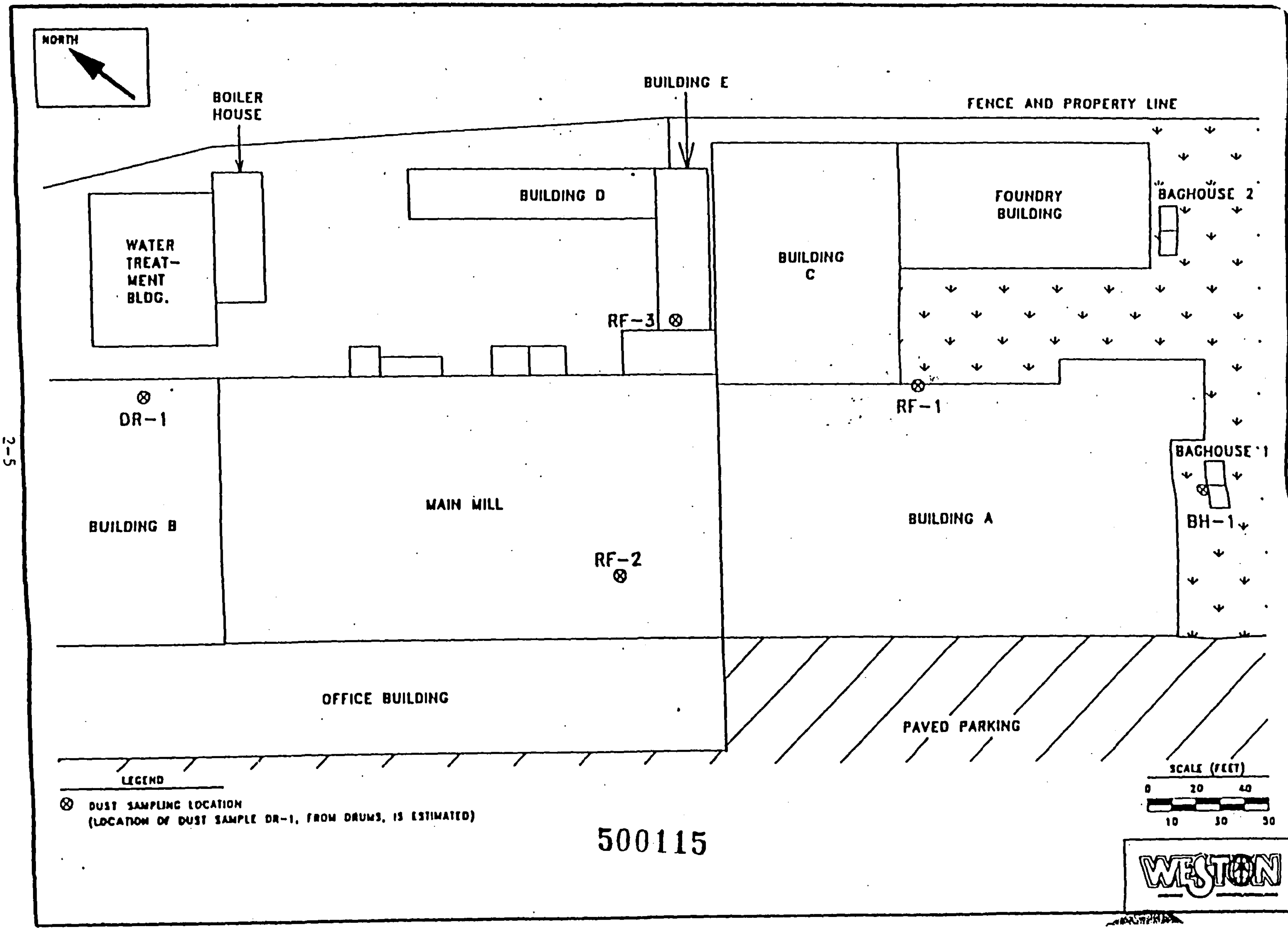
500106

W.O. 6104-01-01



500110

FIGURE 2 - SOIL BORING LOCATIONS AT THE ILCO-UNICAN FACILITY



NORTH
BOILER HOUSE
BUILDING E
FENCE AND PROPERTY LINE
BUILDING D
FOUNDRY BUILDING
BAGHOUSE 2
WATER TREAT-MENT BLDG.
BUILDING C
RF-3
RF-1
DR-1
BAGHOUSE 1
BH-1
MAIN MILL
BUILDING B
BUILDING A
RF-2
OFFICE BUILDING
PAVED PARKING
LEGEND
⊗ DUST SAMPLING LOCATION
(LOCATION OF DUST SAMPLE DR-1, FROM DRUMS, IS ESTIMATED)
SCALE (FEET)
0 20 40
10 30 50
WESTON

