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Site Name (Subject):	UNIROYAL INC/UNIROYAL CHEMICAL
Site ID (Document ID):	NCD003164464
Document Name (DocType):	Contractor Report (CONTR)
Report Segment:	
Description:	Site Inspection Prioritization
Date of Document:	8/22/1994
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NCDENR
North Carolina Department of Environment and Natural Resources
Dexter R. Matthews, Director
Division of Waste Management
Michael F. Easley, Governor
William G. Ross, Jr., Secretary

April 26, 2005

Ms. Jennifer Wendel, RPM
US EPA Region IV Waste Division
Atlanta Federal Building
61 Forsyth St., 11th Floor
Atlanta, GA 30303-3104

Subject: Preliminary Assessment (PA)
Universal Friction Composites
EPA ID# NCN 000 407 827
Marshville, Union County, NC

Dear Ms. Wendel:

Enclosed is the Preliminary Assessment (PA) report for the Universal Friction Composites site (NCN 000 407 827), Marshville, Union County, NC.

Based on the findings of this report, the site poses minimal potential threat to human health, the food chain, and the environment and is recommended for no further action under CERCLA. If you have any questions, please contact me at melanie.bartlett@ncmail.net or (919) 508-8446.

Sincerely,

Melanie Bartlett

Melanie Bartlett
Environmental Engineer
NC Superfund Section

Enclosures

1646 Mail Service Center, Raleigh, North Carolina 27699-1646
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ABBREVIATED PRELIMINARY ASSESSMENT CHECKLIST

This checklist can be used to help the site investigator determine if an Abbreviated Preliminary Assessment (APA) is warranted. This checklist should document the rationale for the decision on whether further steps in the site investigation process are required under CERCLA. Use additional sheets, if necessary.

Checklist Preparer:	**Melanie Bartlett/Environmental Engineer**	**April 26, 2005**
	Name/Title	Date
	NCDENR-Superfund Section	***919-508-8446***
	Address	Phone
	melanie.bartlett@ncmail.net	
	E-mail Address	

Site Name:	**Universal Friction Composites**		
Previous Names (if any):			
EPA ID #	**NCN 000 407 827**		
Site Location:	**Unarco Road, Marshville, Union County, NC**		
Latitude:	**34.9886°**	**Longitude:**	**80.3543°**

Describe the release (or potential release) and its probable nature:

Part 1 - Superfund Eligibility Evaluation

If all answers are no go on to Part 2, otherwise proceed to Part 3.	**YES**	**NO**
1. Is the site currently in CERCLIS or an alias of another site?	X	
2. Is the site being addressed by some other remedial program (Federal, State, or Tribal)?	X	
3. Are the hazardous substances potentially released at the site regulated under a statutory exclusion (e.g., petroleum, natural gas, natural gas liquids, synthetic gas usable for fuel, normal application of fertilizer, release located in a workplace, naturally occurring, or regulated by the NRC, UMTRCA, or OSHA)?		X
4. Are the hazardous substances potentially released at the site excluded by policy considerations (i.e., deferred to RCRA corrective action)?		X
5. Is there sufficient documentation to demonstrate that no potential for a release that could cause adverse environmental or human health impacts exists (e.g., comprehensive remedial investigation equivalent data showing no release above ARARs, completed removal action, previous HRS score determined, or an EPA approved risk assessment completed)?		X

Please explain all yes answers.

1. **The site was added to CERCLIS based on a review of the site's ownership history, the similarities to other National Priority List (NPL) sites, and the potential to impact nearby human and environmental targets.**
2. **Cleanup activities at the site have been and continue to be addressed by the NC Solid Waste Section.**

Part 2 - Initial Site Evaluation

Use Exhibit 1 of the APA fact sheet to make site assessment decisions based on the answers below:	YES	NO
1. Does documentation indicate that a target (e.g., drinking water wells, drinking surface water intakes, etc.) has been exposed to a hazardous substance released from the site?		X
2. Is there an apparent release at the site with no documentation of exposed targets, but there are targets on site or immediately adjacent to the site?		X
3. Is there an apparent release and no documented on-site targets or targets immediately adjacent to the site, but there are nearby targets (e.g., targets within 1 mile)?		X
4. Is there no indication of a hazardous substance release, and there are uncontained sources containing CERCLA hazardous substances, but there is a potential to release with targets present on site or in proximity to the site?		X
5. Does the site lack documented on-site, adjacent, or nearby targets?		X
6. Does the site lack releases or potential to release?	X	
7. Does the site lack uncontained sources containing CERCLA eligible substances are present on site?		X

Please explain all yes answer(s).

6. **Documented on-site contamination has been either cleaned up or contained. Exposure to contamination remaining on site is restricted by their physical locations (i.e. beneath the concrete floor of an existing structure) and/or lack of mobility.**

Part 3 - State Site Assessment Recommendation

Check the box that applies based on the conclusions of the APA:

- [X] NFRAP
- [ ] Higher Priority SI
- [ ] Lower Priority SI
- [ ] Defer to RCRA Subtitle C
- [ ] Defer to NRC
- [ ] Refer to Removal Program - further site assessment needed
- [ ] Refer to Removal Program - NFRAP
- [ ] Site is being addressed as part of another CERCLIS site
- [ ] Other:

State Reviewer: **Melanie Bartlett** Melanie Bartlett — Print Name/Signature

04/26/05 — Date

PRELIMINARY ASSESSMENT

Universal Friction Composites
NCN 000 407 827
Marshville, Union County, North Carolina

April 26, 2005

Superfund Section
Division of Waste Management
North Carolina Department of Environment
and Natural Resources

Prepared by:
Melanie Bartlett
Melanie Bartlett
Environmental Engineer

Reviewed by:
Jim Bateson
Jim Bateson, Head
Site Evaluation & Removal Branch

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Executive Summary

The Universal Friction Composites Preliminary Assessment (PA) was conducted to gather data necessary to evaluate the need for further action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The 18.95-acre site is currently vacant and overgrown. An abandoned 150,000-square foot warehouse is located on the property along with several other smaller buildings and above-ground storage tanks. A *Summary of Assessment Findings* by Waters Edge Environmental, LLC ("Waters Edge"), dated December 22, 2000, discussed investigation of seven areas of concern (AOCs). Of those seven AOCs, two were determined to warrant further investigation: the fuel oil dispenser area and an asbestos burial area approximately 80 by 30 feet in size.

A limited site assessment was performed by Waters Edge, the purpose of which was to assess the soil and groundwater conditions near the fuel oil dispenser area. For the samples collected, BTEX, MTBE, and naphthalene were detected in the soils surrounding the area, while no volatiles were detected in the groundwater. This resulted in a soil removal in July 2002, where 97.51 tons of material was removed from the site. Confirmation samples demonstrated minimal contamination remaining on site, with contaminated soils restricted from access due to location under an existing concrete slab and roof.

Waters Edge also addressed on-site asbestos burial areas. In one area, solid-form asbestos fibers were detected under a layer of cover soil ranging from three to eight feet in thickness and approximately 80 by 90 feet in size. This was delineated in an area on the property but outside the fence line. They recommended including this area in the planned deed recordation for the facility.

The NC Division of Water Quality, Groundwater Section, reviewed the Waters Edge reports and recommended the site for no further action at that time based upon soil sampling results from the onsite soil removal during 2002. A revised survey of the two on-site asbestos burial areas was submitted to the NC Division of Waste Management, Solid Waste Section. Based on the cover soil thickness and location of the burial areas as well as the lack of threat to human health and the environment, the property owner was granted a closure notice for an unpermitted solid waste disposal site on July 23, 2003. The site was also given a recommendation of no further action on the issue of the asbestos burial areas.

Due to the lack of nearby targets, the lack of mobility of solid-form asbestos, and the depths and locations of contaminants remaining on site, the site poses a minimal threat to human health and the environment for the soil exposure and groundwater pathways.

The only pathway for which no samples have previously been collected is the surface water pathway. However, given the levels of contamination remaining on site, the lack of mobility of asbestos, the lack of targets, and the distance to the surface water pathway, the potential for contaminant migration to the surface water pathway is considered to be minimal.

Based on the information collected during the PA, the Universal Friction Composites site is recommended for no further action (NFA) under CERCLA.

1.0 INTRODUCTION

Under authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), the North Carolina Superfund Section conducted a Preliminary Assessment (PA) at the Universal Friction Composites site (NCN 000 407 827), located on Unarco Road just north of Highway 74 in Marshville, Union County, North Carolina. The purpose of the PA was to evaluate environmental conditions at the site in order to determine the need for additional remedial activities under the CERCLA program. Information on the site was obtained through file reviews, interviews, and on-site and off-site reconnaissances.

2.0 SITE DESCRIPTION

2.1 Location

The Universal Friction Composites site is located along Unarco Road just north of Highway 74 in Marshville, Union County, NC (Figure 1). The geographic coordinates for the site are 34.9886° north latitude and 80.3543° west longitude (Reference 3).

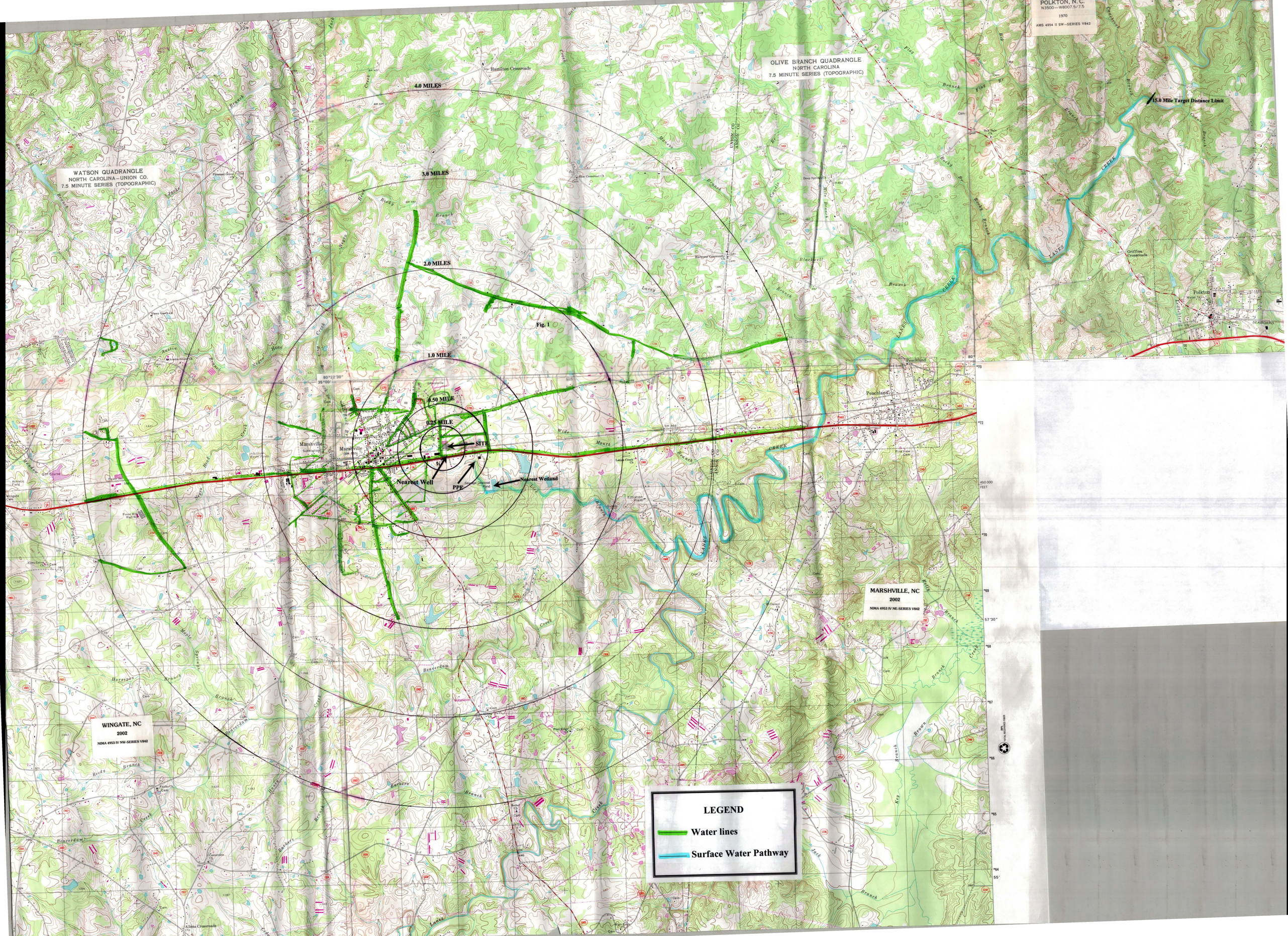
The two-year, twenty-four hour rainfall for Union County averages 3.5 inches (Ref. 4). Normal annual total precipitation averages 46 inches, while mean annual lake evaporation averages 41 inches; therefore, net annual precipitation averages 5 inches near the site (Refs. 5, 6).

2.2 Site Description

The 18.95-acre site is currently vacant and overgrown. An abandoned 150,000-square foot warehouse is located on the property along with several other smaller buildings and above-ground storage tanks. The property is bordered by railroad tracks to the south, Unarco Road to the west, Trawick Road to the north, and an industrial facility to the east. Though portions of the site are fenced, gates were unlocked and partially open, making the site accessible to pedestrian and vehicle traffic (Refs. 7, 8, 9).

2.3 Site/Regulatory History and Waste Characteristics

The site was discovered during a review of former manufacturing facilities conducted by the NC Superfund Section. A review of the North Carolina Directory of Manufacturing Firms showed the following facilities were in operation on this site property during the listed dates of publication: Carolina Asbestos Co. (1944), Union Asbestos and Rubber (1956-1964), and Johns Manville Products (1968) (Ref. 10). Additional names associated with this facility are Raybestos-Manhattan (1988), Raymark, and Universal Friction Composites (Refs. 8, 11).


WATSON QUADRANGLE
NORTH CAROLINA–UNION CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
OLIVE BRANCH QUADRANGLE
NORTH CAROLINA
7.5 MINUTE SERIES (TOPOGRAPHIC)
POLKTON, N.C.
N3500—W8007.5/7.5
1970
AMS 4954 II SW—SERIES V842
MARSHVILLE, NC
2002
NIMA 4953 IV NE-SERIES V842
WINGATE, NC
2002
NIMA 4953 IV NW-SERIES V842
4.0 MILES
3.0 MILES
2.0 MILES
1.0 MILE
0.50 MILE
0.25 MILE
15.0 Mile Target Distance Limit
Fig. 1
SITE
Nearest Well
PPE
Nearest Wetland
Hamilton Crossroads
Griffins Crossroads
Polkton
Peachland
Marshville
Wingate
LEGEND
Water lines
Surface Water Pathway

The facility was in operation as early as the 1930's. Chrystotile asbestos fiber was brought into the plant in compressed bales. Fiber preparation included blending, opening and mixing of the fibers. The opened fiber was stored in stock-holding bins of about 3,000-4,000 pounds capacity, and the pneumatic line that fed fiber to the bins did so by means of a ceiling condenser mounted over a crossing conveyor belt that was located on top of the bins some 25 feet above floor level. The fiber was removed from the bins by hand, using a pitchfork to transfer it to a loose cart from whence it was taken to the front of the card-feed hopper and hand-fed into the carding machines. Waste from the cards was either reused or bagged off and sold (Ref. 12).

Processed fibers were spun, twisted and woven into various asbestos textile products and friction yarns. These products are then shipped off to other facilities for secondary processing, where it was fabricated into woven friction materials such as brake pads (Ref. 13). By 1974, while under the ownership of Raybestos-Manhattan, production capacity for the plant was in excess of 8 million pounds annually (Ref. 12).

In January 1997, the NC Division of Solid Waste Management was notified of a potential asbestos burial area on the Universal Friction Composites property (Ref. 14). Based on this information a request was made for a subsurface investigation of the area, which was conducted in March 1997 (Ref. 15). These soil borings revealed only virgin soil with no evidence of bulk asbestos disposal (Ref. 16).

In October 2000, Phoenix Group III assumed ownership of the site (Ref. 17). An environmental assessment was conducted under the new ownership. The December 22, 2000 *Summary of Assessment Findings* by Waters Edge Environmental, LLC ("Waters Edge") discussed investigation of seven areas of concern (AOCs). Of those seven AOCs, two were determined to warrant further investigation: the fuel oil dispenser area and an asbestos burial area approximately 80 by 30 feet in size (Ref. 18).

Based on information discovered during the initial assessment, Waters Edge prepared an April 26, 2002 *Limited Site Assessment Report* for the Former Universal Friction Composites Facility. The purpose of the activities included in the report was to assess the soil and groundwater conditions near the fuel oil dispenser area. For the samples collected, BTEX, MTBE, and naphthalene were detected in the soils surrounding the area, while no volatiles were detected in the groundwater (Ref. 19).

A soil removal was conducted at the site in July 2002. In the September 4, 2002 *Soil Excavation and Sampling* Report, also prepared by Waters Edge, activities outlined included the excavation of a total of 97.51 tons of material. In addition, confirmation samples were collected and analyzed for volatiles, and clean dirt was backfilled into the area. Waters Edge recommended no further action in this area of the site (Ref. 20).

On November 1, 2002, Waters Edge prepared a *Soil Assessment Report* for the purpose of addressing additional on-site asbestos burial areas. One area, approximately 80 by 90 feet in size, was delineated on the property in an area outside the fence line. Solid-form asbestos

materials were identified in six out of ten borings located this area, at depths ranging from three to eight feet. The report recommended including the asbestos disposal area in the planned deed recordation for the facility (Ref. 21).

On May 7, 2003, the property owner was notified via letter that NC Division of Water Quality, Groundwater Section, had recommended the site for no further action at that time. This recommendation was based upon soil sampling results from the onsite soil removal during 2002 (Ref. 22).

On May 15, 2003, a revised survey of the two onsite asbestos burial areas was submitted to the NC Division of Waste Management, Solid Waste Section, Mooresville Regional Office (MRO) (Ref. 23). Based on the depth and location of the burial areas as well as the lack of threat to human health and the environment, the property owner was granted a closure notice for an unpermitted solid waste disposal site on July 23, 2003 (Ref. 24). The site was also given a recommendation of no further action on the issue of the asbestos burial areas (Refs. 25, 26).

NC Superfund Section personnel conducted an on-site/off-site reconnaissance at the property on July 19, 2004. The property was observed to be vacant and overgrown and although fenced, easily accessible to the public. Based on a review of the site's ownership history, the similarities to other National Priority List (NPL) sites, and potential to impact nearby human and environmental targets, the site was added to was added to CERCLIS (Ref. 27). At that time, the NC Superfund Section was unaware of the site assessment activities described above.

An additional on-site/off-site reconnaissance was conducted by NC Superfund Section personnel on October 27, 2004. Town representatives provided several relevant pieces of information related to the site, including information on environmental assessment activities conducted at the site during recent years. Observations made on site included the presence of asbestos material located in an exposed area of the buildings on the east side of the main warehouse structure (Ref. 9).

During a phone conversation between representatives of the NC Superfund Section and the NC Solid Waste Section, several issues concerning the site were discussed. NC Solid Waste Section personnel indicated that contaminated material had been previously removed from the site and that they had no knowledge of any dumping of asbestos material other than the two on-site burial pits. The issue of the remaining asbestos material located on the site was discussed, with NC Solid Waste Section personnel agreeing to address the issue under their program's authority (Ref. 28).

3.0 GROUNDWATER PATHWAY

3.1 Hydrogeologic Setting

The site is located in the upland section of the Piedmont Physiographic Province of NC. The site is underlain by the tuffaceous argillite unit, which is comprised of interbedded felsic and mafic tuffaceous argillites, fine-grained tuffs, and some breccias and flows. Graywacke sandstone and siltstone are found occasionally overlying and interlayered with the argillites. The argillites are coarsely bedded with individual beds varying from three inches to several feet in thickness (Ref. 29).

The hydraulic conductivity of the material in the unsaturated zone beneath the source areas is estimated to be 1×10^{-6} cm/sec (Ref. 1). The soil type for the site is Cid-Urban land complex, which is composed of moderately deep, moderately well drained and somewhat poorly drained Cid soil and areas of Urban land. The soils are predominantly silty-loamy or clayey, with surficial soils having been altered by cutting, filling, grading, or other alteration. This soil is poorly drained with slopes ranging from 1 to 5 percent (Ref. 30).

3.2 Groundwater Targets

There are no community drinking water wells located within a four-mile radius of the site (Ref. 31). The Town of Marshville is supplied water by the Anson County water system. There is also an emergency connection with the Union County water system (Ref. 9). Several areas outside the Town of Marshville's limits are provided water by the Union County water system (Ref. 32). The nearest private well is located approximately 400 feet south of the site (Fig. 1, Ref. 19).

Using Figure 1, a topographic map house count was performed for houses within a four-mile radius of the site that are not currently provided water by a community water system (Refs. 9, 32). The total number of houses counted was then multiplied by 2.81, the 2000 US Census data average for the number of persons per household in Union County (Ref. 33). The total population estimated to use groundwater as their primary source of drinking water within a four-mile radius of the site is 1,686. The distribution of groundwater users is presented in Table 1.

Table 1
Groundwater Population Distribution
Universal Friction Composites, Marshville, Union County

Distance (miles)	Private Well Population (a)	Community Well Population (b)	Total Groundwater Population
0 – 0.25	6	0	6
0.25 – 0.50	8	0	14
0.50 – 1.0	62	0	76
1.0 – 2.0	351	0	427
2.0 – 3.0	570	0	997
3.0 – 4.0	689	0	1,686

(a) Based on the topographic map house count, multiplied by 2.81, the 2000 US Census average for Union Co. (Ref. 33).

(b) Community well information from the NC Public Water Supply Database (Ref. 31)

3.3 Analytical Results

A sample collected from one temporary monitoring well installed on the site in March 2002 indicated that volatile organic compounds (VOCs) were not present in the groundwater near the fuel oil dispenser area (Ref. 19). The groundwater was not analyzed for asbestos; however, asbestos in a solid form is not mobile in groundwater (Ref. 2).

3.4 Conclusions

The NC Division of Water Quality, Groundwater Section, has recommended the site for no further action. Based on the lack of targets, lack of VOCs present, and the inability of solid-form asbestos to be mobile in groundwater, there is not a significant threat to the groundwater pathway.

4.0 SURFACE WATER PATHWAY

4.1 Hydrologic Setting

The site is located outside the 100-year and 500-year flood plains (Ref. 34). The two-year, twenty-four hour rainfall near the site averages 4.0 inches (Ref. 4). The site is located in a mixed-use area, with commercial and residential properties (Refs. 7, 8).

Stormwater runoff drains from the site towards the east and south. Flow from the site enters the probable point of entry (PPE) at the headwaters of an unnamed tributary, approximately 2,000 feet east-southeast of the site. Flow follows the unnamed tributary in a southerly direction for approximately 2,500 feet before intersecting with Lick Branch. Flow continues to follow in an easterly direction along Lick Branch for approximately 2.5 miles,

whereupon it enters Lanes Creek. The remainder of the fifteen-mile surface water pathway follows Lanes Creek (Fig. 1).

4.2 Surface Water Targets

There are no surface water intakes located along the fifteen-mile surface water pathway (Ref. 35). According to the NC Wildlife Resources Commission, the nearest fishery is located along Lanes Creek, approximately three miles downstream of the PPE and 3.35 miles downstream of the site (Ref. 36). According to the National Wetlands Inventory Maps, there are less than one mile of wetland frontage along the fifteen-mile surface water pathway, with the closest wetlands located approximately ten miles downstream of PPE (Ref. 37).

According to the NC Natural Heritage Program, there are no endangered or threatened species within a four-mile radius of the site. There are also no endangered or threatened species anywhere along the fifteen-mile surface water pathway (Ref. 38).

4.3 Conclusions

No overland flow pathway or surface water pathway samples were collected. Given the lack of volatiles remaining on site, the depth and location of the asbestos burial areas, the lack of mobility of asbestos, the lack of targets, and the distance to the surface water pathway, the potential for migration of the site contaminant to the surface water pathway is minimal.

5.0 SOIL EXPOSURE AND AIR PATHWAYS

5.1 Physical Conditions

The 18.95-acre site is currently vacant and overgrown. An abandoned 150,000-square foot warehouse is located on the property along with several other smaller buildings and above-ground storage tanks. The property is bordered by railroad tracks to the south, Unarco Road to the west, Trawick Road to the north, and an industrial facility to the east. Though portions of the site are fenced, gates were unlocked and partially open, making the site accessible to pedestrian and vehicle traffic (Refs. 7, 8, 9).

5.2 Targets

There are currently no workers or residences on the site. The nearest resident is located approximately 300 feet north of the site. There are no day care centers or schools on or within 200 feet of the site (Fig. 1; Refs. 7, 8, 9).

The nearest HRS-qualifying wetland is located approximately 3,800 feet southeast of the site (Ref. 37). There are no endangered or threatened plants or animal species identified by the NC Natural Heritage Program located on or within 200 feet of the site (Ref. 38).

5.3 Analytical Results

A soil removal, with the excavation of 97.51 tons of material, was conducted at the site in July 2002. Of the six confirmation samples collected, four of the samples demonstrated the absence of total petroleum hydrocarbons (TPH) while only one sample exceeded the action level of 10 mg/kg. For the sample location where the action level was exceeded, the area immediately surrounding the sample location is covered by a concrete slab and a roof, thus minimizing the potential of infiltration of water through the soils (Ref. 20).

An assessment of one of the potential asbestos burial areas was conducted in October 2002. Of the ten soil borings sampled, six of the samples tested positive for chrysotile asbestos. Though asbestos was detected on the property, depths of the asbestos ranged from three to eight feet deep. In addition, one of the two asbestos areas delineated on site is located under an existing structure (Refs. 21, 23, 24).

5.4 Conclusions

Although asbestos remains buried on site, potential exposure via the soil exposure pathway is minimal. Buried asbestos is located either beneath a minimum of three feet of fill dirt and/or a concrete slab that is part of an existing building. Based on the depth and location of the burial areas as well as the lack of threat to human health and the environment, the property owner was granted a closure notice for an unpermitted solid waste disposal site by the NC Solid Waste Section. The site was also given a recommendation of no further action on the issue of the asbestos burial areas by the NC Solid Waste Section. Although asbestos remains buried on site, potential exposure via the soil exposure pathway is minimal. Buried asbestos is located either beneath a minimum of three feet of fill dirt and/or a concrete slab that is part of an existing building. The air pathway is not considered a pathway of concern.

6.0 SUMMARY AND CONCLUSIONS

The Universal Friction Composites site PA was conducted to gather data necessary to evaluate the need for further action under CERCLA at this site.

A soil removal was conducted in the area of the former fuel oil dispenser. A total of 97.51 tons of material was removed from the site. One temporary monitoring well was installed and sampled for VOCs; no VOCs were detected in the well. Two areas of asbestos material have been delineated and recorded on the site. The site has been given no further action determinations by both the NC Groundwater Section and NC Solid Waste Section.

Due to the lack of nearby targets, the lack of mobility for asbestos, and the depths and locations of contaminants remaining on site, the NC Superfund Section recommends a status of "no further action" under CERCLA for this site.

Universal Friction Composites
NCN 000 407 827
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25. Brown, Gary R., RT Environmental Services, Inc. Letter to Mr. Gary Silversmith, The Phoenix Group, LLC, Re: NCDENR Approval of ACM Closure Areas. October 7, 2003.

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27. Stanley, Jeanette, and Jim Bateson, NC Superfund Section. CERCLIS Site Addition Letter. July 27, 2004.

28. Bartlett, Melanie, NC Superfund Section. Memo to file: Phone Summary. Universal Friction Composites, Marshville, Union County. EPA ID: NCN 000 407 827. February 22, 2005.

29. Floyd, Edwin O., NC Division of Ground Water. *Geology and Ground-water Resources of the Monroe Area, North Carolina.* Ground-water Bulletin Number 5. 1965.

30. US Department of Agriculture, Soil Conservation Service. *Soil Survey of Union County, NC.* January1996.

31. Bartlett, Melanie, NC Superfund Section. Memo to file: Community Wells. Universal Friction Composites, Marshville, Union County. EPA ID: NCN 000 407 827. January 11, 2005.

32. Bartlett, Melanie, NC Superfund Section. Memo to file: Union County Water lines. Universal Friction Composites, Marshville, Union County. EPA ID: NCN 000 407 827. November 4, 2004.

33. United States Department of Commerce. *Profiles of General Demographic Characteristics, 2000 Census of Population and Housing, North Carolina.* May 2001.

34. United States Federal Emergency Management Agency. Flood Insurance Rate Map, Community Panel, #37179C0120 C, Union County, North Carolina. Effective Date: July 5, 1994.

35. Hahn, Mark, NC Public Water Supply. Email, Subject: Surface Water Intakes. October 22, 2004.

36. Dorsey, Lawrence, NC Wildlife Resources Commission. Email, Subject: Mecklenburg/Union Counties – Fishery Information. December 3, 2004.

37. Bartlett, Melanie, NC Superfund Section. Memo to File: Wetlands. Universal Friction Composites, Marshville, Union County. EPA ID: NCN 000 407 827. April 8, 2005.

38. Bryson, Melanie, NC Superfund Section. Memo to File: Natural Heritage Sites – Trip Report. Universal Friction Composites, Marshville, Union County. EPA ID: NCN 000 407 827. September 22, 2004.

REFERENCE 1

Ref. 1

federal register

Friday
December 14, 1990

Part II

Environmental Protection Agency

40 CFR Part 300

Hazard Ranking System; Final Rule

REFERENCE 2

Ref. 2

SUPERFUND CHEMICAL DATA MATRIX METHODOLOGY

Prepared For EPA
January 2004

REFERENCE 3

Ref. 3

LATITUDE AND LONGITUDE CALCULATION WORKSHEET #2

LI USING ENGINEER'S SCALE (1/60)

SITE NAME: Universal Friction Composites CERCLIS #: NCN 000 407 827

AKA: Raymark SSID: n.a.

ADDRESS: Unarco Road

CITY: Marshville STATE: NC ZIP CODE: 28103

SITE REFERENCE POINT: southwest corner of building

USGS QUAD MAP NAME: Marshville TOWNSHIP: - N/S RANGE: - E/W

SCALE: 1 : 24,000 MAP DATE: 1988 SECTION: - 1/4 - 1/4 - 1/4

MAP DATUM [1927] 1983 (CIRCLE ONE) MERIDIAN: -

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 7.5' MAP (attach photocopy)

LONGITUDE: 80 ° 15 ' 0.00 " LATITUDE: 34 ° 52 ' 30.00 "

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 2.5' GRID CELL:

LONGITUDE: 80 ° 20 ' 0.00 " LATITUDE: 34 ° 57 ' 30.00 "

CALCULATIONS: LATITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM LATITUDE GRID LINE TO SITE REF POINT: 330

B) MULTIPLY (A) BY 0.3304 TO CONVERT TO SECONDS:

A X 0.3304 = 109.03 "

C) EXPRESS IN MINUTES AND SECONDS (1' = 60") : 1 ' 49.03 "

D) ADD TO STARTING LATITUDE: 34 ° 57 ' 30.00 " + 1 ' 49.03 "

SITE LATITUDE: 34 ° 59 ' 19.03 "

34.9886 °

CALCULATIONS: LONGITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM RIGHT LONGITUDE LINE TO SITE REF POINT: 228

B) MULTIPLY (A) BY 0.3304 TO CONVERT TO SECONDS:

A X 0.3304 = 75.33 "

C) EXPRESS IN MINUTES AND SECONDS (1' = 60") : 1 ' 15.33 "

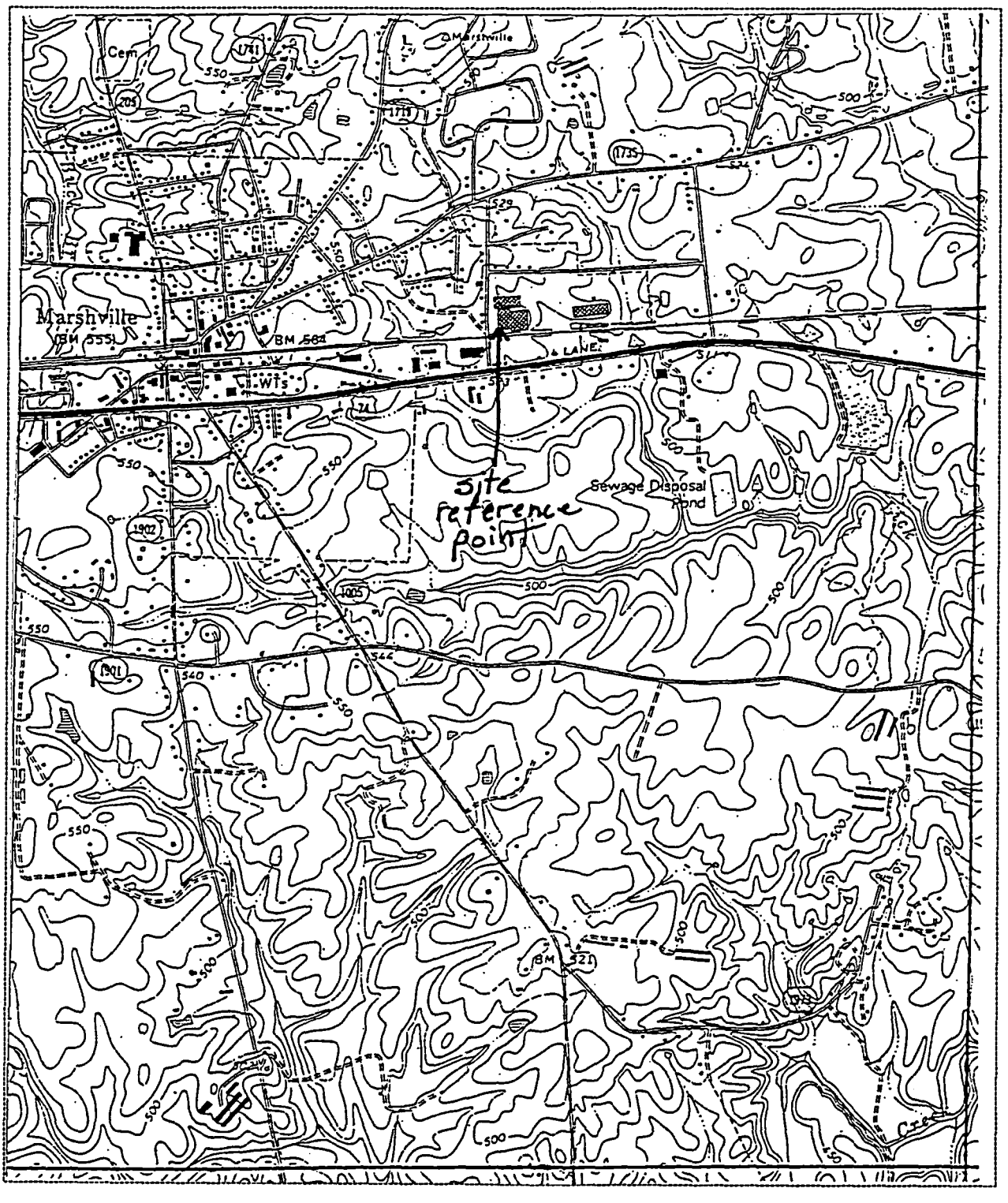
D) ADD TO STARTING LATITUDE: 80 ° 20 ' 0.00 " + 1 ' 15.33 "

SITE LONGITUDE: 80 ° 21 ' 15.33 "

80.3543 °

INVESTIGATOR: Melanie Bartlett DATE: 4/13/2005

SITE NAME: Universal Friction Composites NUMBER: NCN 000 407 827



TOPOGRAPHIC MAP QUADRANGLE NAME: Marshville SCALE: 1 : 24,000

COORDINATES FROM LOWER RIGHT (SOUTHEAST) CORNER OF 2.5' GRID CELL:

LATITUDE: 34 ° 57 ' 30.00 " LONGITUDE: 80 ° 20 ' 0.00 "

34.9583 ° 80.3333 °

REFERENCE 4

DEPARTMENT OF COMMERCE
Sinclair Weeks, Secretary

WEATHER BUREAU
F. W. Reichelderfer, Chief

TECHNICAL PAPER NO. 40

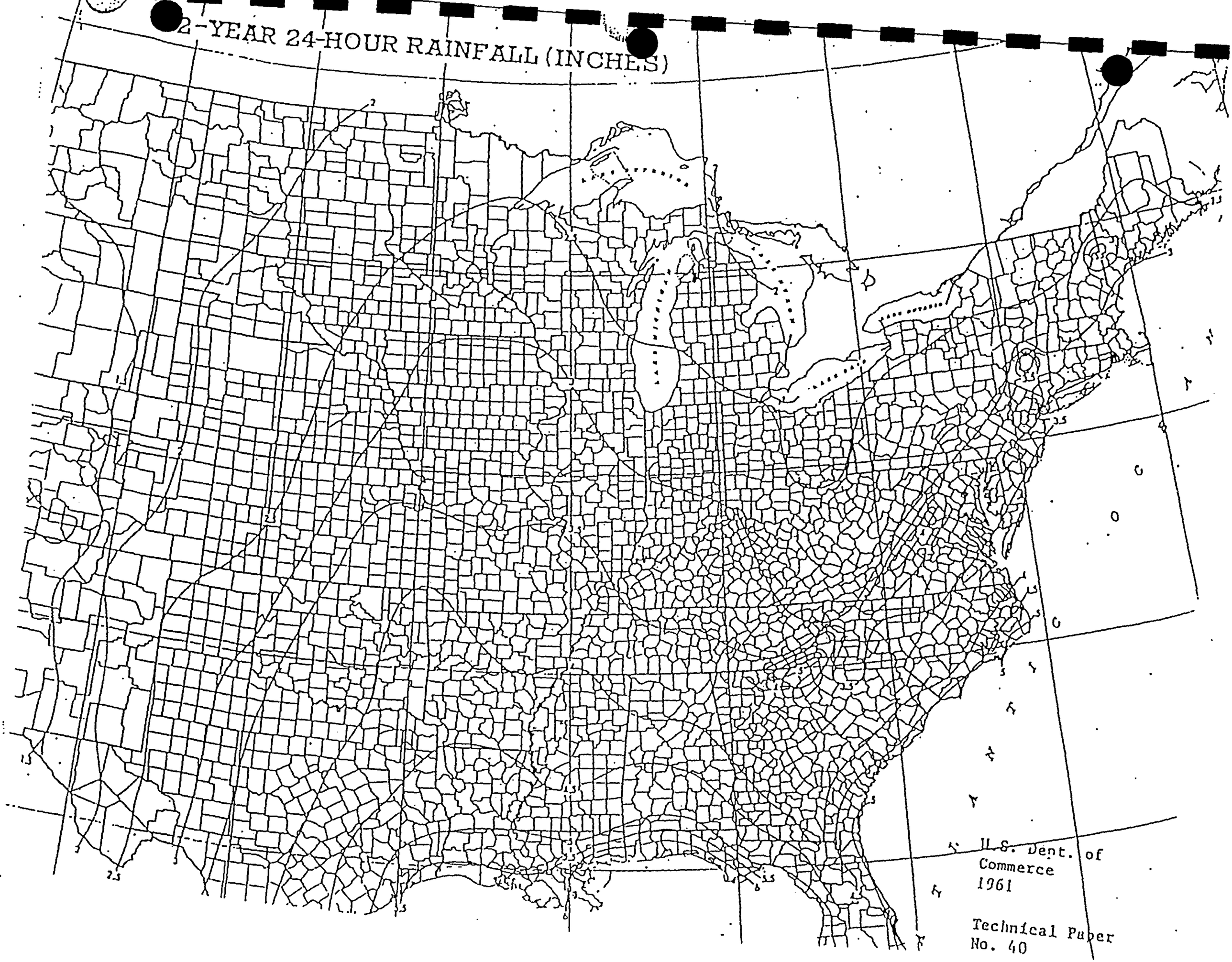
RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years

Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division
for
Engineering Division, Soil Conservation Service
U.S. Department of Agriculture

PROPERTY OF EPA
FIT IV

Ref. 4


2-YEAR 24-HOUR RAINFALL (INCHES)
U.S. Dept. of Commerce 1961
Technical Paper No. 40

REFERENCE 5

December 18, 2001

MEMORANDUM

To: Superfund Section Staff

From: Melanie Bryson Melanie Bryson

Re: Updated Annual Precipitation Map

Information concerning annual precipitation totals for North Carolina has been updated. Maps for all states were developed through a partnership between the United States Department of Agriculture-Natural Resources Conservation Service's (USDA-NRCS) National Water and Climate Center (NWCC) and the Spatial Climate Analysis Service (SCAS) at Oregon State University (OSU), developers of PRISM (the Parameter-elevation Regressions on Independent Slopes Model). A copy of the map for North Carolina's annual precipitation can be found at the following address:

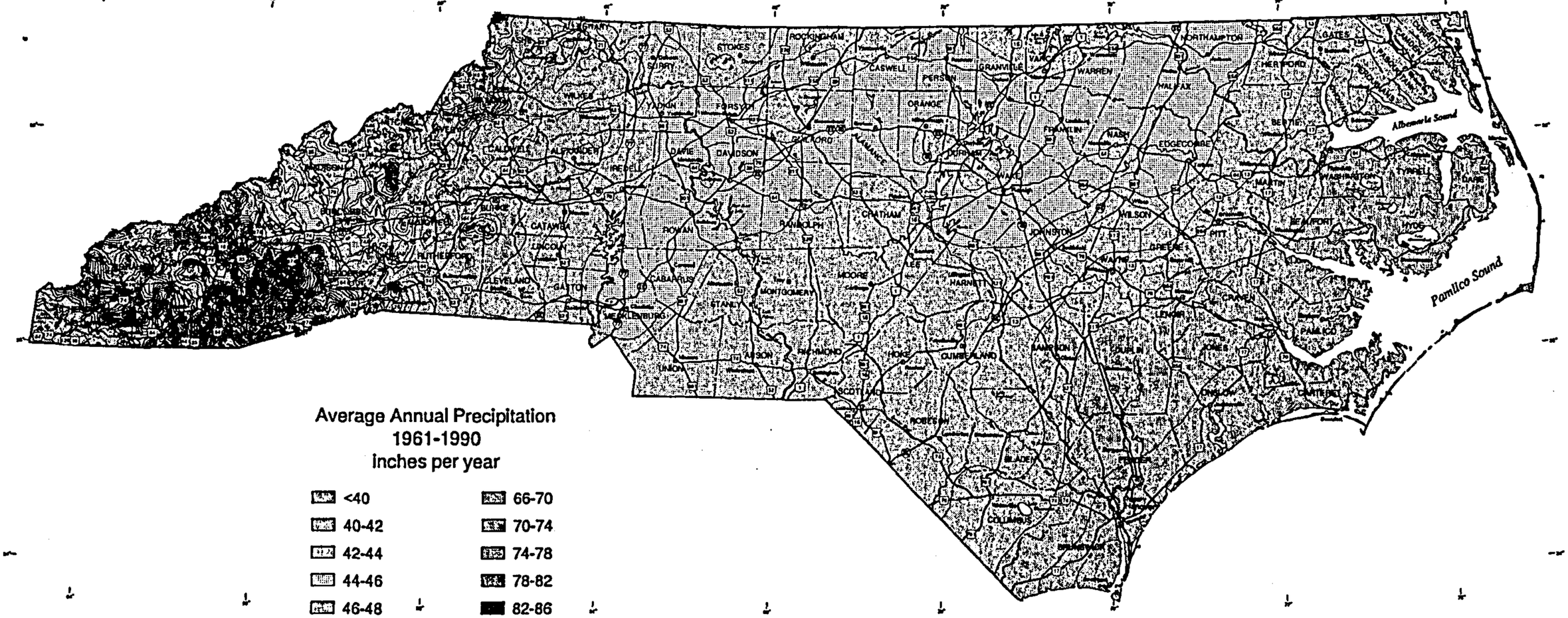
http://www.ftw.nrcs.usda.gov/prism/prismmaps_3.html#North Carolina

In addition, a black and white copy has been attached to this memo for your files. A larger version of the map in color has been printed out and included with the other reference materials.