500115

TABLE 1

RESULTS OF ANALYSIS OF SOIL SAMPLES FOR VOLATILE ORGANIC COMPOUNDS
TAKEN AT THE ILCO-UNICAN FACILITY IN WINSTON-SALEM, NORTH CAROLINA

PARAMETER	SB-A1-12	SB-A1-14	SB-A2-14	SB-A2-16	SB-B1-12	SB-B1-14
Chloromethane	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	5 B	ND	ND	ND
Acetone	21 B	12 B	23 B	24 C	23 B	17 B
Carbon Disulfide	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND
Vinyl Acetate	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND
Xylene (total)	ND	ND	ND	ND	ND	ND

NOTES: Units are micrograms per kilogram (ug/kg), dry weight basis.
Samples collected on October 2-4, 1990.
ND indicates that the parameter was not present at or above the detection limit.
B indicates that the compound was observed in the corresponding internal laboratory blank sample as well as the soil sample; the reported presence of the compound is attributed to the background presence of the compound in the laboratory.
C indicates that the reported presence of the compound is judged to be attributable to the background presence of the compound in the laboratory, although the compound was not observed in the corresponding internal laboratory blank sample.

500119

TABLE 1

RESULTS OF ANALYSIS OF SOIL SAMPLES FOR VOLATILE ORGANIC COMPOUNDS
TAKEN AT THE ILCO-UNICAN FACILITY IN WINSTON-SALEM, NORTH CAROLINA
(Continued)

PARAMETER	SB-B2-12	SB-B2-14	SB-C1-12	SB-C1-14	SB-C2-12	SB-C2-14	TRIP BLANK
Chloromethane	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	ND	7 B	ND	ND	ND	ND	7 C
Acetone	35 C	48 C	22 C	22 C	22 C	30 C	ND
Carbon Disulfide	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	21	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND
Vinyl Acetate	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND
Xylene (total)	ND	ND	ND	ND	ND	ND	ND

NOTES: Units are micrograms per kilogram (ug/kg), dry weight basis, except trip blank.
Units are micrograms per liter (ug/L) for trip blank.
Samples collected on October 2-4, 1990.
ND indicates that the parameter was not present at or above the detection limit.
B indicates that the compound was observed in the corresponding internal laboratory blank sample as well as the soil sample; the reported presence of the compound is attributed to the background presence of the compound in the laboratory.
C indicates that the reported presence of the compound is judged to be attributable to the background presence of the compound in the laboratory, although the compound was not observed in the corresponding internal laboratory blank sample.

TABLE 2

RESULTS OF ANALYSIS OF DUST SAMPLES FOR EP TOXICITY METALS
TAKEN AT THE ILCO-UNICAN FACILITY IN WINSTON-SALEM, NORTH CAROLINA

MAXIMUM CONCENTRATION PER 40CFR 261.24	METAL	CONCENTRATION IN EXTRACT BH-1	RF-1	RF-2	RF-3	DR-1
5.0	Arsenic	ND	ND	ND	ND	ND
100.0	Barium	ND	ND	ND	ND	ND
1.0	Cadmium	0.021	0.038	16.4	0.010	0.019
5.0	Chromium	0.056	ND	0.061	ND	0.021
---	Hexavalent chromium	ND	ND	ND	ND	ND
5.0	Lead	ND	4.5	2.3	3.6	1.0
0.2	Mercury	ND	ND	ND	ND	ND
1.0	Selenium	ND	ND	ND	ND	ND
5.0	Silver	0.16	0.18	0.18	0.043	0.072

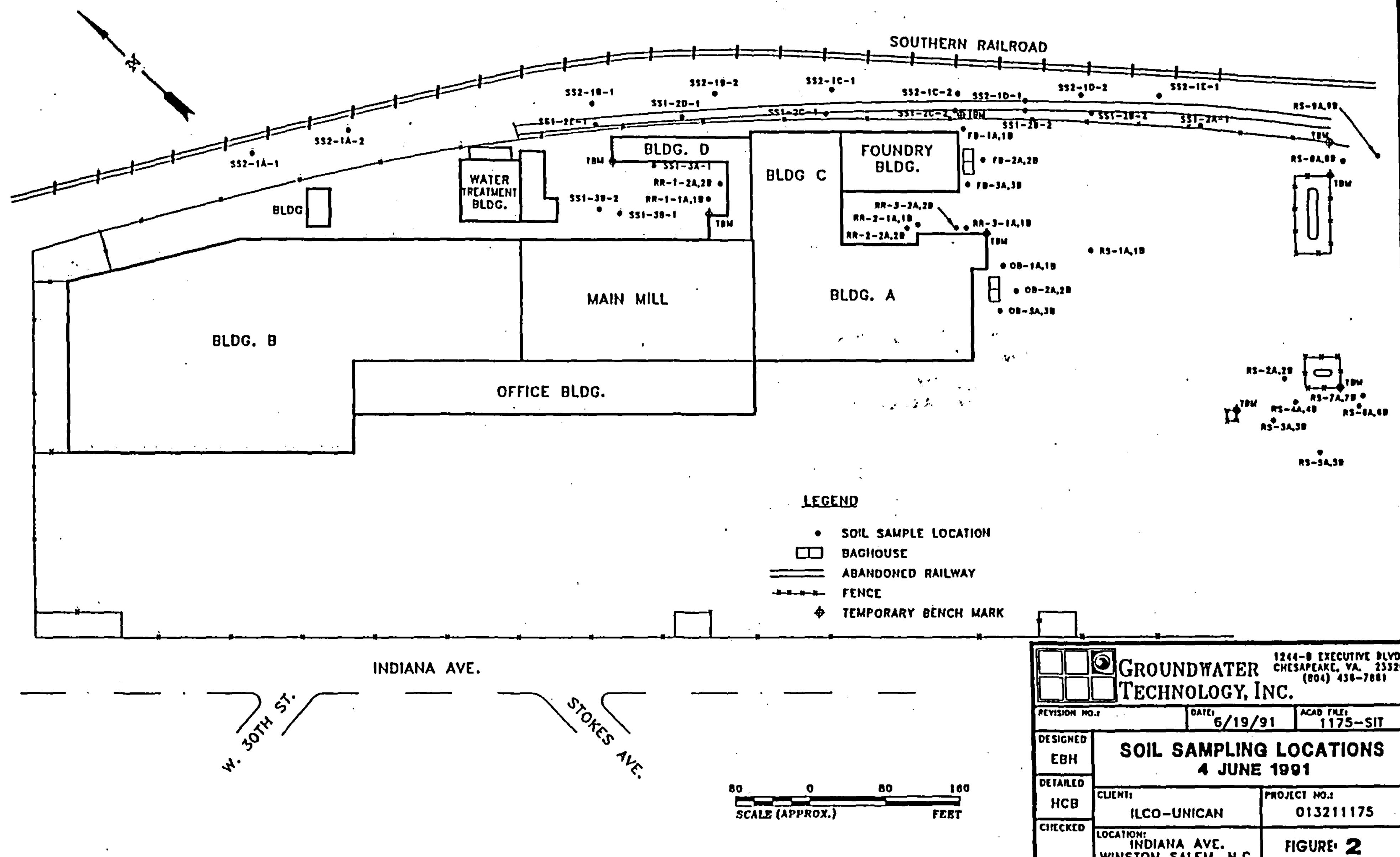
NOTES: Units are milligrams per liter (mg/L).
ND indicates that the parameter was not present at or above the detection limit.