U.S. DEPARTMENT OF AGRICULTURE

NATURAL RESOURCES CONSERVATION SERVICE

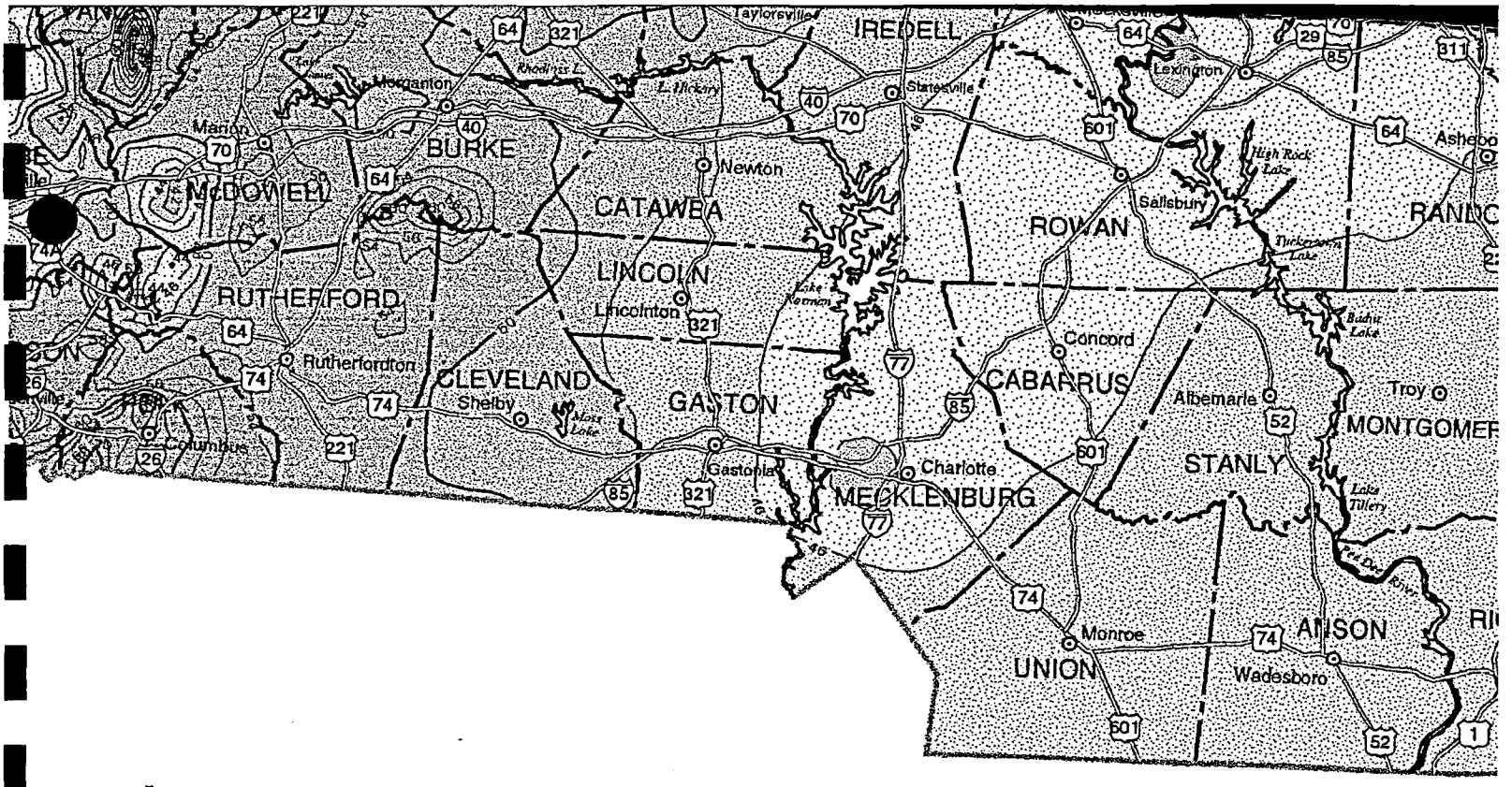
NORTH CAROLINA
ANNUAL PRECIPITATION



Average Annual Precipitation
1961-1990
inches per year

- <40
- 40-42
- 42-44
- 44-46
- 46-48
- 48-50
- 50-54
- 54-58
- 58-62
- 62-66
- 66-70
- 70-74
- 74-78
- 78-82
- 82-86
- 86-90
- 90-100
- 100-110
- 110-120

SCALE 1 : 1,180,000



age Annual Precipitation
1961-1990
inches per year

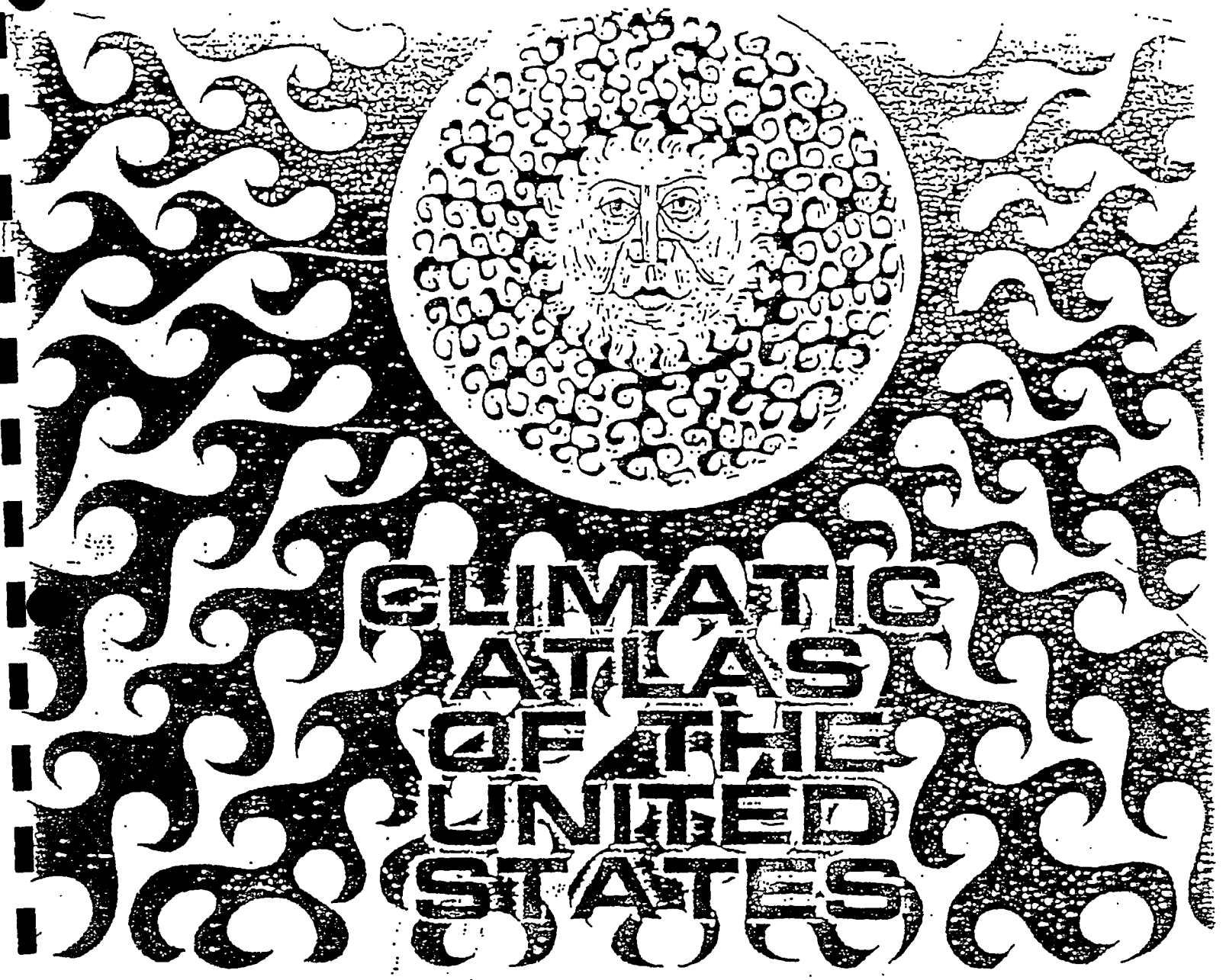
0	66-70
-42	70-74
-44	74-78
4-46	78-82
6-48	82-86
8-50	86-90
-54	90-100
-58	100-110
-62	110-120
-66	

82° 81° 80°

REFERENCE 6

Reference 15

Ref. 6



ICE . Environmental Science Services Administration . Environmental Data Service

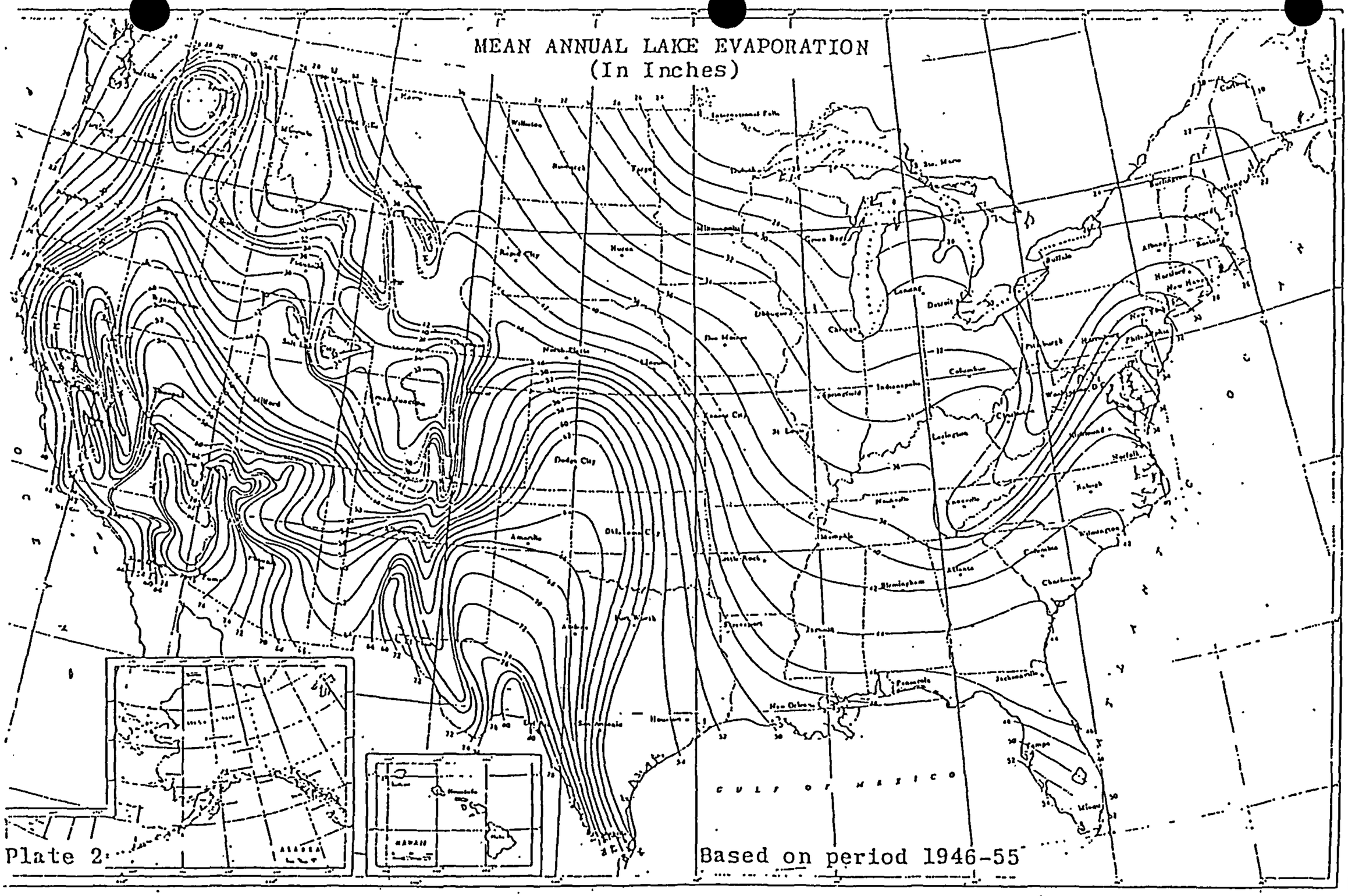
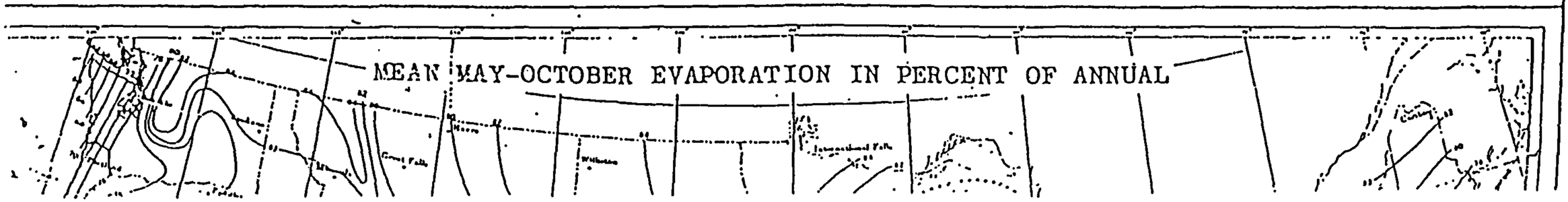


Plate 2

Based on period 1946-55

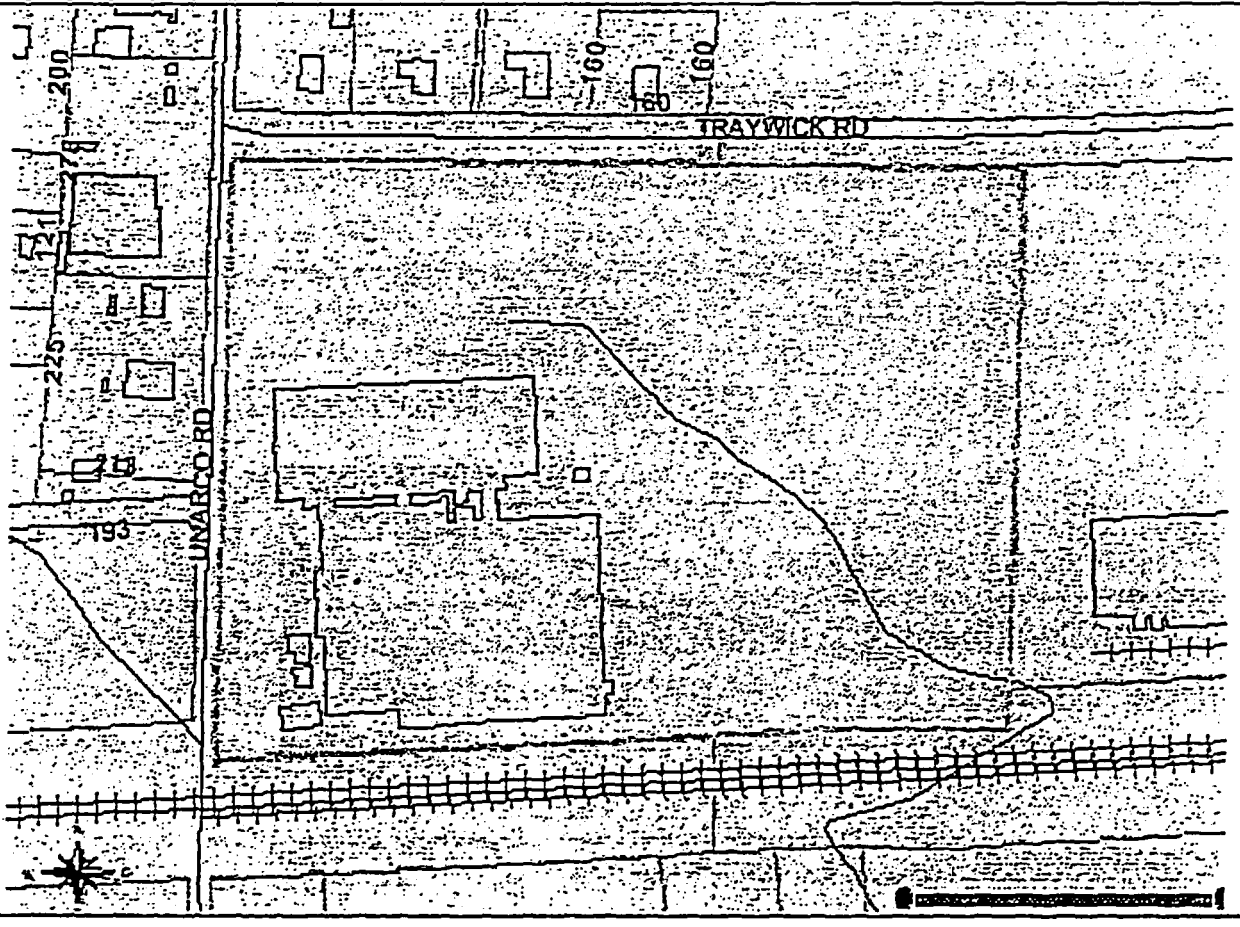


REFERENCE 7

Ref. 7

Union County- Parcel Print Display

Parcel Information	
Parcel ID	02114136
Owner Name	PHOENIX GROUP III LLC
Owner Mailing Address	2600 VIRGINIA AVE NW STE606
Owner City/St/Zip	WASHINGTON DC 20037
Acreage	18.95 Acres
Real Value	$716,850.00
Zoning	CITY



Visible Layers:

Lot Dimensions, Schools, Streets, Railroad lines, Water Lines, Streams, Structures, Lakes, Parcels

Date/Time Stamp	This map is prepared for the inventory of real property found within Union County, NC and is compiled from recorded deeds, plats, and other public records and data. Users of this map are hereby notified that the aforementioned public primary information sources should be consulted for verification of the information contained on this map. Union County and the mapping companies assume no legal responsibilies for the information contained on this map. Grid based on the North Carolina State Plane Coordinate System All dimnsions in feet
July 27, 104 10:52:15 am	

(1)

Union County - Parcel Information

Find Adjoining Parcels

Find parcels that are within 1 FEET of this parcel. Find Parcels
(A value of 1 finds adjoining parcels.)

This data was last updated on August 1, 2001. Click here to create print page with map and tax information.

Tax Information

Parcel ID	02114136	Stamp Date	
Owner Name	PHOENIX GROUP III LLC	Legal Address	RAYMARK INDUSTRIES
Owner Mailing Address	2600 VIRGINIA AVE NW STE606	Acreage	18.95 Acres
Owner City/St/Zip	WASHINGTON DC 20037	Land Value	$209,400.00
Deed	1488-492	M Value	$716,850.00
Stamps		Improved Value	$507,450.00
Stamp Code		Real Value	$716,850.00

Top of Page Close Parcel Information Window

Location Information

Township	Marshville	Fire District	Beaver Lane
Municipal Code	Marshville	Census Tract Number	208
Zoning	CITY	Census Tract Population	5007
Zoning Admin	Marshville	Census Tract Acres	34425
School District	County		

Top of Page Close Parcel Information Window

Site/Land Information

Soil Types	BuB MhA CnB CmB	Ortho	5495
Zone	Not in FEMA Zone	FEMA Map	37179C0120 C
Map	Not in FEMA Zone	FEMA Inset	
Community	Not in FEMA Zone		

Top of Page Close Parcel Information Window

Appraisal Information

Main Floor Sqft	42,500	Year Built	1940

Top of Page Close Parcel Information Window

Date/Time Stamp	
July 27, 104 10:50:52 am	This map is prepared for the inventory of real property found within Union County, NC and is compiled from recorded deeds, plats, and other public records and data. Users of this map are hereby notified that the aforementioned public primary information sources should be consulted for verification of the information contained on this map. Union County and the mapping companies assume no legal responsibilities for the information contained on this map. Grid based on the North Carolina State Plane Coordinate System All dimensions in feet

(2)

Union County - Parcel Radius Search Results

Your search for parcels within 100 feet of Parcel # 02114136 resulted in 11 record(s).

Click here to download the records in comma-delimted text format

Parcel Number	Parcel Owner	Address	City State	Zipcode	Acreage	Municipal Code	Total Real Value
02114130A							
02302007	CHRIST BIBLE TEACHING CENTER	1019 UNARCO RD	MARSHVILLE NC	28103	3.87	408	$769,890.00
02114135	CHRIST BIBLE TEACHING CENTER INC	1019 UNARCO RD	MARSHVILLE NC	28103	0	408	$24,710.00
02301011	EASON WILLIAM T & WF CAMELIA S	P O BOX 460	MARSHVILLE NC	28103	1.08	408	$41,170.00
02114137	EPSILON REALTY COMPANY & IRWIN FRIEDMAN	560 FERRY ST	NEWARK NJ	07105	12.466	408	$1,108,820.00
02114132	HELMS KATHERINE G	BOX 4	MARSHVILLE NC	28103	1.236	408	$39,480.00
02301008	HIGH DOUGLAS BOYCE & DORIS T	RT 2 BOX 91	PEACHLAND NC	28133	0	408	$170,180.00
02114133	HIGH EMMA T	BOX 632	MARSHVILLE NC	28103	0	408	$36,850.00
02114131	MARBLE TOMMY EUGENE & DOROTHY MARBLE	P O BOX 1 - CHAMBERS ST	MARSHVILLE NC	28103-0001	0.588	408	$26,540.00
02114132A	TOWN OF MARSHVILLE	201 W MAIN ST	MARSHVILLE NC	28103	0	408	$100.00
02302001B	TOWN OF MARSHVILLE	201 W MAIN ST	MARSHVILLE NC	28103	0.28	408	$400.00

Date/Time Stamp	
July 27, 104 11:18:42 am	This map is prepared for the inventory of real property found within Union County, NC and is compiled from recorded deeds, plats, and other public records and data. Users of this map are hereby notified that the aforementioned public primary information sources should be consulted for verification of the information contained on this map. Union County and the mapping companies assume no legal responsibilies for the information contained on this map. Grid based on the North Carolina State Plane Coordinate System All dimensions in feet

Top of Page Close Parcel Information Window

3

Union County - Parcel Radius Search Results

Your search for parcels within 200 feet of Parcel # 02114136 resulted in 18 record(s).

Click here to download the records in comma-delimted text format

Parcel Number	Parcel Owner	Address	City State	Zipcode	Acreage	Municipal Code	Total Real Value
02114130A							
02114139							
02114141A	BELK EVELYN EILEEN STATON & JOHN A &	1581 TWIN OAKS DR	KING NC	27021	0.62	408	$30,490.00
02114141	BELK EVELYN EILEEN STATON & JOHN A &	1581 TWIN OAKS DR	KING NC	27021	0.878	408	$11,470.00
02302007	CHRIST BIBLE TEACHING CENTER	1019 UNARCO RD	MARSHVILLE NC	28103	3.87	408	$769,890.00
02301007	CHRIST BIBLE TEACHING CENTER INC	1019 UNARCO RD	MARSHVILLE NC	28103	0	408	$100,060.00
02114135	CHRIST BIBLE TEACHING CENTER INC	1019 UNARCO RD	MARSHVILLE NC	28103	0	408	$24,710.00
02301011	EASON WILLIAM T & WF CAMELIA S	P O BOX 460	MARSHVILLE NC	28103	1.08	408	$41,170.00
02114137	EPSILON REALTY COMPANY & IRWIN FRIEDMAN	560 FERRY ST	NEWARK NJ	07105	12.466	408	$1,108,820.00
02114132	HELMS KATHERINE G	BOX 4	MARSHVILLE NC	28103	1.236	408	$39,480.00
02301008	HIGH DOUGLAS BOYCE & DORIS T	RT 2 BOX 91	PEACHLAND NC	28133	0	408	$170,180.00
02114133	HIGH EMMA T	BOX 632	MARSHVILLE NC	28103	0	408	$36,850.00
02114131	MARBLE TOMMY EUGENE & DOROTHY MARBLE	P O BOX 1 - CHAMBERS ST	MARSHVILLE NC	28103-0001	0.588	408	$26,540.00
02114142	MARSHVILLE COTTON MILLS INC %J J SHUBERT	CLUSTER BOX 7504	MARSHVILLE NC	28103	0	408	$51,050.00
02114146	MBR RENTALS LLC	2514 LANDSFORD RD	MARSHVILLE NC	28103	0.87	408	$37,900.00
02114132A	TOWN OF MARSHVILLE	201 W MAIN ST	MARSHVILLE NC	28103	0	408	$100.00
02302001B	TOWN OF MARSHVILLE	201 W MAIN ST	MARSHVILLE NC	28103	0.28	408	$400.00
02302008	WILLIAMS GEORGE M	8505 OLIVE BRANCH RD	MARSHVILLE NC	28103	2.72	408	$59,240.00

Date/Time Stamp	This map is prepared for the inventory of real property found within Union County, NC and is compiled from recorded deeds, plats, and other public records and data. Users of this map are hereby notified that the aforementioned public primary information sources should be consulted for verification of the information contained on this map. Union County and the mapping companies assume no legal responsibilities for the information contained on this map. Grid based on the North Carolina State Plane Coordinate System All dimensions in feet
July 27, 104 11:22:30 am	

Top of Page Close Parcel Information Window

4

REFERENCE 8

MEMO

DATE: July 27, 2004
TO: File
FROM: Jeanette Stanley, Environmental Chemist
NC Site Evaluation and Removal Branch
SITE: Universal Friction Composites
NCD 049 768 658 (RCRA Handler ID)
Marshville, Union Co., NC 28103

On July 19, 2004, I visited the Marshville, NC area, looking for a former asbestos facility listed as "Johns Manville Products" in 1968 Directory of NC Directory of Manufacturing Firms. My review of earlier directories showed the following site names listed in the respective directories:

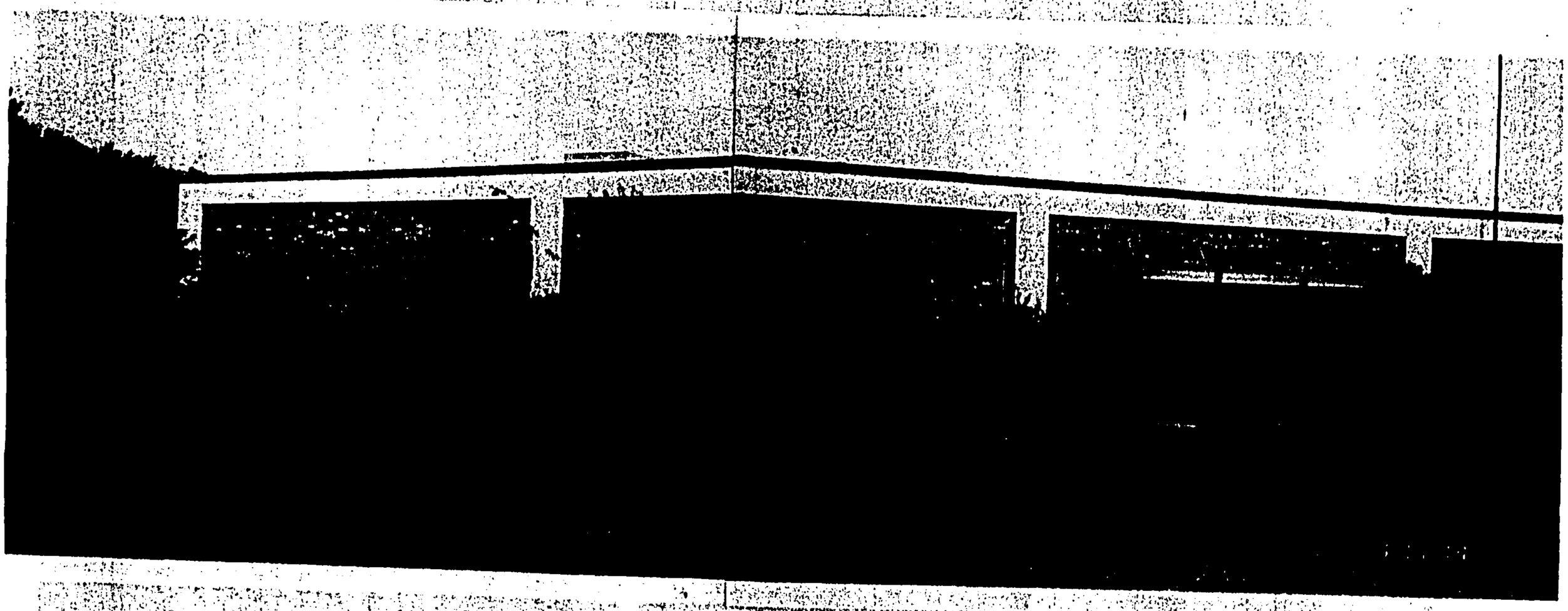
1944 – Carolina Asbestos Co.
1956 – 1964 – Union Asbestos and Rubber
1968 – Johns Manville Products

I visited the Marshville Town Hall and met with Carolyn Haigler, Tax Collector (704) 624-2680 / 624-2515. She gave me directions to the former Johns Manville Products company, and stated that it was most recently known as Universal Friction Composites. They made brakes and other asbestos products, and bankruptcy was filed in April 2004. She reported that the facility was formerly known as Raymark. She reported that the Universal Friction Composites facility is on Unarco Rd.

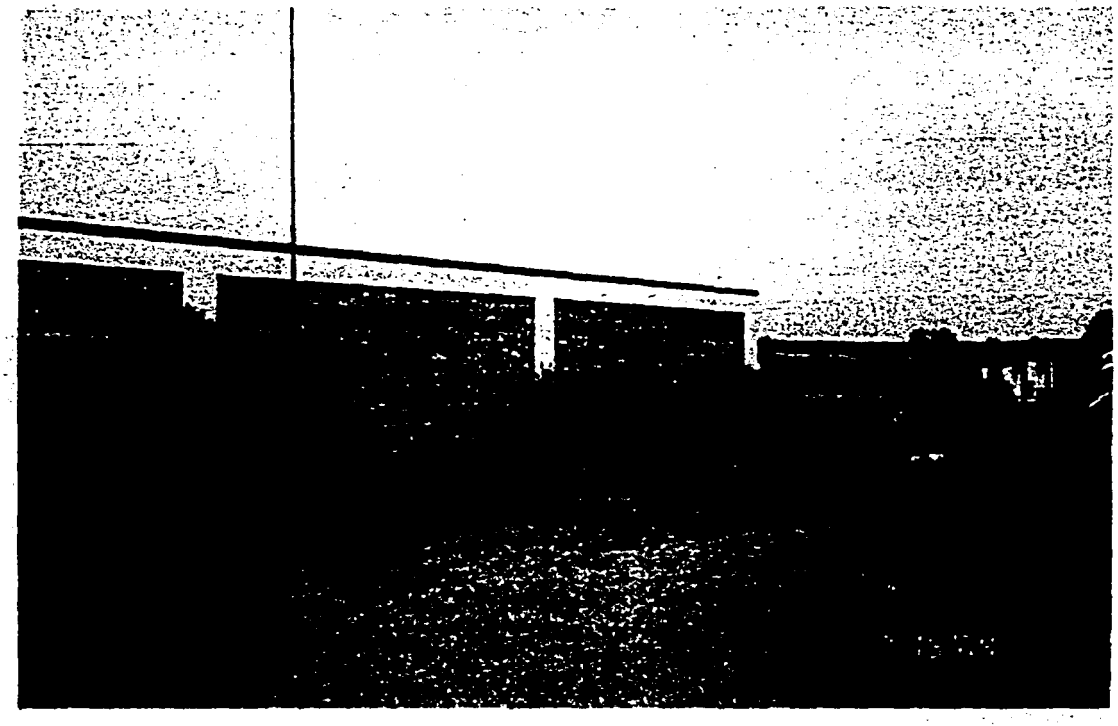
Jim Bateson and I drove to the facility and noted that it was vacant and overgrown. Although fenced, the entire facility (interior and exterior) was accessible to both pedestrian and vehicular traffic. Onsite were two horizontal tanks (approximate volume 20,000 gallons each) and one approximately 50,000 gallon vertical tank. We noted a chain link fence at the rear of the building, with a double wide, padlocked gate leading to the rear of the property. Scrap metal was visible in the overgrown rear portion of the property. Photographs of the facility are attached.

I subsequently talked with Carolyn Hailger by telephone and she described some of the adjacent land use. At the Unarco Road / Rt. 74 intersection is a former wood products (napkin holders, etc.) facility on the left, before the RR tracks. After crossing the RR tracks is a large church, Bill Eason Sandblasting (office only) and Catering, High's Welding shop, and the Daycare Center for the Church. Behind the Universal Friction facility, to the east is another industrial facility, formerly Delta Plastics, and is now operated as Poly Plastics. She reported that Unarco Road was formerly called Raybestos Road. She did not know why the road name was changed, or the origin of the "Unarco" name.

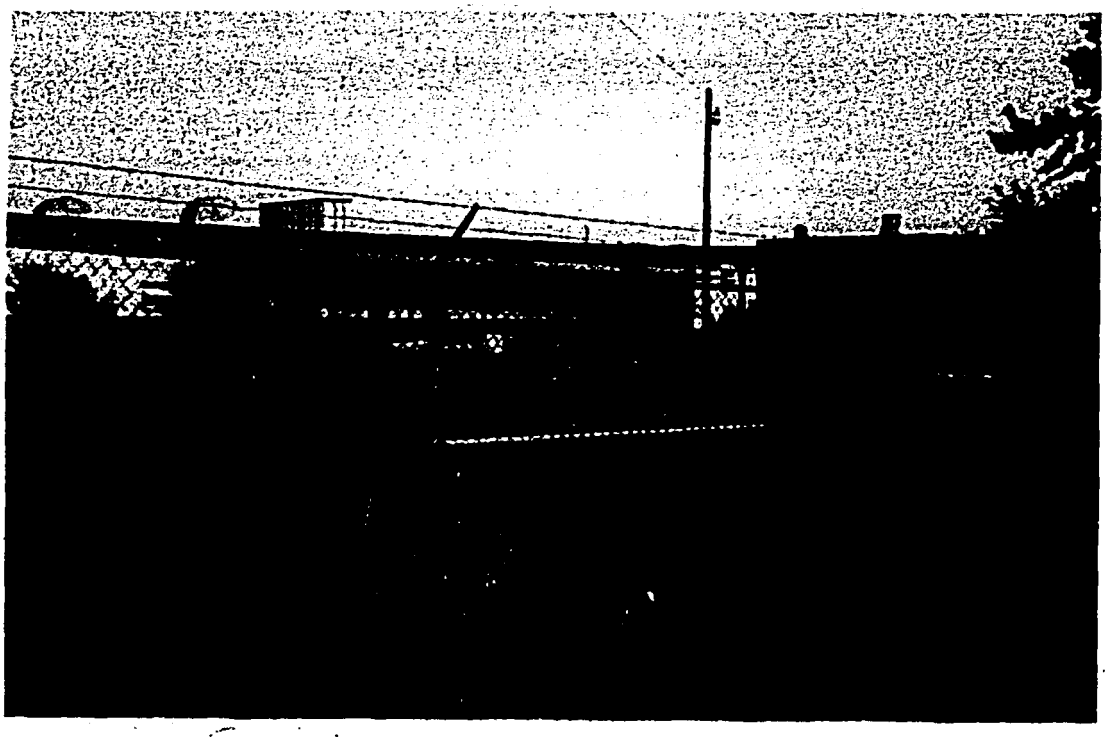
Ms. Haigler referred me to the County assessment office at (704) 283-3746 for information on acreage. I called the assessment office and was provided with the parcel number – 02114146. I then accessed Union County's web site and retrieved the information.



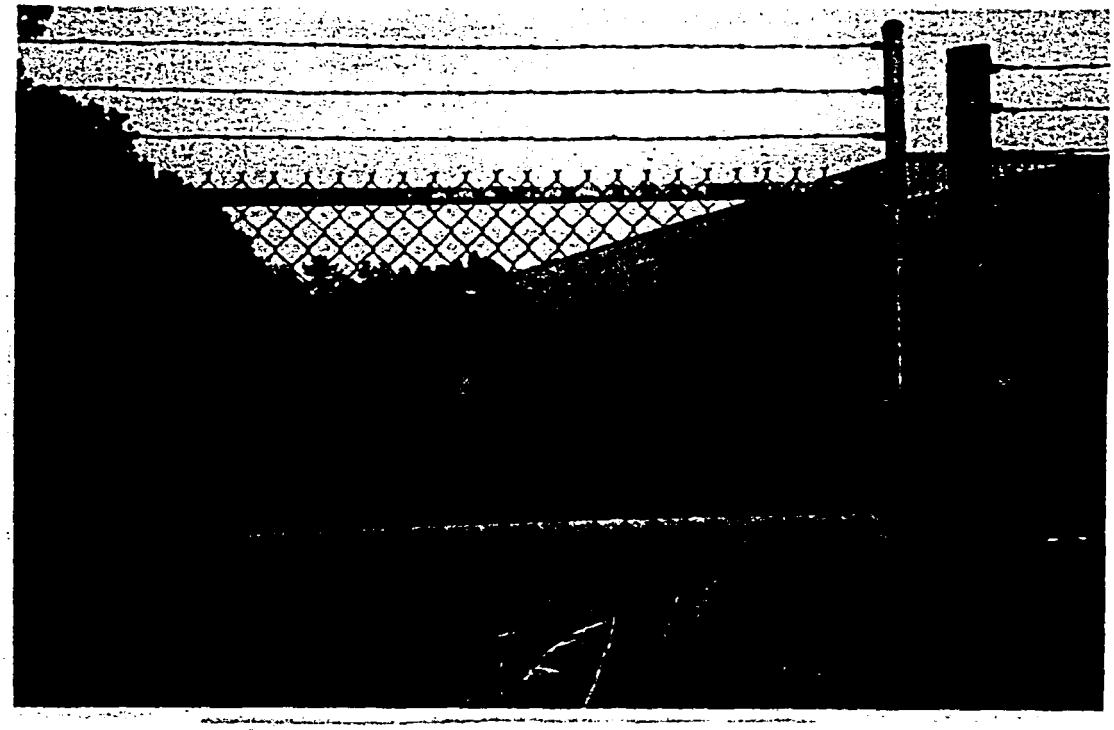
Universal Friction Composites, Front of Building
July 19, 2004



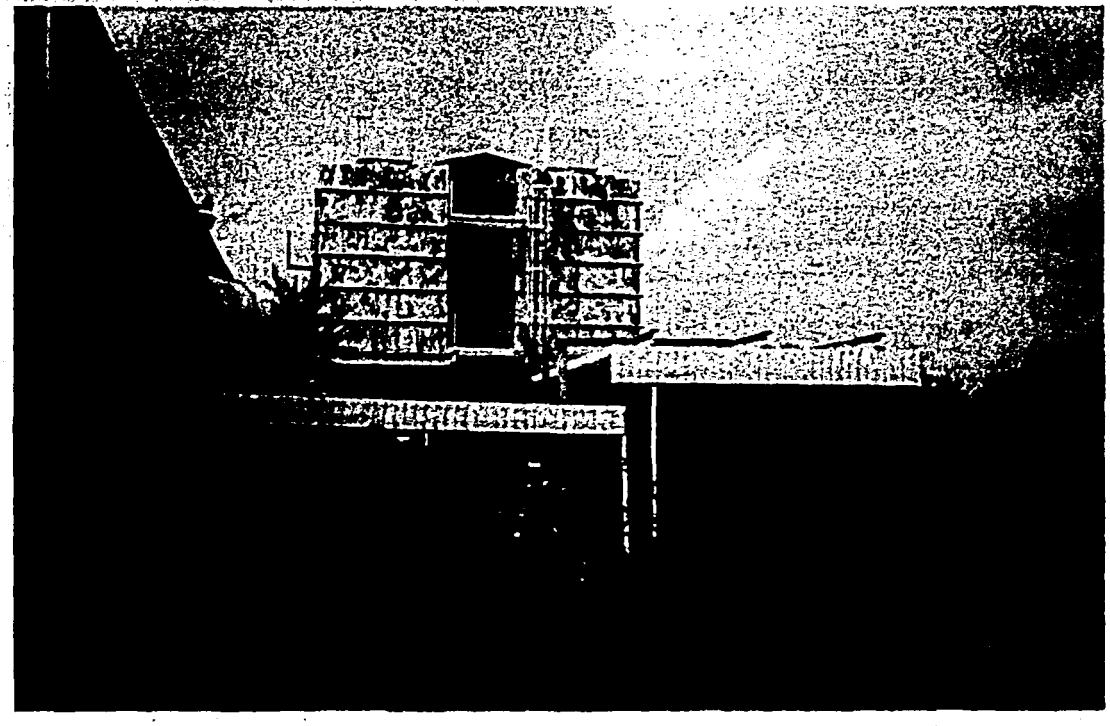
Universal Friction Composites, Front of Building
July 19, 2004



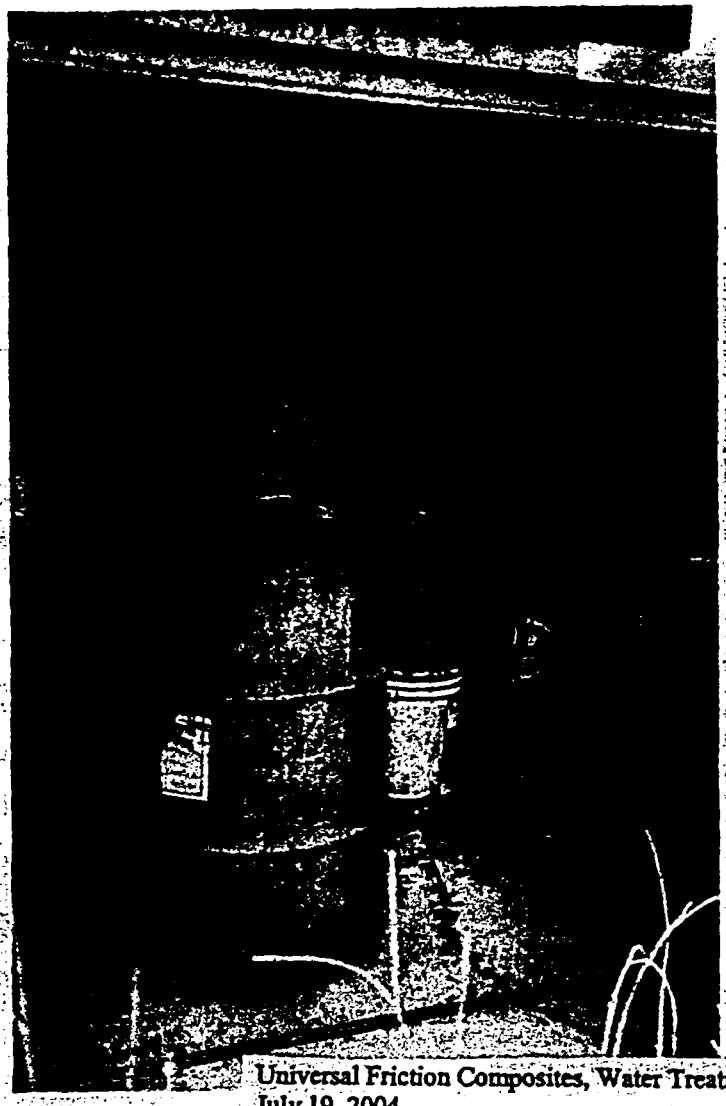
Universal Friction Composites, Front of Building
July 19, 2004



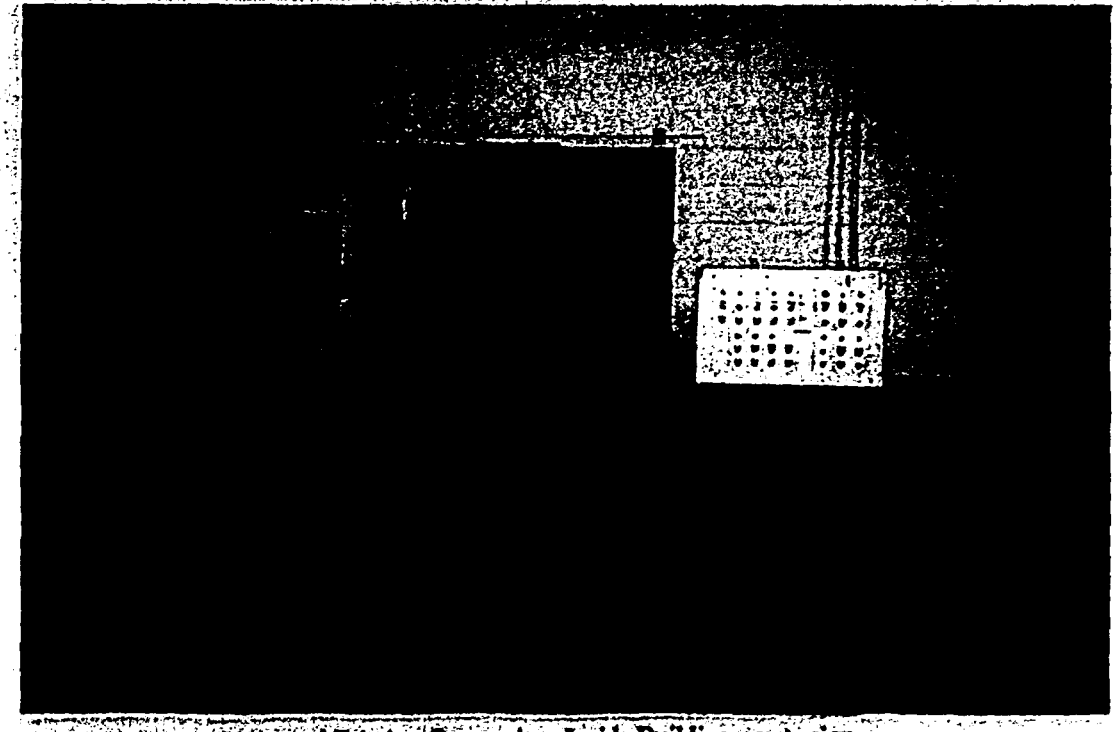
Universal Friction Composites, North side of Building
July 19, 2004



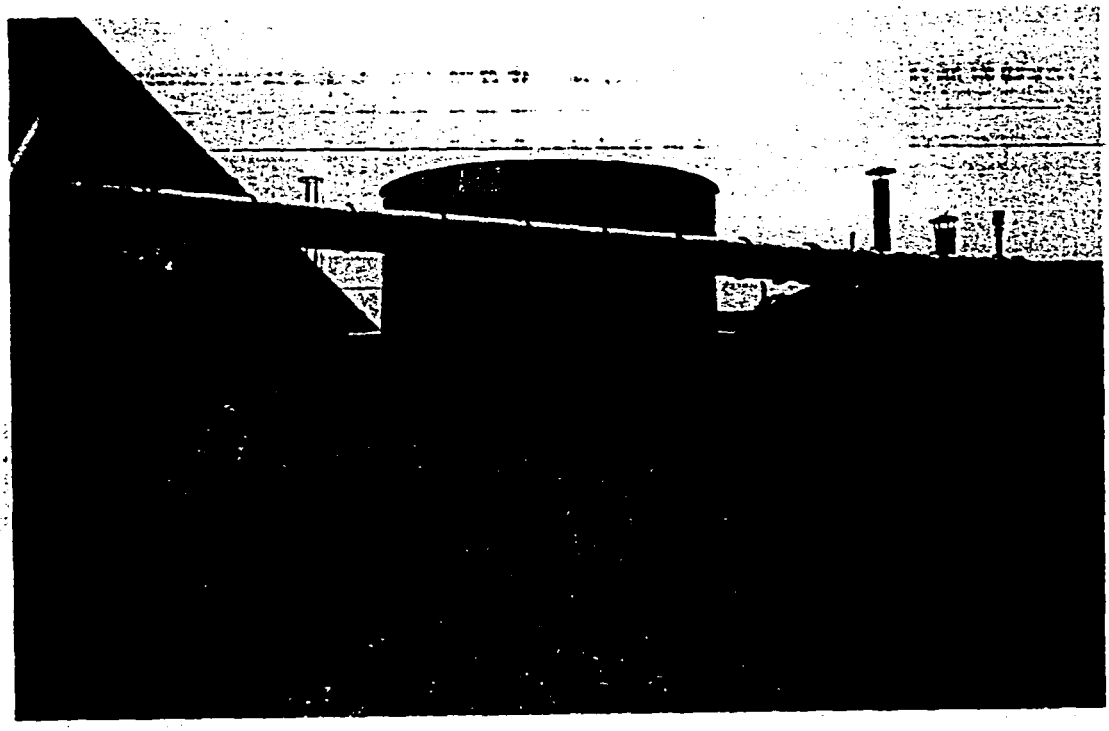
Universal Friction Composites, Rear of Building
July 19, 2004



Universal Friction Composites, Water Treatment Chemicals inside shed
July 19, 2004



Universal Friction Composites, Inside Building – note sign
July 19, 2004



Universal Friction Composites, AST at Rear of Building
July 19, 2004

Universal Friction Composites, ASTs at Rear of Building, northeast corner
July 19, 2004

REFERENCE 9

November 4, 2004

MEMO

To: File

From: Melanie Bartlett Melanie Bartlett

Subject: Onsite/Offsite Reconnaissance – Trip Report
Universal Friction Composites
Marshville, Union County, NC
US EPA ID: NCN 000 407 827

On Wednesday, October 27, 2004, Melanie Bartlett (MB) and Jeanette Stanley (JS) conducted an onsite/offsite reconnaissance visit to the Universal Friction Composites site in Marshville, Union County, NC. The purpose of the trip was to collect information about the site, observe the site, and note surrounding targets.

MB and JS initially went to the Town Hall. MB met with Mr. Carl Webber, Town Administrator for the Town of Marshville. Mr. Webber provided current contact information for the site (Mr. Gary Silversmith, Phoenix Group, Business-202-337-7300, Mobile-202-487-8777). Mr. Webber also provided a summary report given to the Town and completed by the Phoenix Group. Mr. Webber allowed MB to borrow the report for the purpose of the copying the information.

MB then proceeded to meet with Mr. Bivens Steele, Public Utilities Director for the Town of Marshville. Mr. Steele stated that the Town buys its water from the Anson County Water System and that the connection was located along Highway 74. He also stated that there was one emergency connection with Union County. MB and JS follwed Mr. Steele to the Public Utilities office to review maps. The decision was made that MB would return on Friday, October 29, 2004, to further review the maps and obtain additional waterline private well user information.

MB and JS then proceed to the site. The site is fenced, though two entrances to the property were found to be unlocked and partially opened. A large building, with several small ones and several storage tanks, were remaining on site. Raw product was observed in a small room with several hoppers, on the east side of the building. Vents were observed all along the north side of the main building. A fuel storage tank where previous cleanup activities had occurred was located on the northeast corner of the building.

After walking/driving around all four sides of the building, MB and JS walked on an area outside the fence along the drainage ditch leading from the property. No water was observed in this ditch.

On Friday, October 29, 2004, MB returned to Town Hall. MB met with Mr. Webber to return his copy of the report and answer questions about site activities that he had. When MB had answered all of Mr. Webber's questions, Mr. Steele provided MB with the locations of all the Town's waterlines, as well as the location of the emergency connected with Union County near Wingate and the connection with the Anson County Water System. Mr. Steele also provided a list of all the houses within Town limits that did not have a connection to the Town's water system. Mr. Steele stated that his meter reader had collected the information for him.

JOB BOOK

FROM BEN MEADOWS COMPANY

PROJECT NAME Universal Friction Composites

PROJECT NUMBER NCN000407827

CREW Melanie Bartlett

DATE _____ BOOK # ____ OF ____

WEATHER _____

FIELD BOOK
16 PAGE
8 LEAVES
50% RAG

CURVE FORMULAS

$T = R \tan \frac{1}{2} I$

$T = \frac{50 \tan \frac{1}{2} I}{\text{Sin.} \frac{1}{2} D}$

$\text{Sin.} \frac{1}{2} D = \frac{50}{R}$

$\text{Sin.} \frac{1}{2} D = \frac{50 \tan \frac{1}{2} I}{T}$

$R = T \cot. \frac{1}{2} I$

$R = \frac{50}{\text{Sin.} \frac{1}{2} D}$

$E = R \text{ ex. sec } \frac{1}{2} I$

$E = T \tan \frac{1}{4} I$

$\text{Chord def.} = \frac{\text{chord}^2}{R}$

$\text{No. chords} = \frac{I}{D}$

Tan. def. = ½ chord def.

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve. very nearly.

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft.) and divide given deflection by the product.

Rule 2. Multiply given deflection by 57.3, and divide the product by the given distance.

To find deflection for a given angle and distance. Multiply the angle by .01745, and the product by the distance.

GENERAL DATA

Right Angle Triangles. Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

Given Base 100, Alt. $10.10^2 \div 200 = .5$. $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. $25.25^2 \div 200 = 3.125$: $100 - 3.125 = 96.875$ = Base.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.

Leveling. The correction for curvature and refraction, in feet and decimals of feet is equal to $0.574 d^2$, where d is the distance in miles. The correction for curvature alone is closely, $\frac{2}{3} d^2$. The combined correction is negative.

Probable Error. If d_1, d_2, d_3, etc. are the discrepancies of various results from the mean, and if Σd^2 = the sum of the squares of these differences and n = the number of observations, then the probable error of the mean $= \pm 0.6745 \sqrt{\frac{\Sigma d^2}{n(n-1)}}$

MINUTES IN DECIMALS OF A DEGREE

1′	.0167	11′	.1833	21′	.3500	31′	.5167	41′	.6833	51′	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

INCHES IN DECIMALS OF A FOOT

1-16	3-32	⅛	3-16	¼	5-16	⅜	½	⅝	¾	⅞
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729

1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

Universal Friction Composites 10/27/04
NGN 000407 827

60°F Overcast, misty

11[15] Melanie Bartlett and Jeanette Stanley arrived @ Town Hall

Carl W Webber - Town Administrator
- provided contact information + additional report from Phoenix Group

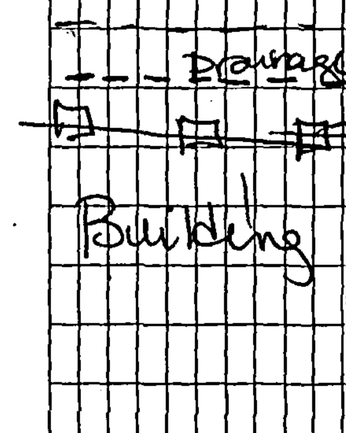
Bivens Steele Public Utilities Director
- Marshville buys water from Anson Co water system
- emergency connection to Union County
- connection to Anson County along Highway 74
- MB will return on Friday to review waterline maps (go to town hall)

12[30] JS+MB arrived @ site
- entered back gate off Traywick

Melanie Bartlett

Universal Friction Composites 10/27/04

Photos 1+2
raw product in large hopper area
on east side of building
Photos 3-5
3-fuel storage area
4+5 E/NE area of building
-red tank-water tank



7223, 7221, 7207 one of these 3 I did see
a well user in Apr. 2002 Limited
site assessment

site for Rent (336) 625-6076

Photo 6
Inside SW corner of building

Melanie Bartlett

Universal Friction Composites 10/07/04

Photo 7
West side of property/building

Photo 8
Christ Bible Teaching Center

JS + MB followed open area east of building outside gate.
- JS + MS following clearing to send
  - did not see streambed w/flowing water
14:00 MB + JS Departed site

Melanie Bartlett

House beside of
1417 Old Peadland Rd.

1523 " " "

1623 " " "

515 Haddy Rd.

509 " "

One House after
1801 Old Peadland Rd.

2204 Old Peadland Rd.

2304 " " "

2309 " " "

2314 " " "

2416 Old Peadland Rd.

2422 " " "

2426 " " "

2502 " " "

2510 " " "

2408 Old Lawyers Rd.

2725 " " "

2715 " " "

2605 " " "

1807 Olive Board

Gary Pennigar
915 Dr. Blair Rd.

1703 Old Hwy. 74

8110 Hwy. 74

8304 Hwy. 74

8606 Hwy. 74

2 House's after
8021 Hwy. 74 West

212 Water Plt. Rd.

402 " " "

House between
these address's

2011 Old Lawyers Rd.

1514 " " "

1720 Hamilton
Crossroads

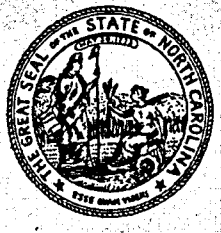
905 " "

REFERENCE 10

Ref. 10

North Carolina State Library,
Raleigh

NORTH CAROLINA
DIRECTORY
OF
Manufacturing Firms



1964

PREPARED BY
DIVISION OF STATISTICS
THE NORTH CAROLINA DEPARTMENT OF LABOR

FRANK CRANE, COMMISSIONER
LEWIS P. SORRELL, DEPUTY COMMISSIONER
W. L. STRICKLAND, DIRECTOR, DIVISION OF STATISTICS

PRICE $5.00 PER COPY

REFERENCE 11

Ref. 11

U.S. Environmental Prot

Facility Registry System (FRS)

Facility Detail Report

Report an Error

FRS

Facility Name:	RAYBESTOS-MANHATTAN INC
Location Address:	ASBESTOS-PLANT RD
Supplemental Address:	
City Name:	MARSHVILLE
State	NC
County Name:	UNION
ZIP/Postal Code:	28103
EPA Region:	04
Congressional District Number:	
Legislative District Number:	
HUC Code:	
Federal Facility:	
Tribal Land :	NO
Latitude:	
Longitude:	
Method:	
Reference Point Description:	
Duns Number:	
Registry ID:	110007659042

Report Facility Discrepancy

Map this facility

Environmental Interests

Information System	Information System ID	Environmental Interest Type	Data Source	Last Updated Date	Supplemental Environmental Interests:
RCRAINFO	NCD049768658	NOT IN A UNIVERSE	NOTIFICATION	09/13/1988	

Facility Mailing Addresses

Affiliation Type	Delivery Point	City Name	State	Postal Code	Information System
FACILITY MAILING ADDRESS	PO BOX 429	MARSHVILLE	NC	28103	RCRAINFO
REGULATORY CONTACT	ASBESTOS-PLANT RD	MARSHVILLE	NC	28103	RCRAINFO

NAICS Codes

No NAICS Codes returned.

SIC Codes

No SIC Codes returned.

Contacts

Affiliation Type	Full Name	Office Phone	Information System	Mailing Address	Report Discrepancy
REGULATORY CONTACT	LEWIS WILLIAMS	7046245031	RCRAINFO	View	Report

Organizations

Affiliation Type	Name	DUNS Number	Information System	Mailing Address	Report Discrepancy
OWNER	RAYBESTOS-MANHATTAN INC		RCRAINFO		Report

Alternative Names

No Alternative Names returned.

Query executed on: JUL-21-2004

REFERENCE 12

DUST CONTROL IN A CONVENTIONAL ASBESTOS TEXTILE FACTORY

Hilton C. Lewinsohn

Raybestos Manhattan, Inc.
Trumbull, Connecticut 06611

C. A. Kennedy, J. E. Day, and P. H. Cooper

Raybestos Manhattan Industrial Products Company
North Charleston, South Carolina 29406

The first recommended threshold limit value (TLV) for asbestos exposure was that of Dreessen *et al.* of the U.S. Public Health Service. [1] In 1938 following a survey of 541 employees of four North Carolina asbestos textile mills, USPHS proposed a standard of 5 million particles/cubic foot (mppcf) for the prevention of asbestosis. This standard was included in the American Conference of Governmental Industrial Hygienists (ACGIH) list of maximum allowable concentration (MAC) values in 1946 and, in 1948 was placed on the ACGIH listing of TLVs. ACGIH TLVs became legally enforceable standards in 1968 for those industries to which the Walsh-Healy Act applied.[2]

The standard proposed by the British Occupational Hygiene Society in 1968[3] and adopted in Britain in 1970[4] was based upon the concept of a cumulative dose and the risk of less than 1% of exposed persons developing the earliest signs of asbestosis. This standard of 100 fiber years per cm^3 was interpreted as meaning that a similar risk applied for an exposure of 2 fibers/cm^3 for 50 years, 4 fibers/cm^3 for 25 years, etc.

In the United States, a federal standard of 12 fibers/cm^3 greater than 5 μm in length, 2 mppcf, was promulgated on May 20, 1969, under the provisions of the Walsh-Healy Public Controls Act. This also was proposed as an interim standard under the Occupational Safety & Health Act, 1970 on May 29, 1971 but was soon replaced by an Emergency Temporary Standard of 5 f/cm^3 on December 7, 1971.

As required by the Occupational Safety & Health Act, a permanent standard for asbestos exposure was promulgated six months later in June, 1972.[5] This standard permitted exposure to airborne concentrations of asbestos fibers, longer than 5 micrometers, provided that the 8 hour time weighted average (TWA) concentrations to which any employee may be exposed "shall not exceed 5 fiber per cubic centimeter of air." The standard also stipulated that, effective July 1, 1976, "the 8 hour TWA airborne concentrations of asbestos fibers to which any employee may be exposed shall not exceed two fibers, longer than 5 micrometers, per cubic centimeter of air."

Thus, industry knew that it had a target to obtain by July, 1976 and decisions had to be taken as to how the task of complying would be achieved. This company decided that, irrespective of the standard demanded, it would use the most effective and practicable means of reducing dust to the lowest possible level and would continue to manufacture asbestos textiles by conventional methods. In this paper we will describe the engineering methods that enabled us to achieve our target and still maintain the continuity of the operation. It was not feasible to complete the project until July, 1977.

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Historical Details

The Marshville plant acquired by Raybestos-Manhattan in November 1969 was run down in the preparation–carding and weaving areas. Much work was needed to make the plant a productive and profitable venture. The employee union recognized the problem and demanded certain commitments before signing over its negotiated contract to Raybestos-Manhattan. One of those commitments was for the development of a "safe work-place" for its membership, to which we readily agreed.

In 1969 approximately 87,000 cubic feet per minute (CFM) of exhaust air was collected in a baghouse and could be recycled to the workplace. Approximately 9000 CFM of exhaust air was collected in a cyclone collector exhausting to the atmosphere.

The baghouse air was collected from preparation and carding. The cyclone air was collected from weaving and filling winding. There were no other areas in the plant with exhaust ventilation. Waste fiber was removed from the bag–house in open–top boxes and from the cyclone periodically by shovels.

The chrysotile asbestos fiber was brought into the plant in compressed bales. The asbestos and carrier fiber storage areas were orderly with little or no noticeable dust emission.

Fiber preparation, including blending, opening and mixing was accomplished with old-fashioned methods. The opened fiber was stored in stock–holding bins of about 3000–4000 pounds capacity and the pneumatic line that fed fiber to the bins did so by means of a ceiling condenser mounted over a crossing conveyor belt that was located on top of the bins some 25 feet above floor level. The fiber had to be removed from the bins by hand, using a pitchfork to transfer it to a loose cart from whence it was taken to the front of the card–feed hopper and hand–fed to the carding machines. (FIGURE 1)

The cards were built in the late 1930s and early 1940s. The roving from these cards, wound on wooden spools, was very weak and broke constantly. Breaks of this type contributed to the dust problem in the later spinning operation. The cards had enclosed and exhausted cylinders but were dusty due to the design, poor upkeep and inadequacy of the dust system. Under–card wastes were removed by a mechanical rake, delivered pneumatically to the baghouse and removed by shakedown. A portion of it was reused and the rest bagged off and sold.

Spinning was dusty mainly due to yarn breaks. As the end broke, it hit the adjacent ends and created dust.

Twisting suffered from the same problem but to a lesser degree. Winding was dry without exhaust ventilation and dust was created by this process as well.

Weaving was done dry with extracted air on some looms. Attempts at exhausting automatic looms had been unsuccessful and those fitted with wet pans were not effective because only a portion of the yarns in each type was wetted. The yarn for weaving was wound dry with no dust control and the warp yarns were supplied from creels in a dry state and no dust controls.

Inspection and shipping was probably the cleanest operation in the plant due to the nature of the job and there were no dust controls. The cloth and tape was wrapped in kraft paper and shipped.

In summarizing the environmental condition of the Marshville plant at the time of the R/M acquisition, dust counts were barely below 12 fcc, the maximum allowable concentration recommended by the ACGIH, and the productive process was inadequate for a profitable venture. However, R/M recognized that the plant had potential and was in need of a yarn and cloth making facility for their friction products plant in Pennsylvania.

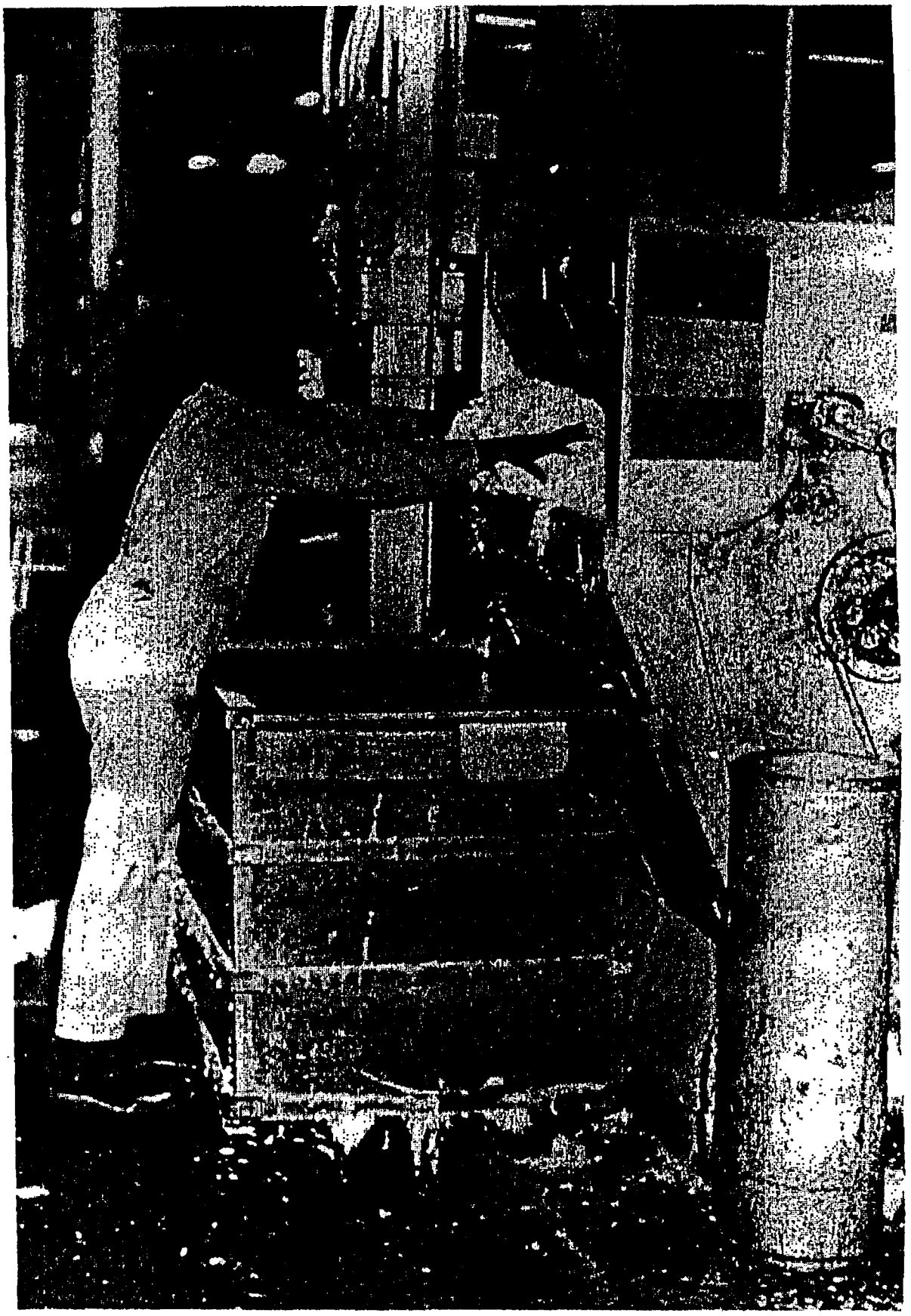

FIGURE 1. Hand-feeding a card hopper.

It was decided then to convert the product line from typical asbestos textiles into yarn and cloth for use in friction materials manufacture and to reduce dust generation where possible.

The strategies to be used were:

1. Increase carding production by upgrading and reclothing the cards, convert the tape condensor cards to ring condensers and produce a quality roving of a coarser count from all cards wound on cheeses instead of jackspools.
2. Upgrade the raw material by using Cassiar fiber in Grades A and AA and Bells 3–T, by using good long staple cotton combined with rayon and by the introduction of a core yarn (for carrier) at the card to allow for good roving strength for spinning.
3. Change the method of spinning and twisting from ring spindles to flyer spindles.
4. Start a program to reduce dust generation in weaving by dampening the yarns at the loom and winding for weaving.

The action plan necessary to implement the above took nearly four years (from 1969 to 1973).

Corporate Policy

In 1974 Raybestos-Manhattan, Inc. formulated a comprehensive corporate policy that included the elimination of asbestos from products where a viable substitute could be found. All other asbestos containing products would be manufactured by a "clean system." Control measures were to be developed to cover the entire process from the introduction of the raw asbestos through the disposal of waste, scrap and rejected material.

An intensive study was made of all asbestos and asbestos containing products. Products were identified for elimination from manufacture and others were identified as candidates for manufacture under the "clean system" concept. Restructuring of the manufacturing system and capacities was then planned.

In June, 1975 a comprehensive "clean system" plan for asbestos textiles, requiring the expenditure of $12.3 million, was approved. It provided $2.6 million for the redesign and conversion of the conventional textile operation at the Marshville plant to a "clean system" conventional textile process. The remaining $9.7 million was for a wet extrusion process plant at North Charleston, South Carolina and for the close out of yarn manufacturing at the Manheim, Pennsylvania plant.

Strategies Developed for Marshville Plan

To accomplish the objectives for the Marshville plant, the following strategies were developed:

1. Eliminate all man–handling of raw asbestos fiber by use of a closed system where possible.
2. Reduce dust generation by effective exhausting or wetting where possible.
3. Utilize as much of the existing equipment as possible from both Pennsylvania and Marshville plants by relocating, rebuilding, and modifying where needed.

4. Upgrade and expand existing building, simplify vacuum cleaning by having smooth walls and avoid ledges and surfaces that catch and retain dust.
5. Provide a maximum of fresh clean air to the workplace by use of heated or humidified make–up air units.
6. By design, provide for a safe, clean method of waste collection and reuse and/or removal.

The action plan required nearly two years for completion, reducing fiber counts to less than 1 f/cm^3 and increasing the plant capacity considerably.

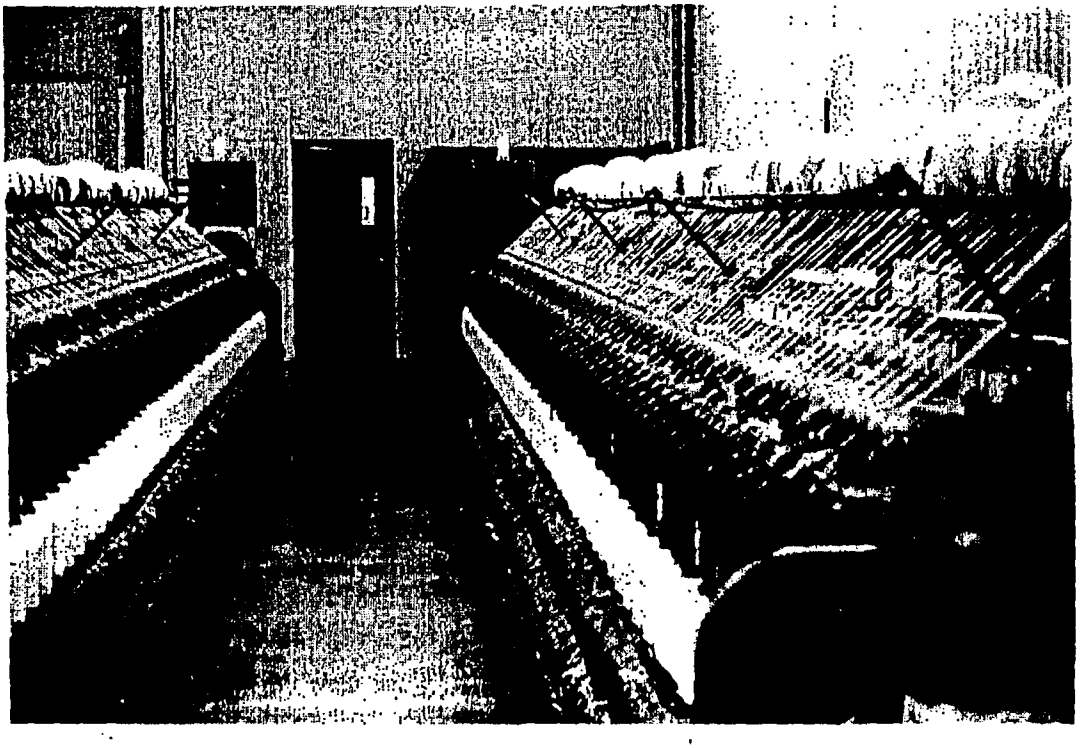

FIGURE 2. New addition built during modernization of plant.

ACTION PROGRAM

Plant Facility

A new addition of 50,000 square feet of floor space was built utilizing the "smooth surface" approach. This new floor space was designated for spinning, twisting equipment, an office, and a maintenance shop/boiler room (FIGURE 2).

Fresh make up air with added heat and humidity was provided for by installing three 50,000 CFM, and one 65,000 CFM roof mounted units. These required that an additional 500 horsepower boiler be installed giving a total boiler horsepower of 750.

Additional exhaust air was provided by installing a 110,000 CFM baghouse of the pull through type having two 125 horsepower backward inclined blade fans. There are ten bag cell modules, five on each fan. Shakedown and waste removal is accomplished by screw conveyors dumping through rotary air locks into plastic bags. This allows for

FIGURE 3. Opening bags of asbestos with exhaust air draughted away from the operator and into the hopper. (Note Breach of Work Rules--Use of Empty Asbestos Bags to Make Workapron)

a total of nearly 200,000 CFM of exhaust air. The building is thus under a slight positive pressure. The starting and stopping of the make-up and exhaust air have to be tied together electronically to prevent damage to the building.

Blending/Opening

A "fiber control" blending line is used to blend the asbestos, carrier and waste. Each feed hopper is enclosed and under a negative pressure, opened at the feed end only so as to allow the bags of asbestos to be opened in an area draughted away from the operator and into the hopper. (FIGURE 3).

The under card waste is returned pneumatically to its respective feed hopper of the blend line, where the long fibers are separated from the shorts and sand, by passing through the screen of a ceiling condenser directly into the hopper. The hopper is completely enclosed and exhausted. This eliminates the job of under–card fly removal once done manually.

The blended stock is conveyed pneumatically to a "reserve hopper" kept under negative pressure where up to 5000 pounds can be stored for work in process inventory, allowing blendline changes for versatility in mixes.

The stock or mix is transferred pneumatically to card feeds. It has been found that air velocity of 2000 fpm minimum will carry the mix through a ten-inch diameter duct up to three hundred feet away to a card feed providing that there is no increase in duct elevation and a minimum number of turns. An air velocity of 4300 fpm is used to maintain the efficiency of the system (FIGURE 4).

These processes eliminated the job of "stock hauling."

Carding

An acceptable, high quality roving can be produced from a single cylinder card providing the card is fed with a mix having an intimate blend, uniformly opened and made into a web having uniform density and weight. This conserves exhaust air in carding, allows for higher card loads per operator, and reduces card maintenance.

The feed decided upon is the CMC "Evenfeed." The design concept of the feed is an air laid web. Level control in the hopper is controlled by two photo electric cells, a high level, and a low level control. The ceiling condenser runs constantly. An air operated damper valve is controlled by the indications of the photo cells. Low level indication will open the damper located on the clean air side of the ceiling condenser, allowing fiber laden air to pass through the condenser, and thus, depositing fiber into the feed hopper of the "Evenfeed." High level indication will close the damper, stopping the flow of fiber to that unit.

It has been determined that no more than six "Evenfeeds" can be serviced at a time due to the production capability of the fiber opening mechanism (FOM) and amount of fiber that can be kept moving through an air duct. Thus, there are six cards to a line.

Controlling the total system, (six cards, six Evenfeeds, one FOM, one reserve hopper) for one line of cards demands sophisticated electronic controls. An electronic scanning system that can scan the photo cell indications in any predetermined sequence is employed on each card line. Depending on roving count desired, and production rate of the cards, the system is scanned once every 15 to 45 seconds for hopper level control. This allows a uniform feed to the cards.

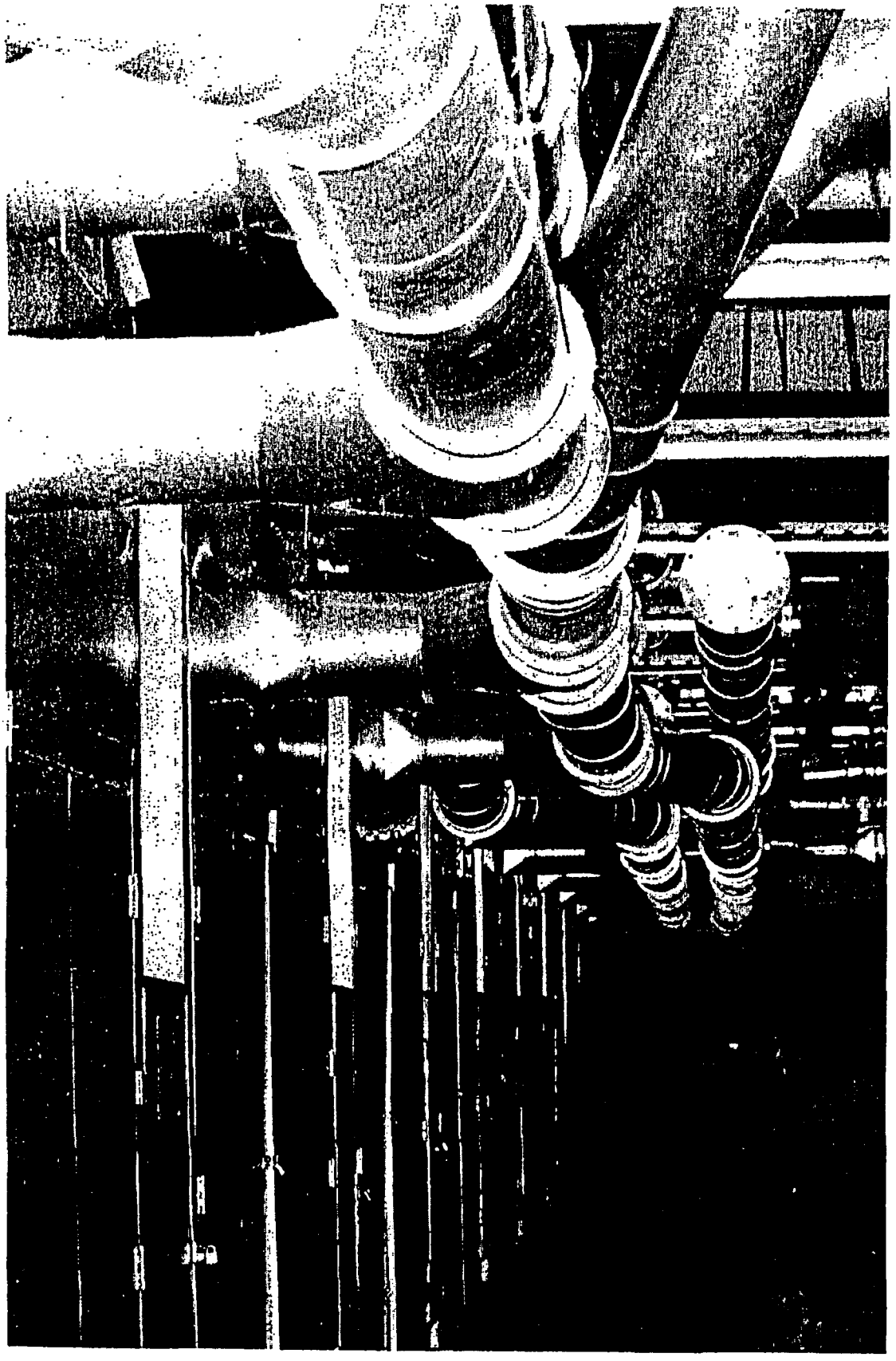

FIGURE 4. The stock or mix is transferred pneumatically to card feeds.

Controlling dust emission at the cards has been accomplished by double enclosing the cards and exhausting the enclosures into a baghouse, at the same time forcing fresh make-up air from overhead ducts downward through the work alley, passing by the operator, and into the enclosure opening (FIGURE 5).

The function of the double enclosure is to minimize and contain dust generated by the card. The secondary enclosure surrounds the immediate card area, opening only at the front for roving removal. There are service panels that may be opened or removed for card maintenance (FIGURE 6).

FIGURE 5. General view of front of cards showing enclosure and overhead ducts for forcing make-up air downward through the work alley, passing by the operator and into the enclosure opening.

Spinning and Twisting

The spinning room has been designed to create a cross draft in the room. Fresh make-up air is brought into the room through the ceiling on one side and distributed by means of a header and duct system across the room. This allows approximately five air exchanges per hour with no air extraction from machinery.

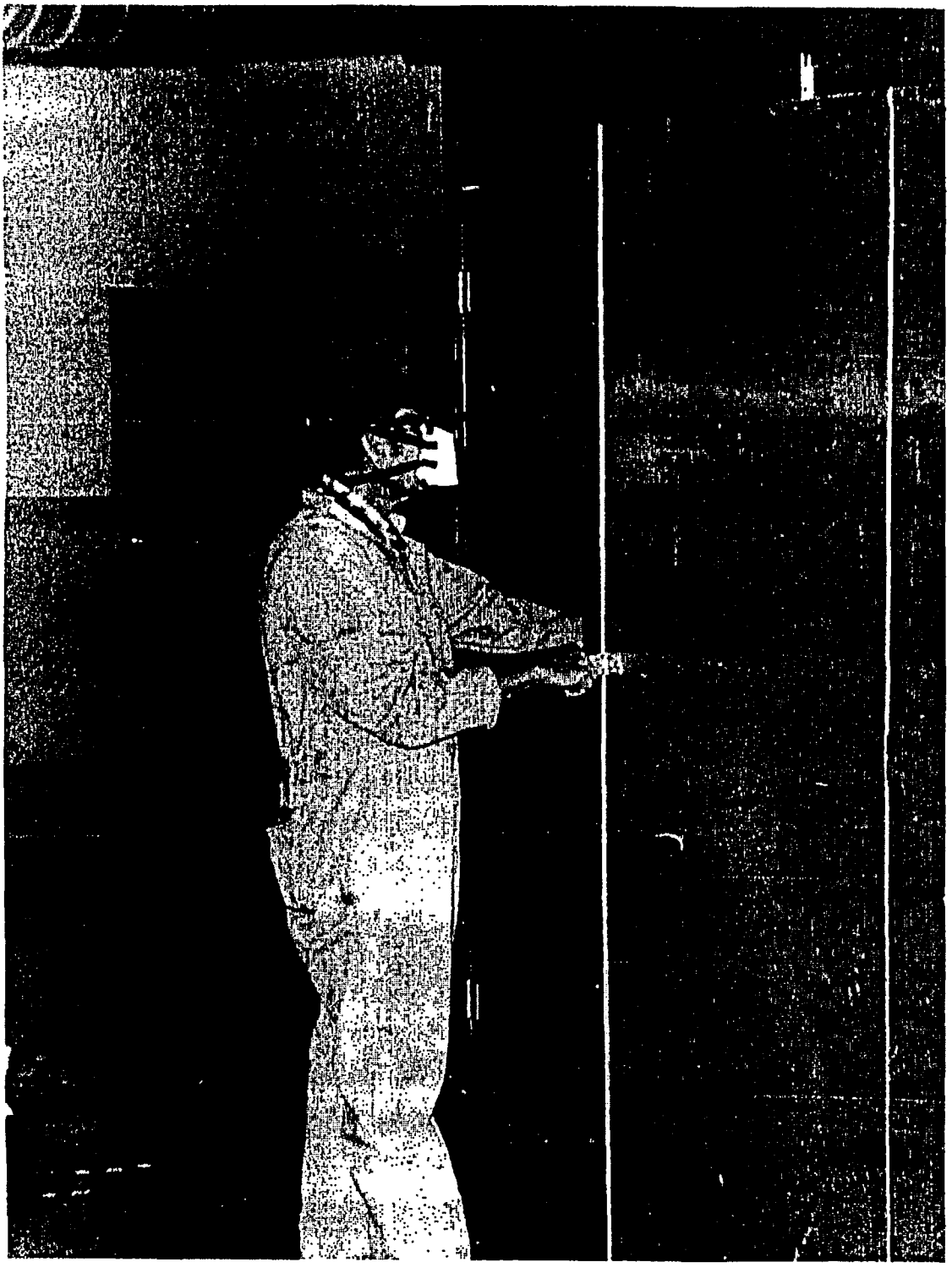

FIGURE 6. Opening service panels for card maintenance.

The spinning and twisting is done on flyer type frames, although they have had their speed reduced to minimize noise and dust (approximately 900 rpm spindle speed). Roving is wound on cheeses and carrier core yarns are used. Work practices are the main contributing factor in reducing dust in this area.

Winding for Sales

Our plant uses mainly Foster 77 winders. The winders are enclosed and exhausted effectively, having the backs, sides and top covered, leaving a portion of the front open for operator access. Suspension of heavy, clear, plastic strips vertically in the face opening of the enclosure allows good operator access and visibility while maintaining high air velocity low volume system (FIGURE 7).

Work practices in this area are also a major contributing factor in achieving low dust counts.

Weaving

All weaving is now performed with wetted yarns. The wetting of the warp yarns is done by padding-rolls immersed in water troughs located behind the harness section

FIGURE 7. Enclosed and exhausted winding operation.

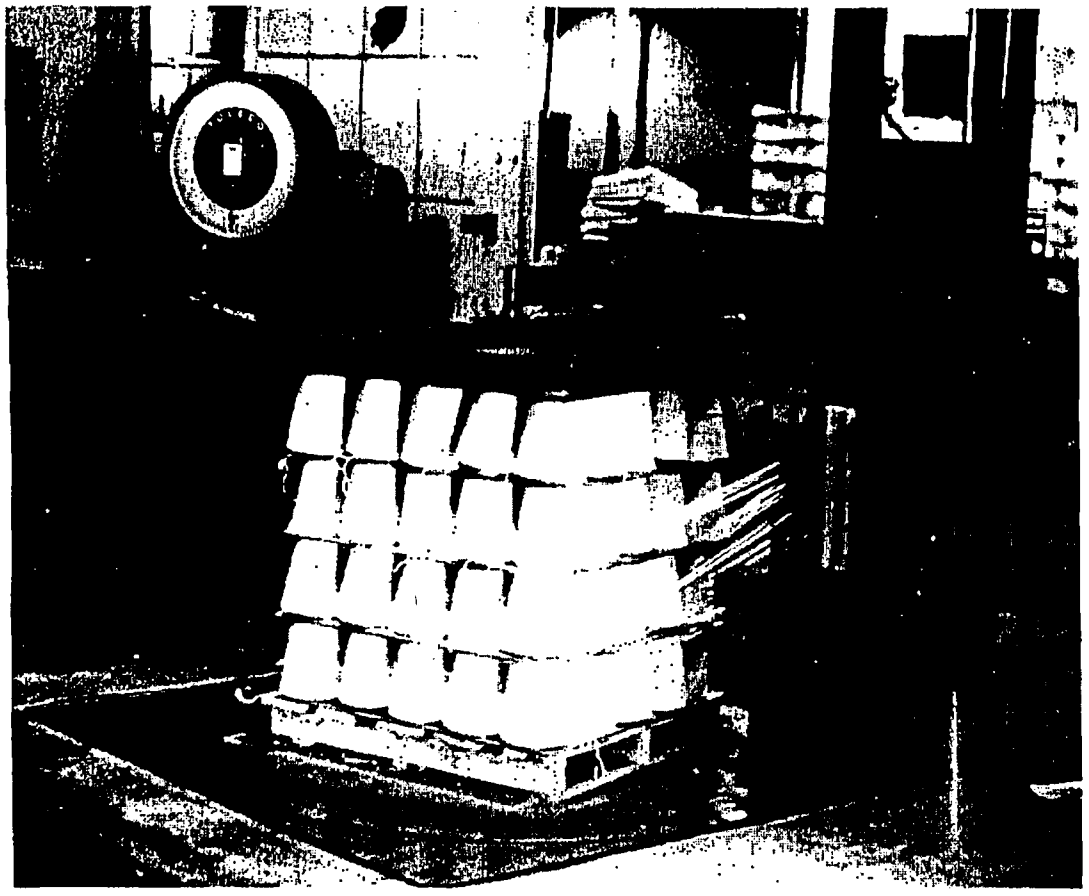

FIGURE 8. Yarns packaged in stretch-wrapped plastic and stacked on pallets.

of the looms. Filling yarns are wetted in the same manner during winding. They are again immersed in water just prior to weaving. A resin treatment is also applied at the loom in the same manner as wetting. This serves to "lock in" the fibers in the woven fabric, minimizing dust generation from the fabric in later use. The weaving area has narrow fabric and heavy hand looms. "Wet process" yarns from North Charleston are now being introduced in weaving in the Marshville plant and this will further insure low dust counts.

Inspection and Shipping

Due to the nature of the job and resin treatment applied to the cloth in weaving, dust has nearly been eliminated in inspection.

The yarns are now packaged in stretch wrapped plastic on pallets. The cloth is packaged in plastic bags and tapes are packaged in shrink wrapped plastic. Dust has virtually been eliminated in this area (FIGURE 8).

OPERATING PRACTICES

Before the implementation of engineering design and methods at the Marshville plant, it was recognized that engineering alone would not maintain a "clean system."

During the construction phase, development of work practices and administrative procedures was given a high priority. When the construction phase was completed, these new practices and procedures were ready for implementation.

Work Practices

All employees, including supervisors and management, are expected to maintain constant attention to performance of stipulated work practices.

Examples of work practices, to assure the efficient operation of the "clean system" are:

a. *Maintenance*—All processes except spinning, twisting and weaving are enclosed and ventilated at Marshville. Special provisions, such as lock-out procedures, protective clothing and equipment, and supervisory monitoring procedures have been instituted to protect personnel from excessive dust exposure during periodic and emergency maintenance situations, in the enclosed operations.

b. *Waste handling*—These operations can easily get out of control without good work practices. Wetting methods and bagging procedures have been given priority consideration. Waste is handled by classification, such as bag house waste, loom waste, roving waste, etc. with specific responsibility for proper handling being assigned to designated personnel.

c. *Baghouse operations*—These areas offer the greatest probability for spills or malfunctions to occur. Attending personnel are required to wear protective clothing and respirators when entering the hopper areas of the interior baghouses. These areas are posted, requiring authorized entry only with protective equipment (FIGURE 9).

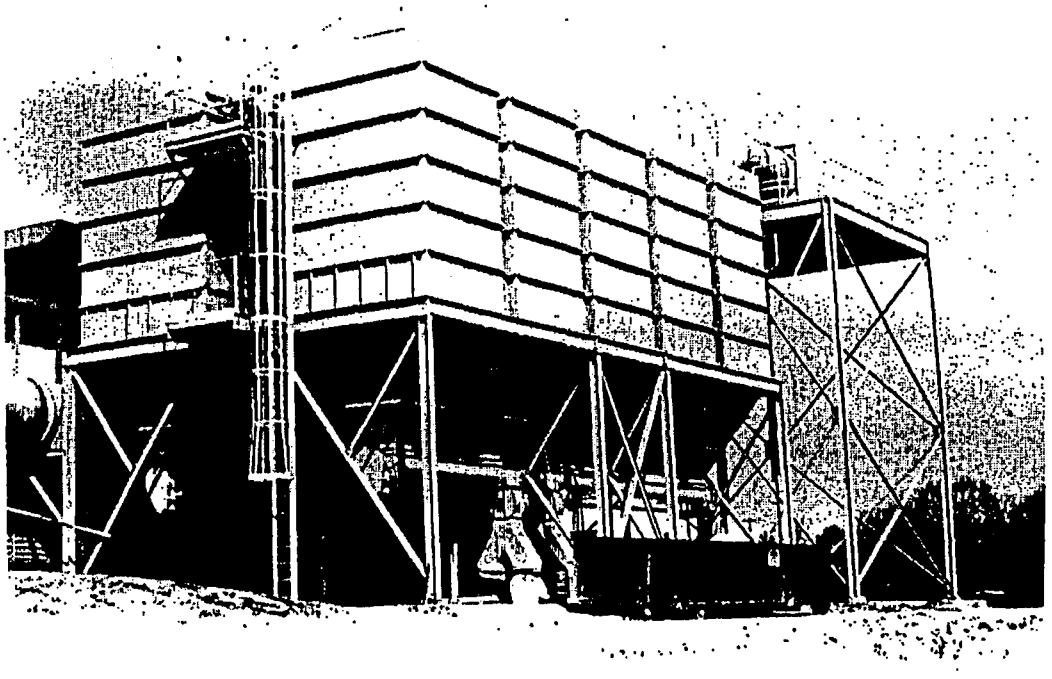

FIGURE 9. Outside view of baghouse.

d. *Clean-up methods*—Routine clean-up operations at Marshville require the use of industrial utility vacuum cleaners on a continuous basis. Special clean-ups of building's overhead areas, pipes, etc. are performed by personnel in protective clothing and respirators (FIGURE 10).

e. *Equipment removal*—From time to time it is necessary to move machinery and equipment. The work practice used requires a thorough cleaning of the equipment to eliminate loose asbestos and then oiling to suppress any dust that may have escaped the cleaning process.

f. *Warehouse surveillance*—In the storage and moving of bagged raw asbestos fiber or packaged finished goods, tears and holes are sometimes created by handling equipment that allow the escape of airborne asbestos dust. The work practice requires the immediate patching of all bags or containers at the time of rupture, or when discovered, and before further moving (FIGURE 11).

Administrative Procedures

Administrative procedures are used to supplement the engineering controls, methods and work practices and to further assure effective use of the "clean system."

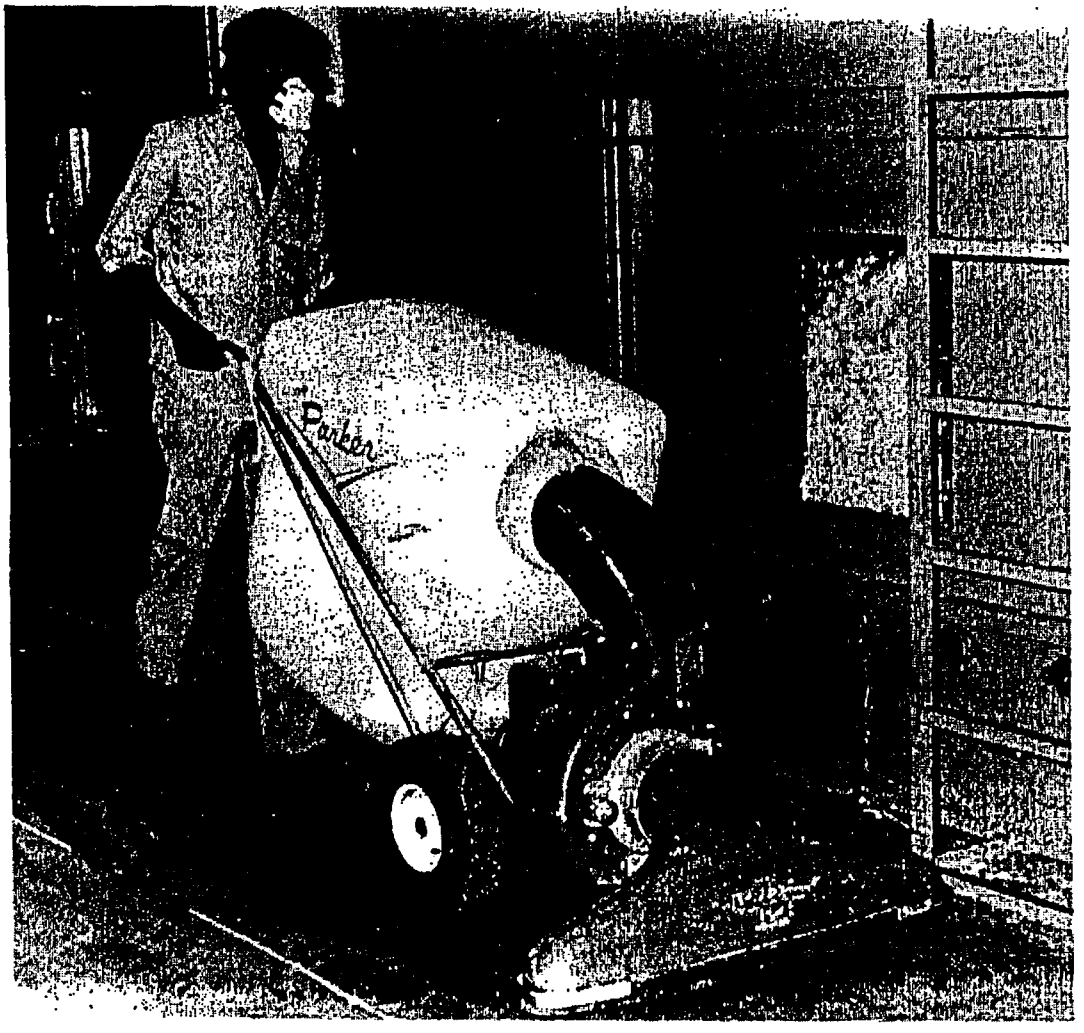

FIGURE 10. Routine cleaning in process.

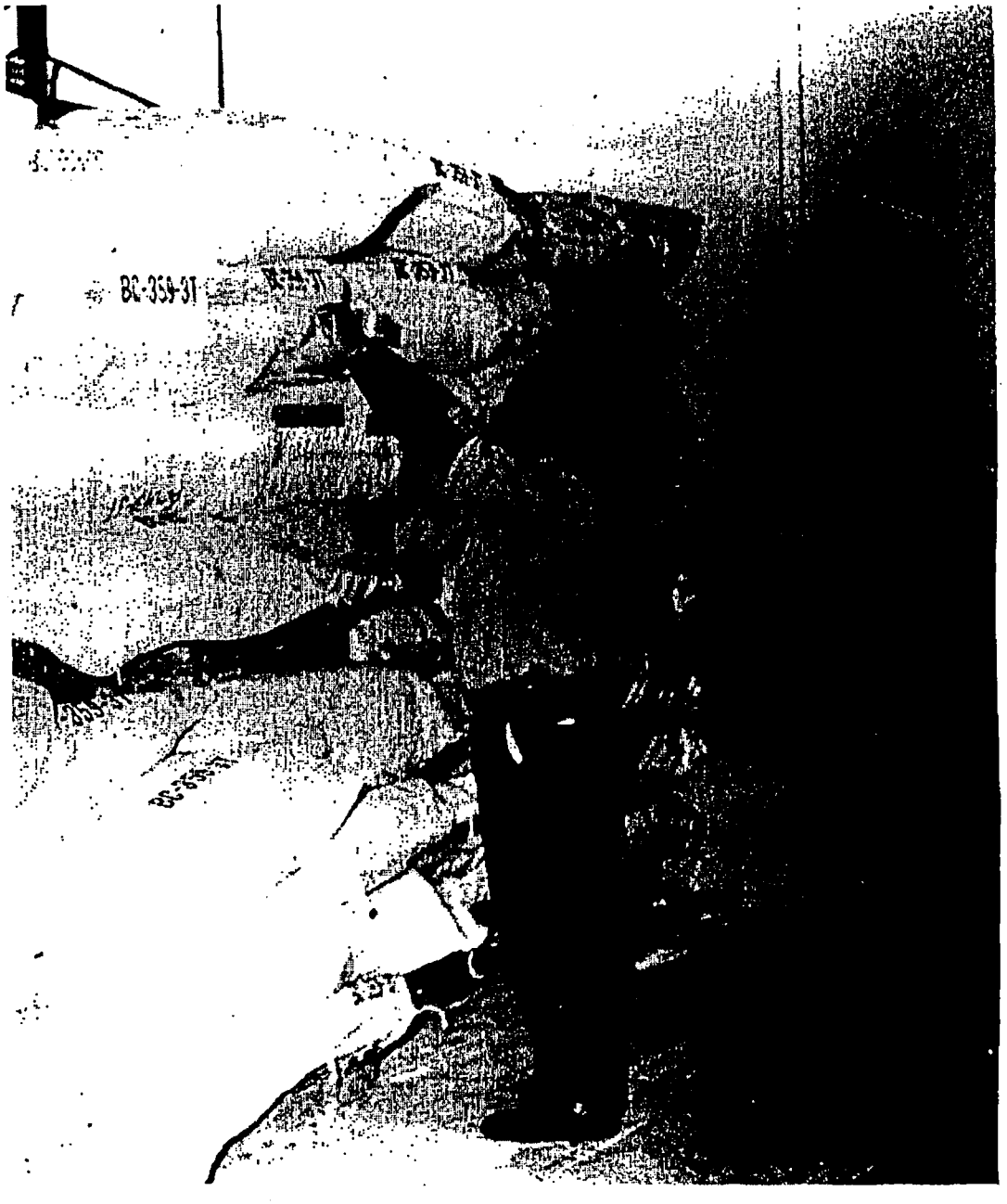

FIGURE 11. Patching damaged bags of asbestos fiber.

These procedures range from mandatory measures to optional additional personal protection for employees. The following are examples of the administrative procedures used at Marshville.

a. *Protective equipment*—During any emergency situation, protective clothing including a respirator must be worn. This includes, for example, emergency maintenance of enclosed equipment or rupture of a pressurized fiber carrying duct. Special clean-up crews must also use this equipment. These procedures are necessary as airborne levels of asbestos dust during clean-up or emergency maintenance operations are unpredictable. Respirators and dual lockers are

made available to all employees regardless of how little asbestos dust exposure may occur.

b. *Disciplinary enforcement*—Employees are required to adhere to the work practices and procedures developed to operate the "clean system." To enforce the program graduated disciplinary measures are used up to and including dismissal to emphasize and support the importance attached to carrying out the work practices.

c. *Clean-up personnel*—Clean-up personnel, working continuously on each shift have been added to compliment the engineering achievements at Marshville. These employees are in addition to those who performed this function prior to the engineering changes and represent more than a doubling of this effort.

d. *Employee information*—Achievement of a "clean system" process stimulated a renewed effort in the employee educational program. Audiovisual instructional materials, pamphlet handouts and verbal instructions by first line supervision are all used to re-emphasize the importance of limiting asbestos dust exposure to the lowest achievable level.

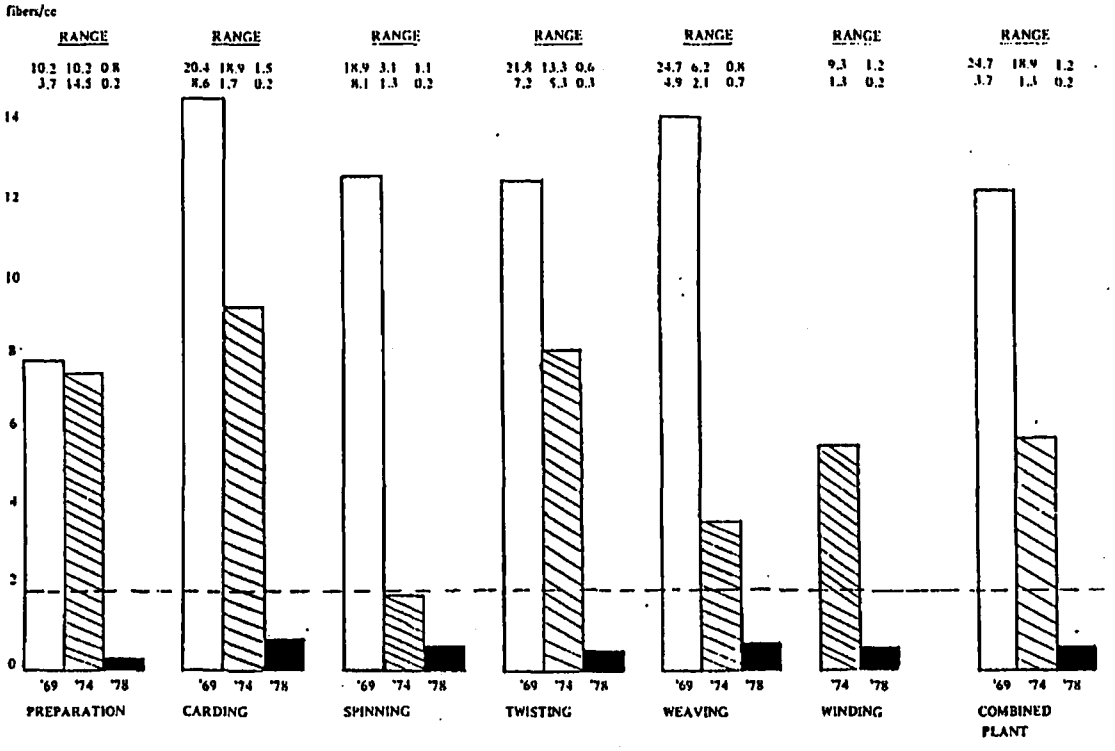

FIGURE 12. Summary of annual mean asbestos fiber counts in various areas during 1969, 1974 and 1978.

c. *Dust monitoring*—Monitoring of asbestos dust exposure to individuals and work area dust levels at Marshville is being performed at a frequency considerably greater than is now required by the OSHA asbestos standard in view of the fact that all areas are controlled to levels below the permissible limits. Each month a selected number of dust samples are taken. Additionally, a complete and extensive survey is accomplished annually to assure that the base exposure level is known.

CONCLUSION

The plant has approximately 150,000 square feet of floor space and employs slightly over 200 people. It has capacity for making in excess of 8 million pounds of asbestos textile products and friction yarns annually. The clean-up, expansion program was completed under the forecasted budget monies and slightly over in time. Despite increased energy costs, the manufacturing cost has not increased per pound of product made. Increased productivity has helped offset inflation and energy costs.