500121

Appendix B.7

Soil Sampling/Analysis in Spill Sites #1 and #2, Roof Runoff Areas, Baghouse Areas, and Waste Piles #1 and #2; from Groundwater Technology, Inc. (1991)

from GTI 1991)



GROUNDWATER TECHNOLOGY, INC.
1244-B EXECUTIVE BLVD.
CHESAPEAKE, VA. 23320
(804) 436-7881

REVISION NO.:	DATE: 6/19/91	ACAD FILE: 1175-SIT
DESIGNED EBH	SOIL SAMPLING LOCATIONS 4 JUNE 1991	
DETAILED HCB	CLIENT: ILCO-UNICAN	PROJECT NO.: 013211175
CHECKED	LOCATION: INDIANA AVE. WINSTON SALEM, N.C.	FIGURE: 2

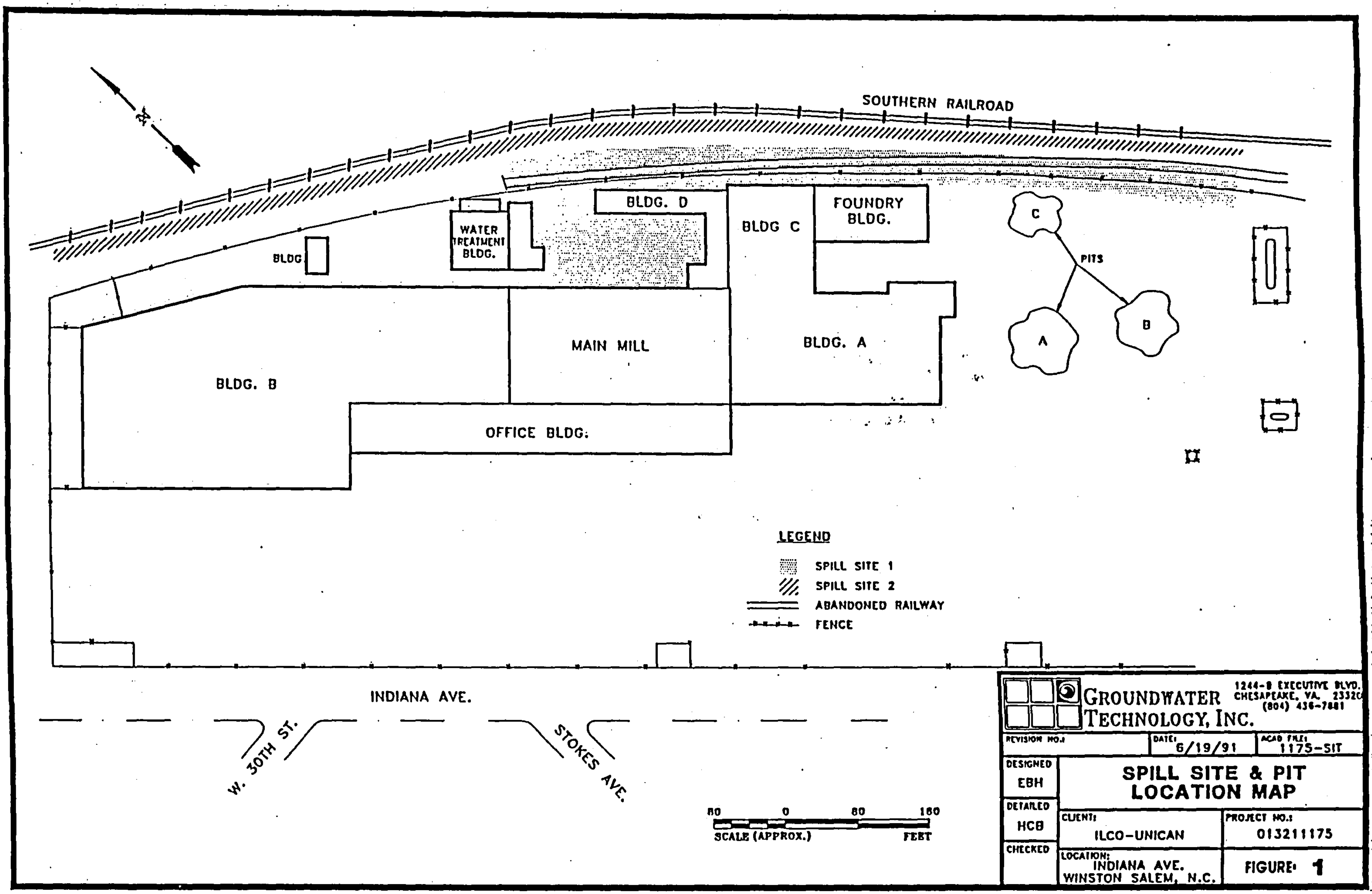

N
SOUTHERN RAILROAD
BLDG
WATER TREATMENT BLDG.
BLDG. D
BLDG C
FOUNDRY BLDG.
C
PITS
A
B
MAIN MILL
BLDG. A
BLDG. B
OFFICE BLDG.
LEGEND
SPILL SITE 1
SPILL SITE 2
ABANDONED RAILWAY
FENCE
INDIANA AVE.
W. 30TH ST.
STOKES AVE.
80 0 80 160
SCALE (APPROX.)
FEET
GROUNDWATER TECHNOLOGY, INC.
1244-B EXECUTIVE BLVD.
CHESAPEAKE, VA. 23320
(804) 436-7881
REVISION NO.:
DATE: 6/19/91
ACAD FILE: 1175-SIT
DESIGNED EBH
DETAILED HCB
CHECKED
SPILL SITE & PIT LOCATION MAP
CLIENT: ILCO-UNICAN
PROJECT NO.: 013211175
LOCATION: INDIANA AVE. WINSTON SALEM, N.C.
FIGURE: 1

TABLE 4
ANALYTICAL CHEMISTRY RESULTS SUMMARY (mg/kg)