The improvements in dust control can be quantified by studying the mean asbestos fiber counts in various manufacturing areas. FIGURE 12 indicates the dust levels in this plant in 1969, on acquisition by Raybestos Manhattan, in 1974 when the "clean system" was proposed, and in 1978 after completion of the project. All levels are maintained below 1 fiber/ml, 8 hour TWA. The dustiest operations have been totally enclosed or eliminated.

The importance of work practices cannot be over emphasized. Poor work practices or carelessness in adherence to good work practices at any single operation within the plant, can result in widespread contamination and possible dust exposure.

It is recognized and accepted that although the engineering designs embarked upon have been completed, experience will determine what additional improvements can be made or need to be made. It is also recognized that operational procedures may have to be modified from time to time. It is the intention at Marshville to reduce employee dust exposures to the lowest possible level achievable by reasonably practicable means with the goal of providing a safer and healthier workplace than existed in the recent past. It is also the intention of this company to continue to produce asbestos textiles of a conventional nature in the knowledge that the Marshville plant probably ranks as the cleanest plant of its kind in the world.

This paper serves to illustrate the difficulties that might be encountered when conducting epidemiological studies in industry to determine dose/response relationships when technical achievements in environmental sampling, raw material production and engineering controls undergo changes over a period of time while the process and final product remains essentially unaltered.

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XXVI. ASBESTOS TEXTILES

A. Product Description

Asbestos textiles are produced by standard textile production techniques involving carding, combing, and spinning of the asbestos fibers. Asbestos fibers can be blended with other types of fibers to give the resulting textile products added tensile strength. The manner in which asbestos fibers are processed into asbestos yarn and cloth products is illustrated in Figure 1.

There are two basic processes employed in asbestos textile manufacturing: the conventional and wet processes. Although most textiles are manufactured by the conventional process, each of these methods will be described.

1. Conventional Processing of Asbestos Fibers to Form Textile Products

In the conventional process, raw asbestos fibers of various grades are blended and mixed according to the fiber characteristics, manufacturing and finished product requirements, and intended use. The different grades of asbestos fiber received are placed in the fiber blender where they are mixed according to the requirements specified for the finished product. The selected fibers are then fed into a hopper where they are blended. Finally, the blended material is sent to the carding operation.

In the carding operation, asbestos fibers are combed into a relatively parallel arrangement called a fiber mat. This mat is pressed and layered into a lap consisting of alternating perpendicular arrangements of fiber mats. The lap is then slit into thin, continuous ribbons called roving. Cotton, rayon or other material may be added at this stage to strengthen the roving.

Roving, which has been mechanically twisted and spun to give it greater tensile strength, forms a single yarn. This yarn may be twisted with other single yarns, wire or other material to produce plied yarn that can be coated to produce thread or treated yarns. Plied yarns may be woven to produce

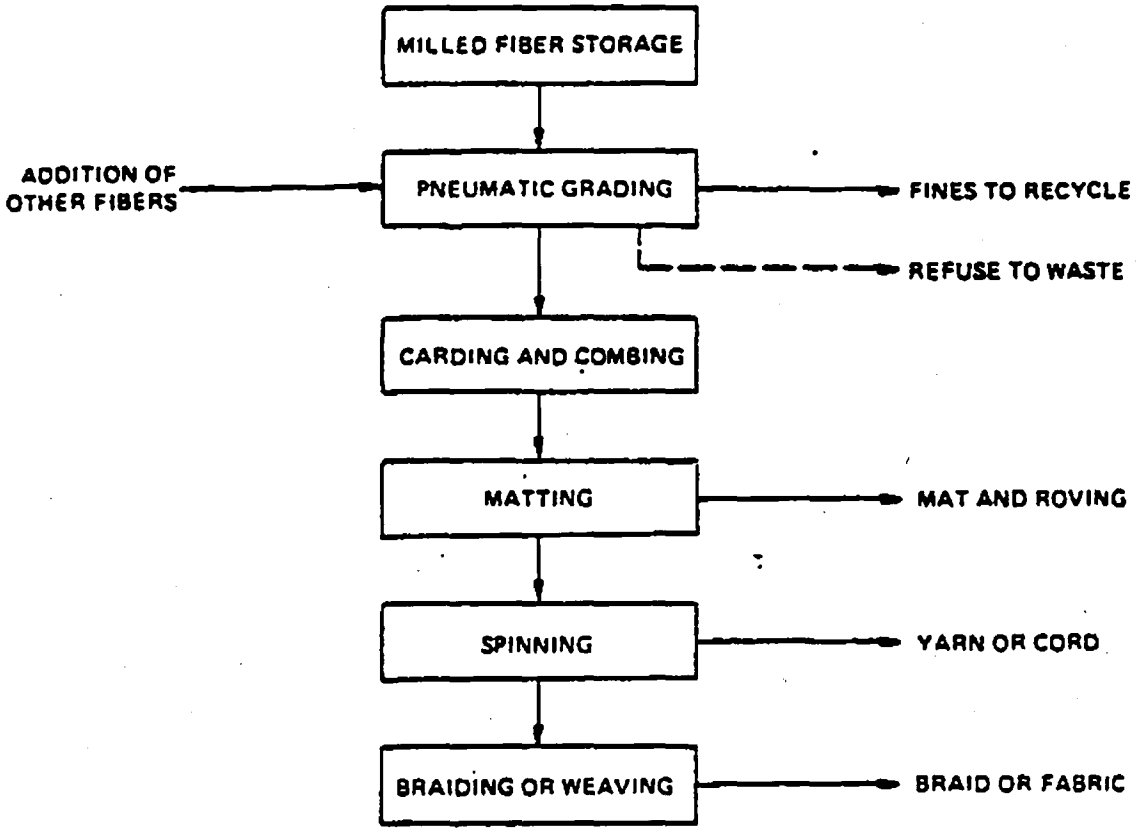

Figure 1. Manufacturing steps for asbestos textiles.

Source: NTIS 1975.

fabric, tubing (sleeving), or tape, as seen in Figure 2. Alternately, plied yarns may be twisted to form wicking and twisted rope, or braided to form braided rope or sleeving.

The conventional process of asbestos yarn manufacture can either be a dry or a damp method. These two methods are identical except that during the damp method the yarn is moistened either by contact with water on a roller or by a mist spray. This moistening of the yarns reduces the amount of fiber that becomes airborne and also aids the processing of fibers into yarn.

2. Wet Processing of Asbestos Fibers to Form Textile Products

The wet process is based on forming single filament fibers by extrusion. The process consists of making a gelatinous mixture of fine asbestos fibers in water with a volatile dispersant. The mass is then extruded through small dies to form asbestos thread. The extruded thread is spun to form yarn which is fabricated into various plied yarn products as in the conventional process.

The textile products formed using this wet technique tend to hold asbestos fibers better than those produced by the conventional processes, thus reducing workplace fiber levels, but the yarn formed has the disadvantage of poor absorption and impregnation characteristics.

3. Asbestos Textile Subcategories

There are eight main subcategories of asbestos textiles that are used in the various applications covered within this section. Each textile subcategory can be grouped into one of the two main categories, asbestos yarn or cloth, as follows:

- asbestos yarn;
  - -- yarn;
  - -- thread;
  - -- wick;
  - -- cord;
  - -- braided and twisted rope; and
  - -- braided tubing (sleeving).

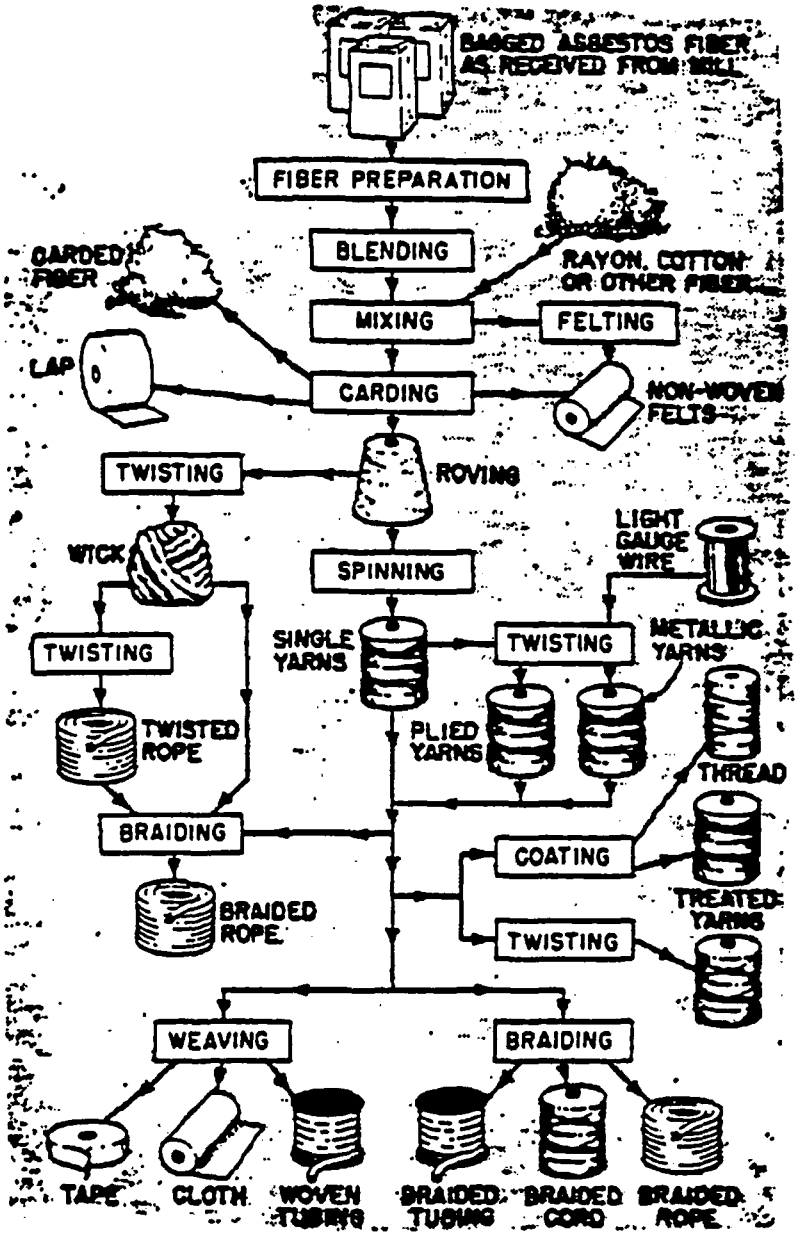

Figure 2. Manufacturing operations for asbestos textiles.

Source: Handbook of Asbestos Textiles. American Textile Institute. 1967.

- asbestos cloth

  -- cloth;
  -- slit and woven tape; and
  -- woven asbestos tubing (sleeving).

The manufacturing process for each of these textile subcategories is briefly described, and some of the typical dimensions of the products are included. In addition, some of the typical fillers, carrier yarns, and inserts that are used in conjunction with asbestos containing materials are described (American Textile Institute 1967).

- Asbestos yarns are commonly reinforced with nylon, cotton, polyester, or wire. The asbestos yarns produced are made in various sizes and plies and serve as the basic components in the fabrication of many other asbestos textiles: twisted, woven, and braided. The amount of asbestos contained in asbestos yarns is the basis for designating asbestos textile grades as listed in Table 1. The American Society for Testing of Materials (ASTM) has designated various grades for asbestos textiles that differ slightly with each textile form.

- Asbestos threads are produced in both metallic (wire-inserted) and plain (non-metallic) classes. Depending on the tensile strength and thermal stability requirements, asbestos thread is furnished in different grades, although most of it is underwriters' grade (80-85 percent asbestos). Asbestos thread is often coated with an acrylic or wax coating to increase its strength and to facilitate the sewing of asbestos fabrics.

- Asbestos wick consists of several strands of asbestos yarn twisted together to form a general utility product with varied industrial applications (e.g., packing, or upon further processing the making of rope and braid).

- Asbestos cord is usually twisted asbestos yarn (a predetermined number of strands) that forms a cord of desired diameter and tensile strength. The yarns used may be sized or unsized, plain or wire-inserted, single or plied, depending on the end use of the product. Asbestos cord is manufactured in all standard ASTM grades and ranges in diameter from 0.06 inches to 0.38 inches.

- Asbestos rope is available in two styles: twisted and braided. Twisted asbestos rope is made by twisting two or more strands of asbestos wick tightly together. Heavier ropes contain a binder to hold the twist. Braided asbestos rope can be manufactured by three different processes: (1) by braiding one or more jackets of asbestos yarn over a

Table 1. Asbestos Textile Grades

Grades[a]	Asbestos Content by Weight
Commercial	75% up to but not including 80%
Underwriters'	80% up to but not including 85%
Grade A	85% up to but not including 90%
Grade AA	90% up to but not including 95%
Grade AAA	95% up to but not including 99%
Grade AAAA	99% up to and including 100%

[a]Asbestos textile grades differ with each asbestos textile form.

Source: Handbook of Asbestos Textiles. American Textile Institute. 1967.

core of asbestos rope or wick; (2) by braiding asbestos yarn braid over asbestos braid; and (3) by plaiting asbestos yarn into a square cross section (square braid). Asbestos rope is available in all ASTM grades and varies in diameter from 0.25 to 2.0 inches.

- Asbestos tubing (sleeving) can be made from asbestos yarns by braiding. Braided tubings are manufactured in all of the ASTM grades and range from 0.02 inches to several inches inner diameter (i.d.). The wall thickness varies from 0.03 inches to approximately 0.13 inches.

- Asbestos cloth is woven from various plied, twisted, and metallic yarns. There are five classes of asbestos yarns that can be used to produce asbestos cloth. The different classes of asbestos cloth are:

  -- Class A -- Cloth constructed of asbestos yarns containing no reinforcing strands.

  -- Class B -- Cloth constructed of asbestos yarns containing wire reinforcing strands.

  -- Class C -- Cloth constructed of asbestos yarns containing organic reinforcing strands.

  -- Class D -- Cloth constructed of asbestos yarns containing non-metallic inorganic reinforcing strands.

  -- Class E -- Cloth constructed of two or more of the yarns used in cloth classes A through D.

  The most widely used asbestos fabrics are woven from Class A (non-metallic) and Class B (wire-inserted) yarns.

- Asbestos tape is manufactured mostly as plain or non-metallic tape in all of the standard ASTM grades. It is a narrow woven fabric manufactured from plied yarn containing selvage edges (finished to prevent raveling). Additionally, tape may be slit from cloth (slit tape). Depending upon the application, the type of tape and the associated manufacturing process varies. For tapes requiring heat reflectivity, aluminum layers may be sprayed on or bonded to the cloth by a thermosetting resin. The thicknesses of plain tape range from 0.01 inches to 0.03 inches. Metallic tapes can be 0.06 inches and thicker. Standard widths of asbestos tape range from 0.5 inches to 6.0 inches.

- Asbestos tubing (sleeving) can also be made in a woven form. Asbestos yarns can be woven to form a tubing that has a significantly greater inner diameter than the braided tubings. Woven tubings are manufactured in all of the ASTM grades in diameters of less than one inch up to 24 inches.

Two additional asbestos textile subcategories are non-woven products that have been used for electrical insulation purposes, but do not fall into the two designated textile categories. Although these products were not produced by any companies identified during the analysis, brief descriptions are included:

- Asbestos roving is simply non-twisted strands of asbestos fibers that have been carded. Roving can be twisted to form wick or spun to form yarn. Asbestos roving is blended with cotton or other organic fibers to meet specific end-user requirements. It is supplied in the five standard ASTM grades. Asbestos roving has been used as electrical insulation, but no current applications could be found.

- Asbestos lap consists of parallel arrangements of asbestos fibers that have been combed and blended with organic fibers. Asbestos lap is a non-woven fabric and has been used in electrical insulation. No current uses of asbestos lap have been identified.

4. Current Application Areas for Asbestos Textiles

Historically, asbestos textiles have been used in a wide range of products, but many of the traditional products are no longer in production. Substitute fibers have taken up the bulk of the market for electrical and thermal insulation, fire resistant materials, and protective clothing.

The products that continue to be made in significant quantities using asbestos textiles are:[1]

- Woven friction materials;
- Packings and gaskets; and
- Specialty products.

Woven friction materials account for the majority of the asbestos textile products made from asbestos yarn and include woven brake blocks and clutch

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[1] It should be noted that products made from asbestos textiles are different than similar products made from non-woven asbestos fibers. Woven friction materials and packings/gaskets made from asbestos textiles are not included in the non-woven asbestos product categories, but rather are included in the asbestos textiles category. A careful review of the processors data has been performed in order to ensure that no duplication of information has occurred.

facings. Typically, these woven products have better performance characteristics than molded products and are used in large industrial equipment such as oil well drilling rigs and cranes.

The two largest processors of asbestos textile materials are Standco Industries and Raymark Corporation. These companies are producers of woven friction materials and account for almost 90 percent of the asbestos textile market, although the trend in woven friction materials is away from asbestos containing materials in original equipment markets (OEM). In 1985, 50 percent of all OEM vehicular friction materials were expected to be asbestos free (Scott 1984).

Packings and gaskets made from asbestos textiles[2] include both yarn and cloth products. Asbestos yarn products, braid and rope, are used extensively in pump and valve packings and as seals for oven doors, boilers, and furnaces. Asbestos cloth is used to manufacture manhole and flange gaskets as well as seals in incinerator (hot-air) piping, nuclear power plant cooling water towers, and distillation columns.

Although some gasket and packing products continue to be made from asbestos textile materials, the general trend is to move away from asbestos containing products (Garlock 1986, Darco Southern 1986). Most gasket and packing manufacturers have stated that they will be completely out of the asbestos market by 1990 because of the availability of good substitutes.

Finally, specialty products continue to be made from asbestos textile materials, both asbestos cloth and asbestos yarn. It is often difficult to find substitute materials for these specialized applications, but products of this type are usually produced in relatively small volumes (less than 5,000

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[2] The majority of companies involved in the production of asbestos textiles are gasket and packing manufacturers, although they do not account for a very large proportion of the asbestos textile market (11 percent).

pounds). Some products made from asbestos textiles that fall into this category are:

- Mantles for gas lanterns (yarn);
- Wicks for catalytic heaters (yarn);
- Rotor vanes and impellar blades for pumps and compressors used in air tools (cloth);
- Ring type seals for valve and compressor plates (yarn); and
- Bearings for high temperature applications requiring water lubrication (cloth).

It is more difficult to find substitute materials for some applications of asbestos textiles that may require several of the favorable characteristics that asbestos can impart to textile products. For these types of applications, substitute materials may necessitate the use of a mixture of substitute fibers to impart all of the required characteristics to the substitute material. Companies that produce specialty products from asbestos are actively looking for substitute materials if none exist at present.

B. Producers and Importers of Asbestos Textiles

Asbestos textiles account for less than one percent of the total amount of asbestos fibers consumed for end-use products in the United States. In 1985, domestic consumption of asbestos fiber in the form of asbestos textiles was estimated to be approximately 919 tons (ICF 1986a). The majority of this fiber was Grade 3 chrysotile fiber. This figure is 16 percent of the 5,800 tons of fiber consumed in 1981 (ICF 1984a) in this category.

The quantity of asbestos fiber contained in asbestos textile products varies significantly, but an average figure of between 70 and 80 percent is a reasonable estimate of the asbestos content (Garlock 1986) for most asbestos textiles. The total amount of asbestos-containing textiles targeted for consumption in the U.S. is, therefore, estimated to be 1,690 tons of end-use textile products for 1985 (ICF 1986a).

Asbestos textile products consumed in the United States come from two sources: domestic processing of asbestos fibers into yarn and cloth and imports of yarn and cloth. Table 2 compares the imports of asbestos textiles and the domestic output of asbestos textile products for 1981 and 1985. Consumption and output have decreased by over 70 percent for both textile segments over the time period 1981 to 1985 (ICF 1986a).

The two processors involved in the manufacture of asbestos textiles for woven friction materials have stated that their products contain about 50 percent asbestos by weight. The amount of fiber consumed by these companies is estimated to be less than 800 tons.

As other asbestos yarn products are approximately 70 percent asbestos,[3] the remaining products can be estimated to contain less than 100 tons of asbestos fiber. An estimate of less than 900 tons of asbestos fiber consumed in the production of asbestos yarn products for companies that reported using asbestos in 1985 can therefore be made. Although no data for the asbestos content of specific asbestos cloth products were available, an estimate of 80 percent (Garlock 1986) asbestos content has been used to calculate the asbestos fiber consumption for asbestos cloth textiles. It is estimated that the companies that produced asbestos cloth products in 1985 consumed less than 200 tons of fiber. The total amount of fiber consumed in the production of all asbestos textiles in 1985 is therefore less than 1300 tons for 1985.[4]

The discrepancy between the asbestos fiber consumption estimated in Table 2 and the figure presented by the Bureau of Mines (1,344 tons) (Virta 1986) can partially be explained by incomplete reporting or identification of

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[3] The amount of fiber consumed in the production of asbestos textiles other than woven friction materials can only be estimated because the secondary processors were not willing to release or did not know the asbestos concentration figures for their products.

[4] Includes estimated fiber consumption of imported products.

Table 2. Asbestos Fiber Consumption for Textile Products and Output of Textile Products for 1981 and 1985

	Domestic Fiber Consumption[c] (tons)	Total Fiber Consumption[d] (tons)	Domestic Production of Textile Products (tons)	Imports of Textile Products (tons)
Asbestos Yarn				
1981[a]	3,920	5,040	5,600	1,600
1985[b]	558	823	1,125	455
Asbestos Cloth				
1981[a]	440	760	550	400
1985[b]	0	96	0	120
Total				
1981[a]	4,360	5,800	6,150	2,000
1985[b]	558	919	1,125	575

NOTE: The table identifies production only for those companies for which data have been collected during the survey. Some companies, especially those that import small quantities from small countries, may not have been identified.

[a]TSCA 1982.

[b]ICF 1986a.

[c]This calculation is based on confidential business information.

[d]Estimated total fiber consumption figures for 1981 are calculated using average asbestos concentration figures: Asbestos yarn is approximately 70 percent asbestos and asbestos cloth is approximately 80 percent asbestos.

companies processing asbestos textiles. The asbestos textile imports that have been accounted for totalled about 600 tons in 1985. The U.S. Imports for Consumption Schedule FT 246, published by the U.S. Department of Commerce (DOC 1985), however, indicates that approximately 1,100 tons of asbestos yarn, slivers, etc. (TSUSA 518.2100) were imported from 17 countries.[5]

Most of the secondary processors of asbestos yarn and cloth receive their materials from foreign companies and process the imported textile mixtures into end-use products. Several companies, however, receive textile mixtures from domestic sources. At least one company, Amatex Corporation, imports asbestos textile mixtures from plants in Mexico. Amatex does not do any secondary processing of these mixtures, but distributes them to other companies that are secondary processors (Amatex 1986).

There are other companies that have similar import/distribution practices (A.W. Chesterton 1986), and this may help to account for the discrepancy between imports identified in the survey and those reported by the Department of Commerce. Some companies are neither primary nor secondary processors, but rather importers and distributors. Data on these companies were not available for the initial 1982 EPA survey (ICF 1984b).

Some of the companies identified in the survey are involved in the processing of both asbestos cloth and yarn into end-products. In addition, the materials used by these companies are sometimes from several sources. Of the companies that have been identified, five are secondary processors of both

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[5] The TSUSA commodity code for yarn and related materials probably includes some products that are not considered textiles or are already finished products not requiring any processing, but the higher figure tends to indicate that information is missing regarding textile products imported from some countries. None of the companies that were contacted during the course of the survey indicated that any asbestos textiles were imported from any countries other than Canada, Mexico, and South Korea (Aztec 1986). Although these three countries account for the bulk of U.S. asbestos imports, other countries are exporting asbestos textiles to the U.S.

asbestos cloth and asbestos yarn. Tables 3 and 4 present quantities of yarn and cloth consumed and imported in secondary processing.

C. Trends

Thirteen companies involved in the production and distribution of asbestos textiles in 1985 have been identified. These 13 companies can be grouped into four categories based on their particular involvement in the asbestos textile market. The categories and the companies that fall under them are listed in Table 5.

In 1981, there were 21 processors of asbestos textiles (four primary, 17 secondary) as identified in the 1982 TSCA Section 8(a) survey. By 1985 the number of processors had dropped to six (one primary and five secondary). The change in processors identified in the survey is a 75 percent drop for primary processors[6] (from four in 1981 to one in 1985) and a 71 percent drop for secondary processors (from 17 in 1981 to five in 1985) (ICF 1986a, TSCA 1982).

In addition to processors identified in the survey, seven out of 16 companies (a 56 percent drop) identified as importers in 1982 (ICF 1984a) continued to import in 1985 (ICF 1986a).

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[6] The only domestic primary processor of asbestos textiles, Raymark Corporation, produces asbestos yarn from asbestos fiber at its plant in Marshville, North Carolina. Subsequently, the yarn is shipped to other Raymark plants where secondary processing to form woven brake blocks and clutch facings is performed (Raymark 1986). This production sequence is slightly different than that used by most manufacturers of woven friction materials. Most processors of these types of friction materials do primary and secondary processing at the same facility, and output is classified as woven friction materials. Raymark does not follow this pattern (the primary and secondary processing facilities are at different locations), so the output of the Marshville facility is classified as asbestos yarn. The yarn is then shipped to other Raymark facilities for secondary processing where it is fabricated into woven friction materials.

Table 3. Quantity of Asbestos Yarn Consumed by Secondary Processors

	Quantity of Domestic Asbestos Mixture Consumed[a] (short tons)	Quantity of Imported Asbestos Mixture Consumed (short tons)
Total	13.4	431.8

[a]The sources of domestic asbestos yarn are companies that import the mixture, but do not perform secondary processing. Only one company of this type could be identified importing 25 short tons of asbestos yarn for distribution to other companies that subsequently do the secondary processing.

Source: ICF 1986a.

Table 4. Quantity of Asbestos Cloth Consumed by Secondary Processors

	Quantity of Domestic Asbestos Mixture Consumed[a] (short tons)	Quantity of Imported Asbestos Mixture Consumed (short tons)
Total	9.4	94.8

[a]The sources of domestic asbestos cloth are companies that import the mixture, but do not perform secondary processing. Only one company of this type could be identified importing 25 short tons of asbestos cloth for distribution to other companies that subsequently do the secondary processing.

Source: ICF 1986a.

Table 5. Companies Involved in Asbestos Production and Distribution in 1985

Category	Company Name and Address	Asbestos Textile Product/Intended Use
Primary Processor of Asbestos Textiles from Asbestos Fibers	Raymark Corporation Marshville, NC	Asbestos yarn/woven brake blocks and clutch facings
Importer of Asbestos Textiles for Distribution Only	Amatex Corporation Norristown, PA	Asbestos yarn and cloth/ distribution to domestic secondary processors
Secondary Processor of Asbestos Textiles Received Directly from Foreign Sources	A.W. Chesterton Woburn, MA	Asbestos yarn and cloth/ packings and gaskets
	Arcy Manufacturing New York, NY	Asbestos cloth/welding blankets
	Aztec Industries N. Brookfield, MA	Asbestos cloth/gaskets
	The Coleman Company Wichita, KS	Asbestos yarn/mantles for gas lanterns
	Darco Southern Independence, VA	Asbestos cloth/gaskets
	Gatke Corporation Warsaw, IN	Asbestos cloth/high-temperature bearings
	Martin Merkel Houston, TX	Asbestos yarn/packings
	Standco Industries Houston, TX	Asbestos yarn/woven brake blocks and clutch facings
	Utex Industries Weimar, TX	Asbestos yarn/packings

Table 5 (Continued)

Category	Company Name and Address	Asbestos Textile Product/Intended Use
Secondary Processor of of Asbestos Textiles Received from Domestic Distributors	A.W. Chesterton Woburn, MA	Asbestos yarn/packings
	General Gasket Corp. St. Louis, MO	Asbestos yarn and cloth/ gaskets
	Rhopac, Inc. Skokie, IL	Asbestos yarn and cloth/ packings and gaskets
	Standco Industries Houston, TX	Asbestos cloth/gaskets
	Utex Industries, Inc. Weimar, TX	Asbestos cloth/packings

Source: ICF 1986a.

D. Substitutes

Asbestos has been used in textile products because it imparts desirable characteristics to the materials that are made from it. Asbestos based textile products have the following characteristics that make them ideally suited for use in high temperature and corrosive environments:

- Fire/acid resistance;
- Non-flammability;
- Low thermal conductivity; and
- Molten metal resistance.

Asbestos is also easily fabricated and exhibits great tensile strength and abrasion resistance. It is a flexible material in its fabricated form and is used for sealing applications especially when good compressibility and recovery are required.

Due to health concerns regarding asbestos inhalation, there has been a major effort to develop substitute materials that exhibit some of the characteristics of asbestos textiles. The major fibers used in the formulation of substitute textile products are:

- Fiber glass;
- Ceramics;
- Carbon/graphite;
- Aramids; and
- Polybenzimidazole (PBI).

In addition, some other fibers have been used to produce small amounts of textile materials that can be substituted for asbestos in some applications. Cotton and wool blends have been used in textile products as substitutes for asbestos, but in general they are not very resistant to heat. Quartz and other mineral fibers have also been used in small volumes. The five major substitute fibers mentioned above, however, account for the majority of the substitute materials that can replace asbestos.

Substitute textile products have already replaced asbestos to a certain extent and can be expected to replace most of the remaining segments of the

market. An approximate breakdown of asbestos substitute markets and the percentage of the asbestos market that each has been able to assimilate is listed in Table 6.

1. Fiberglass Textiles

Fiberglass is used preferentially when looking for substitute products due to its good workability, durability, and cost (50-70 percent less than similar asbestos based textiles) (Darco Southern 1986). Other substitute materials tend to be more expensive than asbestos and typically are not used to the same extent as fiberglass (Utex 1986).

Fiberglass textile products have been widely used as substitutes for asbestos, but they do have several major shortcomings. For replacement products requiring abrasion or flux resistance, fiberglass alone is not an adequate substitute. Manufacturers have dealt with this problem by blending glass with other materials. For example, glass can be blended with aramids to produce textile materials that can withstand fairly high temperatures (500°F) and show good abrasion resistance (Chemical Business 1984).

Fiberglass fibers can be treated by chemical leaching with sulfuric acid to form a continuous-filament, amorphous silica product with the thermal performance of a refractory material. After treatment with acid, the resulting filament is almost pure silica (SiO_2) and can be woven to form textile materials with excellent thermal resistance. The temperature limit for ordinary fiberglass materials is around 1000°F, at which point they lose tensile strength and begin to melt. The amorphous silica products, however, retain their strength and flexibility to temperatures of 1800°F and will continue to provide thermal protection up to 3100°F, although some degree of shrinkage and embrittlement does occur as temperatures approach the upper limit (Armco 1979).

Table 6. Existing Market Shares for Asbestos Substitute Fibers

Substitute Fiber	Percentage of Asbestos Market
Glass	50%
Ceramic	15%
Aramid	15%
PBI	10%
Carbon	10%

Note: As more substitute products are becoming available, the market share for glass is beginning to dwindle.

Source: Garlock 1986.

Amorphous silica textiles have seen widespread use as thermal and electrical barriers and have replaced asbestos products to a great extent in these applications. The cost of high-temperature refractory silica textiles is not much greater than fiberglass textiles (Armco 1979) and only slightly greater than asbestos textiles used in similar applications. As the performance with regard to temperature limit is better than asbestos for the refractory glass products in nonabrasive applications (Amatex 1986a), substitution has taken place to a large degree.

In high temperature applications where compression and abrasion are likely to be encountered, other materials or blends of glass, silica, and other fibers are used. If only slight abrasion resistance is required, the refractory silicas do quite well. Rope gasketing for partial grooves in oven or furnace doors and sealing elements in all types of manufacturing equipment that handle heat (e.g., ovens, furnaces, boilers) can be made from refractory silicas.

Refractory silica textiles are not ideally suited for applications requiring a great deal of abrasion resistance, but their abrasion resistance capability can be augmented by specially treating the material with a hydrocarbon finish (Armco 1979). In general, however, refractory silica textiles are not used in areas where abrasive conditions would be encountered.

2. Ceramic Fiber Textiles

Ceramic fiber, consisting of high purity alumina and silica in various percentages, can be used to produce ceramic textile products. These ceramic textiles are similar to amorphous and textured silica products in that they exhibit refractory characteristics and can be used in high-temperature applications (up to 2300°F).

Fiberfrax yarn, a representative type of ceramic fiber yarn, contains approximately 20 percent organic fiber and is spun around corrosion resistant

alloys of nickel and chromium (temperature limit 2000°F) or 1200°F monofilament glass strands. These inserts provide maximum tensile strength at elevated temperatures (Carborundum 1986).

Although ceramic fiber yarns have a high temperature limit in continuous use, the textiles made from them lose tensile strength after exposure to heat for extended periods of time. The temperature limit of the insert material must be considered in determining whether a ceramic fiber textile product can be used in applications where tensile strength is important.

In the application areas where substitution is incomplete, ceramic fiber textiles are viable substitutes for some applications currently using asbestos: furnace and oven door seals, flange and burner gaskets, and static packings. Ceramic fiber textile products have a higher temperature limit, are more flexible, conform to the shape required, and often have a longer service life than comparable asbestos based products. In general the costs of ceramic fiber products are comparable to asbestos products.

There are some drawbacks associated with the use of ceramic fiber for asbestos replacement cloth and yarn products. The ceramic cloth used in expansion joints, a gasket application, exhibits slightly more permeability at low temperatures and may be slightly more expensive (10-15 percent) in some product application areas (Carborundum 1986).

Ceramic rope products made from yarn are less dense than comparable asbestos products, are not as packable (too resilient), and therefore do not exhibit the required characteristics for some gasket applications. Ceramic fiber rope also exhibits poorer performance in some oven furnace door applications. Due to the low density and lower abrasion resistance of the ceramic products, they do not meet the standards of the traditional asbestos based products (Carborundum 1980).

Finally, static packings made from ceramic rope usually perform very well as asbestos replacement products, but there are not as many forms available, so complete substitution for all asbestos packings is not possible.

3. Aramid Fiber Textiles

Other substitute fibers that can replace asbestos in some textile applications are aramid fibers. By spinning a polymeric solution of aramids, a fiber can be produced that is a good replacement for asbestos. Aramid fiber is stronger on a by-weight basis than asbestos and can be used in pump packings, brake linings, and gaskets (DuPont 1980).

Aramids can also be blended with other fibers to produce asbestos replacement textiles that exhibit the favorable characteristics of each fiber type incorporated into the textile material. Amatex Corporation produces a heat-resistant textile that is made from Nomex and Kevlar fibers mixed with small amounts of polybenzimidazole (PBI) and glass fibers to raise the temperature limit of the material (Amatex 1986). The material, NOR-FAB , shows excellent abrasion- and heat-resisting characteristics, is lightweight, and is not susceptible to most acid and alkali solutions. By blending the aramid fibers with other synthetics and glass fibers, the favorable characteristics of aramids can be incorporated into products with higher temperature limits. In the case of NOR-FAB , excellent protection up to 650°F is possible with intermittent protection at much higher temperatures.

4. Carbon Fiber Textiles

Carbon fibers, another asbestos replacement fiber, are characterized by extremely high strength and high temperature resistance. Carbon fibers are made by controlled carbonization of an already formed fibrous structure based on an appropriate organic polymer. The organic polymers most commonly used in the production of carbon fibers are homopolymers of acrylonitrile and viscose rayon multifilament yarns.

The polyacrylonitrile (PAN) based fibers consist of 92-95 percent carbon (the rest being mostly nitrogen), and the higher strength rayon based fibers can be up to 99 percent carbon (Kirk-Othmer 1977). In general, the carbon fiber yarns and cloths are used in applications requiring strength and light weight (e.g., aerospace and industrial applications). Carbon fiber textiles often include other fibers, such as glass, along with a matrix resin (e.g., polyesters, epoxies, or polyimides).

Although there is some ambiguity regarding the term carbon fiber, it should be noted that this term does not include graphite fibers which are materials exhibiting the three-dimensional characteristic of polycrystalline graphite. Essentially all commercial carbon based textiles are made from carbon fibers (Kirk-Othmer 1977).

Carbon fibers have been used as an asbestos replacement in the production of friction materials. Even though the performance is superior to the asbestos goods that they replace, carbon fiber tends to be very expensive and availability can be a factor. In this and other substitution areas, the tradeoff between additional cost and improved performance must be evaluated. Some applications that require a specific level of performance may, therefore, use a more expensive fiber regardless of expense. In other application areas (e.g., aerospace), the cost of the fiber may be insignificant compared to the cost of the finished product in which the textile material is being used.

5. Polybenzimidazole Fiber Textiles

Polybenzimidazole (PBI) fibers can also be used to form asbestos replacement textiles. Based on the reaction of 3,3'-diaminobenzidine and diphenyl isophthalate, these aromatic polymers are prepared by conventional condensation techniques. The resulting polyimides can be fabricated into heat- and flame-resistant fibers that exhibit a unique property for synthetic polymers. Most synthetic polymers do not reabsorb moisture after being

exposed to high temperatures. PBI, however, does regain moisture (up to 13 percent) and is therefore not as subject to degradation in some applications.

PBI fibers can be spun into yarns and then woven to form fabrics that are heat resistant up to 932°F. In addition, fabrics made from PBI fibers show good acid resistance, good cryogenic characteristics, and are readily processed on conventional textile equipment (Kirk-Othmer 1977).

Although PBI fibers exhibit excellent characteristics for very specialized applications (e.g., aerospace and other industries requiring high performance products), they tend to be very expensive. Most industries cannot afford to use PBI containing textiles in their asbestos replacement application areas because of the high cost and must either settle for other available substitute fibers or blend PBI fibers with other fibers to reduce the costs.

6. Asbestos Replacement

Typically, less expensive fibers such as fiberglass or ceramic are used to make up the bulk of any asbestos replacement textile, and the more expensive aramid, carbon, and PBI fibers are added to impart favorable properties on an application-by-application basis. For applications in which readily available substitute fiber textiles are available (i.e., commercially available single fiber products and relatively simple blends), the amount of fiber in the substitute product can be determined. In these application areas, however, substitution is considered to be complete.

The simple textile types (non-blended) are not considered to be replacements for the remaining asbestos textile applications as they do not meet the performance requirements for critical uses. For high performance application areas the amount of each fiber that is used in an asbestos replacement textile is determined by experimental procedure. By varying the concentrations of the available substitute fibers, a substitute textile

product can be formulated that exhibits all of the required characteristics for a particular application.

The experimental nature of asbestos replacement procedures makes it difficult to speculate on the exact types of fibers that would be used in any given application area. Substitute products can be found for all asbestos textiles even though the exact nature of substitution is complicated. For example, the amount of fiber of a particular type and the weight of the finished product would be different than for a similar product made with asbestos.[7] In addition, actual formulations are often considered confidential and it is difficult to find data on product make-up.

As the level of detail needed to characterize specific replacement textile products is not readily available, some simplifying assumptions must be made for the asbestos textiles market. These assumptions are:

- All asbestos yarn and cloth products will be grouped into one product area (textiles);
- The blends of fibers in replacement textiles will be assumed to equal the market share for existing, asbestos replacement textiles that are made exclusively with one fiber (see Table 6);
- Service life will be assumed to be equal for all asbestos and replacement textiles (actual service life can vary for specific applications from one to 20 times that of asbestos, depending on the application);[8]

---

[7] As opposed to other products that use asbestos as an additive, asbestos textiles are comprised of up to 100 percent asbestos. Thus, formulations made with substitute fibers may vary significantly in weight from asbestos products. The relative density of the fiber compared to asbestos and the relative amount used as compared to asbestos determine the weight of the finished product made with substitute fibers.

[8] The actual service life is very dependent on the environment in which the asbestos-containing product and its substitute product would be contained. Depending on various conditions encountered in a particular use scenario (e.g., abrasiveness, high temperature) the possible substitute products would have greatly varying useful lives. Without performing an involved technical assessment of use conditions it is not possible to accurately predict the differences in the actual service life for the various substitute fiber-containing products relative to their asbestos counterparts.

- Unusual and unrepresentative products (e.g., aerospace replacement products that are 1,000 times as expensive as the asbestos product) will be excluded from the cost analysis.[9]

Attachment A contains a discussion of the calculations used in this analysis. The inputs for the Asbestos Regulatory Model for textile products are also presented.

E. Summary

Asbestos textiles can be grouped into two categories: asbestos cloth and asbestos yarn. A third category, asbestos protective clothing, has been eliminated because no producers could be identified.

Production and imports of these materials dwindled significantly between 1981 and 1985, and substitute products have taken over a large portion of the market. All segments of the asbestos textile industry for 1985 were down 70 percent or more compared to 1981 figures.

Substitution is complete for most product areas, but products are still made from asbestos in the following areas: woven friction materials, packings and gaskets, and specialty products. The major fibers that are used as substitutes are glass, ceramic, aramid, polybenzimidazole, and carbon fibers.

Analysis of the asbestos textile market and identification of substitute materials makes it possible to estimate the cost of substitute materials for remaining asbestos markets. The cost range for substitute products varies significantly depending on the application. Limited information makes it difficult to exactly constrain the costs, but average costs based on cost ranges established during the course of this analysis are presented in Table 7 (see Attachment A).

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[9] These products tend to be produced in very small volumes and data are generally not available concerning their cost and performance relative to asbestos products.

ATTACHMENT A

The relevant information used to calculate the costs of substitute textile materials relative to representative asbestos products is contained in this attachment.

As has been mentioned, for the application areas where substitution has taken place, the substitute textiles tend to use relatively simple blends of fibers. The remaining product areas are very diverse and replacement products differ significantly. If, however, essentially pure fiber products were made to replace the remaining asbestos textile markets, their costs would be in the ranges identified in Table 7.

Cost ranges are given because there are application-specific factors determining the actual cost of a substitute fiber textile. As the specifications of a particular application may include requirements regarding the quality as well as the quantity of substitute fiber that is used in the final product, the actual end-product costs will vary from application to application.

The cost of replacement for remaining asbestos products will be assumed to be the same for asbestos yarn and cloth products. An average textile product will, therefore, be the basis for determining the costs of substitution.

The average cost of an asbestos textile mixture that was being produced in 1985 was calculated to be $1.65/lb. (ICF 1986a). The equivalent prices for substitute products are given in Table 8.

Table 7. Costs of Substitute Fiber Textiles

Substitute Fiber	Cost Range of Fiber Relative to Asbestos for All Applications	Normalized[a] Weight of Fiber Used Relative to Asbestos	Cost Range of Finished Product Relative to Asbestos	Average Cost Relative to Asbestos
Glass	1-2	0.7	0.7-1.4	1.05
Ceramic	1-5	0.8	0.8-4.0	2.40
Aramid	6-9	0.8	4.8-7.2	6.00
Carbon	4-12	2.0	8.0-24.0	16.00
PBI	10-30	1.2	12.0-36.0	24.00

[a]Normalized with respect to amount used and weight of finished product.

Sources: Chemical Business 1984, Carborundum 1980, Industrial Minerals 1984, Spaulding 1986, Amatex 1986.

Table 8. Data Inputs for Asbestos Regulatory Cost Model for Textiles

Product	Output (tons)	Product Asbestos Coefficient (tons/ton)[a]	Consumption Production Ratio	Price ($/ton)	Useful Life	Equivalent Price ($/ton)	Market Share	Reference
Asbestos Mixtures	1,125	0.4960	1.511	3,300	1 year	3,300	N/A	ICF 1986a
Glass Fiber Mixtures	N/A	N/A	N/A	3,460	1 year	3,460	50%	Carborundum 1986
Ceramic Fiber Mixtures	N/A	N/A	N/A	7,920	1 year	7,920	15%	Chemical Business 1984
Aramid Fiber Mixtures	N/A	N/A	N/A	19,800	1 year	19,800	15%	Scott 1984
Carbon Fiber Mixtures	N/A	N/A	N/A	52,800	1 year	52,800	10%	Spaulding 1986
PBI Fiber Mixtures	N/A	N/A	N/A	79,200	1 year	79,200	10%	Garlock 1986

[a]Tons of fiber per ton of textile output.

N/A: Not Applicable.

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REFERENCE 14

Ref. 14

Universal Friction Composites

Unarco Road
P.O. Box 429
Marshville, NC 28103

January 30, 1997

Ric Doby
NC DEHNR
919 North Main St
Mooresville, NC 28115

Dear Mr. Doby:

In reference to your request for the location of any asbestos buried on the site of UFC's Marshville, NC plant I am sending you a drawing of the property showing its location in Marshville and the effected area. I have drawn in the building and it is not to scale.

The area shown in red starting immediately behind the building is estimated to be the location of buried asbestos based on the memory of one of the older employees. He remembers asbestos being buried in the late 60's or early 70's which is about the time that this company, then part of Raybestos Manhattan, purchased the property. However, the property was used to produce asbestos products for many years prior to that time and asbestos could be buried in other areas that we have no knowledge of.

Please advise me if any further information is needed.

Bill Stogner

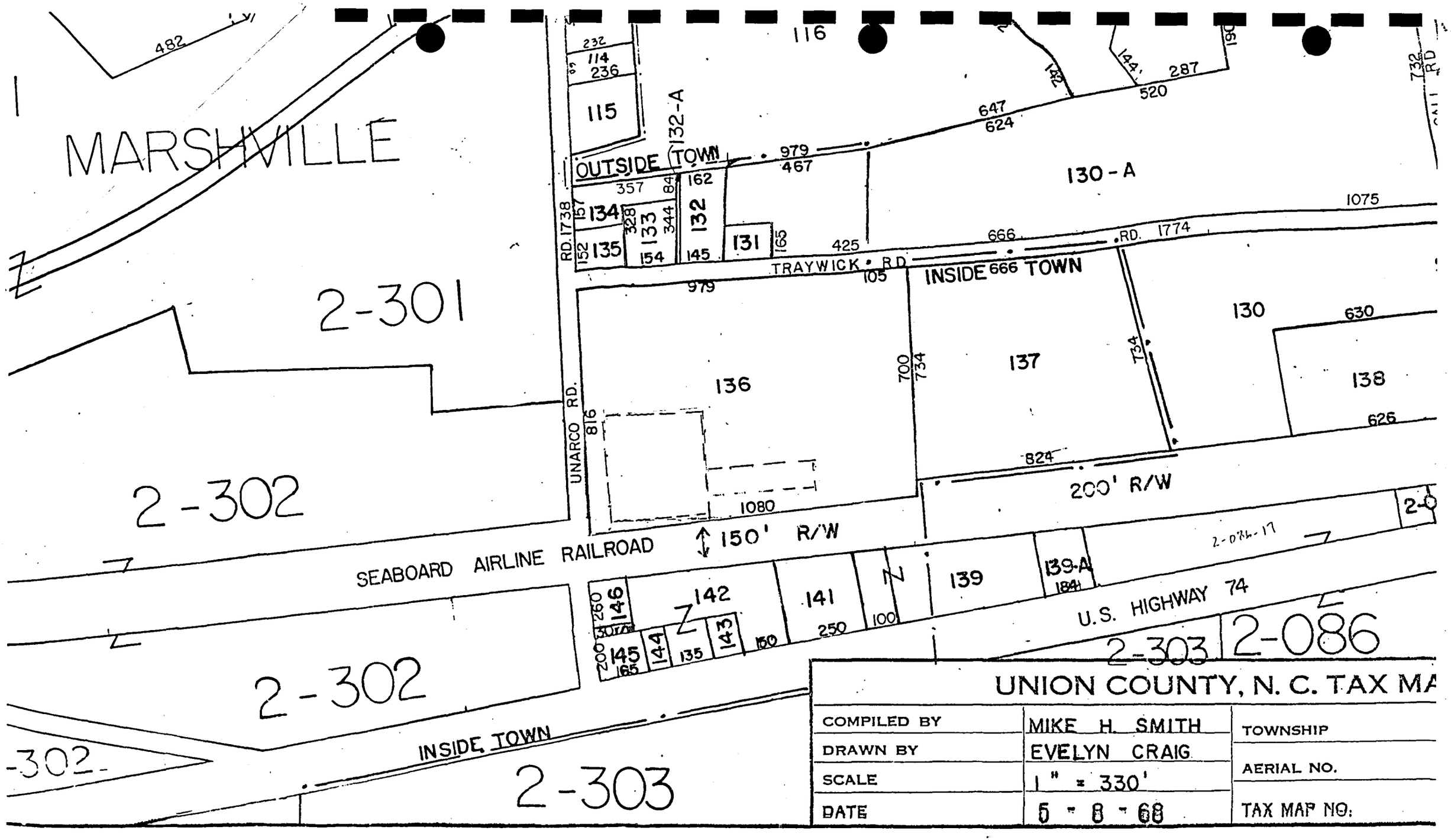
William L. Stogner
Plant Manager

cc: Herm Ramig

Enclosure

/ch

Telephone (704) 624-5031 Corporate Headquarters: Manning, SC Fax (704) 624-6527


MARSHVILLE
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U.S. HIGHWAY 74
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INSIDE TOWN
UNION COUNTY, N. C. TAX MA
COMPILED BY
MIKE H. SMITH
DRAWN BY
EVELYN CRAIG
SCALE
1" = 330'
DATE
5 - 8 - 68
TOWNSHIP
AERIAL NO.
TAX MAP NO.

REFERENCE 15

Universal Friction Composites 123 East Stiegel Street, Manheim, PA 17545
Telephone: (717) 665-2211
R&D Fax: (717) 665-2572

April 7, 1997

Mr. C. Rick Doby, Sr.
Waste Management Specialist
State of North Carolina
Department of Environment, Health and Natural Resources
919 North Main Street
Mooresville, NC 28115

Dear Mr. Doby:

Subject: Asbestos Disposal
Universal Friction Composites
Marshville, Union County

Reference: Letter from Mr. W. Stogner to Mr. R. Doby dated 1/30/97
Letter from Mr. R. Doby to Mr. W. Stogner dated 2/13/97
Telecon between Messrs. R. Doby and H. Ramig on 2/19/97
Letter from Mr. H. Ramig to Mr. R. Doby dated 3/18/97

Your letter dated February 13 requested a subsurface investigation be conducted on the subject site. This request was based on a letter to you from Mr. William Stogner dated January 30 that defined an area suspected to contain buried asbestos.

On March 24 and 25, twelve test borings were made in the area thought to contain asbestos. These borings were done to depths ranging from two to three feet and generally covered the entire area. Specific boring locations are shown on the sketch accompanying this letter. No evidence of asbestos was found.

Please advise if this work is sufficient to conclude the investigation or if you require additional information.

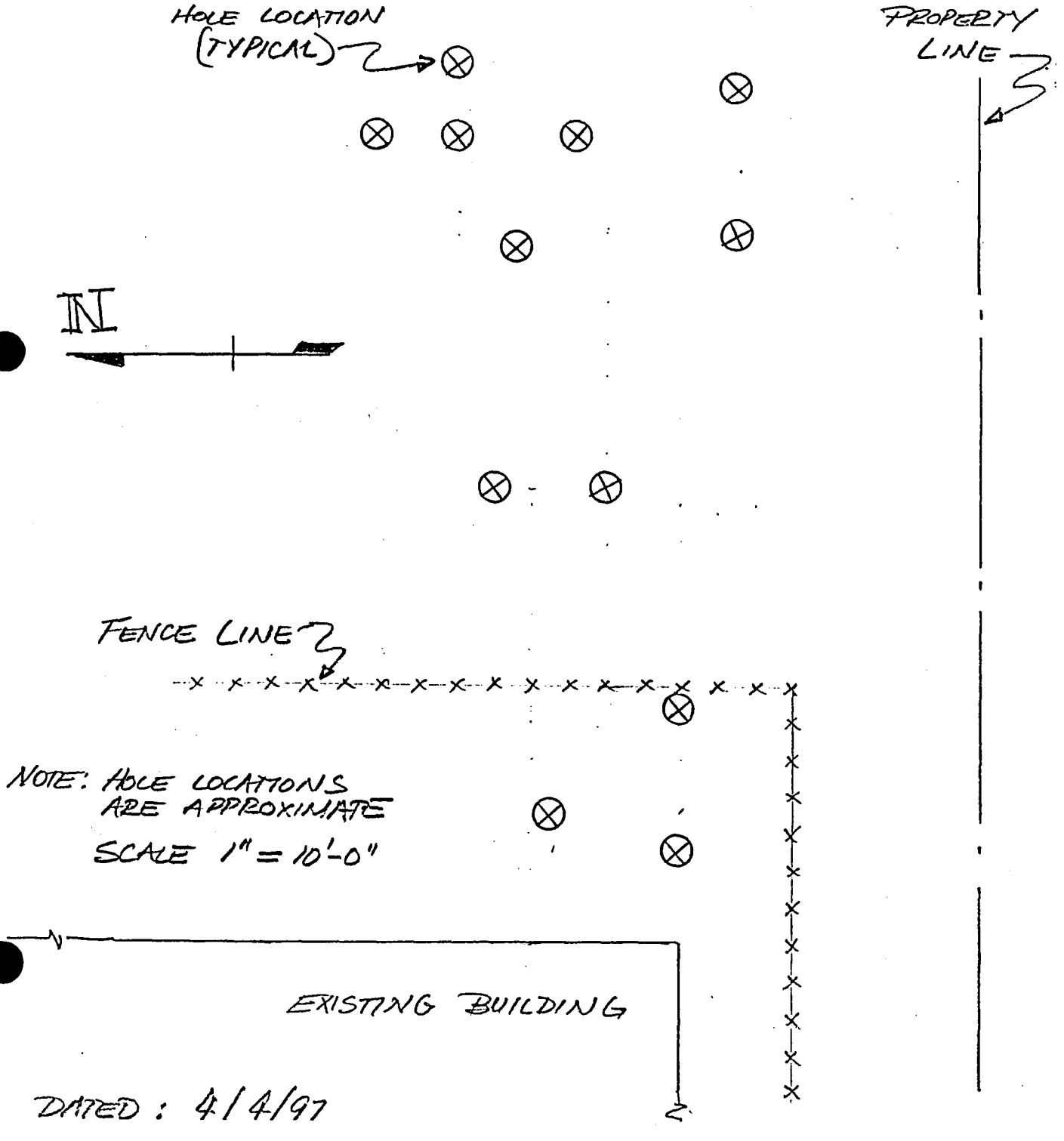
If you have any questions or need some follow up discussion, you can contact me by telephone at (717) 664-5326 or fax (717) 665-2572.

Sincerely,

Herman J. Ramig

Herman J. Ramig, P. E.
Director, Environmental Compliance

Universal Friction Composites



DATED: 4/4/97

REFERENCE 16

Ref. 16

Universal Friction Composites 123 East Stiegel Street, Manheim, PA 17545
Telephone: (717) 665-2211
R&D Fax: (717) 665-2572

August 6, 1997

Mr. C. Rick Doby, Sr.
Waste Management Specialist
State of North Carolina
Department of Environment, Health and Natural Resources
919 North Main Street
Mooresville, NC 28115

Dear Mr. Doby:

Subject: Asbestos Disposal
Universal Friction Composites
Marshville, Union County

Reference: Letter from Mr. W. Stogner to Mr. R. Doby dated 1/30/97
Letter from Mr. R. Doby to Mr. W. Stogner dated 2/13/97
Telecon between Messrs. R. Doby and H. Ramig on 2/19/97
Letter from Mr. H. Ramig to Mr. R. Doby dated 3/18/97
Letter from Mr. H. Ramig to Mr. R. Doby dated 4/7/97
Letter from Mr. R Doby to Mr. H. Ramig dated 5/1/97
Letter from Mr. R Doby to Mr. H. Ramig dated 7/30/97
Telecon between Mr. H. Ramig and Messrs. R. Doby and P. Prete on 7/30/97

The above is a historic reference of pertinent correspondence and conversations regarding the investigation of the subject area suspected to contain buried asbestos. Your most recent correspondence and our conversations requested amplification of the findings reported in my letter of April 7, 1997.

To recap, on March 24 and 25, twelve test borings were made in the area thought to contain buried asbestos. These borings were done to depths ranging from two to three feet and covered an area of approximately 26,000 sq. ft. Specific boring locations were shown on the sketch previously provided.

All borings showed only virgin soil. There was no evidence in any of the borings to suggest that there was bulk asbestos disposal. Additional information that can support this conclusion is the Marshville sewer line, installed about 17 years ago, that traverses the area in a generally north to south direction. There is no information that buried asbestos was found during this construction. And, it is known with reasonable certainty that there has been no asbestos disposal since then.

If you have any questions or need some follow up discussion, you can contact me by telephone at (717) 664-5326 or fax (717) 665-2572.

Sincerely,

Herman J. Ramig

Herman J. Ramig, P. E.
Director, Environmental Compliance

REFERENCE 17

Ref. 17

McMILLAN, SURLES & TERRY, P.A.
6101 Carnegie Blvd., Suite #310
Charlotte, NC 28209
(704) 552-9997
(704) 552-0540 (Fax)

DOCUMENT TRANSMITTAL

Phoenix Group III

2600 Virginia Ave. N.W. Ste 606

Washington D.C. 20037

DATE: 1/25/01

RE: Raymark Industries

ENCLOSED PLEASE FIND THE FOLLOWING ORIGINAL DOCUMENTATION:

	ORIGINAL RECORDED WARRANTY DEED
	ORIGINAL RECORDED DEED OF TRUST/MORTGAGE
	CERTIFIED COPY OF
	ORIGINAL RECORDED ASSIGNMENT
	ORIGINAL RECORDED NOTICE OF SALE
	RE-RECORDED WARRANTY DEED
	RE-RECORDED DEED OF TRUST/MORTGAGE
X	ORIGINAL RECORDED QUIT CLAIM DEED

THANK YOU FOR THIS OPPORTUNITY TO BE OF SERVICE. IF WE MAY BE OF ANY FURTHER ASSISTANCE, PLEASE DO NOT HESITATE TO CALL.

Very truly yours,

Karen Masseria

Karen Masseria
Post Closing Paralegal

/km

Enclosure(s) as stated.

BK 1488PG492

0037990

REVENUE STAMPS - $560.00

Tax Code #02-114-136

QUIT CLAIM DEED

Filed for record
Date 1.10.2001
Time 2:11 o'clock P M.
JUDY G. PRICE, Register of Deeds
Union County, Monroe, North Carolina

KNOW ALL PERSONS BY THESE PRESENTS:

THAT, I, Bradley Smith, as Trustee of the Raymark Industries, Inc. Retirement Plan For Hourly Paid Employees And The Retirement Plan For Hourly Paid Employees Of Raymark Industries, Inc., Marshville Plant (collectively the "Pension Plans"), whose mailing address is c/o Raymark Industries, Inc., FTI/Kahn 622 Third Avenue 31st Floor, New York, NY 10027, for ten (10) dollars and other good and sufficient consideration paid by Phoenix Group III, LLC, of 2600 Virginia Avenue, N.W., Suite 606, Washington, D.C. 20037, (hereinafter "Grantee"), do hereby quit claim to the said Grantee, its heirs and assigns forever, all such right, title, interest, claim and demand that I as such Trustee have in and to that certain piece or parcel of land, with the buildings and improvements thereon, situated in the Town of Marshville, County of Union, State of North Carolina, known as the "Marshville Property" being the same premises as conveyed to the Pension Plans by virtue of a Quit Claim Deed from Raymark Industries, Inc. dated August 15, 1996 and recorded in Book 899, Page 383 of the Union County Registry Land Records attached as Exhibit A and incorporated by reference hereto.

TO HAVE AND TO HOLD, the above granted and bargained premises, with the appurtenances thereof, to Grantee, its heirs and assigns.

IN WITNESS WHEREOF, I, as such Trustee, have caused this instrument to be executed this 23rd day of October, 2000.

Witnessed By:

Bradley Smith, Trustee

UNION COUNTY NC
13

01/10/2001
$560.00

STATE OF NORTH CAROLINA

Real Estate Excise Tax

RECORDED AND VERIFIED
JT

Prepared by ~~and Return to:~~

Pepe & Hazard LLP
Goodwin Square
225 Asylum Street
Hartford, Connecticut 06103
Attention: Reed D. Rubenstein, Esq.

Return to:
McMillan, Burles & Berry
6101 Carnegie Blvd.
Charlotte, NC 28209

RDR/296 9/12/489969v1
10/04/00- IRT/RDR

BK 1488PG493

STATE OF Pa)
: ss:
COUNTY OF Lancaster)

The foregoing instrument was acknowledged before me, this 23 day of October, 2000, by Bradley Smith, Trustee, as aforesaid.

Notary Public
My Commission Expires:

Latest Mailing Address of Grantee:

Phoenix Group III, LLC
2600 Virginia Avenue, N.W.
Suite 606
Washington, D.C. 20037

Notarial Seal
Melissa Thompson, Notary Public
Lancaster, Lancaster County
My Commission Expires Jan. 5, 2004

NORTH CAROLINA - UNION COUNTY
The foregoing certificate(s) of
Melissa Thompson
Notary Public
of _____ is/are certified
to be correct. Filed for record this 10th day
of Jan. 2001, at 2:11 PM

JUDY G. PRICE, REGISTER OF DEEDS
BY: Serena Ciocca
Asst./Dept.

RDR/29619/12/489969v1
10/04/00-HRT/RDR

EXHIBIT A

Legal Description

(Marshville, North Carolina)

Beginning at a concrete monument located in the westerly line of County Road #1738, being also 50 feet measured in a northerly direction from the center of the main line track of the Seaboard Coast Line Railroad, and running thence with the westerly line of County Road #1738 North 3 degrees 30 minutes East 816.1 feet; thence crossing County Road #1738 and within the boundaries of Traywick Road, South 85 degrees 50 minutes East 977.5 feet; thence South 3 degrees 50 minutes West 28.30 feet to the northerly line of the property conveyed by Johns-Manville Products Corporation to Raybestos-Manhattan, Inc. by deed registered in Book 229, Page 449, Union County Registry; thence with a line of said property South 86 degrees 45 minutes East 105.3 feet; thence South 4 degrees 05 minutes West 700.4 feet to an iron stake in the northerly line of the right of way of the Seaboard Coast Line Railroad; thence with the same South 89 degrees 29 minutes West 1080 feet to the BEGINNING, containing 18.95 acres according to a survey made by Ralph W. Elliott, R.L.S., dated November 13, 1969.

This conveyance is made subject to and together with the benefits of the flowing easements and agreements: (1) Unrecorded agreement dated November 16, 1966, between Seaboard Airline Railroad Company and Johns-Manville Products Corporation establishing a side or spur track; (2) Right of way agreement with Duke Power Company dated December 1, 1947, registered in Book 107, Page 91; (3) Right of way agreement with Southern Public Utilities Company dated September 21, 1926, registered in Book 65, Page 229, Union County Registry; this easement agreement provided for right of way into the within conveyed property and for the location of the substation, which, however, has been replaced by the substation referred to in the agreement referred to in the paragraph next above registered in Book 107, Page 91; Duke Power Company and Southern Pacific Utilities Company are one and the same; (4) Right of way for County Road #1738 as shown on the plat of Ralph W. Elliott, R.L.S., dated November 13, 1969; (5) Power line along east margin of County Road #1738 and along southerly margin of County Road #1744; and (6) Right of way agreement in favor of State Highway Commission of North Carolina recorded in Deed Book 198, at Page 223; and other liens, if any, outstanding.

Being the same property described in Deed Book 229, Page 449 (and corrected in deed recorded in Deed Book 230, Page 265) and in Deed Book 899, Page 383, Union County Registry.

REFERENCE 18

Waters Edge Environmental, LLC

302 Pomona Drive, Suite L Greensboro, North Carolina, 27407 Tel: 336.852.5003 Fax: 336.854.9199

December 22, 2000

Mr. Gary R. Brown, P.E.
President
RT Environmental Services, Inc.
215 West Church Road
King of Prussia, Pennsylvania 19406

Reference: Summary of Assessment Findings
Former Universal Friction Composites Facility
Marshville, North Carolina
Waters Edge Job No. G1-16

Dear Mr. Brown:

Waters Edge Environmental, LLC (Waters Edge) is pleased to provide this summary of findings of the assessment of seven Areas of Concern (AOCs) at the former Universal Friction Composites facility located in Marshville, North Carolina. Brief descriptions of the findings in each AOC are listed below. Soil samples and fiber samples have been submitted for laboratory analysis. Although field screening methods can give an accurate indication of conditions at a site, Waters Edge cannot make a final determination of field conditions until the laboratory analytical results have been received.

AOC 1: Suspected Underground Storage Tank – Front of facility

According to information provided to Waters Edge, an underground storage tank (UST) was reportedly abandoned in place near a storage building at the front of the facility. This storage building was reportedly used as a boiler room at some point in the past. Waters Edge conducted a Geoprobe assessment in the area where the UST was suspected to have been abandoned. A total of seven Geoprobe borings were advance in this area. The majority of the borings reached a termination depth of approximately three to four feet below land surface (bls) where competent rock was encountered. One boring was extended to a depth of five feet bls before rock was encountered. A soil sample was collected from this boring for analysis by EPA Method 8270. No evidence of a UST or of volatile organic vapors was detected during the assessment.

AOC 2: Aboveground Storage Tank (AST) Area

According to information provided to Waters Edge, two 20,000-gallon fuel oil USTs were removed from the site in the 1980s and were replaced by two ASTs with a containment dike. Waters Edge advanced three soil borings around the containment dike to approximate depths of 12 to 14 feet bls. Soil samples were collected from each boring for analysis by EPA Method 8270. No evidence of volatile organic vapors was detected during the assessment.

AOC 3: Drainage Feature

According to information provided to Waters Edge, a petroleum release from the AST containment dike occurred in 1997. Fuel from the containment dike apparently flowed into an adjacent drainage feature. Waters Edge advanced two soil borings in the drainage feature to a depth of four feet bls. One soil sample was collected from each boring for analysis by EPA Method 8270. No indication of volatile organic vapors was noted in either sample.

AOC 4: Fuel Dispenser Area

One 550-gallon AST is present in the containment dike for the fuel oil ASTs. Piping from this tank leads to a fuel dispenser near the loading dock area of the facility. Waters Edge advanced two Geoprobe borings immediately adjacent to the fuel dispenser to a depth of four feet bls each. Field screening of the soil samples collected from the borings indicated the presence of volatile organic vapors. Soil samples were collected from these borings for analysis by EPA Method 8260, EPA Method 8270, and lead.

Further assessment in this area was accomplished by advancing three additional soil borings to depths of approximately 12 feet bls. The borings were located approximately 20 feet from the fuel dispenser. Soil samples were collected from each boring for analysis by EPA Method 8260. The presence of volatile organic vapors (slight) was detected in one boring at a depth of 12 feet bls.

AOC 5: Fill Port on Southeastern Corner of Building

One metal pipe was observed at the southeastern corner of the building. During a previously conducted site assessment, this pipe was suspected to represent a fill port for a UST. Waters Edge advanced one soil boring adjacent to the potential UST fill port to an approximate depth of 14 feet bls. One soil sample was collected from this boring for analysis by EPA Methods 8260 and 8270. No volatile organic vapors were detected in this boring, and no evidence of a UST was detected during the assessment.

AOC 6: Compressor Blow-Down Area

An area adjacent to a compressor room was assessed for the presence of oil and grease. Two soil borings were advanced through concrete to a depth of four feet bls. Two soil samples were collected for analysis by EPA Method 8270. No indication of a petroleum release was noted; however, fibrous material was noted in one boring at a depth of 0.5 to 1 foot bls.

AOC 7: Buried Asbestos Material

According to information provided to Waters Edge, potential asbestos containing materials (ACMs) were buried at the rear of the facility in the late 1960s. The area is now covered by an addition to the facility that was built in the 1970s. Waters Edge advanced eleven soil borings through the concrete slab beneath the building addition. Fibrous materials were detected in six of the eleven borings. The thickness of the buried material was approximately two feet, and the extent of the fibrous materials appears to be approximately 80 by 30 feet.

Conclusions

Waters Edge has completed the assessment in the seven AOCs noted above. Evidence of a petroleum release was noted in the fuel dispenser area (AOC 4). As a general rule in North Carolina, sites where a petroleum release has been discovered are usually required to initially conduct a Soil Contamination Report. During the preparation of this report, soil samples are collected from the area of highest previously detected impact and are analyzed by the Massachusetts Department of Environmental Protection (MADEP) methods. If the results of the analysis by the MADEP methods indicate that petroleum hydrocarbon concentrations are below either the "soil-to-groundwater" or "residential maximum soil contaminant concentration" (which ever is lower), the site is considered for closure. If the results of the analysis indicate that the "soil-to-groundwater" or "residential maximum soil contaminant concentration" has been exceeded, the owner/operator is then required to conduct a Limited Site Assessment. This

consists of installing at least one groundwater monitoring well and analyzing the soil and groundwater by the MADEP methods and also conducting a surrounding property use survey. The results of the survey determine if the site can be considered "commercial" and therefore eligible for more lenient cleanup goals. Additional groundwater monitoring wells may be required if certain contaminant concentrations are exceeded.

Fibrous materials were discovered during the assessment activities inside the current facility (AOC 7). These samples have been submitted for laboratory analysis. The fibrous materials appear to extend approximately 80 by 30 feet. Additional discussion concerning the presence or absence of ACMs in these borings can be conducted following the receipt of the laboratory analytical report.

Waters Edge Environmental appreciates the opportunity to provide consulting services for this project to RT Environmental. If you have any questions or require any additional information, please contact me at (336) 852-5003.

Sincerely,

WATERS EDGE ENVIRONMENTAL, LLC

Edward M. Kuhn, P.G.
Branch Manager

GL0034/EMK/jlp

REFERENCE 19

Ref. 19

Limited Site Assessment Report
Former Universal Friction Composites Facility
Unarco Road
Marshville, North Carolina
Latitude 34°59'20" North
Longitude 80°21'13" West
April 26, 2002

Prepared for

RT Environmental Services, Inc.
King of Prussia, Pennsylvania

Prepared by

Waters Edge Environmental, LLC
Greensboro, North Carolina

Waters Edge Environmental, LLC

302 Pomona Drive Suite L, Greensboro, North Carolina 27407 Tel: 336.852.5003 Fax: 336.854.9199

April 26, 2002

Mr. Gary R. Brown, P.E.
RT Environmental Services, Inc.
215 West Church Road
King of Prussia, Pennsylvania 19406

Reference: Limited Site Assessment Report
Former Universal Friction Composites Facility
Unarco Road
Marshville, North Carolina
Waters Edge Job No G2-02

Dear Mr. Brown:

Waters Edge Environmental, LLC (Waters Edge) is pleased to provide this Limited Site Assessment for the former Universal Friction Composites facility located in Marshville, North Carolina. A copy of this report will be sent to the following address:

North Carolina Department of Environment and Natural Resources
Division of Waste Management
Underground Storage Tank Section
Mooresville Regional Office
919 N. Main Street
Mooresville, North Carolina 28115

Waters Edge appreciates the opportunity to provide environmental consulting services to RT Environmental Services, Inc. If you have any questions or require any additional information, please contact us at (336) 852-5003.

Sincerely,

WATERS EDGE ENVIRONMENTAL, LLC

NORTH CAROLINA LICENSED SEAL 1452 GEOLOGIST EDWARD M. KUHN

Edward M. Kuhn, C.G.
Branch Manager

GR2013/EMK/jlp

Limited Site Assessment Report
Former Universal Friction Composites Facility
Unarco Road
Marshville, North Carolina
April 26, 2002

1 Introduction

The former Universal Friction Composites facility (Universal) is located on Unarco Road in Marshville, North Carolina (see Figure 1). One 550-gallon gasoline aboveground storage tank (AST) was used at the subject site for vehicle fueling. A fuel dispenser for the AST is located approximately 50 feet from the AST.

As part of an investigation conducted at the site in December 2000, soil samples were collected from two locations near the fuel dispenser and were submitted for laboratory analysis (see Figure 2). Field screening of the soil samples collected from the borings indicated the presence of volatile organic vapors. Soil samples were collected from these borings for analysis for volatile organic compounds (VOCs) by EPA Method 8260, semi-volatile organic compounds (SVOCs) by EPA Method 8270, and lead. The laboratory analytical results indicated the presence of benzene (14.4 mg/kg), toluene (152 mg/kg), ethyl benzene (47.1 mg/kg), xylenes (277 mg/kg), 1,3,5-trimethylbenzene (41.7 mg/kg), 1,2,4-trimethylbenzene (130 mg/kg), n-propylbenzene (18.6 mg/kg), and naphthalene (3.0 mg/kg) in sample B-4. Sample B-5 also contained detectable concentrations of volatile organic compounds, including benzene (0.174 mg/kg), toluene (0.979 mg/kg), ethyl benzene (0.581 mg/kg), xylenes (2.53 mg/kg), 1,3,5-trimethylbenzene (1.63 mg/kg), 1,2,4-trimethylbenzene (2.39 mg/kg), and n-propylbenzene (0.380 mg/kg). This sample also contained p-isopropyltoluene (0.406 mg/kg) and i-propylbenzene (0.076 mg/kg).

Further assessment in this area was accomplished by advancing three additional soil borings (B-25, B-26, and B-27) to depths of approximately 14 feet bls (see Figure 2). The borings were located approximately 20 feet from the fuel dispenser. Soil samples were collected from each boring for analysis by EPA Method 8260. Volatile organic compounds were detected in sample B-26, including benzene (0.015 mg/kg) and xylenes (0.014 mg/kg). All samples were collected and handled in accordance with the procedures contained in Appendix A. The laboratory analytical report for this phase of assessment is contained in Appendix B. The analytical results are summarized in Table 1.

Based upon the results of the initial assessment and the desire to obtain closure for the site, Waters Edge Environmental, LLC (Waters Edge) was contracted to prepare a Soil Contamination Report for the facility. This would include the collection of additional soil samples for analysis by the Massachusetts Department of Environmental Protection (MADEP) methods for volatile petroleum hydrocarbons (VPH) extractable petroleum hydrocarbons (EPH), and for VOCs and SVOCs by EPA Methods 8260 and 8270.

On January 31, 2002, Waters Edge conducted additional soil assessment activities at the above referenced facility. Two soil borings (B-28 and B-29) were installed at the site. Boring B-28 was installed to a depth of approximately four feet below land surface and was located immediately adjacent to the fuel dispenser. Boring B-29 was installed to a depth of approximately 15 feet below land surface and was located approximately 20 feet from the fuel dispenser (see Figure 2). One soil sample was collected from each boring and was collected and handled in accordance with the procedures contained in Appendix A. Each sample was transported to the analytical laboratory for analysis of VPH, EPH, VOCs, and SVOCs.

The analytical results from the assessment are summarized in Table 1. The complete analytical report is contained in Appendix B.

Sample B-28 contained VOCs including benzene (17 mg/kg), toluene (130 mg/kg), ethylbenzene (51 mg/kg), xylenes (234 mg/kg), methyl-tert-butyl-ether (33 mg/kg), naphthalene (27 mg/kg), di-isopropyl ether (1.2 mg/kg), isopropylbenzene (17 mg/kg), 1,2,4-trimethylbenzene (100 mg/kg), and 1,3,5-trimethylbenzene (47 mg/kg) in concentrations that exceeded the soil-to-groundwater maximum soil contaminant concentration (MSCC). This sample also contained aliphatics (C5-C8, 110 mg/kg) in concentrations exceeding the MSCC. The sample from boring B-29 contained naphthalene (9.7 mg/kg) in concentrations that exceeded the MSCC.

Since the soil-to-groundwater MSCCs were exceeded at the site, a Limited Site Assessment (LSA) would be required to provide additional information to obtain a no further action status at the site.

2 Risk Characterization

The Risk Assessment and Land Use Form was completed for the site and is included as Appendix C. The results of the assessment indicate that the properties surrounding the site are a mixture of residential, commercial and industrial use. Industrial and light industrial facilities are located to the east and west. Commercial properties are located to the south across Highway 74. Residential properties are located to the north. Two residences are located to the south.

3 Receptor Information

3.1 Water Supply Wells

A site reconnaissance was conducted in the area of the facility to determine water usage. The City of Marshville was also contacted to determine if the area surrounding the site has availability of municipal water supply. One residence that appears rely on a water supply well was located within 1,000 feet of the facility. Other residences beyond 1,000 feet from the source area were noted to have water supply wells. Other residences and businesses were located that are supplied with municipal water. A map showing the locations of the residences identified during the reconnaissance is presented as Figure 3.

3.2 Public Water Supplies

The area surrounding the site, including the subject property, is served with public water by the City of Marshville, which receives its water from Anson County. Anson County receives its water from the PeeDee River.

3.3 Surface Water

A drainage swale was noted on the northern property boundary of the site. No water was present in this drainage feature at the time of our site visit. This drainage feature would discharge into an unnamed stream. No other surface water bodies were noted in the area of the site.

3.4 Wellhead Protection Areas

According to available information, there are no wellhead protection areas within 1,500 feet of the release.

3.5 Deep Aquifers in the Coastal Plain Physiographic Region

The site is not located in the Coastal Plain Physiographic Region.

3.6 Subsurface Structures

Sewers, utility lines, and conduits are located along Highway 74 and Unarco Road. Given the depth to groundwater at the site (approximately nine feet), it is unlikely that groundwater would intercept these utilities.

3.7 Land Use

The land use in the area surrounding the release is a mixture of industrial, commercial, and residential. Industrial facilities are located to the east and west. Commercial properties are located to the south across Highway 74. Residential properties are located to the north. Two residences are located to the south.

3.8 Adjacent Property Owners

The owners of all properties contiguous to the subject site are listed below.

Parcel No	Owner Name	Owner Address
02114137	Epsilon Realty Company	560 Ferry St., Newark, NJ 07105
02114130A	Griffins Eighty Eight Cents Store	PO Box 88, Polkton, NC 28315
02114131	Terry and Rhonda Gaddy	2611 Faulks Church Road, Wingate, NC 28174
02114132	Katherine Helms	Box 4, Marshville, NC 28103
02114133	Emma T. High	Box 632, Marshville, NC 28103
02114135	Christ Bible Teaching Center	1103 Unarco Road, Marshville, NC 28103
02302007	Christ Bible Teaching Center	1103 Unarco Road, Marshville, NC 28103
02301008	Douglas and Doris High	Rt. 2, Box 91, Peachland, NC 28133
02301011	William and Camelia Eason	PO Box 460, Marshville, NC 28103
02303058C	Marshville Plaza Properties	128 S. Tryon St., Charlotte, NC 28202

4 Site Geology and Hydrogeology

The geology encountered at the site consisted of sands and sandy clays to a depth of approximately 6.5 ft-bls. Sands were encountered from 6.5 feet to 14 ft-bls, where competent rock (auger refusal) was encountered.

5 Site Assessment Results

5.1 Groundwater Investigation

Based on the results of the initial soil investigation, Waters Edge installed one shallow monitoring well at the site on March 21, 2002 at a location topographically downgradient from the fuel dispenser (see Figure 4). Due to the presence of multiple belowground and aboveground

utilities, the well was installed at the closest practical location approximately 20 feet from the gasoline fuel dispenser after two attempts at locations nearer the fuel dispenser. Monitoring well MW-1 was installed by the use of a drilling rig utilizing hollow-stem augers. The soil boring was advanced to a depth of 14 ft-bls where auger refusal was encountered. The well was constructed with 10 feet of 2-inch diameter 0.010-inch slotted PVC well screen, and 2-inch diameter solid PVC riser extending to the ground surface. Boring logs and well completion records are contained in Appendix D.

5.2 Water Level Measurements

Water level measurements were last collected from the well on March 21, 2002. The depth to groundwater on that date was 9.12 feet.

5.3 Soil Analytical Results

One soil sample was collected during the installation of well MW-1 on March 21, 2002. Soil samples were collected continuously during the advance of each boring. Each soil sample was screened for the presence of volatile organic vapors with a flame-ionization detector (FID). The soil sample from each boring with the highest FID reading or the sample nearest the groundwater table was retained for laboratory analysis. One soil sample was collected from MW-1 at a depth of 5 feet bls. Since the AST and fuel dispenser contained gasoline only, the soil sample was analyzed for VOCs according to EPA Method 8260 and for VPH by the MADEP Methods.

The analytical results from the soil sample collected during the installation of well MW-1 did not indicate the presence of VOCs with the exception of bromoform (13 µg/kg). The soil analytical results are summarized in Table 1.

5.4 Groundwater Analytical Results

One groundwater sample was collected from well MW-1 on March 21, 2002. The groundwater sample was submitted for laboratory analysis of VOCs by EPA Method 8260 and for VPH by the MADEP Methods.

The results of the analysis of the groundwater sample did not indicate the presence of VOCs in the sample collected from well MW-1. The complete analytical report is contained in Appendix B.

6 Conclusions

Previous assessment activities at the site indicated that VOCs are present in the soil immediately adjacent to the location of the fuel dispenser. VOCs were detected in soils in other locations near the fuel dispenser, but at much lower levels. Based on the results of the analysis of soil samples collected from the site, the source of the release appears to be the fuel dispenser.

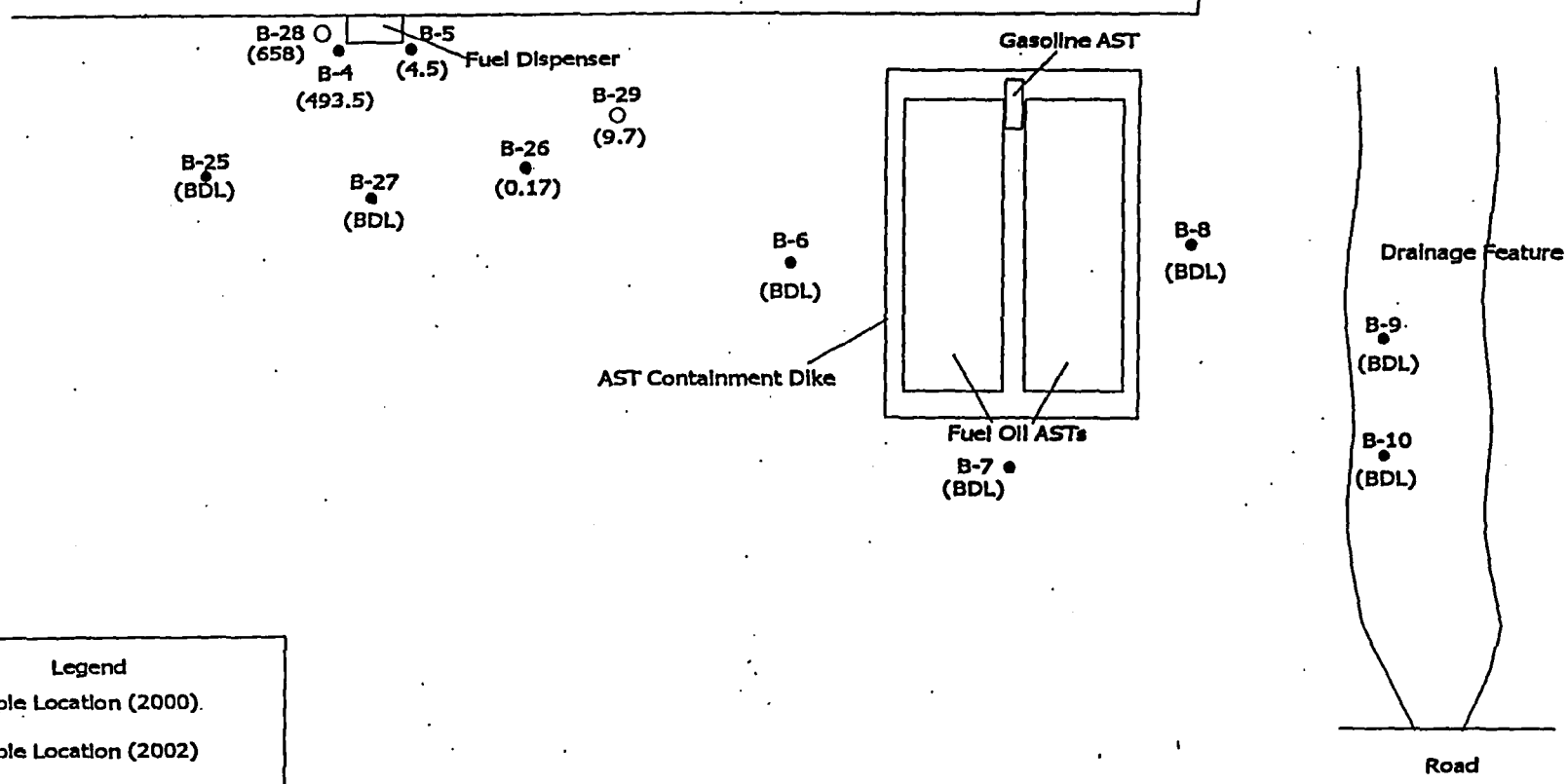
The results of the shallow groundwater assessment did not indicate concentrations of VOCs in the groundwater sample collected from well MW-1.

The analytical results obtained from previous assessment activities as well as the most recent assessment indicate a limited area of soil impact. The groundwater sample analysis did not indicate the presence of VOCs. Based upon the site use and surrounding property use, the site will likely be characterized as an industrial/commercial facility. The analytical results previously obtained from soils at the site would fall below the industrial/commercial MSCCs.

Based upon the analytical results obtained from the site, and the site and surrounding property use, Waters Edge recommends that no further action be required at this site.

FIGURES

Waters Edge Environmental, LLC	Author JLP	Drawing	Layers	Date 4-18-02	Title Site Location Map
	Job No. G2-02	Revision	Figure 1	Scale 1" = 1600'	Former Universal Friction Composites Facility Marshville, North Carolina



Legend

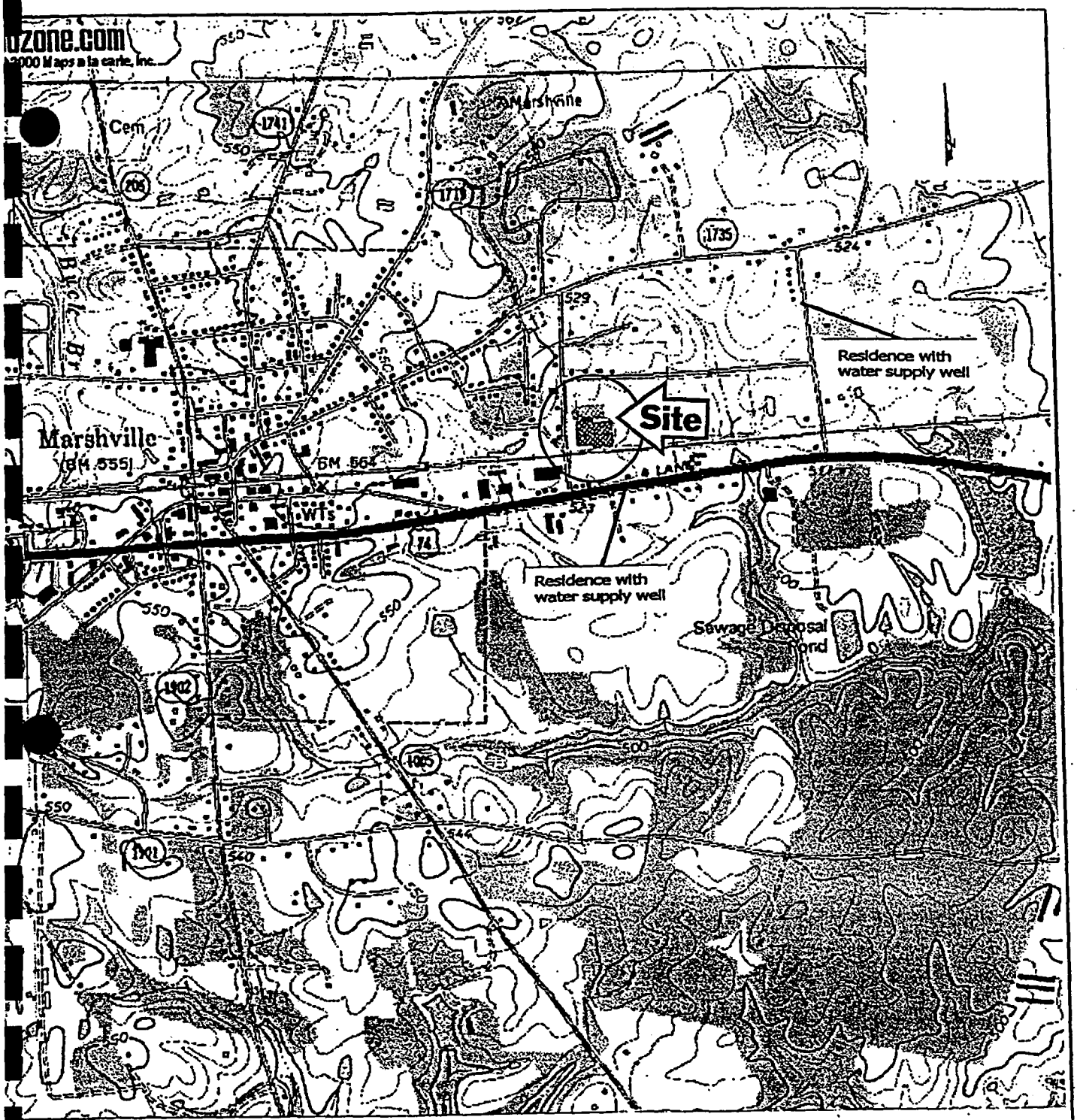
B-6 Soil Sample Location (2000)

B-28 Soil Sample Location (2002)

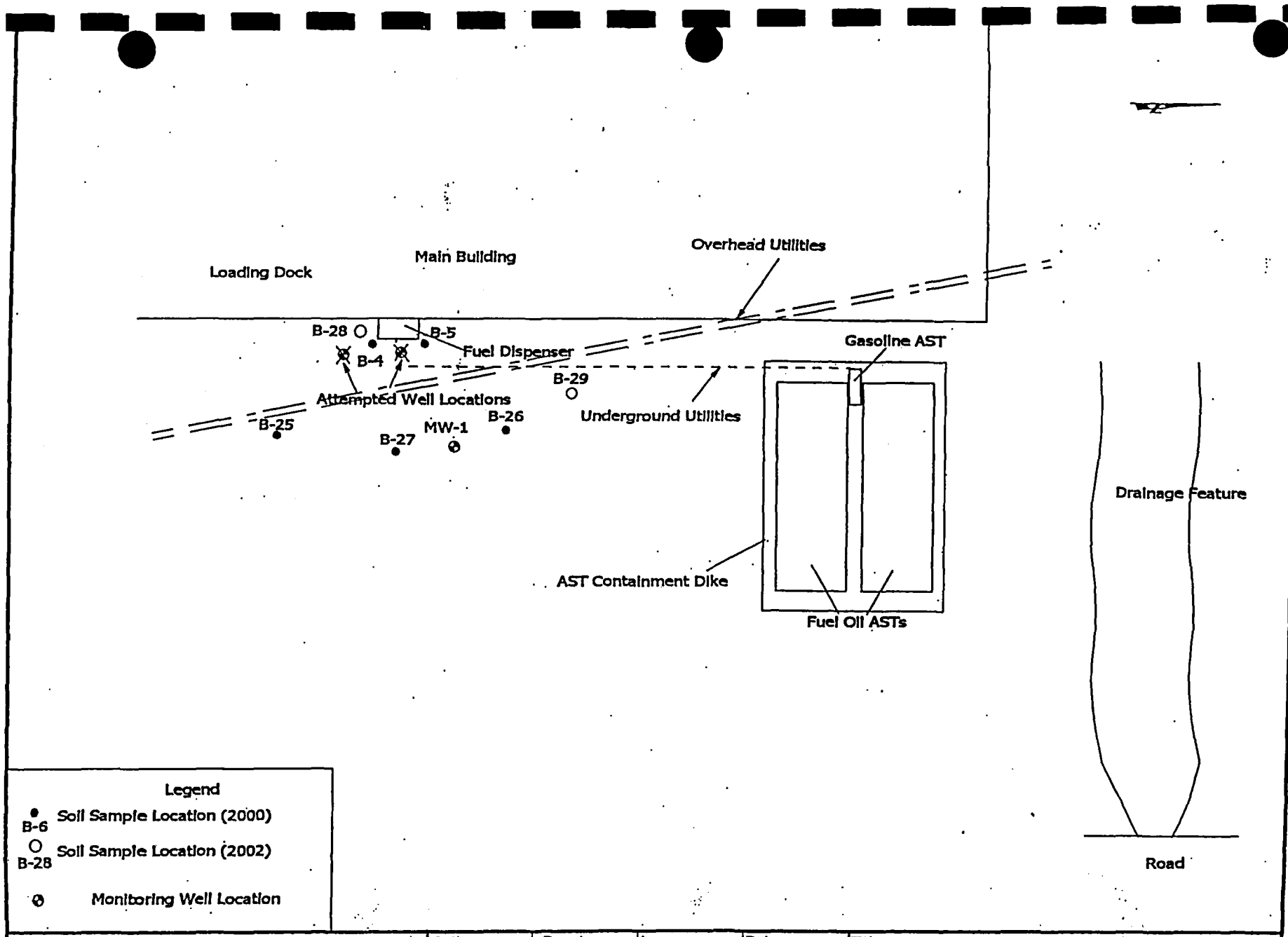
(658) Total VOC Concentration (mg/kg)

Waters Edge Environmental, LLC

Author	Drawing	Layers	Date	Title
JLP	0	0	2-22-01	Soil Sample Location Map - 2000 and 2002 events
Job No.	**Revision**	**Figure**	**Scale**	**Project**
G2-02	000	2	1" = 20'	Former Universal Friction Facility Marshville, North Carolina



Waters Edge Environmental, LLC	Author JLP	Drawing	Layers	Date 4-18-02	Title Water Supply Well Location Map
	Job No. G2-02	Revision	Figure 3	Scale 1" = 1600'	Former Universal Friction Composites Facility Marshville, North Carolina



Waters Edge Environmental, LLC

Author	Drawing	Layers	Date	Title
JLP	0	0	2-22-01	Monitoring Well Location Map
Job No.	**Revision**	**Figure**	**Scale**	**Project**
G2-02	000	4	1" = 20'	Former Universal Friction Facility Marshville, North Carolina

TABLES

Table 1. Soil Analytical Results, Former Universal Friction Facility, Marshville, North Carolina

Sample ID	C5-C8	C9-C12	C9-C10	C9-C18	C19-C36	C11-C22	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene
B-4	NA	NA	NA	NA	NA	NA	14.4	152	47.1	277	ND	3
B-5	NA	NA	NA	NA	NA	NA	0.174	0.979	0.581	2.53	ND	ND
B-26	NA	NA	NA	NA	NA	NA	0.015	ND	ND	0.14	ND	NA
B-28	**110**	ND	ND	77	57	45	**17**	**130**	**51**	**234**	**33**	**27**
B-29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.7**
MW-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MSCC	72	3255	34	9386	93860	206	0.0056	7	0.24	5	0.92	0.58

Notes:
All units in mg/kg
ND = Not detected, NA = Not analyzed
MSCC = Maximum Soil Contaminant Concentration (soil-to-groundwater)
Bold values indicate exceedance of maximum soil contaminant concentrations.
Sample B-28 also contained 0.045 mg/kg n-butylbenzene, 0.21 mg/kg sec-butylbenzene, 1.2 mg/kg diisopropyl ether, 0.14 mg/kg n-propylbenzene, 0.82 mg/kg 2-methylphthalene, 17 mg/kg isopropylbenzene, 100 mg/kg 1,2,4-trimethylbenzene, and 47 mg/kg 1,3,5-trimethylbenzene.
Sample MW-1 contained 13 µg/kg bromoform.

APPENDIX A

Soil borings are used to characterize soil profiles, to determine the presence of organic vapors, and to obtain soil samples for subsequent laboratory analysis. Soil borings may be advanced either manually with a decontaminated hand auger or using a drill rig equipped with hollow-stem augers or other drilling equipment. Soil samples are typically collected from borings installed with a drill rig at 5-foot intervals using a split-spoon sampling device as described in ASTM D 1586-84. Soil samples are typically collected from borings advanced with a hand auger at 1 to 2-foot intervals.

The completed boring is ready for monitoring well installation or is abandoned. If the boring is terminated below the water table, abandonment entails backfilling with a cement grout. Otherwise the boring is abandoned by backfilling with cuttings or other natural material.

Soil Classification

Undisturbed soil samples are logged in the field and classified according to the Unified Soil Classification System (ASTM D 2488-84).

Headspace Screening

Soils are screened with an organic vapor analyzer (OVA) for total volatile organic compounds (VOCs), which may indicate organic or petroleum hydrocarbon contamination. A typical procedure for screening soils involves filling a clean container approximately halfway with soil and sealing the container with aluminum foil. This creates a headspace in which the VOCs in the soil accumulate and equilibrate. After allowing approximately 10 minutes for this processes to occur, the probe of the OVA is then inserted through the aluminum foil seal into the headspace of the container to obtain a VOC reading.

Sample Collection Protocols

Soil samples selected for laboratory analysis are collected into laboratory provided containers appropriate for the parameters being analyzed and are labeled with a minimum of the following information: sampler's name, date of collection, sample number, analysis to be performed, and project number. Soil samples are stored and transported to the analytical laboratory in an insulated cooler chilled to approximately 4°C. To ensure sample integrity, all samples are transported in accordance with EPA chain-of-custody protocols.

Monitoring wells are installed in both unconsolidated and consolidated formations to provide secure sampling points for discrete intervals within confined or unconfined aquifers or hydrostratigraphic units. Following the initial drilling, typically 2 or 4-inch diameter, PVC groundwater monitoring wells are constructed in borings in accordance with the standards specified in the *RCRA Ground Water Monitoring Technical Enforcement Guidance Document.*

Construction

Once the boring is complete, a groundwater monitoring well is constructed by installing a casing and screen. The annulus is typically backfilled with a sand pack selected based on the formation to approximately 1 to 2 feet above the screen. A 1 to 2-foot bentonite seal is emplaced above the sand pack. The remaining annulus is then grouted to the surface with No. 1 Portland cement. The well head is secured with a watertight, lockable well cap and is protected by either a steel manhole cover (at grade) or steel casing (above grade). Further details of the construction of each monitoring well are found in the well construction schematics.

Development

The wells are developed by using individual decontaminated Teflon bailers as surge blocks, by pumping, or by other acceptable well development procedures to remove fines from the surrounding formation and sand pack, which hydraulically connects the wells with the surrounding soils.

Surveying

Surveying is performed to determine the relative reference point elevation of the wells. Elevations are referenced to either the state grid system (mean sea level) or an assumed elevation of 100.00 feet at a temporary benchmark established on-site. Elevations are to the nearest 0.01 foot.

Field Parameters

Prior to groundwater sample collection, the water level in each well is measured with a decontaminated electric water level probe. Water level measurements are used to construct a groundwater contour map (either water table or potentiometric) and to calculate the well volume. The wells are purged by removing three to five times the well volume or until dry with individual decontaminated Teflon bailers to remove stagnant water so that a representative groundwater sample is obtained. Temperature, specific conductivity, and pH are measured and recorded in the field.

Sample Collection Protocols

Groundwater samples are normally collected within 1 hour of purging to minimize the loss of any volatile organic compounds (VOCs) present. Laboratory decontaminated bottom-valve Teflon bailers attached to new nylon cord are used to withdraw the samples.

All groundwater samples are collected and decanted into laboratory provided containers appropriate for the parameters being analyzed, preserved as required by the analytical technique, and are labeled with the following information: sampler's name, date of collection, sample number, analysis to be performed, and project number. Samples are stored and transported to the analytical laboratory in an insulated cooler chilled to approximately 4°C. To ensure sample integrity, all samples are transported in accordance with EPA chain-of-custody protocols. All samples are transported to the laboratory within a 24-hour holding time.