SAMPLE ID #	SAMPLE DEPTH	CYANIDE	CADMIUM	CHROMIUM	LEAD	COPPER	NICKEL	ZINC
SS1-2A-1	1.5 - 2.0'	BDL	BDL	BDL	0.087	0.82	BDL	5.6
SS1-2B-1	1.5 - 2.0'	4.1	BDL	BDL	0.11	2.4	BDL	9.2
SS1-2B-2	1.5 - 2.0'	3.4	BDL	BDL	0.10	2.2	0.34	4.1
SS1-2C-1	1.5 - 2.0'	3.9	BDL	BDL	0.075	0.59	BDL	4.1
SS1-2C-2	1.5 - 2.0'	10	BDL	BDL	0.062	1.7	BDL	6.4
SS1-2D-1	1.5 - 2.0'	BDL	BDL	BDL	0.052	BDL	0.50	2.7
SS1-2E-1	1.5 - 2.0'	BDL	BDL	BDL	0.23	0.46	BDL	2.7
SS1-3A-1	1.5 - 2.0'	58	BDL	BDL	0.059	2.9	BDL	3.6
SS1-3B-1	1.5 - 2.0'	BDL/BDL	BDL	BDL/BDL	0.052/0.057	BDL/BDL	BDL/BDL	0.68/BDL
SS1-3B-2	1.5 - 2.0'	1.3	BDL	BDL	0.081	0.17	BDL	BDL
SS2-1A-1	1.5 - 2.0'	5.2	0.18	BDL	0.098	1.9	0.69	11
SS2-1A-2	1.5 - 2.0'	11	BDL	BDL	0.18	0.23	0.37	0.55
SS2-1B-1	1.5 - 2.0'	BDL	BDL	BDL	0.56	0.46	BDL	4.6
SS2-1B-2	1.5 - 2.0'	BDL	BDL	BDL	BDL	0.14	BDL	0.88
SS2-1C-1	1.5 - 2.0'	9.7	BDL	BDL	0.039	1.4	BDL	4.9
SS2-1C-2	1.5 - 2.0'	BDL	BDL	BDL	0.062	0.23	BDL	0.69
SS2-1D-1	1.5 - 2.0'	22	BDL	BDL	0.076	12	0.48	14
SS2-1D-2	1.5 - 2.0'	BDL	BDL	BDL	0.031	BDL	BDL	2.3

Note: Shaded areas indicate results exceed MCL or NCDHR clean-up criteria for that constituent

TABLE 4 (CONTINUED)