APPENDIX B

Pace Analytical™
www.pacelabs.com

RECEIVED
APR 8 2002

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

1-01, 2002

Kuhn
rs Edge Environmental
Pomona Drive
boro, NC 27407

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

Mr. Kuhn:

sed are the analytical results for sample(s) received by the laboratory on March 22, 2002. Results reported n conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of report.

e any questions concerning this report please feel free to contact me.

rely,

Kristi R. Tart

sti Tart
ti.Tart@pacelabs.com
ct Manager

sures

Certification IDs
water 12
g Water 37706
99006

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

Laboratory Certification IDs

KY Drinking Water	90090
VA Drinking Water	213
FL NELAP	E87627

Accredited in accordance with nelac

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9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
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ge Environmental
omona Drive
o, NC 27407

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

Ed Kuhn
6)852-5003

lts are reported on a dry weight basis

le No: 922166103
ple ID: MW-1

Project Sample Number: 9231372-001
Matrix: Water

Date Collected: 03/21/02 14:30
Date Received: 03/22/02 16:45

rs	Results	Units	Report Limit	Analyzed	by	CAS No.	Ftnote	Reg Limit
als, ICP, Trace	Prep/Method: SM 3030C / EPA 200.7							
30C	0.0059	mg/l	0.0030	03/27/02 20:02	DJR	7439-92-1		
igested				03/22/02				
olatiles								
DBCP in Water	Prep/Method: EPA 504.1 / EPA 504.1							
omoethane (EDB)	ND	ug/l	0.020	03/28/02	CBE	106-93-4		
omopropane (S)	111	%		03/28/02	CBE	301-79-56		
atiles								
Aromatic Vol. Orgs.	Prep/Method: EPA 601/602 / EPA 601/602							
difluoromethane	ND	ug/l	1.0	03/28/02 03:56	PPM	75-71-8		
methane	ND	ug/l	2.0	03/28/02 03:56	PPM	74-87-3		
oride	ND	ug/l	1.0	03/28/02 03:56	PPM	75-01-4		
hane	ND	ug/l	1.0	03/28/02 03:56	PPM	74-83-9		
ethane	ND	ug/l	1.0	03/28/02 03:56	PPM	75-00-3		
ofluoromethane	ND	ug/l	1.0	03/28/02 03:56	PPM	75-69-4		
oroethene	ND	ug/l	1.0	03/28/02 03:56	PPM	75-35-4		
ene chloride	ND	ug/l	2.0	03/28/02 03:56	PPM	75-09-2		
1,2-Dichloroethene	ND	ug/l	1.0	03/28/02 03:56	PPM	156-60-5		
oroethane	ND	ug/l	1.0	03/28/02 03:56	PPM	75-34-3		
m	ND	ug/l	1.0	03/28/02 03:56	PPM	67-66-3		
Trichloroethane	ND	ug/l	1.0	03/28/02 03:56	PPM	71-55-6		
trachloride	ND	ug/l	1.0	03/28/02 03:56	PPM	56-23-5		
oroethane	ND	ug/l	1.0	03/28/02 03:56	PPM	107-06-2		
roethene	ND	ug/l	1.0	03/28/02 03:56	PPM	79-01-6		
oropropane	ND	ug/l	1.0	03/28/02 03:56	PPM	78-87-5		
loromethane	ND	ug/l	1.0	03/28/02 03:56	PPM	75-27-4		
ichloropropene	ND	ug/l	1.0	03/28/02 03:56	PPM	10061-01-5		

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Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

No: 922166103 Project Sample Number: 9231372-001 Date Collected: 03/21/02 14:30
le ID: MW-1 Matrix: Water Date Received: 03/22/02 16:45

	Results	Units	Report Limit	Analyzed	by	CAS No.	Ftnote	Reg Limit
-Dichloropropene	ND	ug/l	1.0	03/28/02 03:56	PPM	10061-02-6		
chloroethane	ND	ug/l	1.0	03/28/02 03:56	PPM	79-00-5		
loroethene	ND	ug/l	1.0	03/28/02 03:56	PPM	127-18-4		
oromethane	ND	ug/l	1.0	03/28/02 03:56	PPM	124-48-1		
	ND	ug/l	1.0	03/28/02 03:56	PPM	75-25-2		
-Tetrachloroethane	ND	ug/l	1.0	03/28/02 03:56	PPM	79-34-5		
rt-butyl ether	ND	ug/l	1.0	03/28/02 03:56	PPM	1634-04-4		
yl ether	ND	ug/l	1.0	03/28/02 03:56	PPM	108-20-3		
	ND	ug/l	1.0	03/28/02 03:56	PPM	71-43-2		
	ND	ug/l	1.0	03/28/02 03:56	PPM	108-88-3		
zene	ND	ug/l	1.0	03/28/02 03:56	PPM	108-90-7		
ene	ND	ug/l	1.0	03/28/02 03:56	PPM	100-41-4		
ene	ND	ug/l	1.0	03/28/02 03:56	PPM			
	ND	ug/l	1.0	03/28/02 03:56	PPM	95-47-6		
orobenzene	ND	ug/l	1.0	03/28/02 03:56	PPM	541-73-1		
hlorobenzene	ND	ug/l	1.0	03/28/02 03:56	PPM	106-46-7		
orobenzene	ND	ug/l	1.0	03/28/02 03:56	PPM	95-50-1		
uorobenzene (S)	81	%		03/28/02 03:56	PPM	625-98-9		

ter by Mass. Method	Prep/Method: VPH / VPH				
(C05-C08)	ND	ug/l	100	03/28/02	KSB
(C09-C12)	ND	ug/l	100	03/28/02	KSB
c (C09-C10)	ND	ug/l	100	03/28/02	KSB
motoluene (FID)(S)	100	%		03/28/02	KSB
motoluene (PID)(S)	95	%		03/28/02	KSB

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Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

ample No: 922166194 Project Sample Number: 9231372-002 Date Collected: 03/21/02 10:45
t Sample ID: MW-1(5') Matrix: Soil Date Received: 03/22/02 16:45

eters	Results	Units	Report Limit	Analyzed	by	CAS No.	Ftnote	Reg Limit
Chemistry								
ent Moisture	Method: % Moisture							
ercent Moisture	15.4	%		03/28/02	HEH			
olatiles								
Hain Soil by Mass. Method	Prep/Method: VPH / VPH							
phatic (C05-C08)	ND	mg/kg	12.	03/28/02	KSB			
phatic (C09-C12)	ND	mg/kg	12.	03/28/02	KSB			
romatic (C09-C10)	ND	mg/kg	12.	03/28/02	KSB			
5-Dibromotoluene (FID)(S)	111	%		03/28/02	KSB			
-Dibromotoluene (PID)(S)	88	%		03/28/02	KSB			
/MS Volatiles								
S VOCs 5035/8260 low level	Prep/Method: EPA 8260 / EPA 8260							
zene	ND	ug/kg	5.3	03/26/02 05:56	RWS	71-43-2		
romobenzene	ND	ug/kg	5.3	03/26/02 05:56	RWS	108-86-1		
mochloromethane	ND	ug/kg	5.3	03/26/02 05:56	RWS	74-97-5		
chloromethane	ND	ug/kg	5.3	03/26/02 05:56	RWS	75-27-4		
romoform	13.	ug/kg	5.3	03/26/02 05:56	RWS	75-25-2		
omomethane	ND	ug/kg	11.	03/26/02 05:56	RWS	74-83-9		
utylbenzene	ND	ug/kg	5.3	03/26/02 05:56	RWS	104-51-8		
-Butylbenzene	ND	ug/kg	5.3	03/26/02 05:56	RWS	135-98-8		
ert-Butylbenzene	ND	ug/kg	5.3	03/26/02 05:56	RWS	98-06-6		
bon tetrachloride	ND	ug/kg	5.3	03/26/02 05:56	RWS	56-23-5		
orobenzene	ND	ug/kg	5.3	03/26/02 05:56	RWS	108-90-7		
hloroethane	ND	ug/kg	11.	03/26/02 05:56	RWS	75-00-3		
oroform	ND	ug/kg	5.3	03/26/02 05:56	RWS	67-66-3		
oromethane	ND	ug/kg	11.	03/26/02 05:56	RWS	74-87-3		
-chlorotoluene	ND	ug/kg	5.3	03/26/02 05:56	RWS	95-49-8		
-Chlorotoluene	ND	ug/kg	5.3	03/26/02 05:56	RWS	106-43-4		
-Dibromo-3-chloropropane	ND	ug/kg	5.3	03/26/02 05:56	RWS	96-12-8		
romochloromethane	ND	ug/kg	5.3	03/26/02 05:56	RWS	124-48-1		
2-Dibromoethane (EDB)	ND	ug/kg	5.3	03/26/02 05:56	RWS	106-93-4		
romomethane	ND	ug/kg	5.3	03/26/02 05:56	RWS	74-95-3		
-Dichlorobenzene	ND	ug/kg	5.3	03/26/02 05:56	RWS	95-50-1		
3-Dichlorobenzene	ND	ug/kg	5.3	03/26/02 05:56	RWS	541-73-1		
-Dichlorobenzene	ND	ug/kg	5.3	03/26/02 05:56	RWS	106-46-7		
hlorodifluoromethane	ND	ug/kg	11.	03/26/02 05:56	RWS	75-71-8	1.2	

Date: 04/01/02

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Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

mple No: 922166194 Project Sample Number: 9231372-002 Date Collected: 03/21/02 10:45
Sample ID: MW-1(5') Matrix: Soil Date Received: 03/22/02 16:45

ters	Results	Units	Report Limit	Analyzed	by	CAS No.	Ftnote	Req Limit
Dichloroethane	ND	ug/kg	5.3	03/26/02 05:56	RWS	75-34-3		
2-Dichloroethane	ND	ug/kg	5.3	03/26/02 05:56	RWS	107-06-2		
Dichloroethene	ND	ug/kg	5.3	03/26/02 05:56	RWS	75-35-4		
1,2-Dichloroethene	ND	ug/kg	5.3	03/26/02 05:56	RWS	156-59-2		
s-1,2-Dichloroethene	ND	ug/kg	5.3	03/26/02 05:56	RWS	156-60-5		
2-Dichloropropane	ND	ug/kg	5.3	03/26/02 05:56	RWS	78-87-5		
Dichloropropane	ND	ug/kg	5.3	03/26/02 05:56	RWS	142-28-9		
Dichloropropane	ND	ug/kg	5.3	03/26/02 05:56	RWS	594-20-7		
1-Dichloropropene	ND	ug/kg	5.3	03/26/02 05:56	RWS	563-58-6		
opropyl ether	ND	ug/kg	5.3	03/26/02 05:56	RWS	108-20-3		
lbenzene	ND	ug/kg	5.3	03/26/02 05:56	RWS	100-41-4		
xachloro-1,3-butadiene	ND	ug/kg	5.3	03/26/02 05:56	RWS	87-68-3		
propylbenzene (Cumene)	ND	ug/kg	5.3	03/26/02 05:56	RWS	98-82-8		
opropyltoluene	ND	ug/kg	5.3	03/26/02 05:56	RWS	99-87-6		
ylene chloride	ND	ug/kg	5.3	03/26/02 05:56	RWS	75-09-2		
thyl-tert-butyl ether	ND	ug/kg	5.3	03/26/02 05:56	RWS	1634-04-4		
lene	ND	ug/kg	5.3	03/26/02 05:56	RWS	91-20-3		
lbenzene	ND	ug/kg	5.3	03/26/02 05:56	RWS	103-65-1		
yrene	ND	ug/kg	5.3	03/26/02 05:56	RWS	100-42-5		
1,2-Tetrachloroethane	ND	ug/kg	5.3	03/26/02 05:56	RWS	630-20-6		
2,2-Tetrachloroethane	ND	ug/kg	5.3	03/26/02 05:56	RWS	79-34-5		
trachloroethene	ND	ug/kg	5.3	03/26/02 05:56	RWS	127-18-4		
uene	ND	ug/kg	5.3	03/26/02 05:56	RWS	108-88-3		
3-Trichlorobenzene	ND	ug/kg	5.3	03/26/02 05:56	RWS	87-61-6		
4-Trichlorobenzene	ND	ug/kg	5.3	03/26/02 05:56	RWS	120-82-1		
1,1-Trichloroethane	ND	ug/kg	5.3	03/26/02 05:56	RWS	71-55-6		
2-Trichloroethane	ND	ug/kg	5.3	03/26/02 05:56	RWS	79-00-5		
chloroethene	ND	ug/kg	5.3	03/26/02 05:56	RWS	79-01-6		
richlorofluoromethane	ND	ug/kg	5.3	03/26/02 05:56	RWS	75-69-4		
3-Trichloropropane	ND	ug/kg	5.3	03/26/02 05:56	RWS	96-18-4		
4-Trimethylbenzene	ND	ug/kg	5.3	03/26/02 05:56	RWS	95-63-6		
5-Trimethylbenzene	ND	ug/kg	5.3	03/26/02 05:56	RWS	108-67-8		
nyl chloride	ND	ug/kg	11.	03/26/02 05:56	RWS	75-01-4		
-Xylene	ND	ug/kg	11.	03/26/02 05:56	RWS			
Xylene	ND	ug/kg	5.3	03/26/02 05:56	RWS	95-47-6		
oluene-d8 (S)	90	%		03/26/02 05:56	RWS	2037-26-5		
Bromofluorobenzene (S)	86	%		03/26/02 05:56	RWS	460-00-4		
bromofluoromethane (S)	78	%		03/26/02 05:56	RWS			

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Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

le No: 922166194 Project Sample Number: 9231372-002 Date Collected: 03/21/02 10:45
Sample ID: MW-1(5') Matrix: Soil Date Received: 03/22/02 16:45

rs	Results	Units	Report Limit	Analyzed	by	CAS No.	Ftnote	Req Limit
chloroethane-d4 (S)	72	%		03/26/02 05:56	RWS	17060-07-0		

Date: 04/01/02

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Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

ER FOOTNOTES

Not detected at or above adjusted reporting limit
Not Calculable
Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
Surrogate
Sample analyzed outside instrument tune time.
Insufficient sample provided for re-analysis.

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

QC Batch: 55283 Analysis Method: EPA 504.1
Method: EPA 504.1 Analysis Description: EDB and DBCP in Water
ed Lab Samples: 922166103

LANK: 922175237
ted Lab Samples: 922166103

r	Units	Blank Result	Reporting Limit	Footnotes
bromoethane (EDB)	ug/l	ND	0.020	
-2-bromopropane (S)	%	90		

RY CONTROL SAMPLE & LCSD: 922175260 922175278

ter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	RPD	Footnotes
thane (EDB)	ug/l	0.2500	0.2394	0.1971	96	79	19	
bromopropane (S)					121	87		

DUPLICATE: 922175252

ter	Units	922161559 Result	DUP Result	RPD	Footnotes
bromoethane (EDB)	ug/l	0.6400	0.5200	20	
-2-bromopropane (S)	%	76	84		

e: 04/01/02

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Harshville/G1-16

Batch: 55238 Analysis Method: EPA 601/602
h Method: EPA 601/602 Analysis Description: Halogen. & Aromatic Vol. Orgs.
d Lab Samples: 922166103

BLANK: 922173018
d Lab Samples: 922166103

	Units	Blank Result	Reporting Limit	Footnotes
ifluoromethane	ug/l	ND	1.0	
ethane	ug/l	ND	2.0	
oride	ug/l	ND	1.0	
ane	ug/l	ND	1.0	
thane	ug/l	ND	1.0	
fluoromethane	ug/l	ND	1.0	
oroethene	ug/l	ND	1.0	
chloride	ug/l	ND	2.0	
2-Dichloroethene	ug/l	ND	1.0	
thane	ug/l	ND	1.0	
	ug/l	ND	1.0	
richloroethane	ug/l	ND	1.0	
trachloride	ug/l	ND	1.0	
oroethane	ug/l	ND	1.0	
roethene	ug/l	ND	1.0	
loropropane	ug/l	ND	1.0	
loromethane	ug/l	ND	1.0	
ichloropropene	ug/l	ND	1.0	
3-Dichloropropene	ug/l	ND	1.0	
chloroethane	ug/l	ND	1.0	
roethene	ug/l	ND	1.0	
chloromethane	ug/l	ND	1.0	
	ug/l	ND	1.0	
etrachloroethane	ug/l	ND	1.0	
tert-butyl ether	ug/l	ND	1.0	
pyl ether	ug/l	ND	1.0	
	ug/l	ND	1.0	
	ug/l	ND	1.0	
enzene	ug/l	ND	1.0	
ene	ug/l	ND	1.0	

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

) BLANK: 922173018
ted Lab Samples: 922166103

er	Units	Blank Result	Reporting Limit	Footnotes
ne	ug/l	ND	1.0	
ene	ug/l	ND	1.0	
lorobenzene	ug/l	ND	1.0	
lorobenzene	ug/l	ND	1.0	
hlorobenzene	ug/l	ND	1.0	
ro-3-fluorobenzene (S)	%	92		

TORY CONTROL SAMPLE: 922173026

ter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
difluoromethane	ug/l	20	20.11	101	
e	ug/l	20	17.43	87	
hloride	ug/l	20	21.81	109	
ethane	ug/l	20	18.82	94	
hane	ug/l	20	24.06	120	
ofluoromethane	ug/l	20	25.34	127	
ichloroethene	ug/l	20	23.12	116	
e chloride	ug/l	20	22.10	111	
2-Dichloroethene	ug/l	20	17.13	86	
ichloroethane	ug/l	20	26.32	132	
form	ug/l	20	26.28	131	
ichloroethane	ug/l	20	26.72	134	
etrachloride	ug/l	20	26.74	134	
ichloroethane	ug/l	20	24.64	123	
oethene	ug/l	20	25.81	129	
loropropane	ug/l	20	26.01	130	
ichloromethane	ug/l	20	25.02	125	
Dichloropropene	ug/l	20	24.91	125	
3-Dichloropropene	ug/l	20	26.86	134	
richloroethane	ug/l	20	27.06	135	
hloroethene	ug/l	20	23.53	118	
hloromethane	ug/l	20	24.66	123	
m	ug/l	20	23.45	117	

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

CONTROL SAMPLE: 922173026

	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
trachloroethane	ug/l	20	23.99	120	
butyl ether	ug/l	20	24.48	122	
ether	ug/l	20	18.04	90	
	ug/l	20	19.47	97	
	ug/l	20	20.15	101	
e	ug/l	20	26.09	130	
	ug/l	20	20.29	101	
	ug/l	40	39.91	100	
	ug/l	20	20.10	101	
benzene	ug/l	20	27.02	135	
robenzene	ug/l	20	22.47	112	
benzene	ug/l	20	24.79	124	
luorobenzene (S)				98	

: 922173034

	Units	922166202 Result	DUP Result	RPD	Footnotes
uoromethane	ug/l	ND	ND	NC	
ane	ug/l	ND	ND	NC	
de	ug/l	ND	ND	NC	
	ug/l	ND	ND	NC	
ne	ug/l	ND	ND	NC	
luoromethane	ug/l	ND	ND	NC	
ethene	ug/l	ND	ND	NC	
loride	ug/l	ND	ND	NC	
Dichloroethene	ug/l	ND	ND	NC	
ethane	ug/l	ND	ND	NC	
	ug/l	ND	ND	NC	
hloroethane	ug/l	ND	ND	NC	
chloride	ug/l	ND	ND	NC	
ethane	ug/l	ND	ND	NC	
hene	ug/l	ND	ND	NC	
ropropane	ug/l	ND	ND	NC	
romethane	ug/l	ND	ND	NC	

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

LE DUPLICATE: 922173034

eter	Units	922166202 Result	DUP Result	RPD	Footnotes
s-1,3-Dichloropropene	ug/l	ND	ND	NC	
s-1,3-Dichloropropene	ug/l	ND	ND	NC	
-Trichloroethane	ug/l	ND	ND	NC	
chloroethene	ug/l	ND	ND	NC	
romochloromethane	ug/l	ND	ND	NC	
form	ug/l	ND	ND	NC	
,2-Tetrachloroethane	ug/l	ND	ND	NC	
hyl-tert-butyl ether	ug/l	1800	1900	4	
propyl ether	ug/l	ND	ND	NC	
ne	ug/l	14000	14000	0	
uene	ug/l	11000	11000	0	
obenzene	ug/l	ND	ND	NC	
benzene	ug/l	920.0	920.0	0	
xylene	ug/l	2500	2500	1	
ylene	ug/l	1100	1100	0	
robenzene	ug/l	ND	ND	NC	
orobenzene	ug/l	ND	ND	NC	
-Dichlorobenzene	ug/l	ND	ND	NC	
bro-3-fluorobenzene (S)	%	87	90		

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

Batch: 55246 Analysis Method: VPH
Method: VPH Analysis Description: VPH in Water by Mass. Method
Lab Samples: 922166103

922173612
Lab Samples: 922166103

	Units	Blank Result	Reporting Limit	Footnotes
(C05-C08)	ug/l	ND	100	
(C09-C12)	ug/l	ND	100	
C09-C10)	ug/l	ND	100	
otoluene (FID)(S)	%	74		
motoluene (PID)(S)	%	66		1

CONTROL SAMPLE & LCSD: 922173620 922173638

	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	RPD	Footnotes
(C05-C08)	ug/l	160	177.6	167.6	111	105	6	
C09-C12)	ug/l	40	48.88	29.99	122	75	48	
09-C10)	ug/l	40	40.63	36.77	102	92	10	
notoluene (FID)(S)					124	98		
toluene (PID)(S)					121	93		

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

QC Batch: 55247 Analysis Method: VPH
Method: VPH Analysis Description: VPH in Soil by Mass. Method
Lab Samples: 922166194

ANK: 922173646
Lab Samples: 922166194

	Units	Blank Result	Reporting Limit	Footnotes
c (C05-C08)	mg/kg	ND	10.	
(C09-C12)	mg/kg	ND	10.	
(C09-C10)	mg/kg	ND	10.	
motoluene (FID)(S)	%	104		
omotoluene (PID)(S)	%	87		

RY CONTROL SAMPLE & LCSD: 922173653 922173661

r	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	RPD	Footnotes
(C05-C08)	mg/kg	8.000	6.754	5.605	84	70	19	
(C09-C12)	mg/kg	2.000	1.365	1.221	68	61	11	1,1
(C09-C10)	mg/kg	2.000	3.618	3.368	181	168	7	1,1
omotoluene (FID)(S)					111	103		
otoluene (PID)(S)					116	88		

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

QC Batch: 55165 Analysis Method: EPA 8260
h Method: EPA 8260 Analysis Description: GC/MS VOCs 5035/8260 low level
d Lab Samples: 922166194

ANK: 922169842
d Lab Samples: 922166194

	Units	Blank Result	Reporting Limit	Footnotes
	ug/kg	ND	5.0	
nzene	ug/kg	ND	5.0	
romethane	ug/kg	ND	5.0	
hloromethane	ug/kg	ND	5.0	
rm	ug/kg	ND	5.0	
hane	ug/kg	ND	10.	
nzene	ug/kg	ND	5.0	
ylbenzene	ug/kg	ND	5.0	
lbenzene	ug/kg	ND	5.0	
hloride	ug/kg	ND	5.0	
enzene	ug/kg	ND	5.0	
thane	ug/kg	ND	10.	
rm	ug/kg	ND	5.0	
thane	ug/kg	ND	10.	
otoluene	ug/kg	ND	5.0	
toluene	ug/kg	ND	5.0	
mo-3-chloropropane	ug/kg	ND	5.0	
chloromethane	ug/kg	ND	5.0	
moethane (EDB)	ug/kg	ND	5.0	
ethane	ug/kg	ND	5.0	
lorobenzene	ug/kg	ND	5.0	
hlorobenzene	ug/kg	ND	5.0	
lorobenzene	ug/kg	ND	5.0	
difluoromethane	ug/kg	ND	10.	
chloroethane	ug/kg	ND	5.0	
loroethane	ug/kg	ND	5.0	
loroethene	ug/kg	ND	5.0	
2-Dichloroethene	ug/kg	ND	5.0	
2-Dichloroethene	ug/kg	ND	5.0	
loropropane	ug/kg	ND	5.0	

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

K: 922169842
d Lab Samples: 922166194

	Units	Blank Result	Reporting Limit	Footnotes
opropane	ug/kg	ND	5.0	
opropane	ug/kg	ND	5.0	
oropropene	ug/kg	ND	5.0	
l ether	ug/kg	ND	5.0	
e	ug/kg	ND	5.0	
1,3-butadiene	ug/kg	ND	5.0	
benzene (Cumene)	ug/kg	ND	5.0	
toluene	ug/kg	ND	5.0	
hloride	ug/kg	ND	5.0	
rt-butyl ether	ug/kg	ND	5.0	
	ug/kg	ND	5.0	
zene	ug/kg	ND	5.0	
	ug/kg	ND	5.0	
etrachloroethane	ug/kg	ND	5.0	
oroethane	ug/kg	ND	5.0	
ethene	ug/kg	ND	5.0	
	ug/kg	ND	5.0	
lorobenzene	ug/kg	ND	5.0	
lorobenzene	ug/kg	ND	5.0	
chloroethane	ug/kg	ND	5.0	
loroethane	ug/kg	ND	5.0	
hene	ug/kg	ND	5.0	
luoromethane	ug/kg	ND	5.0	
chloropropane	ug/kg	ND	5.0	
thylbenzene	ug/kg	ND	5.0	
thylbenzene	ug/kg	ND	5.0	
oride	ug/kg	ND	10.	
	ug/kg	ND	10.	
	ug/kg	ND	5.0	
8 (S)	%	101		
robenzene (S)	%	98		
romethane (S)	%	101		
oroethane-d4 (S)	%	101		

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

CONTROL SAMPLE & LCSD: 922169859 922169867

	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	RPD	Footnotes
	ug/kg	50	54.25	47.68	108	95	13	
ne	ug/kg	50	60.40	51.36	121	103	16	
omethane	ug/kg	50	46.11	39.54	92	79	15	
oromethane	ug/kg	50	49.73	44.11	100	88	12	
m	ug/kg	50	50.66	43.42	101	87	15	
ne	ug/kg	50	312.9	336.0	626	672	7	2,2
zene	ug/kg	50	61.24	54.97	122	110	11	
lbenzene	ug/kg	50	65.43	57.60	131	115	13	
benzene	ug/kg	50	66.42	58.00	133	116	14	
rachloride	ug/kg	50	54.66	48.23	109	96	12	
nzene	ug/kg	50	53.88	47.57	108	95	12	
ne	ug/kg	50	74.32	64.91	149	130	14	
	ug/kg	50	55.46	48.15	111	96	14	
hane	ug/kg	50	65.97	59.07	132	118	11	2
oluene	ug/kg	50	61.38	54.02	123	108	13	
e	ug/kg	50	58.73	52.12	117	104	12	
o-3-chloropropane	ug/kg	50	43.81	36.54	88	73	18	
hloromethane	ug/kg	50	54.52	47.44	109	95	14	
oethane (EDB)	ug/kg	50	48.64	42.49	97	85	14	
hane	ug/kg	50	44.94	39.06	90	78	14	
lorobenzene	ug/kg	50	58.39	51.59	117	103	12	
robenzene	ug/kg	50	56.39	49.97	113	100	12	
robenzene	ug/kg	50	54.56	48.80	109	98	11	
fluoromethane	ug/kg	50	67.39	59.43	135	119	13	2
loroethane	ug/kg	50	55.94	48.92	112	98	13	
roethane	ug/kg	50	48.96	42.68	98	85	14	
roethene	ug/kg	50	51.68	44.30	103	89	15	
Dichloroethene	ug/kg	50	55.00	48.36	110	97	13	
Dichloroethene	ug/kg	50	55.68	48.52	111	97	14	
ropropane	ug/kg	50	48.73	42.88	98	86	13	
loropropane	ug/kg	50	50.23	43.92	100	88	13	
ropropane	ug/kg	50	56.09	50.06	112	100	11	
ropropene	ug/kg	50	54.76	48.39	110	97	12	
yl ether	ug/kg	50	70.20	61.51	140	123	13	1
zene	ug/kg	50	53.89	48.40	108	97	11	
-1,3-butadiene	ug/kg	50	59.20	55.80	118	112	6	

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

BORATORY CONTROL SAMPLE & LCSD: 922169859 922169867

meter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	RPD	Footnotes
opropylbenzene (Cumene)	ug/kg	50	54.65	49.15	109	98	11	
opropyltoluene	ug/kg	50	63.09	56.14	126	112	12	
ylene chloride	ug/kg	50	53.63	45.53	107	91	16	
thyl-tert-butyl ether	ug/kg	50	57.47	49.08	115	98	16	
thalene	ug/kg	50	50.75	43.91	101	88	14	
opylbenzene	ug/kg	50	63.15	55.13	126	110	14	
rene	ug/kg	50	50.77	46.02	102	92	10	
1,2-Tetrachloroethane	ug/kg	50	53.28	47.02	107	94	12	
2,2-Tetrachloroethane	ug/kg	50	44.73	38.94	90	78	14	
achloroethene	ug/kg	50	57.38	50.36	115	101	13	
luene	ug/kg	50	47.44	42.20	95	84	12	
3-Trichlorobenzene	ug/kg	50	50.78	46.60	102	93	9	
4-Trichlorobenzene	ug/kg	50	46.64	44.18	93	88	5	
1,1-Trichloroethane	ug/kg	50	58.27	52.39	117	105	11	
2-Trichloroethane	ug/kg	50	40.93	35.31	82	71	15	
ethene	ug/kg	50	47.20	41.71	94	83	12	
chlorofluoromethane	ug/kg	50	49.03	42.48	98	85	14	
2,3-Trichloropropane	ug/kg	50	41.98	35.97	84	72	15	
4-Trimethylbenzene	ug/kg	50	61.66	54.84	123	110	12	
5-Trimethylbenzene	ug/kg	50	63.65	56.18	127	112	12	
nyl chloride	ug/kg	50	53.39	45.97	107	92	15	
xylene	ug/kg	100	105.3	94.43	105	94	11	
ene	ug/kg	50	52.99	47.30	106	95	11	
luene-d8 (S)					91	92		
omofluorobenzene (S)					90	92		
omofluoromethane (S)					104	103		
2-Dichloroethane-d4 (S)					98	98		

X SPIKE: 922169883

eter	Units	922162482 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
nzene	ug/kg	73.25	61.62	113.9	66	3
robenzene	ug/kg	0	61.62	76.82	125	
ichloroethene	ug/kg	0	61.62	71.81	116	

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

PIKE: 922169883

	Units	922162482 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
	ug/kg	82.45	61.62	101.3	31	3
thene	ug/kg	0	61.62	70.67	115	
(S)					89	
luorobenzene (S)					90	
oromethane (S)					104	
roethane-d4 (S)					95	

LICATE: 922175146

	Units	931164719 Result	DUP Result	RPD	Footnotes
	ug/kg	ND	ND	NC	
zene	ug/kg	ND	ND	NC	
omethane	ug/kg	ND	ND	NC	
ethane	ug/kg	ND	ND	NC	
	ug/kg	ND	ND	NC	
ane	ug/kg	ND	ND	NC	
zene	ug/kg	ND	ND	NC	
enzene	ug/kg	ND	ND	NC	
ylbenzene	ug/kg	ND	ND	NC	
rachloride	ug/kg	ND	ND	NC	
ene	ug/kg	ND	ND	NC	
ane	ug/kg	ND	ND	NC	
	ug/kg	ND	ND	NC	
ane	ug/kg	ND	ND	NC	
oluene	ug/kg	ND	ND	NC	
oluene	ug/kg	ND	ND	NC	
o-3-chloropropane	ug/kg	ND	ND	NC	
bromethane	ug/kg	ND	ND	NC	
omoethane (EDB)	ug/kg	ND	ND	NC	
hane	ug/kg	ND	ND	NC	
robenzene	ug/kg	ND	ND	NC	
lorobenzene	ug/kg	ND	ND	NC	
robenzene	ug/kg	ND	ND	NC	
fluoromethane	ug/kg	ND	ND	NC	

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

DUPLICATE: 922175146

[illegible]	Units	931164719 Result	DUP Result	RPD	Footnotes
[illegible]hloroethane	ug/kg	ND	ND	NC	
[illegible]oroethane	ug/kg	ND	ND	NC	
[illegible]oroethene	ug/kg	ND	ND	NC	
[illegible]-Dichloroethene	ug/kg	ND	ND	NC	
[illegible]-Dichloroethene	ug/kg	ND	ND	NC	
[illegible]oropropane	ug/kg	ND	ND	NC	
[illegible]hloropropane	ug/kg	ND	ND	NC	
[illegible]oropropane	ug/kg	ND	ND	NC	
[illegible]oropropene	ug/kg	ND	ND	NC	
[illegible]opyl ether	ug/kg	ND	ND	NC	
[illegible]nzene	ug/kg	ND	ND	NC	
[illegible]o-1,3-butadiene	ug/kg	ND	ND	NC	
[illegible]benzene (Cumene)	ug/kg	ND	ND	NC	
[illegible]opyltoluene	ug/kg	ND	ND	NC	
[illegible]loride	ug/kg	ND	ND	NC	
[illegible]utyl ether	ug/kg	ND	ND	NC	
[illegible]lene	ug/kg	ND	ND	NC	
[illegible]benzene	ug/kg	ND	ND	NC	
[illegible]	ug/kg	ND	ND	NC	
[illegible]-Tetrachloroethane	ug/kg	ND	ND	NC	
[illegible]-Tetrachloroethane	ug/kg	ND	ND	NC	
[illegible]roethene	ug/kg	ND	ND	NC	
[illegible]	ug/kg	ND	ND	NC	
[illegible]Trichlorobenzene	ug/kg	ND	ND	NC	
[illegible]ichlorobenzene	ug/kg	ND	ND	NC	
[illegible]ichloroethane	ug/kg	ND	ND	NC	
[illegible]Trichloroethane	ug/kg	ND	ND	NC	
[illegible]oethene	ug/kg	ND	ND	NC	
[illegible]ofluoromethane	ug/kg	ND	ND	NC	
[illegible]richloropropane	ug/kg	ND	ND	NC	
[illegible]Trimethylbenzene	ug/kg	ND	ND	NC	
[illegible]imethylbenzene	ug/kg	ND	ND	NC	
[illegible]loride	ug/kg	ND	ND	NC	
[illegible]lene	ug/kg	ND	ND	NC	
[illegible]	ug/kg	ND	ND	NC	
[illegible]d8 (S)	%	89	99		

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

UPLICATE: 922175146

	Units	931164719 Result	DUP Result	RPD	Footnotes
luorobenzene (S)	%	87	103		
romomethane (S)	%	108	90		
roethane-d4 (S)	%	101	88		

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QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

C Batch: 55086 Analysis Method: EPA 200.7
ethod: SM 3030C Analysis Description: 3030C Metals, ICP, Trace
Lab Samples: 922166103

NK: 922166855
ed Lab Samples: 922166103

	Units	Blank Result	Reporting Limit	Footnotes
30C	mg/l	ND	0.0030	

RY CONTROL SAMPLE: 922166863

	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
30C	mg/l	0.2500	0.2450	98	

PIKE & MATRIX SPIKE DUPLICATE: 922166871 922166889

	Units	922166103 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	RPD	Footnotes
	mg/l	0.00586	0.2500	0.3010	0.3150	118	124	5	

PLICATE: 922166897

	Units	922166558 Result	DUP Result	RPD	Footnotes
	mg/l	0.2800	0.2800	0	

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REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Laboratory Certification IDs
KY Drinking Water 90090
VA Drinking Water 213
FL NELAP E87627

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

QUALITY CONTROL DATA

Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

C Batch: 55302 Analysis Method: % Moisture
ethod: Analysis Description: Percent Moisture
Lab Samples: 922166194

UICATE: 922176128

	Units	501584247 Result	DUP Result	RPD	Footnotes
isture	%	16.10	15.90	1	

LICATE: 922176136

	Units	922171061 Result	DUP Result	RPD	Footnotes
oisture	%	22.20	22.50	1	

ertification IDs
ater 12
g Water 37706
99006

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Lab Project Number: 9231372
Client Project ID: RT ENV- Marshville/G1-16

TY CONTROL DATA PARAMETER FOOTNOTES

ent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

(D)Laboratory Control Sample (Duplicate)
D)Matrix Spike (Duplicate)
UP Sample Duplicate
Not detected at or above adjusted reporting limit
Not Calculable
Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
D Relative Percent Difference
Surrogate
1] The surrogate and/or spike recovery was outside acceptance limits.
2] Recovery falls outside of QC limits, however, this compound is not found in the associated samples.
Due to matrix interference the matrix spike and/or matrix spike duplicate do not provide reliable values. Sample results for this QC batch accepted based on LCS and/or LCSD % Recovery and/or RPD values.

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ater 12
ing Water 37706
99006

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Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

pril 4, 2002

r. Ed Kuhn
Vater's Edge Environmental
2-L Pomona Drive
eensboro, NC 27407

: Client Project ID: RT ENV-Marshville/G1-16

Dear Mr. Kuhn:

am writing regarding the GC/MS volatile results for sample MW-1(5') (922166194).

e to an instrumentation error this sample was analyzed outside of the 12-hour tune protocol ecified in the procedure. The continuing calibration that followed the analysis of the sample so did not meet quality control criteria. When this happens, the laboratory reanalyzes the mple. However, reanalysis was not possible due to insufficient sample volume.

you have any questions or need further explanation, please contact me at 704-875-9092 9.

cerely yours,

Marcus Jones

vis Jones
uality Assurance Officer

Limited Site Assessment Report

A. Site Identification

DATE OF REPORT: April 26, 2002
Facility I.D.: Pending UST Incident Number (if known): Pending
Site Name: Former Universal Friction Composites
Site Location: Unarco Road
Nearest City/Town: Marshville County: Union

UST Owner: Phoenix Group
Address: 2600 Virginia Ave NW, The Watergate Suite 606, Washington, DC 20037 Phone: 202-337-7300

UST Operator: ____Same
Address: _____ Phone: _____

Property Owner: Same
Address: _____ Phone: _____

Property Occupant: Vacant
Address: _____ Phone: _____

Consultant/Contractor: Waters Edge Environmental, LLC
Address: 302-L Pomona Drive, Greensboro, NC 27407 Phone: 336-852-5003

Release Information
Date Discovered: December 2000
Latitude: 39°59'20"N **Longitude:** 80°21'13"W
Estimated Quantity of Release:__Unknown
Cause of Release: _____Unknown
Source of Release (e.g., Piping/UST): Fuel Dispenser/Piping

Sizes and contents of UST system(s) from which the release occurred): 550-gallon Aboveground Storage Tank/Piping

Complete and include in report items B through J in the order listed.

I, Edward M. Kuhn, P.G., a Professional Engineer/Licensed Geologist (circle one) for Waters Edge Environmental, LLC, do certify that the information contained in this report is correct and accurate to the best of my knowledge.

NORTH CAROLINA LICENSED SEAL 1452 GEOLOGIST EDWARD M. KUHN

(Please Affix Seal and Signature)

Risk Characterization

mit the following questionnaire in its entirety. Answer all questions completely. Attach additional ag needed to fully explain answers. Base answers/explanations on information known or required to obtained during the Limited Site Assessment.

OTE: *Source area means point of release from a UST system.*

Limited Site Assessment Risk Classification and Land Use Form

Part I – Groundwater/Surface Water/Vapor Impacts

High Risk

1. Has the release contaminated any water supply well including any well used for non-drinking purposes? YES/NO
2. Is a water supply well used for drinking water located within 1,000 feet of the source area of the release? YES/NO
3. Is a water supply well not used for drinking water (e.g., irrigation, washing cars, industrial cooling water, filling swimming pools) located within 250 feet of the source area of the release? YES/NO
4. Does groundwater within 500 feet of the source area of the release have the potential for future use (there is no other source of water supply other than the groundwater)? YES/NO
5. Do vapors from the release pose a threat of explosion because of accumulation of the vapors in a confined space or pose any other serious threat to public health, public safety or the environment? YES/NO

Ifyes,describe.

_____

_____

Are there any other factors that would cause the release to pose an imminent danger to public health, public safety, or the environment? YES/NO

Ifyes,describe. N/A

Intermediate Risk

7. Is a surface water body located within 500 feet of the source area of the release? YES/NO

If YES, does the maximum groundwater contaminant concentration exceed the surface water quality standards and criteria found in 15A NCAC 2B .0200 by a factor of 10? YES/NO

8. Is the source area of the release located within a approved or planned wellhead protection area as defined in 42 USC 300h-7(e)? YES/NO

Ifyes,describe.

_____

_____

9. Is the release located in the Coastal Plain physiographic region as designated on a map entitled "Geology of North Carolina" published by the Department in 1985? YES/NO

_____

_____

If YES, is the source area of the release located in an area in which there is recharge to an unconfined or semi-confined deeper aquifer that is being used or may be used as a source of drinking water? YES/NO

IfYES,describe.

N/A

10. Do the levels of groundwater contamination for any contaminant exceed the gross contamination levels (see Table 9) established by the Department? YES/NO

Part II - Land Use

Property Containing Source Area of Release

The questions below pertain to the property containing the source area of the release.

1. Does the property contain one or more primary or secondary residences (permanent or temporary)? YES/NO
   Describe.

2. Does the property contain a school, daycare center, hospital, playground, park, recreation area, church, nursing home, or other place of public assembly? YES/NO
   Describe.

3. Does the property contain a commercial (e.g., retail, warehouse, office/business space, etc.) or industrial (e.g., manufacturing, utilities, industrial research and development, chemical/petroleum bulk storage, etc.) enterprise, an inactive commercial or industrial enterprise, or is the land undeveloped? YES/NO
   Describe. The property was formerly used for the manufacture of asbestos products. The facility is currently vacant. Manufacturing operations ceased in late 1998.

4. Do children visit the property? YES/NO
   Explain.

   Is access to the property reliably restricted consistent with its use (e.g., by fences, security personnel or both)? YES/NO
   Explain.
   A fence completely surrounds the property. Locked gates prevent access.

5. Do pavement, buildings, or other structures cap the contaminated soil? YES/NO

   Describe. The impacted soils are located adjacent to a fuel dispenser, which is located immediately adjacent to the building exterior wall. Therefore, it is assumed that some of the impacted soil is capped by the facility.

   If yes, what mechanisms are in place or can be put into place to ensure that the contaminated soil will remain capped in the foreseeable future?
   It is assumed that the facility will be utilized for some manufacturing activity for the forseeable future. Therefore, it is also assumed that the soils will remain capped.

6. What is the zoning status of the property? The property is zoned Light Industrial/Heavy Commercial.

7. Is the use of the property likely to change in the next 20 years? YES/NO
   Explain. It is assumed that the facility will be utilized for some manufacturing activity for the foreseeable future.

Property Surrounding Source Area of Release

The questions below pertain to the area within 1,500 feet of the source area of the release (excludes property containing source area of the release):

1. What is the distance from the source area of the release to the nearest primary or secondary residence (permanent or temporary)? Approximately 0.10 miles to the north of the source area.

2. What is the distance from the source area of the release to the nearest school, daycare center, hospital, playground, park, recreation area, church, nursing home or other place of public assembly? A church is located approximately 0.15 miles to the southeast of the source area.

3. What is the zoning status of properties in the surrounding area? Properties in the surrounding area are zoned City, Highway Corridor-Mixed Use (HC), Light Industrial (LI), and Residential (R-20).

4. Briefly characterize the use and activities of the land in the surrounding area.

The land use in the surrounding area is a mixture of industrial, commercial, and residential use. Industrial facilities are located to the east and west. Residences are located to the north. Commercial properties and residences are located to the south.

8 C. Receptor Information

1. Water Supply Wells (Complete and attach Table B-5 and attach map showing well locations)

2. Public Water Supplies

Are public water supplies available within 1,500 feet of the source area of the release? (YES)/NO

If yes, where is the location of the nearest public water lines and the source(s) of the public water supply.(indicate on map) Describe. Public water is supplied to the area and water lines are located along Unarco Road and also along US Highway 74.

3. Surface Water

Identify all surface water bodies (e.g., ditch, pond, stream, lake, river) within 1,500 feet of the source area of the release. This information must be shown on the USGS topographic map.

4. Wellhead Protection Areas.

Identify all planned or approved wellhead protection areas (e.g., ditch, pond, stream, lake, river) within 1,500 feet of the source area of the release. This information must be shown on the USGS topographic map. Wellhead protection areas are defined in 42 USC 300h-7(e).

5. Describe Deep Aquifers in the Coastal Plain Physiographic Region (refer to page 19 of the guidelines):

NOTE: *This requirement only pertains to releases in the Coastal Plain physiographic region as designated on a map entitled "Geology of North Carolina" published by the Department in 1985.*

N/A

6 Describe Subsurface Structures (refer to page 19 of the guidelines):

Sewers, utility lines, and conduits are located along Highway 74 and Unarco Road. Given the depth to groundwater at the site (approximately nine feet), it is unlikely that groundwater would intercept these utilities.

7. Property Owners and Occupants

See Section 3.8 of report text.

9 D. Site Geology and Hydrogeology

Describe the soil and geology encountered at the site. Discuss the effects of soil and geological characteristics on the migration and attenuation of contaminants. Include information obtained during

essment activities (e.g., lithologic descriptions made during drilling, probe surveys, tank closure, etc). Phase II investigation is required include a discussion of groundwater flow direction and hydraulic ra t (vertical and horizontal).

Sections 5.1 and 5.2 of report text.

E. Sampling Results

Phase I Investigation

NOTE: *Responsible parties for all releases must perform a Phase I investigation.*

- See Sections 5.3 and 5.4 of report text.

Monitoring well construction information

- See Appendix C of report text.

Phase II Investigation (If required)

N/A

11 F. Conclusions and Recommendations

Discuss the risk criteria that apply to the release and identify any other site-specific factors related to the release that may pose a risk to human health and the environment. Also, discuss any site-specific conditions or possible actions that could result in lowering the level of risk posed by the release.

Previous assessment activities at the site indicated that VOCs are present in the soil immediately adjacent to the location of the fuel dispenser. VOCs were detected in soils in other locations near the fuel dispenser, but at much lower levels. Based on the results of the analysis of soil samples collected from the site, the source of the release appears to be the fuel dispenser.

The results of the shallow groundwater assessment did not indicate concentrations of VOCs in the groundwater sample collected from well MW-1.

The analytical results obtained from previous assessment activities as well as the most recent assessment indicate a limited area of soil impact. The groundwater sample analysis did not indicate the presence of VOCs. Based upon the site use and surrounding property use, the site will likely be characterized as an industrial/commercial facility. The analytical results previously obtained from soils at the site would fall below the industrial/commercial MSCCs.

Based upon the analytical results obtained from the site, and the site and surrounding property use, Waters Edge recommends that no further action be required at this site.

WELL CONSTRUCTION RECORD

olina – Department of Environmental and Natural Resources – Division of Water Quality – Groundwater Section

CTOR (INDIVIDUAL) NAME (print) MARK GETTYS CERTIFICATION # 2345

NTRACTOR COMPANY NAME GEOLOGIC EXPLORATION, INC. PHONE # (704) 872-7686

ELL CONSTRUCTION PERMIT# _____ (if applicable) ASSOCIATED WQ PERMIT# _____ (if applicable)

USE (Check Applicable Box): Residential ☐ Municipal/Public ☐ Industrial ☐ Agricultural ☐
toring ☒ Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, list Use _____

LOCATION:
Town: MARSHVILLE County UNION
74 & UNARCO ROAD
Name, Numbers, Community, Subdivision, Lot No., Zip Code)

R: GARY BROWN
ss 245 W. CHURCH ROAD
(Street or Route No.)
PRUSSIA PA 19406
wn State Zip Code
)
ode – Phone Number

DRILLED 03-21-02
DEPTH: 14.0 FEET
S WELL REPLACE EXISTING WELL? YES ☐ NO ☒
C WATER LEVEL Below Top of Casing: _____ FT.
(Use "+" if Above Top of Casing)
OF CASING IS 0.0 FT. Above Land Surface*
op of casing terminated at/or below land surface requires a
in accordance with 15A NCAC 2C .0118.
h): N/A METHOD OF TEST N/A.
TER ZONES (depth): N/A

FECTION: Type N/A Amount _____
NG:

	Depth			Diameter	Wall Thickness or Weight/Ft.	Material
0.0	To	4.0	Ft	2 INCH	SCH 40	PVC
	To		Ft.			
	To		Ft.			

ut:	Depth			Material	Method
0.0	To	1.0	Ft.	Portland Bentonite	Slurry
	To		Ft.		

EEN:	Depth			Diameter		Slot Size		Material
4.0	To	14.0	Ft.	2.0	in.	.010	in	PVC
	To		Ft.		in.		in	

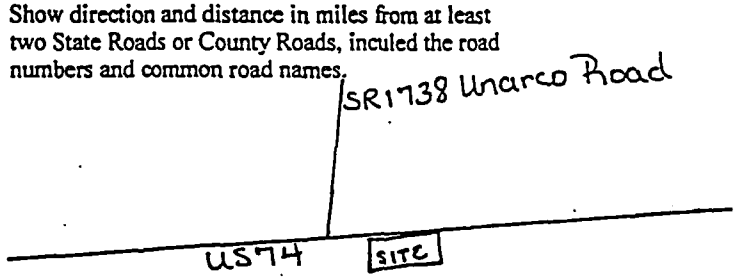
D/GRAVEL PACK:

Depth				Size	Material
2.0	To	14.0	Ft.	20-40	FINE SILICA SAND
	To		Ft.		

Topographic/Land setting
☐ Ridge ☐ Slope ☐ Valley ☒ Flat
(check appropriate box)
Latitude/longitude of well location
_____
(degrees/minutes/seconds)
Latitude/longitude source: ☐ GPS ☐ Topographic map
(check box)

DEPTH From	DEPTH To	DRILLING LOG Formation Description
0.0	14.0	BROWN SAND

LOCATION SKETCH
Show direction and distance in miles from at least two State Roads or County Roads, inculed the road numbers and common road names.