SAMPLE ID #	SAMPLE DEPTH	CYANIDE	CADMIUM	CHROMIUM	LEAD	COPPER	NICKEL	ZINC
SS2-1E-1	1.5 - 2.0'	BDL	BDL	BDL	BDL	BDL	BDL	0.54
RR-1-1A	0 - .5	13	BDL	BDL	3.8	32	0.80	300
RR-1-1B	1.5 - 2	240	BDL	BDL	1.8	5.7	0.79	500
RR-1-2A	0 - .5	26	BDL	BDL	2.3	0.69	0.80	600
RR-1-2B	1.5 - 2	7.3	BDL	BDL	0.94	5.7	0.23	59
RR-2-1A	0 - .5	13	BDL	BDL	BDL	0.12	2.8	820
RR-2-1B	1.5 - 2	BDL	BDL	BDL	BDL	0.26	0.39	61
RR-2-2A	0 - .5	BDL	BDL	BDL	0.30	0.69	0.18	200
RR-2-2B	1.5 - 2	BDL	BDL	BDL	BDL	0.24	BDL	6.3
RR-3-1A	0 - .5	BDL	BDL	BDL	0.13	0.67	0.65	860
RR-3-1B	1.5 - 2	BDL	BDL	BDL	0.15	0.20	BDL	22
RR-3-2A	0 - .5	1.6	BDL	BDL	1.6	34	0.30	88
RR-3-2B	1.5 - 2	1.7	BDL	BDL	2.3	25	0.17	36
FB-1A-1	0 - .5	14/BDL	0.06/0.08	BDL	7.7/6.7	48/31	0.34/0.18	230/180
FB-1B	1.5 - 2	BDL	BDL	BDL	1.1	5.9	BDL	27
FB-2A	0 - .5	BDL	BDL	BDL	12	40	0.48	110
FB-2B	1.5 - 2	BDL	BDL	BDL	0.082	BDL	BDL	0.81
FB-3A	0 - .5	BDL	0.07	BDL	5.0	57	0.49	130

Note: Shaded areas indicate results exceed MCL or NCDHR clean-up criteria for that constituent

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TABLE 4 (CONTINUED)

SAMPLE ID #	SAMPLE DEPTH	CYANIDE	CADMIUM	CHROMIUM	LEAD	COPPER	NICKEL	ZINC
FB-3B	1.5-2	BDL	BDL	BDL	0.32	5.9	BDL	19
OB-1A	0-.5	3.3	BDL	BDL	0.20	5.5	0.22	37
OB-1B	1.5-2	BDL	BDL	BDL	0.060	BDL	BDL	0.72
OB-2A	0-.5	1.4	BDL	BDL	0.36	10	0.45	99
OB-2B	1.5-2	BDL	BDL	BDL	0.13	0.32	BDL	6.4
OB-3A	0-.5	BDL	BDL	BDL	0.41	8	BDL	30
OB-3B	1.5-2	BDL	BDL	BDL	0.047	BDL	BDL	4.9
RS-1A	0-.5	1.4	BDL	BDL	0.90	6	1.7	170
RS-1B	1.5-2	BDL	BDL	BDL	0.11	0.61	1.2	15
RS-2A	0-.5	7.7	BDL	BDL	0.89	5.4	0.91	110
RS-2B	1.5-2	9.8	BDL	BDL	0.35	1.2	0.43	23
RS-3A	0-.5	17	BDL	BDL	0.16	9.5	1.4	110
RS-3B	1.5-2	BDL	BDL	BDL	0.47	0.96	0.45	12
RS-4A	0-.5	97	.73	BDL	21	74	8.7	490
RS-4B	1.5-2	18	.18	BDL	2.1	55	2.9	200
RS-5A	0-.5	6.9	BDL	BDL	0.25	3.7	0.43	15
RS-5B	1.5-2	BDL	BDL	BDL	1.5	2.6	0.46	34
RS-6A	0-.5	48	BDL	0.23	0.46	75	2.7	47

Note: Shaded areas indicate results exceed MCL or NCDHR clean-up criteria for that constituent

TABLE 4 (CONTINUED)

SAMPLE ID #	SAMPLE DEPTH	CYANIDE	CADMIUM	CHROMIUM	LEAD	COPPER	NICKEL	ZINC
RS-6B	1.5 - 2	5.6	0.10	BDL	0.88	21	1.4	55
RS-7A	0 - .5	130	0.10	0.19	2.8	130	10	110
RS-7B	1.5 - 2	280	0.13	BDL	0.12	180	25	170
RS-8A	0 - .5	53/94	BDL/0.07	0.89/1.1	0.42/0.48	84/110	16/20	130/170
RS-8B	1.5 - 2	16	BDL	BDL	0.50	4.1	1	6.9
RS-9A	0 - .5	640	1.2	0.77	0.75	140	38	110
RS-9B	1.5 - 2	59	0.16	BDL	0.11	4.3	1.1	7.3

Note: Shaded areas indicate results exceed MCL or NCDHR clean-up criteria for that constituent

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4.2 Potential Regulatory Criteria For Comparison

A summary chart of potentially applicable regulatory criteria is given in Table 5.