MARKS: MW-1 BENTONITE SEAL FROM 1.0 TO 2.0 FEET

RBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL
UCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Mark K. Gettys 4/8/02
SIGNATURE OF PERSON CONSTRUCTING THE WELL DATE

be al to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center – Raleigh, NC
63 ne No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

ring /Well Construction Log

Construction Permit Number			*Waters Edge Environmental, LLC*
Number	*MW-1*	Purpose	*Assessment*
ct Name	*Former Universal Friction*	Contractor	*Geologic Exploration*
ject No.	*G2-02*	Registration	*1175*
gist	*B. Crandall*	Driller	*M. Gettys*
Date	*3/21/2002* Complete Date *3/21/2002*	Equipment	*CME-45*

ing Method

ments

Well Construction Information		Depth From - To	Blow Count 6"	6"	6"	6"	Soil / Rock Description / Comments	FID / PID (ppm) @ Depth (ft.)
hole Dia.	8.25 "	0- 0.5					Topsoil/Gravel	
er Type	PVC							
eter	2"	3.5 - 5.0					Tan/brown sand	
en Type	PVC							
ameter	2"							
interval	4.0 - 0.0	8.5 - 10.0					Tan/brown sand	
en intervai	14.0 - 4.0							
t Size	0.010"							
pe	Portland	13.5 - 14					Tan/brown sand - refusal @ 14 ft.	
erval	1.0 - 0.0							
ntonite Type	Pellet						BT @ 14 ft bls.	
val	2.0 - 1.0							
ter Pack	Fine sand							
erval	14.0 - 2.0							
l Depth	14							
P.Elevation								
um								
Water Level Information								
Date	W. L. Below R. P.							
21/2002	9.12							
							** Denotes soil sample submitted for laboratory analysis.*	

= Reference Point W.L. = Water Level TBM = Temporary Benchmark MSL = Mean Sea Level

REFERENCE 20

Ref. 20

Soil Excavation and Sampling Report
Former Universal Friction Facility
Marshville, North Carolina
September 4, 2002

Prepared for

RT Environmental Services, Inc.
King of Prussia, Pennsylvania

Prepared by

Waters Edge Environmental, LLC
Greensboro, North Carolina

WATERS EDGE ENVIRONMENTAL, LLC
302 POMONA DRIVE, SUITE L • GREENSBORO, NC 27407 • PHONE 336.852.5003 • FAX 336.854.9199

September 4, 2002

Mr. Gary R. Brown, P.E.
RT Environmental Services, Inc.
215 West Church Road
King of Prussia, Pennsylvania 19406

Reference: Soil Excavation and Sampling Report
Former Universal Friction Facility
Marshville, North Carolina
Waters Edge Job Number G2-12

Dear Mr. Brown:

Waters Edge Environmental, LLC (Waters Edge) is pleased to provide this Soil Excavation and Sampling Report for the above referenced facility. The purpose of this report is to provide a summary of the field activities and the laboratory analytical results, and to provide our conclusions and recommendations regarding this site.

Waters Edge appreciates the opportunity to provide environmental consulting services to [illegible]. If you have any questions or require additional information regarding these activities, please contact me at (336) 852-5003.

Sincerely,

WATERS EDGE ENVIRONMENTAL, LLC

NORTH CAROLINA LICENSED SEAL 1452 GEOLOGIST EDWARD M. KUHN

Edward M. Kuhn, L.G.
Senior Project Manager

GR2030a/EMK/jlp

Soil Excavation and Sampling Report
Former Universal Friction Facility
Marshville, North Carolina
September 4, 2002

1 Introduction

Waters Edge Environmental, LLC (Waters Edge) is pleased to present this Soil Excavation and Sampling Report for the former Universal Friction facility located in Marshville, North Carolina (see Figure 1). This report documents the soil remediation and sampling activities performed at the subject site.

2 Background

The site was formerly used as a manufacturing facility. During assessment activities conducted in 2000, a fuel dispenser and aboveground storage tank (AST) system were noted on the eastern portion of the facility. Soil borings were advanced in the area adjacent to the AST in December 2000. Additional soil borings were conducted in January 2002. The information collected during the December 2000 and January 2002 soil assessments were submitted to the North Carolina Department of Environment and Natural Resources (NCDENR) in a Site Check Report and Soil Contamination Report dated February 25, 2002. Soils impacted with gasoline were detected during the assessments and were defined to be in the immediate vicinity of the fuel dispenser. Following communication with the NCDENR, a groundwater monitoring well was installed and other information necessary for the preparation of a Limited Site Assessment (LSA) Report was collected from the site. The LSA Report was dated April 26, 2002 and was submitted to the NCDENR. Subsequent communication with the NCDENR indicated that if the impacted soils could be removed from the site then the site could be considered for closure since groundwater impact was not detected in the existing monitoring well.

Subsequently, Waters Edge Environmental, LLC (Waters Edge) was contracted by RT Environmental Services, Inc. to oversee soil excavation activities, and to collect confirmatory soil samples following the excavation and removal of impacted soils. Waters Edge would also prepare a report summarizing the field activities and analytical results obtained from the sampling activities.

3 Soil Excavation and Sampling Activities

On July 25, 2002, Waters Edge personnel arrived at the site to conduct soil excavation and sampling activities. Soil excavation and remediation services were provided by Soil Solutions, Inc. Excavation activities were initially concentrated on the fuel dispenser area. Waters Edge personnel supervised the excavation activities and screened soils using a photoionization detector (PID) to aid in the delineation of impacted soils. After beginning excavation activities, a previously undetected 2-inch diameter fuel supply pipe was observed in the excavation area. The exposed portion of pipe appeared to be in poor condition and filled with a water/fuel mixture. A small amount of water/fuel mixture (approximately 30 gallons) was released from the pipe and was excavated along with other petroleum-impacted soils. Soil excavation activities continued through July 26, 2002. Soil excavation activities were somewhat limited by the close proximity of the facility building wall and foundation located on the western portion of the excavation

ea. The final excavation dimensions measured approximately 18 feet by 16 feet and 10 feet deep. A small amount of fibrous material (thought to be potentially asbestos) was ncountered during the excavation activities. This material was limited in quantity, ixed with site soils, and appeared to be backfill material. The excavated material (97.51 tons) was manifested, loaded on to dump trucks and transported to the Soil olutions, Inc. facility located in Winston-Salem, North Carolina for disposal and eatment. Manifests and weigh tickets are included in Appendix A.

During excavation activities, organic vapors with a different odor than gasoline were ncountered on the western wall of the excavation. In order to ensure that all impacted oils at the site were identified, one soil sample (SSVI) was collected from the western excavation wall. This soil sample was submitted to Pace Analytical Services, Inc. (Pace) or laboratory analysis of volatile organic compounds (VOCs) by EPA Method 8260. At he conclusion of excavation activities, five confirmation soil samples (SSB, SSN, SSS, SSE, and SSW) were collected from the floor and sides of the excavation. All soil amples were collected and handled in accordance with the procedures contained in ppendix B. The excavation was then backfilled with imported fill material. The onfirmation soil samples were submitted to Pace to be analyzed for gasoline range total etroleum hydrocarbons (TPH) using modified EPA Method 8015. The locations of the oil samples and the excavated area are shown in Figure 2.

Soil Analytical Results

No detectable TPH were detected in any of the confirmation soil samples collected from he site with the exception of sample SSW, collected from the western side of the xcavation next to the building foundation. This sample contained 18 mg/kg of TPH. The North Carolina action level for gasoline range TPH is 10 mg/kg. Volatile organic vapor concentrations appeared to be decreasing with depth in this location. This limited rea of impacted soil is covered by a concrete slab and a roof, minimizing the potential of nfiltration of water through the soils. The residual concentrations of TPH would be expected to degrade through attenuation over time to levels below the North Carolina ction level. The analytical results from soil sample SSVI contained compounds ypically associated with gasoline, and at total VOC concentrations of less than two mg/kg. This sample was collected at a depth of approximately seven feet, one foot deeper than soil sample SSW. The different odor noted in soil sample SSVI is thought to e attributed to weathering of gasoline. The complete laboratory analytical reports are contained in Appendix C. A summary of the analytical results is presented in Table 1.

5 Conclusions and Recommendations

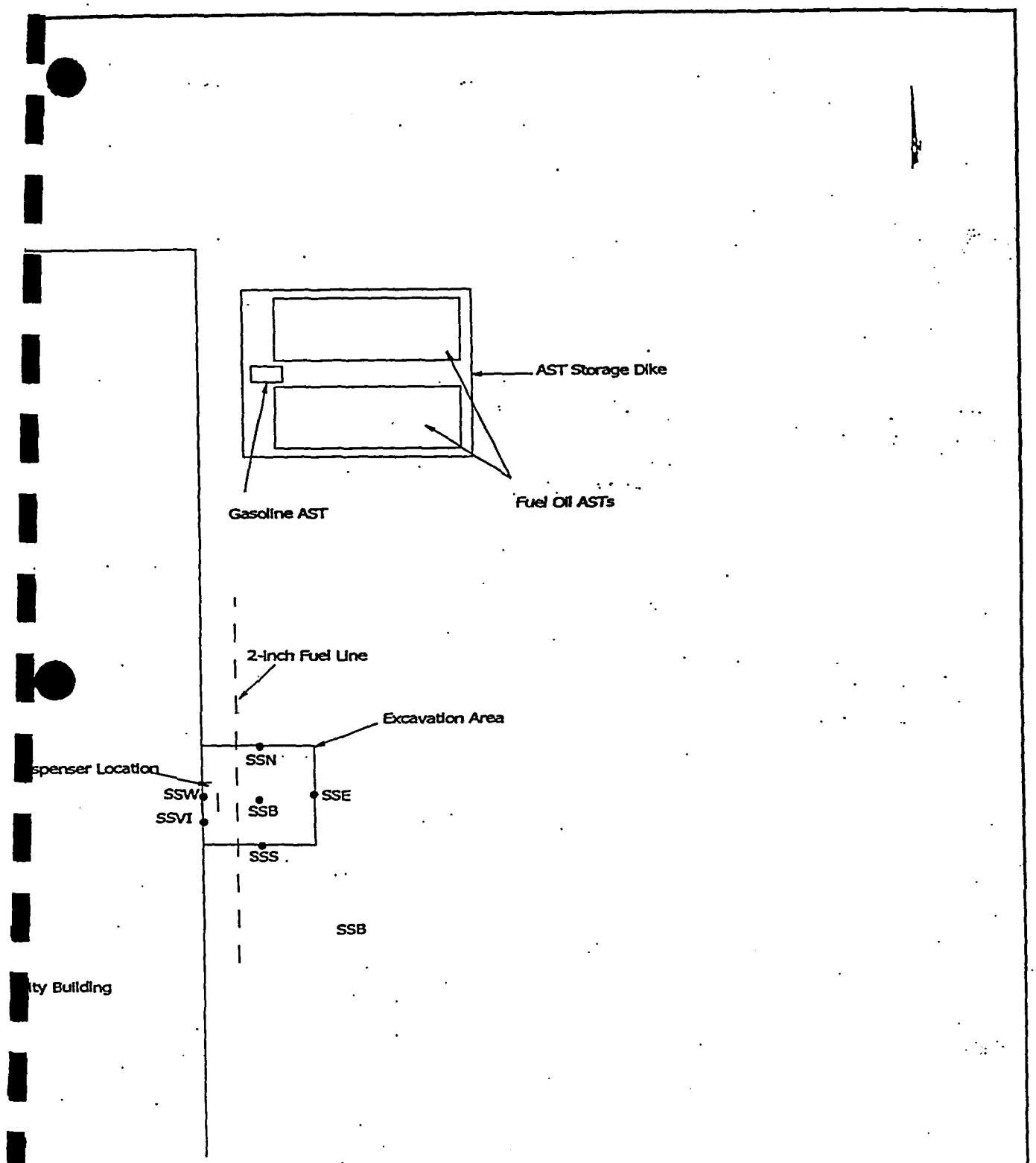
Based upon the laboratory analyses, excavation activities appear to have removed all accessible impacted soils from the site. One confirmation soil sample contained TPH slightly in excess of the 10 mg/kg action level. Further excavation in the area where the confirmation sample was collected is not possible due to concerns of undermining the building foundation. Volatile organic vapors appeared to be decreasing with depth in this area of the excavation. Based on this observation and on the results of an additional soil ple collected at a greater depth, this limited area of impacted soil is not likely to pact the groundwater beneath the site. This limited area of impacted soil is covered by a concrete slab and a roof, minimizing the potential of infiltration of water through the soils. The residual concentrations of TPH would be expected to degrade through attenuation over time to levels below the North Carolina action level. Additionally,

based on previous sampling of the groundwater monitoring well installed at the site, the groundwater at the site has not been impacted. Based upon these factors, Waters Edge recommends that no further action be required at this site.

Waters Edge has submitted a copy of this report to the following address:

North Carolina Department of Environment and Natural Resources
Division of Water Quality
Groundwater Section
Mooresville Regional Office
919 N. Main Street
Mooresville, North Carolina 28115

Attention: Ms. Peggy Finley



Waters Edge Environmental, LLC	Author JLP	Drawing	Layers	Date 8-19-02	Title Site Map/Soil Sample Location Map
	Job No. G2-12	Revision	Figure 2	Scale 1" = 20'	Former Universal Friction Facility Marshville, North Carolina

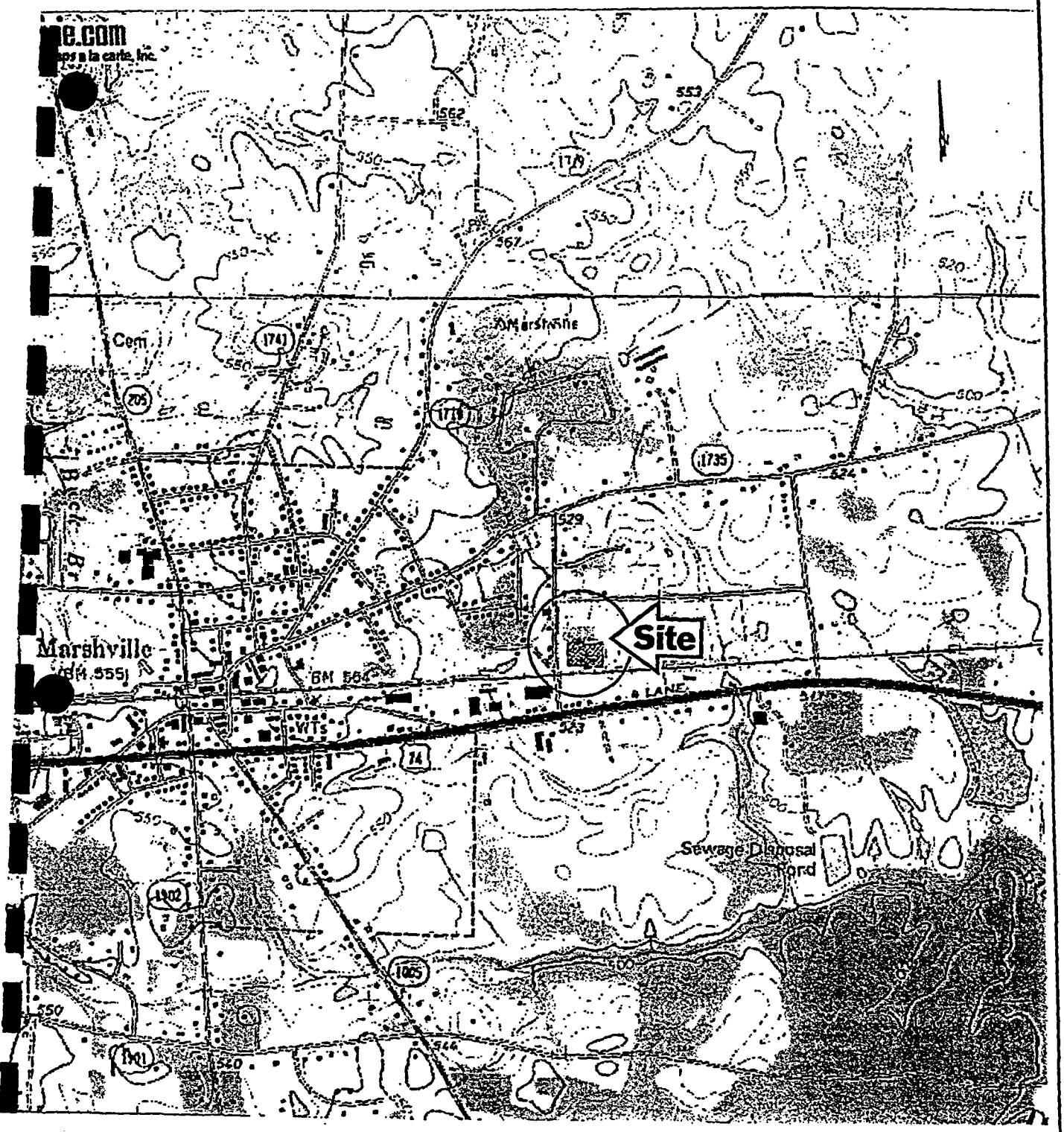
Table 1. Soil Analytical Results, Former Universal Friction Facility, Marshville, North Carolina

Sample ID	Depth (ft)	TPH - Gasoline (mg/kg)
SSB	7.5	BDL
SSN	7	BDL
SSS	7	BDL
SSE	8	BDL
SSW	6	18
SSVI	7	*

Notes:
BDL = Below Method Detection Limit
** Soil sample SSVI was analyzed by EPA Method 8260 for VOCs. The sample contained the following compounds:*
Benzene – 26 ug/kg
Di-isopropyl ether – 150 ug/kg
Ethylbenzene – 11 ug/kg
MTBE – 840 ug/kg
Toluene – 6.4 ug/kg
Xylenes (total) – 78 ug/kg

Analytical Laboratory: Pace Analytical Services, Inc.

Waters Edge Job No. G2-12



Waters Edge Environmental, LLC	Author JLP	Drawing	Layers	Date 8-19-02	Title Site Location Map
	Job No. G2-12	Revision	Figure 1	Scale 1" = 2000'	Former Universal Friction Facility Marshville, North Carolina

SOIL SOLUTIONS

CERTIFICATE OF ACCEPTANCE

Soil Solutions, Inc. does hereby certify that 97.51 tons of non-hazardous contaminated material received on 07/25/2002 and 07/26/2002 from:

Generator: Phoenix Group, LLC

Originating at: Unarco Road and U.S. 74
Marshville, NC

SSI Waste ID#: 070217

has been accepted by Soil Solutions, Inc. and will be remediated in their Soil Treatment Facility in Winston-Salem, North Carolina. Soil Solutions, Inc. guarantees the contaminated material will be treated to below regulatory standards established by the North Carolina Department of Environment and Natural Resources for clean soil.

Thomas W. Hammett
Signature

Thomas W. Hammett
Senior Vice President
Soil Solutions, Inc.

SOIL SOLUTIONS, INC.

1703 Vargrave Street, Winston-Salem, NC 27107

NON-HAZARDOUS MATERIALS MANIFEST

Manifest No. 52124

GENERATOR INFORMATION

Phoenix Group, LLC. Phone: 202-337-7300
Unarco Rd. US 74
Marshville, NC Contact: Gary Silverman

MATERIAL DESCRIPTION / QUANTITY / WEIGHT

ght (lbs): 77160 Material: Soil
ht (lbs): 30820 Contaminant: Gasoline
(lbs): 46340

ntity 23.17 Tons Drums Pails Sacs Yards Other:

TRANSPORTER INFORMATION

Soil Solutions, Inc. Phone: 336-725-5844
55201 Contact: Tony Disher

nsporter, I certify that the materials described above being shipped under this non-hazardous nifest are properly classified, packaged, labeled, secured and are in proper condition for transport under the applicable regulations governing transportation, and I hereby receive this material for the facility designate.

nature: Date: 7-25-02

FACILITY INFORMATION

SSI Project #: 070217

UTIONS, INC.
grave Street
alem, NC 27107

Phone: (336) 725-5844

Contact: Tony Disher

e carrier has delivered the materials described above to this facility, and I hereby accept this treatment and/or disposal in a manner that has been authorized by the State of North Carolina.

nature: Date: 4-25-02

ility Canary/Invoice Goldenrod/Generator Pink/Carrier

SOIL SOLUTIONS, INC.

1703 Vargrave Street, Winston-Salem, NC 27107

NON-HAZARDOUS MATERIALS MANIFEST

Manifest No. 52115

GENERATOR INFORMATION

~~Phoenix Group, LLC.~~ Phone: ~~202-337-7300~~

ss: Unarco Rd. US 74

Marshville, NC

Contact: Gary Silverman

MATERIAL DESCRIPTION / QUANTITY / WEIGHT

ight (lbs): 68560 Material: Soil

ght (lbs): 30380 Contaminant: Gasoline

ht (lbs): 38180

Quantity 19.09 (Tons) Drums Pails Sacs Yards Other: _____

TRANSPORTER INFORMATION

er: Soil Solutions, Inc. Phone: 336-725-5844

55202 Contact: Tony Disher

ansporter, I certify that the materials described above being shipped under this non-hazardous manifest are properly classified, packaged, labeled, secured and are in proper condition for transport herce under the applicable regulations governing transportation, and I hereby receive this material for to the facility designate.

Signature: [signature] Date: 7-25-02

FACILITY INFORMATION

SSI Project #: 070217

OLUTIONS, INC.
/argrave Street
n-Salem, NC 27107

Phone: (336) 725-5844

Contact: Tony Disher

that the carrier has delivered the materials described above to this facility, and I hereby accept this l for treatment and/or disposal in a manner that has been authorized by the State of North Carolina.

Signature: [signature] Date: 7/25/02

SOIL SOLUTIONS, INC.

1703 Vargrave Street, Winston-Salem, NC 27107

NON-HAZARDOUS MATERIALS MANIFEST

Manifest No. 52123

GENERATOR INFORMATION

tor: Phoenix Group, LLC. Phone: 202-337-7300

Address: Unarco Rd. US 74

Marshville, NC

ate: Contact: Gary Silverman

MATERIAL DESCRIPTION / QUANTITY / WEIGHT

s Weight (lbs): 51760 Material: Soil

Weight (lbs): 22460 Contaminant: Gasoline

Weight (lbs): 29,300

Quantity 14.65 Tons Drums Pails Sacs Yards Other: _____

TRANSPORTER INFORMATION

Soil Solutions, Inc.

sporter: Phone: 336-725-5844

#: 101 Contact: Tony Disher

e transporter, I certify that the materials described above being shipped under this non-hazardous ials manifest are properly classified, packaged, labeled, secured and are in proper condition for transport ommerce under the applicable regulations governing transportation, and I hereby receive this material for ry to the facility designate.

er Signature: Date: 7/25/02

FACILITY INFORMATION

070217

SSI Project #:

L SOLUTIONS, INC.
3 Vargrave Street
ston-Salem, NC 27107

Phone: (336) 725-5844

Contact: Tony Disher

tify that the carrier has delivered the materials described above to this facility, and I hereby accept this rial for treatment and/or disposal in a manner that has been authorized by the State of North Carolina.

lity Signature: Date: 7/25/02

Pink/Carrier

SOIL SOLUTIONS, INC.

1703 Vargrave Street, Winston-Salem, NC 27107

NON-HAZARDOUS MATERIALS MANIFEST

Manifest No. 52125

GENERATOR INFORMATION

tor: Phoenix Group, LLC. Phone: 202-337-7300

ddress: Unarco Rd. US 74

Marshville, NC

te: Contact: Gary Silverman

MATERIAL DESCRIPTION/QUANTITY/WEIGHT

Weight (lbs): 79,720 Material: Soil

Weight (lbs): 50 700 Contaminant: Gasoline

eight (lbs): 50 020

Quantity 23.51 Tons Drums Pails Sacs Yards Other: _____

TRANSPORTER INFORMATION

orter: Dobson Trucking Phone: 800-292-8914

#: 947 Contact: Nub McCormick

transporter, I certify that the materials described above being shipped under this non-hazardous s manifest are properly classified, packaged, labeled, secured and are in proper condition for transport merce under the applicable regulations governing transportation, and I hereby receive this material for to the facility designate.

r Signature: Date: 4/26/02

FACILITY INFORMATION

SSI Project #: 070217

SOLUTIONS, INC.
Vargrave Street
n-Salem, NC 27107

Phone: (336) 725-5844

Contact: Tony Disher

that the carrier has delivered the materials described above to this facility, and I hereby accept this l for treatment and/or disposal in a manner that has been authorized by the State of North Carolina.

y Signature: Date: 26 Apr

SOIL SOLUTIONS, INC.

1703 Vargrave Street, Winston-Salem, NC 27107

NON-HAZARDOUS MATERIALS MANIFEST

Manifest No. 52116

GENERATOR INFORMATION

tor: ~~Phoenix Group, LLC.~~ Phone: ~~202-337-7300~~

ress: Unarco Rd. US 74

te: Marshville, NC Contact: Gary Silverman

MATERIAL DESCRIPTION/QUANTITY/WEIGHT

eight (lbs): 64980 Material: ~~Soil~~

Veight (lbs): 30,800 Contaminant: Gasoline

ght (lbs): 34,180

Quantity 17.09 (Tons) Drums Pails Sacs Yards Other: _____

TRANSPORTER INFORMATION

ter: ~~Soil Solutions, Inc.~~ Dobson Trucking Phone: 336-725-5844

#: 45 Contact: Tony Disher

transporter, I certify that the materials described above being shipped under this non-hazardous manifest are properly classified, packaged, labeled, secured and are in proper condition for transport erce under the applicable regulations governing transportation, and I hereby receive this material for to the facility designate.

Signature: [signature] Date: 7-26-02

FACILITY INFORMATION

SSI Project #: 070217

LUTIONS, INC.
argrave Street
Salem, NC 27107

Phone: (336) 725-5844

Contact: Tony Disher

the carrier has delivered the materials described above to this facility, and I hereby accept this or treatment and/or disposal in a manner that has been authorized by the State of North Carolina.

Signature: Tom Hammett Date: 7/26/02

acility Canary/Invoice Goldenrod/Generator Pink/Carrier

JCK
ALE
SCALE COMPANY
P.O. BOX 630
COTT, IA 52773
563) 284-6263
w.catscale.com

CAT Scale Company Attn: Operations Manager.

* The four weights shown below are separate weights. The GROSS WEIGHT is the CERTIFIED WEIGHT and was weighed on a full length platform scale.

DATE: 07/26/02

STEER AXLE 12100 lb
DRIVE AXLE 31040 lb
TRAILER AXLE 34580 lb
* GROSS WEIGHT 77720 lb

SCALE LOCATION: CAT 405 SPEEDWAY I85 AND EXIT 63 KANNAPOLIS NC.

JBLIC WEIGHMASTER'S CERTIFICATE OF WEIGHT & MEASURE

This is to certify that the following described merchandise was weighed, counted, or measured by a public or deputy weighmaster, and when properly signed and sealed shall be prima facie evidence of the accuracy of the weight shown as prescribed by law.

IMPRINT SEAL HERE (IF APPLICABLE)

LIVESTOCK, PRODUCE, PROPERTY, COMMODITY, OR ARTICLE WEIGHED

COMPANY Dobson Trucking TRACTOR # 47 TRAILER # M120

FEE 7.50 WEIGHMASTER OR WEIGHER SIGNATURE FULL WEIGH TICKET # (IF REWEIGH)

DRIVER IN TRUCK UNLESS CHECKED HERE: —

* CAT SCALE COMPANY® 3006 (4/02)

MER COPY

TICKET NUMBER

The CAT Scale Company guarantees that our scales will give an accurate weight. What makes us different from other scale companies is that we back up our guarantee with cash.®

USE CAT SCALE GET A JACKET! SEE PINK JACKET CLAIM FORM FOR DETAILS

"WEIGH WHAT WE SAY OR WE PAY"®

If you get an overweight fine from the state AFTER one of our CAT Scales showed a legal weight, we will immediately check our scale and we will:
(1) Reimburse you for the cost of the overweight fine if our scale is wrong, OR
(2) A representative of CAT Scale Company will appear in court WITH the driver as an expert witness if we believe our scale was correct.

IF YOU SHOULD GET AN OVERWEIGHT FINE, YOU SHOULD DO THE FOLLOWING TO GET THE PROBLEM RESOLVED:

1) Post bond and request a court date.
2) Call CAT Scale Company direct 24 hours a day at 1-877-CAT-SCALE (toll free).
3) IMMEDIATELY send a copy of the citation, CAT Scale ticket, your name, company, address, and phone number to CAT Scale Company Attn: Operations Manager.

RTIFIED
TOMATED
JCK
ALE
SCALE COMPANY
P.O. BOX 630
COTT, IA 52773
563) 284-6263
w.catscale.com

* The four weights shown below are separate weights. The GROSS WEIGHT is the CERTIFIED WEIGHT and was weighed on a full length platform scale.

DATE: 07/26/02

STEER AXLE 10460 lb
DRIVE AXLE 24620 lb
TRAILER AXLE 29900 lb
* GROSS WEIGHT 64980 lb

1942
65244
SCALE LOCATION: CAT 405 SPEEDWAY I85 AND EXIT 63. KANNAPOLIS NC.

BLIC WEIGHMASTER'S CERTIFICATE OF WEIGHT & MEASURE

This is to certify that the following described merchandise was weighed, counted, or measured by a public or deputy weighmaster, and when properly signed and sealed shall be prima facie evidence of the accuracy of the weight shown as prescribed by law.

IMPRINT SEAL HERE (IF APPLICABLE)

LIVESTOCK, PRODUCE, PROPERTY, COMMODITY, OR ARTICLE WEIGHED

COMPANY Dobson TRACTOR # 45 TRAILER #

(563) 284-6263
www.catscale.com

DATE: 07/25/02

STEER AXLE 9840 lb
DRIVE AXLE 29920 lb
TRAILER AXLE 37400 lb
* GROSS WEIGHT 77160 lb

SCALE LOCATION: CAT 95 2TJ I 85 EXIT 86 LINWOOD NC

PUBLIC WEIGHMASTER'S CERTIFICATE OF WEIGHT & MEASURE

This is to certify that the following described merchandise was weighed, counted, or measu public or deputy weighmaster, and when properly signed and sealed shall be prima facie evide accuracy of the weight shown as prescribed by law.

IMPRINT SEAL HERE (IF APPLICABLE)

LIVESTOCK, PRODUCE, PROPERTY, COMMODITY, OR ARTICLE WEIGHED

COMPANY TRACTOR # TRAILER #

FEE 7.50 WEIGHMASTER OR WEIGHER SIGNATURE FULL WEIGH TICKET # (IF REWEIGH)

DRIVER IN TRUCK UNLESS CHECKED HERE: —

* CAT SCALE C

CUSTOMER COPY

(563) 284-6263
www.catscale.com

DATE: 07/25/02

STEER AXLE 10560 lb
DRIVE AXLE 27720 lb
TRAILER AXLE 30280 lb
* GROSS WEIGHT 68560 lb

171917
16087
SCALE LOCATION: CAT 95 2TJ I 85 EXIT 86 LINWOOD NC

PUBLIC WEIGHMASTER'S CERTIFICATE OF WEIGHT & MEASURE

This is to certify that the following described merchandise was weighed, counted, or mea public or deputy weighmaster, and when properly signed and sealed shall be prima facie evid accuracy of the weight shown as prescribed by law.

IMPRINT SEAL HERE (IF APPLICABLE)

LIVESTOCK, PRODUCE, PROPERTY, COMMODITY, OR ARTICLE WEIGHED

COMPANY TRACTOR # TRAILER #

FEE 7.50 WEIGHMASTER OR WEIGHER SIGNATURE FULL WEIGH TICKET # (IF REWEIGH)

DRIVER IN TRUCK UNLESS CHECKED HERE: —

* CAT SCAL

CUSTOMER COPY

www.catscale.com

DATE: 07/25/02

STEER AXLE 15840 lb
DRIVE AXLE 35920 lb
TRAILER AXLE 0 lb
* GROSS WEIGHT 51760 lb

171830
16086
SCALE LOCATION: CAT 95 2TJ I 85 EXIT 86 LINWOOD NC

PUBLIC WEIGHMASTER'S CERTIFICATE OF WEIGHT & MEASURE

This is to certify that the following described merchandise was weighed, counted, or mea public or deputy weighmaster, and when properly signed and sealed shall be prima facie evid accuracy of the weight shown as prescribed by law.

IMPRINT SEAL HERE (IF APPLICABLE)

LIVESTOCK, PRODUCE, PROPERTY, COMMODITY, OR ARTICLE WEIGHED

COMPANY TRACTOR # TRAILER #

borings are used to characterize soil profiles, to determine the presence of organic vapors, and to obtain oil samples for subsequent laboratory analysis. Soil borings may be advanced either manually with a ontaminated hand auger or using a drill rig equipped with hollow-stem augers or other drilling equipment. l samples are typically collected from borings installed with a drill rig at 5-foot intervals using a split-spoon ampling device as described in ASTM D 1586-84. Soil samples are typically collected from borings anced with a hand auger at 1 to 2-foot intervals.

he completed boring is ready for monitoring well installation or is abandoned. If the boring is terminated elow the water table, abandonment entails backfilling with a cement grout. Otherwise the boring is andoned by backfilling with cuttings or other natural material.

oil Classification

Undisturbed soil samples are logged in the field and classified according to the Unified Soil Classification ystem (ASTM D 2488-84).

Headspace Screening

are screened with an organic vapor analyzer (OVA) for total volatile organic compounds (VOCs), which may indicate organic or petroleum hydrocarbon contamination. A typical procedure for screening soils involves filling a clean container approximately halfway with soil and sealing the container with aluminum foil. This creates a headspace in which the VOCs in the soil accumulate and equilibrate. After allowing approximately 10 minutes for this processes to occur, the probe of the OVA is then inserted through the aluminum foil seal into the headspace of the container to obtain a VOC reading.

Sample Collection Protocols

Soil samples selected for laboratory analysis are collected into laboratory provided containers appropriate for the parameters being analyzed and are labeled with a minimum of the following information: sampler's name, date of collection, sample number, analysis to be performed, and project number. Soil samples are stored and transported to the analytical laboratory in an insulated cooler chilled to approximately 4°C. To ensure sample integrity, all samples are transported in accordance with EPA chain-of-custody protocols.

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

ugust 16, 2002

RECEIVED
AUG 20 2002

. Ed Kuhn
aters Edge Environmental
02-L Pomona Drive
eensboro, NC 27407

: Lab Project Number: 9235043
Client Project ID: RT ENV Marshville/G2-12

ar Mr. Kuhn:

nclosed are the analytical results for sample(s) received by the laboratory on July 30, 2002. Results reported conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of e report.

you have any questions concerning this report please feel free to contact me.

incerely,

Kristi R. Tart

isti Tart
Kristi.Tart@pacelabs.com
oject Manager

nclosures

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Huntersville, NC 28078
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Fax: 704.875.9091

Lab Project Number: 9235043
Client Project ID: RT ENV Marshville/G2-12

ults are reported on a dry weight basis

le No: 922419601 Project Sample Number: 9235043-001 Date Collected: 07/25/02 16:00
mple ID: SSB Matrix: Soil Date Received: 07/30/02 15:25

ers	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	ReqLmt
mistry								
Moisture	Method: % Moisture							
nt Moisture	15.8	%		07/31/02	AST			
volatiles								
oil	Method: EPA 8015							
e	ND	mg/kg	7.1	08/02/02	KSB			
fluorobenzene (S)	55	%		08/02/02	KSB	460-00-4		

/02

ertification IDs
vater 12

REPORT OF LABORATORY ANALYSIS

Laboratory Certification IDs
LA Wastewater 04034

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Phone: 704.875.9092
Fax: 704.875.9091

Lab Project Number: 9235043
Client Project ID: RT ENV Marshville/G2-12

No: 922419619 Project Sample Number: 9235043-002 Date Collected: 07/26/02 11:30
ample ID: SSE Matrix: Soil Date Received: 07/30/02 15:25

	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
emistry								
Moisture	Method: % Moisture							
Moisture	17.9	%		07/31/02	AST			
ivolatiles								
	Method: EPA 8015							
	ND	mg/kg	7.3	08/08/02	CMJ			
nofluorobenzene (S)	166	%		08/08/02	CMJ	460-00-4	1	

Dat 16/02

ry Certification IDs
ewater 12
nking Water 37706

REPORT OF LABORATORY ANALYSIS
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Laboratory Certification IDs
LA Wastewater 04034
VA Drinking Water 213
FL NELAP E87627

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9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

Lab Project Number: 9235043
Client Project ID: RT ENV Marshville/G2-12

No: 922419627 | Project Sample Number: 9235043-003 | Date Collected: 07/26/02 11:40
mple ID: SSS | Matrix: Soil | Date Received: 07/30/02 15:25

	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
mistry								
Moisture	Method: % Moisture							
oisture	16.1	%		07/31/02	AST			
volatiles								
	Method: EPA 8015							
	ND	mg/kg	7.2	08/08/02	CMJ			
fluorobenzene (S)	96	%		08/08/02	CMJ	460-00-4		

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ater 12
ng Water 37706

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Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

Lab Project Number: 9235043
Client Project ID: RT ENV Marshville/G2-12

e No: 922419635 Project Sample Number: 9235043-004 Date Collected: 07/26/02 13:30
Sample ID: SSN Matrix: Soil Date Received: 07/30/02 15:25

s	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
emistry								
Moisture	Method: % Moisture							
Moisture	18.8	%		07/31/02	AST			
nivolatiles								
1	Method: EPA 8015							
e	ND	mg/kg	7.4	08/08/02	CMJ			
omofluorobenzene (S)	157	%		08/08/02	CMJ	460-00-4	1	

D 8/16/02

ory Certification IDs
ewater 12
inking Water 37706

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Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

Lab Project Number: 9235043
Client Project ID: RT ENV Marshville/G2-12

le No: 922419643 | Project Sample Number: 9235043-005 | Date Collected: 07/26/02 14:45
Sample ID: SSW | Matrix: Soil | Date Received: 07/30/02 15:25

rs	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
emistry								
ent Moisture	Method: % Moisture							
t Moisture	20.3	%		07/31/02	AST			
emivolatiles								
oil	Method: EPA 8015							
ne	18.	mg/kg	7.5	08/08/02	KSB			
omofluorobenzene (S)	74	%		08/08/02	KSB	460-00-4		

ory Certification IDs
tewater 12
rinking Water 37706
99006

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Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

Lab Project Number: 9235043
Client Project ID: RT ENV Marshville/G2-12

RAMETER FOOTNOTES

ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
(S)	Surrogate
[1]	The surrogate and/or spike recovery was outside acceptance limits.

ratory Certification IDs
Wastewater 12
Drinking Water 37706
99006

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VA Drinking Water 213

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Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

QUALITY CONTROL DATA

Lab Project Number: 9235043
Client Project ID: RT ENV Marshville/G2-12

QC Batch: 61087 Analysis Method: EPA 8015
tch Method: EPA 8015 Analysis Description: GAS, Soil
iated Lab Samples: 922419601 922419619 922419627 922419635 922419643

D BLANK: 922426903
ciated Lab Samples: 922419601 922419619 922419627 922419635 922419643

eter	Units	Blank Result	Reporting Limit	Footnotes
oline	mg/kg	ND	6.0	
mofluorobenzene (S)	%	55		

RATORY CONTROL SAMPLE: 922426911

ameter	Units	Spike Conc.	LCS Result	LCS % Rec	Footnotes
	mg/kg	50.00	62.12	124	
uorobenzene (S)				75	

Date: 08/16/02

atory Certification IDs
stewater 12
nking Water 37706
9006

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Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

QUALITY CONTROL DATA

Lab Project Number: 9235043
Client Project ID: RT ENV Marshville/G2-12

C Batch: 60943 Analysis Method: % Moisture
ethod: Analysis Description: Percent Moisture
Lab Samples: 922419601 922419619 922419627 922419635 922419643

LICATE: 922420070

	Units	922417811 Result	DUP Result	RPD	Footnotes
isture	%	14.80	15.30	3	

PLICATE: 922420088

	Units	922418538 Result	DUP Result	RPD	Footnotes
oisture	%	22.40	23.90	7	

y Certification IDs
water 12
ng Water 37706
99006

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VA Drinking Water 213
FL NELAP E87627

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Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

Lab Project Number: 9235043
Client Project ID: RT ENV Marshville/G2-12

Y CONTROL DATA PARAMETER FOOTNOTES

stent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

(D) Laboratory Control Sample (Duplicate)
S(D) Matrix Spike (Duplicate)
P Sample Duplicate
Not detected at or above adjusted reporting limit
C Not Calculable
J Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
L Adjusted Method Detection Limit
D Relative Percent Difference
(S) Surrogate

ry Certification IDs
ewater 12
nking Water 37706

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Laboratory Certification IDs
LA Wastewater 04034
VA Drinking Water 213

ed Client Information: Section A | Required Client Information: Section B | Page [redacted]

Waters Edge Environmental
Greensboro

Report To: Ed Kuhn
Invoice To: Ed Kuhn
P.O. Ed Kuhn
Project Name: RTENV - Marshville
Project Number: G2-12

852 5002 | Fax 336 854 1119

Client Information (Check quote/contract):
Requested Due Date: | TAT: STANDARD

* Turn around times less than 14 days subject to laboratory and contractual obligations and may result in Rush Turnaround Surcharge.
Turn Around Time (TAT) in calendar days.

Quote Reference:
Project Manager: KLT
Project #: 925043
Profile #:
Requested Analysis: 5030 TPH

Section D Required Client Information:

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

SAMPLE ID (One character per box. (A-Z, 0-9 / .-) Sample IDs MUST BE UNIQUE)	MATRIX CODE	DATE COLLECTED mm / dd / yy	TIME COLLECTED hh:mm a/p	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	5030 TPH	Remarks / Lab ID
SSB	SL	7/25/02	4:00pm	1	X						X	922419001
SSE	SL	7/26/02	11:30 am	1	X						X	922419019
SSS	SL	7/26/02	11:40am	1	X						X	922419027
SSN	SL	7/26/02	1:30pm	1	X						X	922419035
SSW	SL	7/26/02	2:45pm	1	X						X	922419043

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:	3.1			Robert Crandall / Waters Edge	7/26/02	0820	David R. Bryan PACE	7/26/02	0820
Received on ICE:	(Y) / N			David R. Bryan	7/26/02	1520	[illegible]	7/26/02	1520
Sealed Cooler:	Y / (N)								
Samples Intact:	(Y) / N								

itional Comments:

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Robert Crandall
SIGNATURE of SAMPLER: R. Crandall
DATE Signed: (MM / DD / YY)

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ugust 06, 2002

. Ed Kuhn
ters Edge Environmental
302-L Pomona Drive
eensboro, NC 27407

RECEIVED
AUG 12 2002

: Lab Project Number: 9235042
Client Project ID: RT ENV-Marshville G2-12

ar Mr. Kuhn:

Enclosed are the analytical results for sample(s) received by the laboratory on July 30, 2002. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of report.

If you have any questions concerning this report please feel free to contact me.

Sincerely,

Kristi R Tart

risti Tart
risti.Tart@pacelabs.com
Project Manager

nclosures

ory Certification IDs
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inking Water 37706
99006

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Lab Project Number: 9235042
Client Project ID: RT ENV-Marshville G2-12

esults are reported on a dry weight basis

mple No: 922419593 | Project Sample Number: 9235042-001 | Date Collected: 07/26/02 14:30
t Sample ID: SSVI | Matrix: Soil | Date Received: 07/30/02 15:25

ters	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
Chemistry								
t Moisture	Method: % Moisture							
ent Moisture	20.6	%		07/31/02	AST			
S Volatiles								
VOCs by 8260, low level	Method: EPA 8260							
ene	26.	ug/kg	6.3	08/03/02 13:07	RWS	71-43-2		
omobenzene	ND	ug/kg	6.3	08/03/02 13:07	RWS	108-86-1		
ochloromethane	ND	ug/kg	6.3	08/03/02 13:07	RWS	74-97-5		
odichloromethane	ND	ug/kg	6.3	08/03/02 13:07	RWS	75-27-4		
omoform	ND	ug/kg	6.3	08/03/02 13:07	RWS	75-25-2		
omethane	ND	ug/kg	13.	08/03/02 13:07	RWS	74-83-9		
tylbenzene	ND	ug/kg	6.3	08/03/02 13:07	RWS	104-51-8		
c-Butylbenzene	ND	ug/kg	6.3	08/03/02 13:07	RWS	135-98-8		
rt-Butylbenzene	ND	ug/kg	6.3	08/03/02 13:07	RWS	98-06-6		
etrachloride	ND	ug/kg	6.3	08/03/02 13:07	RWS	56-23-5		
enzene	ND	ug/kg	6.3	08/03/02 13:07	RWS	108-90-7		
loroethane	ND	ug/kg	13.	08/03/02 13:07	RWS	75-00-3		
oroform	ND	ug/kg	6.3	08/03/02 13:07	RWS	67-66-3		
oromethane	ND	ug/kg	13.	08/03/02 13:07	RWS	74-87-3		
-Chlorotoluene	ND	ug/kg	6.3	08/03/02 13:07	RWS	95-49-8		
hlorotoluene	ND	ug/kg	6.3	08/03/02 13:07	RWS	106-43-4		
-Dibromo-3-chloropropane	ND	ug/kg	6.3	08/03/02 13:07	RWS	96-12-8		
bromochloromethane	ND	ug/kg	6.3	08/03/02 13:07	RWS	124-48-1		
2-Dibromoethane (EDB)	ND	ug/kg	6.3	08/03/02 13:07	RWS	106-93-4		
bromomethane	ND	ug/kg	6.3	08/03/02 13:07	RWS	74-95-3		
2-Dichlorobenzene	ND	ug/kg	6.3	08/03/02 13:07	RWS	95-50-1		
1,3-Dichlorobenzene	ND	ug/kg	6.3	08/03/02 13:07	RWS	541-73-1		
4-Dichlorobenzene	ND	ug/kg	6.3	08/03/02 13:07	RWS	106-46-7		
chlorodifluoromethane	ND	ug/kg	13.	08/03/02 13:07	RWS	75-71-8		
1,1-Dichloroethane	ND	ug/kg	6.3	08/03/02 13:07	RWS	75-34-3		
1,2-Dichloroethane	ND	ug/kg	6.3	08/03/02 13:07	RWS	107-06-2		
1-Dichloroethene	ND	ug/kg	6.3	08/03/02 13:07	RWS	75-35-4		
s-1,2-Dichloroethene	ND	ug/kg	6.3	08/03/02 13:07	RWS	156-59-2		
trans-1,2-Dichloroethene	ND	ug/kg	6.3	08/03/02 13:07	RWS	156-60-5		
2-Dichloropropane	ND	ug/kg	6.3	08/03/02 13:07	RWS	78-87-5		
3-Dichloropropane	ND	ug/kg	6.3	08/03/02 13:07	RWS	142-28-9		
2,2-Dichloropropane	ND	ug/kg	6.3	08/03/02 13:07	RWS	594-20-7		

Date: 08/06/02

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Lab Project Number: 9235042
Client Project ID: RT ENV-Marshville G2-12

le No: 922419593 | Project Sample Number: 9235042-001 | Date Collected: 07/26/02 14:30
Sample ID: SSVI | Matrix: Soil | Date Received: 07/30/02 15:25

ers	Results	Units	Report Limit	Analyzed	By	CAS No.	Qual	RegLmt
ichloropropene	ND	ug/kg	6.3	08/03/02 13:07	RWS	563-58-6		
sopropyl ether	150	ug/kg	6.3	08/03/02 13:07	RWS	108-20-3		
benzene	11.	ug/kg	6.3	08/03/02 13:07	RWS	100-41-4		
hloro-1,3-butadiene	ND	ug/kg	6.3	08/03/02 13:07	RWS	87-68-3		
propylbenzene (Cumene)	ND	ug/kg	6.3	08/03/02 13:07	RWS	98-82-8		
propyltoluene	ND	ug/kg	6.3	08/03/02 13:07	RWS	99-87-6		
lene chloride	ND	ug/kg	6.3	08/03/02 13:07	RWS	75-09-2		
yl-tert-butyl ether	840	ug/kg	310	08/03/02 13:07	RWS	1634-04-4		
thalene	ND	ug/kg	6.3	08/03/02 13:07	RWS	91-20-3		
pylbenzene	ND	ug/kg	6.3	08/03/02 13:07	RWS	103-65-1		
ene	ND	ug/kg	6.3	08/03/02 13:07	RWS	100-42-5		
,1,2-Tetrachloroethane	ND	ug/kg	6.3	08/03/02 13:07	RWS	630-20-6		
2-Tetrachloroethane	ND	ug/kg	6.3	08/03/02 13:07	RWS	79-34-5		
chloroethene	ND	ug/kg	6.3	08/03/02 13:07	RWS	127-18-4		
luene	6.4	ug/kg	6.3	08/03/02 13:07	RWS	108-88-3		
3-Trichlorobenzene	ND	ug/kg	6.3	08/03/02 13:07	RWS	87-61-6		
chlorobenzene	ND	ug/kg	6.3	08/03/02 13:07	RWS	120-82-1		
1,1-Trichloroethane	ND	ug/kg	6.3	08/03/02 13:07	RWS	71-55-6		
1,2-Trichloroethane	ND	ug/kg	6.3	08/03/02 13:07	RWS	79-00-5		
hloroethene	ND	ug/kg	6.3	08/03/02 13:07	RWS	79-01-6		
hlorofluoromethane	ND	ug/kg	6.3	08/03/02 13:07	RWS	75-69-4		
2,3-Trichloropropane	ND	ug/kg	6.3	08/03/02 13:07	RWS	96-18-4		
4-Trimethylbenzene	ND	ug/kg	6.3	08/03/02 13:07	RWS	95-63-6		
5-Trimethylbenzene	ND	ug/kg	6.3	08/03/02 13:07	RWS	108-67-8		
nyl chloride	ND	ug/kg	13.	08/03/02 13:07	RWS	75-01-4		
Xylene	49.	ug/kg	13.	08/03/02 13:07	RWS			
lene	29.	ug/kg	6.3	08/03/02 13:07	RWS	95-47-6		
luene-d8 (S)	97	%		08/03/02 13:07	RWS	2037-26-5		
Bromofluorobenzene (S)	88	%		08/03/02 13:07	RWS	460-00-4		
romofluoromethane (S)	112	%		08/03/02 13:07	RWS	1868-53-7		
-Dichloroethane-d4 (S)	115	%		08/03/02 13:07	RWS	17060-07-0		

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Lab Project Number: 9235042
Client Project ID: RT ENV-Marshville G2-12

ER FOOTNOTES

D Not detected at or above adjusted reporting limit
Not Calculable
Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
DL Adjusted Method Detection Limit
Surrogate