TABLE 5

POTENTIALLY APPLICABLE REGULATORY LEVELS	TOTAL CYANIDE mg/l	CADMIUM mg/l	CHROMIUM mg/l	LEAD mg/l	COPPER mg/l	NICKEL mg/l	ZINC mg/l
Original Required NC Clean-up Level**	40 ppm*	0.01	0.05	0.05	N/A	0.35	N/A
TCLP Regulatory Level	N/A	1.0	5.0	5.0	N/A	N/A	N/A
Proposed MCL	0.2	0.005	0.1	1.3	1.3	0.1	5.0
Action Levels (Soil) FR 7/27/90 (Proposed)	2,000	40	400	N/A	N/A	2,000	N/A

* Extractable, 0.20 ppm, Reactive 10 ppm

** Drinking Water standards Assumed For all Parameters (MCL's)

4.3 Volatile Organic Sampling

Two soil sample locations displayed elevated field organic vapor meter readings, and were therefore submitted for volatile organic analysis (EPA 8240). A summary of results is presented in Table 6 and the actual laboratory result sheets are included in Appendix D.

TABLE 6

VOLATILE/SEMI-VOLATILE COMPOUNDS	SAMPLE LOCATION RR-1-1B	SAMPLE LOCATION RR-2-2A
Methelene Chloride (624)	920 μg/kg	910 μg/kg
Xylenes (624)	1,300 μg/kg	BDL μg/kg
bis(2-Ethylhexy)phthalate (625)	1,900 μg/kg	BDL μg/kg
2-Methylnapthalene (625)	5,800 μg/kg	BDL μg/kg
Phenanthrene (625)	2,300 μg/kg	BDL μg/kg

Appendix B.8

Additional Soil Sampling/Analysis in Spill Sites #1 and #2, Roof Runoff Areas, Baghouse Areas, and Waste Piles #1 and #2; from Geraghty & Miller, Inc. (1992)

Table 1. Results of Partial Hazardous Substance List Metals and Cyanide Analyses of Soil Samples Collected at Ilco-Unican's Facility in Winston-Salem, N.C. on 1-15-92, 1-16-92, and 1-21-92.

Sample ID	SS1-2C-1	SS2-1A-1	SS2-1D-1	RR-1-1A	RR-1-1B	RR-3-2A	RR-3-2B
Depth in inches	30-36	30-36	30-36	0-6	18-24	0-6	18-24
Constituent - mg/kg dw*							
(USEPA Method in Parentheses)							
Antimony(6010)	<6.6	<5.4	<5.9	<160*F65	<6.1	6.7	<6.9
Arsenic(7060)	<1.2	<0.99	<1.2	<1.3	1.3	14	6.2
Barium(6010)	33	6.7	36	140	58	44	21
Beryllium(6010)	<0.66	<0.54	<0.59	0.75	<0.61	<0.61	<0.59
Cadmium(6010)	3.3	<0.54	1.1	1.5	0.87	1.8	0.85
Chromium(6010)	29	1.1	18	31	12	25	15
Cobalt(6010)	2.6	1.4	1.4	16	1.8	2.9	1.9
Copper(6010)	120	4.3	370	7700	320	6100	1100
Lead(7421)	44	12	18	230	30	200	50
Mercury(7471)	0.1	0.014	<0.012	0.025	0.11	0.077	0.061
Nickel(6010)	21	6.7	92	100	28	46	16
Selenium(7740)	<1.2	<1.1	<1.2	<1.3	<1.2	<1.2	<1.2
Silver(6010)	<1.3	<1.1	<1.2	1.6	<1.2	1.5	<1.2
Thallium(7841)	<1.2	<1.1	<1.2	<1.3	<1.2	<1.2	<1.2
Vanadium(6010)	53	<1.1	16	51	22	53	34
Zinc(6010)	250	130	420	46000	470	6200	1400
Cyanide(9010)	<1.3	<1.1	<1.2	2.4	2.5	<1.2	1.5

* - Milligrams per kilogram on a dry-weight basis.

** - Milligrams per liter.

*F65 - Elevated detection limits were reported due to sample matrix interference which required sample dilution prior to analysis.

NA - Sample was not analyzed for this constituent.

from G&M
(3/10/92)

GERAGHTY & MILLER, INC.