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QUALITY CONTROL DATA

Lab Project Number: 9235042
Client Project ID: RT ENV-Marshville G2-12

QC Batch: 61105
tch Method: EPA 8260
iated Lab Samples: 922419593

Analysis Method: EPA 8260
Analysis Description: GC/MS VOCs by 8260, low level

D BLANK: 922427513
ociated Lab Samples: 922419593

eter	Units	Blank Result	Reporting Limit	Footnotes
zene	ug/kg	ND	5.0	
benzene	ug/kg	ND	5.0	
chloromethane	ug/kg	ND	5.0	
modichloromethane	ug/kg	ND	5.0	
form	ug/kg	ND	5.0	
methane	ug/kg	ND	10.	
utylbenzene	ug/kg	ND	5.0	
-Butylbenzene	ug/kg	ND	5.0	
lbenzene	ug/kg	ND	5.0	
trachloride	ug/kg	ND	5.0	
orobenzene	ug/kg	ND	5.0	
oethane	ug/kg	ND	10.	
oform	ug/kg	ND	5.0	
oromethane	ug/kg	ND	10.	
lorotoluene	ug/kg	ND	5.0	
orotoluene	ug/kg	ND	5.0	
ibromo-3-chloropropane	ug/kg	ND	5.0	
romochloromethane	ug/kg	ND	5.0	
ibromoethane (EDB)	ug/kg	ND	5.0	
momethane	ug/kg	ND	5.0	
-Dichlorobenzene	ug/kg	ND	5.0	
ichlorobenzene	ug/kg	ND	5.0	
ichlorobenzene	ug/kg	ND	5.0	
lorodifluoromethane	ug/kg	ND	10.	
-Dichloroethane	ug/kg	ND	5.0	
ichloroethane	ug/kg	ND	5.0	
ichloroethene	ug/kg	ND	5.0	
-1,2-Dichloroethene	ug/kg	ND	5.0	
-1,2-Dichloroethene	ug/kg	ND	5.0	
ichloropropane	ug/kg	ND	5.0	
-Dichloropropane	ug/kg	ND	5.0	

Date: 08/06/02

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QUALITY CONTROL DATA

Lab Project Number: 9235042
Client Project ID: RT ENV-Marshville G2-12

NK: 922427513
l Lab Samples; 922419593

	Units	Blank Result	Reporting Limit	Footnotes
oropropane	ug/kg	ND	5.0	
hloropropene	ug/kg	ND	5.0	
yl ether	ug/kg	ND	5.0	
ene	ug/kg	ND	5.0	
ro-1,3-butadiene	ug/kg	ND	5.0	
benzene (Cumene)	ug/kg	ND	5.0	
yltoluene	ug/kg	ND	5.0	
ne chloride	ug/kg	ND	5.0	
ert-butyl ether	ug/kg	ND	5.0	
ne	ug/kg	ND	5.0	
benzene	ug/kg	ND	5.0	
	ug/kg	ND	5.0	
chloroethane	ug/kg	ND	5.0	
chloroethane	ug/kg	ND	5.0	
loroethene	ug/kg	ND	5.0	
	ug/kg	ND	5.0	
chlorobenzene	ug/kg	ND	5.0	
richlorobenzene	ug/kg	ND	5.0	
richloroethane	ug/kg	ND	5.0	
chloroethane	ug/kg	ND	5.0	
ethene	ug/kg	5.3	5.0	
orofluoromethane	ug/kg	ND	5.0	
ichloropropane	ug/kg	ND	5.0	
imethylbenzene	ug/kg	ND	5.0	
Trimethylbenzene	ug/kg	ND	5.0	
loride	ug/kg	ND	10.	
ne	ug/kg	ND	10.	
ne	ug/kg	ND	5.0	
e-d8 (S)	%	98		
luorobenzene (S)	%	86		
luoromethane (S)	%	119		
chloroethane-d4 (S)	%	123		

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QUALITY CONTROL DATA

Lab Project Number: 9235042
Client Project ID: RT ENV-Marshville G2-12

Y CONTROL SAMPLE & LCSD: 922427521 922427539

er	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	RPD	Footnotes
	ug/kg	50.00	56.78	51.33	114	103	10	
zene	ug/kg	50.00	67.18	58.83	134	118	13	1
loromethane	ug/kg	50.00	62.31	55.37	125	111	12	
loromethane	ug/kg	50.00	59.54	53.27	119	107	11	
	ug/kg	50.00	59.40	54.49	119	109	9	
thane	ug/kg	50.00	85.21	73.70	170	147	14	
enzene	ug/kg	50.00	54.76	49.89	110	100	9	
lbenzene	ug/kg	50.00	64.38	57.41	129	115	11	
tylbenzene	ug/kg	50.00	67.21	59.41	134	119	12	
tetrachloride	ug/kg	50.00	62.44	55.23	125	110	12	
nzene	ug/kg	50.00	55.05	49.93	110	100	10	
hane	ug/kg	50.00	66.78	61.49	134	123	8	
form	ug/kg	50.00	62.96	55.15	126	110	13	
	ug/kg	50.00	52.97	46.55	106	93	13	
ene	ug/kg	50.00	63.23	55.76	126	112	13	
rotoluene	ug/kg	50.00	61.13	53.84	122	108	13	
omo-3-chloropropane	ug/kg	50.00	69.60	64.25	139	129	8	1
hloromethane	ug/kg	50.00	58.83	52.40	118	105	12	
romoethane (EDB)	ug/kg	50.00	60.38	53.62	121	107	12	
omethane	ug/kg	50.00	53.82	47.48	108	95	13	
lorobenzene	ug/kg	50.00	56.68	51.91	113	104	9	
lorobenzene	ug/kg	50.00	55.24	50.22	110	100	10	
chlorobenzene	ug/kg	50.00	53.82	48.83	108	98	10	
difluoromethane	ug/kg	50.00	82.59	74.70	165	149	10	1,1
loroethane	ug/kg	50.00	61.36	53.65	123	107	13	
chloroethane	ug/kg	50.00	69.45	60.62	139	121	14	1
chloroethene	ug/kg	50.00	65.08	56.66	130	113	14	
Dichloroethene	ug/kg	50.00	62.70	55.25	125	110	13	
2-Dichloroethene	ug/kg	50.00	63.86	54.77	128	110	15	
ichloropropane	ug/kg	50.00	59.69	53.71	119	107	11	
hloropropane	ug/kg	50.00	59.78	52.72	120	105	13	
hloropropane	ug/kg	50.00	62.78	54.73	126	109	14	
ichloropropene	ug/kg	50.00	67.91	59.27	136	119	14	
opyl ether	ug/kg	50.00	61.12	53.10	122	106	14	
nzene	ug/kg	50.00	55.04	50.34	110	101	9	
oro-1,3-butadiene	ug/kg	50.00	60.10	56.02	120	112	7	
opylbenzene (Cumene)	ug/kg	50.00	56.54	51.25	113	103	10	

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QUALITY CONTROL DATA

Lab Project Number: 9235042
Client Project ID: RT ENV-Marshville G2-12

RY CONTROL SAMPLE & LCSD: 922427521 922427539

r	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	RPD	Footnotes
ltoluene	ug/kg	50.00	60.81	54.93	122	110	10	
chloride	ug/kg	50.00	61.91	54.68	124	109	12	
ert-butyl ether	ug/kg	50.00	57.29	49.62	115	99	14	
ene	ug/kg	50.00	44.32	43.10	89	86	3	
nzene	ug/kg	50.00	63.98	56.05	128	112	13	
	ug/kg	50.00	54.93	50.83	110	102	8	
Tetrachloroethane	ug/kg	50.00	61.43	55.42	123	111	10	
trachloroethane	ug/kg	50.00	62.88	58.78	126	118	7	
oethene	ug/kg	50.00	50.15	44.88	100	90	11	
	ug/kg	50.00	56.05	51.82	112	104	8	
chlorobenzene	ug/kg	50.00	42.19	41.48	84	83	2	
chlorobenzene	ug/kg	50.00	39.03	37.62	78	75	4	
ichloroethane	ug/kg	50.00	65.57	57.36	131	115	13	
ichloroethane	ug/kg	50.00	60.68	54.47	121	109	11	
e	ug/kg	50.00	65.36	58.19	131	116	12	
romethane	ug/kg	50.00	62.51	54.95	125	110	13	
ichloropropane	ug/kg	50.00	65.56	60.45	131	121	8	1
ethylbenzene	ug/kg	50.00	59.79	52.08	120	104	14	
ethylbenzene	ug/kg	50.00	62.15	54.92	124	110	12	
loride	ug/kg	50.00	54.65	49.97	109	100	9	
ne	ug/kg	100.00	107.9	98.82	108	99	9	
	ug/kg	50.00	55.72	51.03	111	102	9	
8 (S)					100	102		
fluorobenzene (S)					93	96		
oromethane (S)					115	110		
roethane-d4 (S)					118	112		

IKE: 922427547

	Units	922419593 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
	ug/kg	26.32	62.96	110.8	134	
enzene	ug/kg	0	62.96	67.56	107	
roethene	ug/kg	0	62.96	84.13	134	
	ug/kg	6.351	62.96	82.08	120	
roethene	ug/kg	0	62.96	74.05	118	

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QUALITY CONTROL DATA

Lab Project Number: 9235042
Client Project ID: RT ENV-Marshville G2-12

E: 922427547

	Units	922419593 Result	Spike Conc.	MS Result	MS % Rec	Footnotes
(S)					106	
orobenzene (S)					97	
uoromethane (S)					135	2
oethane-d4 (S)					145	2

LICATE: 922430392

	Units	922426739 Result	DUP Result	RPD	Footnotes
	ug/kg	ND	ND	NC	
ne	ug/kg	ND	ND	NC	
romethane	ug/kg	ND	ND	NC	
ethane	ug/kg	ND	ND	NC	
	ug/kg	ND	ND	NC	
ane	ug/kg	ND	ND	NC	
zene	ug/kg	ND	ND	NC	
enzene	ug/kg	ND	ND	NC	
benzene	ug/kg	ND	ND	NC	
trachloride	ug/kg	ND	ND	NC	
ene	ug/kg	ND	ND	NC	
ne	ug/kg	ND	ND	NC	
m	ug/kg	ND	ND	NC	
ane	ug/kg	ND	ND	NC	
luene	ug/kg	ND	ND	NC	
toluene	ug/kg	ND	ND	NC	
o-3-chloropropane	ug/kg	ND	ND	NC	
romethane	ug/kg	ND	ND	NC	
oethane (EDB)	ug/kg	ND	ND	NC	
ethane	ug/kg	ND	ND	NC	
robenzene	ug/kg	ND	ND	NC	
robenzene	ug/kg	ND	ND	NC	
lorobenzene	ug/kg	ND	ND	NC	
fluoromethane	ug/kg	ND	ND	NC	
roethane	ug/kg	ND	ND	NC	
roroethane	ug/kg	ND	ND	NC	
loroethene	ug/kg	ND	ND	NC	

: 0 2

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LA Wastewater 04034
VA Drinking Water 213

Pace Analytical
www.pacelabs.com

QUALITY CONTROL DATA

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

Lab Project Number: 9235042
Client Project ID: RT ENV-Marshville G2-12

ICATE: 922430392

	Units	922426739 Result	DUP Result	RPD	Footnotes
loroethene	ug/kg	ND	ND	NC	
chloroethene	ug/kg	ND	ND	NC	
ropropane	ug/kg	ND	ND	NC	
propane	ug/kg	ND	ND	NC	
propane	ug/kg	ND	ND	NC	
ropropene	ug/kg	ND	ND	NC	
ether	ug/kg	ND	ND	NC	
	ug/kg	ND	ND	NC	
1,3-butadiene	ug/kg	ND	ND	NC	
enzene (Cumene)	ug/kg	ND	ND	NC	
oluene	ug/kg	ND	ND	NC	
loride	ug/kg	ND	ND	NC	
t-butyl ether	ug/kg	ND	ND	NC	
	ug/kg	ND	ND	NC	
	ug/kg	ND	ND	NC	
	ug/kg	ND	ND	NC	
rachloroethane	ug/kg	ND	ND	NC	
achloroethane	ug/kg	ND	ND	NC	
ethene	ug/kg	ND	ND	NC	
	ug/kg	ND	ND	NC	
orobenzene	ug/kg	ND	ND	NC	
orobenzene	ug/kg	ND	ND	NC	
chloroethane	ug/kg	ND	ND	NC	
loroethane	ug/kg	ND	ND	NC	
ene	ug/kg	ND	ND	NC	
fluoromethane	ug/kg	ND	ND	NC	
chloropropane	ug/kg	ND	ND	NC	
thylbenzene	ug/kg	ND	ND	NC	
thylbenzene	ug/kg	ND	ND	NC	
oride	ug/kg	ND	ND	NC	
	ug/kg	ND	ND	NC	
	ug/kg	ND	ND	NC	
8 (S)	%	102	101		
orobenzene (S)	%	90	91		
romethane (S)	%	119	109		
oethane-d4 (S)	%	122	109		

tification IDs
r 12
Water 37706

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Laboratory Certification IDs
LA Wastewater 04034
VA Drinking Water 213

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

Pace Analytical™
www.pacelabs.com

QUALITY CONTROL DATA

Lab Project Number: 9235042
Client Project ID: RT ENV-Marshville G2-12

tch: 60943
od:
Lab Samples: 922419593

Analysis Method: % Moisture
Analysis Description: Percent Moisture

CATE: 922420070

	Units	922417811 Result	DUP Result	RPD	Footnotes
isture	%	14.80	15.30	3	

CATE: 922420088

	Units	922418538 Result	DUP Result	RPD	Footnotes
isture	%	22.40	23.90	7	

rtification IDs
r 12
Water 37706

REPORT OF LABORATORY ANALYSIS
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without the written consent of Pace Analytical Services, Inc.

Laboratory Certification IDs
LA Wastewater 04034
VA Drinking Water 213
FL NELAP E87627

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091

Lab Project Number: 9235042
Client Project ID: RT ENV-Harshville G2-12

OL DATA PARAMETER FOOTNOTES

EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

aboratory Control Sample (Duplicate)
atrix Spike (Duplicate)
ple Duplicate
detected at or above adjusted reporting limit
ot Calculable
timated concentration above the adjusted method detection limit and below the adjusted reporting limit
justed Method Detection Limit
Relative Percent Difference
Surrogate
covery falls outside of QC limits, however, this compound is not found in the associated samples.
e surrogate and/or spike recovery was outside acceptance limits.

ification IDs
12
Water 37706

REPORT OF LABORATORY ANALYSIS
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without the written consent of Pace Analytical Services, Inc.

Laboratory Certification IDs
LA Wastewater 04034
VA Drinking Water 213
FL NELAP E87627

Pace Analytical™
www.pacelabs.com

CHAIN OF CUSTODY

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

644023

Page: 1 of 1

Section A — Client Information:
Waters Edge Environmental
Greensboro
[illegible]525 5003 Fax 336 854 1199

Section B — Required Client Information:
Report To: Ed Kuhn
Copy To: Ed Kuhn
Invoice To: Ed Kuhn
P.O.
Project Name: RT ENV - Marshville
Project Number: 02-12

Client Information (Check quote/contract):
Requested Due Date:
TAT: STANDARD

* Turn around times less than 14 days subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.
Turn Around Time (TAT) in calendar days.

Section C — To Be Completed by Pace Analytical and Client
Quote Reference:
Project Manager: KBT
Project #: 923 5042
Profile #:
Requested Analysis: 8260

Section D — Required Client Information:

SAMPLE ID
One character per box.
(A–Z, 0–9 / .–)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

SAMPLE ID	MATRIX CODE	DATE COLLECTED (mm / dd / yy)	TIME COLLECTED (hh:mm a/p)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	8260	Remarks / Lab ID
SUI	SL	7/26/02	2:30pm	1	X								X	91191593

SHIPMENT METHOD	AIRBILL NO.	SHIPPING DATE	NO. OF COOLERS

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	[illegible] / Waters Edge	7/30/02	0820	[illegible] / PACE	7/30/02	0820
	[illegible]	7/30/02	1525	[illegible]	7/30/02	1525

SAMPLE CONDITION
Temp in °C: 3.1
Received on Ice: Y/N

SAMPLE NOTES

REFERENCE 21

Ref. 21

Soil Assessment Report
Former Universal Friction Composites Facility
Marshville, North Carolina
November 1, 2002

Prepared for

RT Environmental Services, Inc.
King of Prussia, Pennsylvania

Prepared by

Waters Edge Environmental, LLC
Greensboro, North Carolina

November 1, 2002

Mr. Gary R. Brown, P.E.
RT Environmental Services, Inc.
215 West Church Road
King of Prussia, Pennsylvania 19406

Reference: Soil Assessment Report
Former Universal Friction Composites Facility
Marshville, North Carolina
Waters Edge Job No. G2-20

Dear Mr. Brown:

Waters Edge Environmental, LLC (Waters Edge) is pleased to present this soil assessment report for the former Universal Friction Composites facility located in Marshville, North Carolina.

Waters Edge appreciates the opportunity to continue to provide consulting services to RT Environmental Services, Inc. If you have any questions or require any additional information, please contact me at (336) 852-5003.

Sincerely,

WATERS EDGE ENVIRONMENTAL, LLC

Edward M. Kuhn, L.G.
Branch Manager

GR2037/EMK/jlp

Soil Assessment Report
Former Universal Friction Composites Facility
Marshville, North Carolina
November 1, 2002

1 Introduction

Waters Edge Environmental, LLC (Waters Edge) has conducted soil assessment activities at the former Universal Friction Composites facility. (Universal) facility located in Marshville, North Carolina (see Figure 1). This soil assessment was conducted at the request of RT Environmental Services and The Phoenix Group in response to the reported burial of asbestos containing materials (ACMs) in an area located on the eastern portion of the Universal property, outside of the facility fence. The borings were located in an area that is currently grass and wooded. An area of equipment and debris apparently from the Universal facility is also located in this area. Waters Edge understands that several individuals with knowledge of the operation of the Universal facility have indicated in the past that ACMs were buried in the assessment area. Based on the reported burial of ACMs in this area, RT Environmental Services requested that Waters Edge conduct soil assessment activities in the area. The purpose of the soil assessment was to confirm or deny the presence of ACMs in the reported disposal area, and to also determine the extent of ACMs in the area.

2 Scope of Work

Waters Edge advanced 18 soil borings in the assessment area by direct-push sampling. The soil boring locations are shown in Figure 2. At the beginning of assessment activities, Waters Edge relied upon the recollection of Mr. Craig Helms (a former Universal employee) who indicated that ACMs were buried in four pits, each 30 feet wide by 150 feet long, on the eastern side of the facility inside the fence line. Mr. Helms indicated that the pits were up to 15 feet deep. Although the area of disposal described by Mr. Helms did not correlate with information previously obtained by Waters Edge, Waters Edge installed six soil borings (B-1 through B-6) in this area in an attempt to locate the pits Mr. Helms indicated. Probe refusal was encountered at depths ranging from 6.5 feet (B-5) to 14 feet (B-1). No obvious visual evidence of ACMs was noted in any of the borings in this area, although borings B-1 and B-3 contained a small amount of black fibrous material.

Waters Edge then continued assessment activities in the original assessment area to the east of the facility fence line. Waters Edge installed 14 additional soil borings (B-7 through B-20) in this area. Soil boring locations were limited by the debris and equipment described above, and by wooded areas and a sewer line. The locations of the soil borings are shown in Figure 2. Probe refusal was encountered at approximately 10 feet in each boring. Soil tubes were continuously collected from each soil boring. Each tube was visually examined for the presence of fibrous material. Soil samples were

collected from ten selected soil borings that would allow the extent of the ACMs to be delineated. A total of ten soil samples were collected for laboratory analysis of ACMs by polarized light microscopy (PLM).

Following the completion of soil sampling activities, each soil sample location was filled with bentonite powder.

3 Soil Assessment Results

The analytical results of the samples collected from the selected soil borings are summarized in Table 1. The complete analytical report is contained in Appendix C. Cover material in the assessment area was approximately three to four feet in thickness. Fibrous materials in each boring were encountered between four and eight feet in each boring, and the thickness of the material ranged between two and four feet. Native soils were encountered from eight feet to refusal at approximately ten feet.

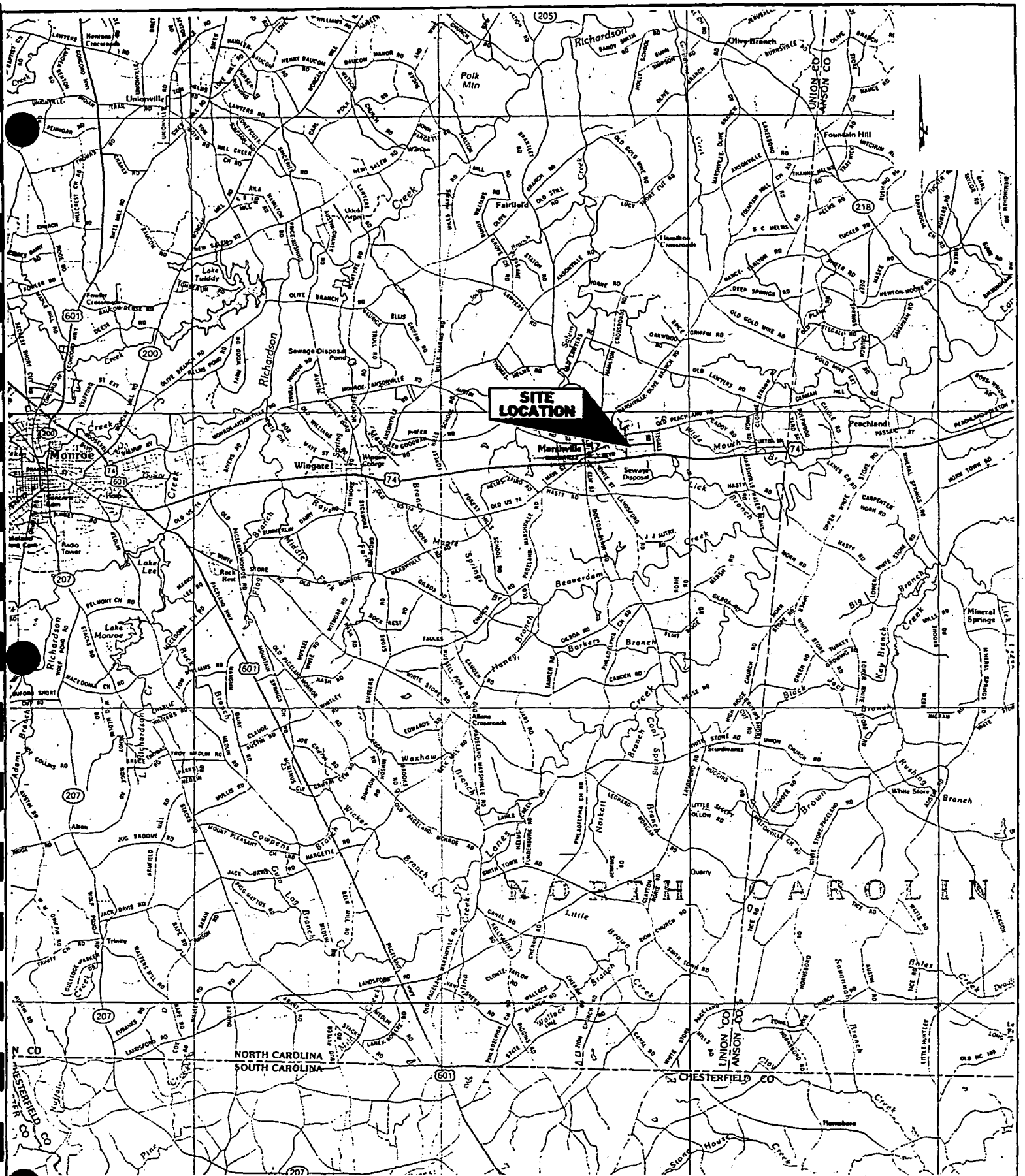
3.1 Laboratory Analytical Results

One soil sample from ten selected soil borings was collected for laboratory analysis based on visual examination of soil tubes. Soil samples from borings with no observable evidence of fibrous materials were not selected for laboratory analysis, except to provide horizontal extent of the ACMs. The analytical results for each sample are summarized in Table 1. ACMs (chrysotile) were detected in the samples collected from borings B-7, B-8, B-9, B-10, B-11, and B-14. No ACMs were detected in samples collected from borings B-16, B-17, B-18, or B-20. Figure 2 illustrates the soil boring locations and the estimated extent of ACMs in this area of the site. The analytical report is contained in Appendix A.

4 Conclusions and Recommendations

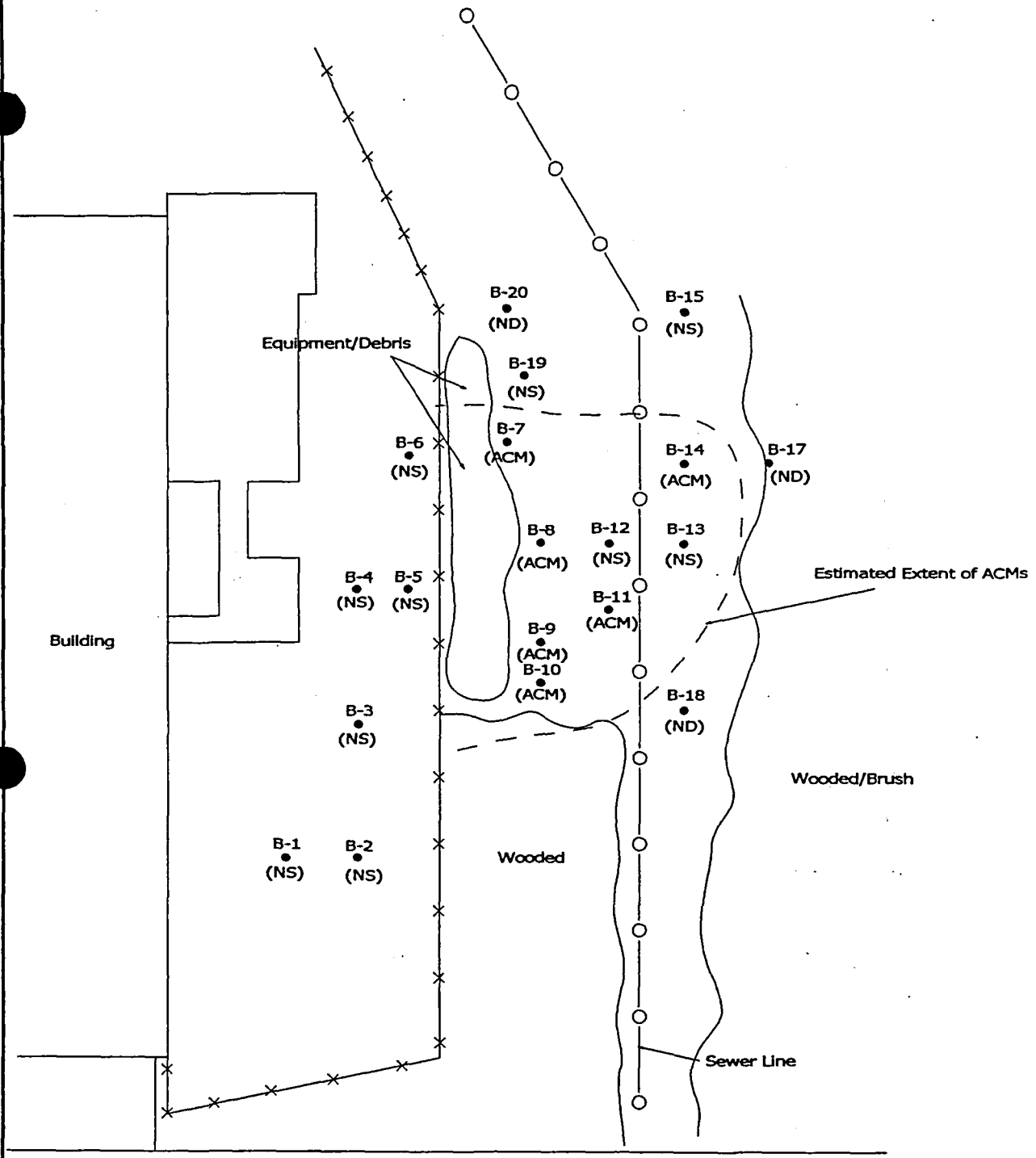
The analytical results from the soil samples submitted for analysis indicate an area containing ACMs at the facility. This area is approximately 80 feet by 90 feet, although access to the southern portion of the assessment area was limited by wooded areas.

Based upon recent conversations with the North Carolina Department of Environment and Natural Resources, Waters Edge recommends that the recently discovered area of ACMs be included in the planned deed recordation for the facility. This would involve a survey of the ACM area by a registered land surveyor, preparing a map indicating the area of ACMs, and recording the map with the Union County Register of Deeds Office and Tax Assessors Office.



Author	Drawing	Layers	Date	Title
JLP			1-31-01	Site Location Map
Job No.	Revision	Figure	Scale	Project
G1-16		1	1" = 12000'	Former Universal Friction Facility Marshville, North Carolina

Waters Edge Environmental, LLC



Legend

B-18 ● Soil Boring Location

NS = Not Sampled

ACM = Asbestos Containing Material

ND = Not Detected

Waters Edge Environmental, LLC	Author JLP	Drawing	Layers	Date 10-29-02	Title Soil Boring Location Map
	Job No. G2-20	Revision	Figure 2	Scale 1" = 40'	Former Universal Friction Composites Facility Marshville, North Carolina

Table 1. Soil Assessment Results, Former Universal Friction Composites Facility, Marshville, North Carolina

Boring ID	Sample Depth (ft)	Asbestos Detected	Asbestos Type
B-7	3-6	Y	Chrysotile
B-8	6-8	Y	Chrysotile
B-9	4-8	Y	Chrysotile
B-10	6-8	Y	Chrysotile
B-11	4-8	Y	Chrysotile
B-14	4-8	Y	Chrysotile
B-16	4	N	--
B-17	4	N	--
B-18	4	N	--
B-20	4	N	--

Notes:

Analytical Laboratory: EMSL Analytical, Inc.

Waters Edge Job No. G2-20

EMSL Analytical, Inc.

620 G Guilford College Road
Greensboro NC 27409
Phone: 336-297-1487
Fax: 336-297-1676

Waters Edge Environmental
302 L Pomona Dr.
Greensboro, NC 27407

Date: 10/28/02
Billing Number: NC024626

Project **Marshville 62-20**

POLARIZED LIGHT MICROSCOPY (PLM)
Qualitative Analysis
Asbestos in Soil

SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE LOCATION	ASBESTOS DETECTED	ASBESTOS TYPE
B-7	3'-6'		Yes	Chrysotile
B-8	6'-8'		Yes	Chrysotile
B-9	4'-8'		Yes	Chrysotile
B-10	6'-8'		Yes	Chrysotile
B-11	4'-8'		Yes	Chrysotile
B-14	4'-8'		Yes	Chrysotile
B-16	0'-4'		No	
B-17	4'		No	
B-18	4'		No	
B-20	4'		No	

RECEIVED

Sharon Donald

Analyst

Nathaniel Lanham

Laboratory Director

Disclaimers: EMSL recommends that soil samples reported as "NO" be tested by EMSL's MSD 9000 method.
This report may not be duplicated except in full without written permission by EMSL Analytical, Inc. This report relates only to the samples reported above.

EMSL Analytical, Inc.
Revised July 1, 1999

CHAIN OF CUSTODY

Asbestos

NC024626

EMSL Rep: Nathaniel Durham

Third Party Billing requires written authorization from third party

Your Company Name:	Waters Edge Environmental	EMSL-Bill to:	Ed Kuhn
Street:	302 L Pomona Drive	Street:	302 L Pomona Drive
Box #:		Box #:	
City/State:	Greensboro NC Zip: 27407	City/State:	Greensboro NC Zip: 2740
Phone Results to:		Fax Results to:	
Name:	Ed Kuhn	Name:	Ed Kuhn
Telephone #:	852 5003	Fax #:	854 9199
Project Name/Number:	Marshville 62-20	Purchase Order #:	62-20

MATRIX

☐ Air	☐ Floor Tile	☒ Soil	
☐ Bulk	☐ Drinking Water	☐ Dust	
☐ Wipe	☐ Wastewater	☐ Micro-Vac	

TURNAROUND

☐ 3 hrs	☐ 6 Hours	☐ Same Day or 12 Hours*	☐ 24 Hours 1 day
☐ 48 Hours 2 days	☐ 72 Hours 3 days	☐ 96 Hours 4 days	☐ 120 Hours 5 Days
☒ 144+ hours 6-10 Days			

TEM AIR, 3 hours, 6 hours, Please call ahead to schedule. There is a premium charge for 3 hour tat, please call 1-800-220-3675 for price prior to sending samples. You will be asked to sign and authorization form for this service. 12 hours (must arrive by 11:00 a.m Mon - Fri..), Please Refer to Price Quote

PCM - Air
- ☐ NIOSH 7400
- ☐ OSHA
- ☐ Other:

TEM AIR
- ☐ AHERA
- ☐ NIOSH 7402
- ☐ EPA Level II

TEM WATER
- ☐ Wastewater
- ☐ Drinking Water EPA 100.
- ☐ Water - NY Wastewater
- ☐ Water-NY Drinking Wate:

PLM - Bulk
- ☐ EPA 600/R-93/116
- ☐ EPA Point Count
- ☐ NY Stratified Point Count
- ☐ PLM NOB (Gravimetric) NY 198.1
- ☐ Other:

TEM BULK
- ☐ Drop Mount (Qualitative)
- ☐ Chatfield
- ☐ TEM NOB (Gravimetric) NY 198.4

TEM MICROVAC / WIPE
- ☐ ASTM D 5755-95 quantitativ method

XRD
- ☐ Asbestos
- ☐ Silica

SEM Air or Bulk
- ☐ Qualitative
- ☐ Quantitative

OTHER
- ☐

SAMPLE NUMBER	LOCATION	VOLUME (If Applicable)

Client Sample # (s) _____ - _____ Total Samples #: 10

Relinquished: R.O. Crawford III Date: 10/21/02 Time: 1100

Received: Lindsey Powell Date: 10/21/02 Time: 11AM

EMSL Analytical, Inc.
Revised July 1, 1999

CHAIN OF CUSTODY

Asbestos

NC0246.26

SAMPLE NUMBER	LOCATION	VOLUME (If Applicable)
B-7	3'-6'	
B-8	6'-8'	
B-9	4'-8'	
B-10	6'-8'	
B-11	RAC [redacted] 4'-8' 10/21/02	
B-14	4'-8'	
B-16	0'-4'	
B-17	4'	
B-18	4'	
B-20	4'	

REFERENCE 22

Ref. 22

Michael F. Easley, Governor
William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Alan W. Klimek, P.E. Director
Division of Water Quality

GROUNDWATER SECTION
May 7, 2003

ix Group
Virginia Ave. NW
atergate Suite 606
ngton, DC 20037
tion: Gary Silversmith

Subject: No Further Action
Former Universal Friction Composites Facility
Groundwater Incident No. ~~13057~~ 8 6 2 15 mat
Union County, N.C.

Mr. Silversmith:

Based on the soil sampling results received in this office on May 6, 2003, no further action is ed at this time. Should new information become available concerning this matter, we reserve the t to reopen the investigation.

e appreciate your cooperation throughout this investigation. If you have any questions or d additional information, please contact me at (704) 663-1699. Thank you.

Sincerely,

Peggy Finley

Margaret A. Finley
Hydrogeological Technician

Groundwater Section-Raleigh
Ed Kuhn, L.G. - Waters Edge Environmental, 302 Pomona Dr. Suite L, Greensboro, NC 27407

F/universal.nfa

REFERENCE 23

Ref. 23

WATERS EDGE ENVIRONMENTAL, LLC
302 POMONA DRIVE, SUITE L • GREENSBORO, NC 27407 • PHONE 336.852.5003 • FAX 336.854.9199

RECEIVED
MAY 16 2003
NC DEPT. OF ENVIRONMENT AND NATURAL RESOURCES MOORESVILLE REGIONAL OFFICE

May 15, 2003

Mr. James Bealle
North Carolina Department of Environment and Natural Resources
Division of Waste Management
Mooresville Regional Office
919 N. Main Street
Mooresville, North Carolina 28115

Reference: Former Universal Friction Composites Facility
Unarco Road
Marshville, North Carolina

Dear Mr. Bealle:

In reference to our most recent telephone conversation, Waters Edge Environmental, LLC (Waters Edge), on behalf of The Phoenix Group, LLC, has completed the revised survey of two areas of buried asbestos material recently discovered at the above-referenced facility. In addition, the presence of both areas of buried asbestos material at the site have been surveyed and recorded at the Union County Register of Deeds office. This survey has been recorded in Plat Cabinet H, File 476. A copy of the surveyed areas is attached. As you will recall, both areas of buried asbestos are covered with either several feet of soil or a concrete floor and roof, and are considered immobile. Therefore, in our opinion, the presence of this buried material does not represent a threat to public health or the environment, unless they are disturbed.

Waters Edge appreciates the attention that you have given to this matter. If you have any questions or require any additional information, please contact me at (336) 852-5003.

Sincerely,

WATERS EDGE ENVIRONMENTAL, LLC

Edward M. Kuhn, L.G.
Senior Project Manager

GL3014/EMK/jlp

STATE OF NORTH CAROLINA
COUNTY OF UNION

I, Nancy J. Sandler, REVIEW OFFICER OF UNION COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

DATE 5/8/03 REVIEW OFFICER

FILED FOR RECORD THIS 8 DAY OF May, 2002, AT 2:55 A.M.,
IN PLAT CAB. H FILE 476
JUDY G. PRICE, REGISTER OF DEEDS
BY Sandy J. Cox ASST/DEPT.

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

LINE TABLE		
No.	BEARING	LENGTH
L1	S03°45'54"W	28.30
L2	S86°49'00"E	105.30
L3	N00°06'59"E	12.00
L4	S89°14'01"E	32.00
L5	S00°06'59"W	50.00
L6	N89°14'01"W	15.00
L7	S00°06'59"W	22.00
L8	N89°14'01"W	17.00
L9	S09°52'49"E	38.67

CLAYTON DEESE 322-175 NOW OR FORMERLY
EMMA T. HIGH 217-95 NOW OR FORMERLY
KATHERINE G. HELMS 144-513 NOW OR FORMERLY
CHARLES F. HALLMAN 239-871 NOW OR FORMERLY
McCOY ELLISON REALTY, INC. 217-412 NOW OR FORMERLY
DOUGLAS BOYCE HIGH 290-062 NOW OR FORMERLY
JAMES R. DRYE 244-847 NOW OR FORMERLY
MARY H. MANES 258-149 NOW OR FORMERLY
JAMES SNEED 154-509 NOW OR FORMERLY
UNION COUNTY INDUSTRIAL FACILITIES NOW OR FORMERLY

TRAYWICK ROAD 60' R/
S 85°54'01" E 977.50
FOUND IRON
FOUND RR SPIKE IN PAVT
FOUND OLD IRON
'OS PLANT ROAD 40' R/W
ASB
N 03°15'47" E 814.82
S03°45'55"E
OLD 1 STORY BRICK COMM. BLDG.
UNPERMITTED WASTE DISPOSAL AREA (INCLUDES ASBESTOS CONTAINING WASTE)
N89°29'08"E 87.70
S00°30'52"E 94.45
89°29'08"W 87.70
S 71°33'07" E 378.54 (TIE)
S 81°11'04" E 865.78 (TIE)
S89°25'00"W 1080.00'
N89°25'00"E
FOUND IRON
FOUND NAIL & INT OF RD & RR TRACK
200'
150'
250'
SEABOARD COASTLINE RAILROAD

THE PURPOSE OF THIS SURVEY IS TO SHOW THE LOCATION OF UNPERMITTED WASTE DISPOSAL AREA. THE BOUNDARY INFORMATION ON THIS PLAT WAS TAKEN FROM A SURVEY BY ME DATED 8-7-1984.

CARROLL L. RUSHING 3-8-03 DATE

VICINITY MAP
NOT TO SCALE
OLD PEACHLAND RD
TRAYWICK RD
SITE
STEGALL RD

Carroll L. Rushing

SURVEY SHOWING UNPERMITTED WASTE DISPOSAL AREA (INCLUDES ASBESTOS CONTAINING WASTE)

THE PROPERTY OF RAYMARK INDUSTRIES, INC.

TOWN OF MARSHVILLE UNION COUNTY, N.C.
SCALE: 1" = 100' DATE MAY 7 2003

REFERENCE 24

RECEIVED
SEP 1 8 2003
NC DEPT OF ENVIRONMENT
AND NATURAL RESOURCES
MOORESVILLE REGIONAL OFFICE

Ref. 24

RECEIVED
N.C. DENR
SEP 1 1 2003
Winston-Salem
Regional Office

CERTIFIED MAIL 7001 2510 0004 8286 7843
RETURN RECEIPT REQUESTED

July 23, 2003

Raymark Industries, Inc.
d.b.a. Phoenix Group, L.L.C.
2600 Virginia Avenue NW
The Watergate, Suite 606
Washington, DC 20037
Attn: Gary Silversmith

Dear Mr. Silversmith:

RE: Closure Notice - Unpermitted Solid Waste Disposal Site
Union County, Non-Facility

Enclosed is a Closure Notice for the unpermitted solid waste disposal site located off Unarco Road, in the Town of Marshville, Union County, North Carolina. Also, attached is a list of instructions that need to be completed regarding same.

If you have any questions, please do not hesitate to contact me at (336) 771-4600, ext. 209.

Sincerely,

Brent S. Rockett

Brent S. Rockett
Western District Supervisor
Solid Waste Section

BSR:wr

Enclosures: Instruction List
Closure Notice
cc: Mark Poindexter, Field Operations Branch Head

INSTRUCTION LIST FOR CLOSURE NOTICE

1. Have Owner sign Closure Notice and Owner's signature notarized.

2. Record map at the Register of Deeds Office.

3. Indicate Map Book and Page Numbers (by Register of Deeds Office prior to filing Closure Notice).

4. Record Closure Notice by Register of Deeds Office.

5. Return completed Closure Notice to:

   Solid Waste Section
   Division of Waste Management
   North Carolina Department of Environment and Natural Resources
   585 Waughtown St.
   Winston-Salem, N.C. 27107

CLOSURE NOTICE

STATE OF NORTH CAROLINA

COUNTY OF UNION

BEFORE THE DIVISION OF WASTE MANAGEMENT
DEPARTMENT OF ENVIRONMENT AND
NATURAL RESOURCES

IN RE:	)	
	)	NOTICE OF CLOSED
PROPERTY OF RAYMARK INDUSTRIES, INC.	)	UNPERMITTED
d.b.a. PHOENIX GROUP, L.L.C.	)	SOLID WASTE
	)	DISPOSAL SITE

NOTICE IS HEREBY GIVEN THAT SOLID WASTE HAS BEEN BURIED ON THE HEREINAFTER DESCRIBED PROPERTY OF:

RAYMARK INDUSTRIES, INC. d.b.a. PHOENIX GROUP, L.L.C. AT THE LOCATION DESCRIBED UPON THE MAP PREPARED BY CARROLL L. RUSHING, N.C.R.L.S., PROFESSIONAL LAND SURVEYOR, AND RECORDED IN _____, _____, UNION COUNTY REGISTRY.

"SCHEDULE A"

BEGINNING at a concrete monument located in the westerly line of County Road # 1738, being also 50 feet measured in a northernly direction from the center of the main line track of the Seaboard Coast Line Railroad, and running thence with the westerly line of County Road # 1738 North 3 degrees 30 minutes East 816.1 feet; thence crossing County Road # 1738 and within the boundaries of Traywick Road, South 85 degrees 50 minutes East 977.5 feet; thence South 3 degrees 50 minutes West 28.30 feet to the northerly line of the property conveyed by Johns-Manville Products Corporation to Raybestos-Manhattan, Inc. By deed registered in Book 229, Page 449, Union County Registry; thence with a line of said property South 86 degrees 45 minutes East 105.3 feet; thence South 4 degrees 05 minutes West 700.4 feet to an iron stake in the northerly line of the right of way of the Seaboard Coast Line Railroad; thence with the same South 89 degrees 29 minutes West 108.0 feet to the Beginning, containing 18.95 acres according to a survey made by Ralph W. Elliott, R.L.S., dated November 13, 1969.

When the property, or any part of this property on which solid waste has been buried, is conveyed, grantor shall place the following language upon the deed, in no smaller type than that used in the body of the deed:

"This is notification that solid waste has been disposed on the property. See Closure Notice Recorded at Book _____, Page _____. Questions concerning this matter may be directed to the North Carolina Department of Environment and Natural Resources, Division of Waste Management, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646."

This Closure Notice is not a permit for solid waste disposal, and is not to be construed as a permit for a disposal facility. The site has never been a permitted solid waste disposal site, and has come to the attention of the Solid Waste Section in the context of closure of non-conforming sites/open dumps, pursuant to 15A N.C. Admin. Code 13B .0502.

The sole purpose of recording this closure notice is to give actual and constructive notice to subsequent purchasers of the property described herein, in order to reduce any risk to public health or the environment from the improper disturbance of the waste.

After recording, this original instrument, affixed with the seal of the Register of Deeds, together with the date, book and page number of recording, shall be returned to:

Solid Waste Section
Division of Waste Management
North Carolina Department of Environment and Natural Resources
585 Waughtown Street
Winston-Salem, North Carolina 27107

Brent S. Rockett

Brent S. Rockett
Western District Supervisor
Solid Waste Section

Gary Silversmith
Raymark Industries, Inc.
d.b.a. Phoenix Group, L.L.C.

NORTH CAROLINA

Iredell COUNTY

I, Lisa L. Murdock, a Notary Public for said County and State,

do hereby certify that Brent S Rockett personally appeared before
(Western District Supervisor, Solid Waste Section, North Carolina Department of Environment and Natural Resources)
me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the 22nd day of July, 2003.

(OFFICIAL SEAL)

Lisa L. Murdock
Notary Public

My commission expires: June 8, 2008.

~~NORTH CAROLINA~~

District of Columbia ~~COUNTY~~

I, _____, a Notary Public for said County and State,

do hereby certify that Gary Silversmitt personally appeared before

me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the 10th day of September, 2003.

(OFFICIAL SEAL)

Evangeline Butler Shelvine
Notary Public

My Commission Expires
December 14, 2005

My commission expires: _____, 20 _____.

North Carolina Department of
Environment and Natural Resources
585 Waughtown Street
Winston-Salem, NC 27107-2241

13-15-01
WINSTON-SALEMENR/WSRO Office

MOORESVILLE REGIONAL OFFICE
TO: James Beall SOLID WASTE
919 N. MAIN STREET
MOORESVILLE, NC 28115
COURIER #09-08-06

REFERENCE 25

Ref. 25

October 7, 2003

Mr. Gary Silversmith
The Phoenix Group, LLC
2600 Virginia Avenue NW
The Watergate Suite 606
Washington, DC 20037
(202) 337-7300 Fax (202) 429-5290

RE: **NCDENR APPROVAL OF ACM CLOSURE AREAS**
RT PROJECT #2834-04

Dear Mr. Silversmith:

We are pleased to report that the North Carolina Solid Waste Section, Division of Waste Management of the North Carolina Department of Environment and Natural Resource has approved in-place closure for the asbestos containing material burial areas at the Marshville facility. The only remaining step needed is for the Deed Notices to be placed, and to be returned to the NCDENR.

As these areas are already covered, the buried material does not represent a hazard. As NCDENR has approved the closure in-place, and determined that No Further Action is needed this issue is not of further concern, and no further study is recommended.

Further, we are pleased to report, that since this is the last issue to be addressed, that there are other environmental issues at the Marshville facility which appear to be of further concern at this time.

We have appreciated the opportunity to be of service at the Marshville facility; please call if any questions.

Very truly yours,

RT ENVIRONMENTAL SERVICES, INC.

Gary R. Brown, P.E.
President

Edward Kuhn, L.G.
Waters Edge Environmental

GRB/jw
RT Projects\2834-04\28340400.wpd

cc: D. Lashley - Green Vest

REFERENCE 26

Ref. 26

WATERS EDGE ENVIRONMENTAL, LLC
4901 WATERS EDGE DRIVE, SUITE 201 • RALEIGH, NC 27606 • PHONE 919.859.9987 • FAX 919.859.9930

January 27, 2004

Mr. Julian Foscue
Solid Waste Section
Division of Solid Waste Management
NCDENR
858 Waughtown Street
Winston-Salem, NC 27107-2241

RECEIVED
JAN 2 9 2004
NC DEPT OF ENVIRONMENT
AND NATURAL RESOURCES
MOORESVILLE REGIONAL OFFICE

Reference: Recordation of Asbestos Disposal Area
Former Universal Friction Composites Facility
Marshville, NC
Waters Edge Job No. R4-05

Dear Mr. Foscue:

We are pleased to submit the deed recordation information to close out the issue of covered asbestos on company property. Based on February 13, 1997 correspondence from Mr. Rick Doby (NCDENR- Mooresville Regional Office), he required that a map depicting the past asbestos disposal area (labeled as an unpermitted solid waste disposal site) be recorded with the register of deeds affixed with the Register's seal with the book and page number and sent to your office. I have included these requirements as part of the February 13, 1997 document in Appendix A and the map is contained in Appendix B.

Waters Edge appreciates the opportunity to provide environmental consulting services to the Phoenix Group. As this closes out this issue, the Phoenix Group should maintain this documentation in the permanent site records. If you have any questions regarding the information contained herein, please do not hesitate to contact our office at (919) 859-9987.

Sincerely,

WATERS EDGE ENVIRONMENTAL, LLC

Phillip L. Rahn
President

cc: Gary Silversmith- The Phoenix Group (w/o Appendix B)
Gary Brown- RT Environmental (w/o Appendix B)
Rick Doby- NCDENR-Mooresville Regional Office (w/o Appendix B)

04-014

State of North Carolina
Department of Environment,
Health and Natural Resources
Mooresville Regional Office

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary

DEHNR

DIVISION OF SOLID WASTE MANAGEMENT

February 13, 1997

Mr. William L. Stogner, Plant Manager
Universal Friction Composites
Post Office Box 429
Marshville, North Carolina 28103

RE: Asbestos Disposal

Dear Mr. Stogner:

Thank you for your recent reply of January 30, 1997 acknowledging the possibility of buried asbestos on company property in Marshville, North Carolina.

I now recommend that you conduct a subsurface investigation of the suspect area to be certain that disposal of asbestos actually took place and for determining the boundaries of the disposal area. Once this information is obtained and you are certain of a disposal area, NOTIFICATION and RECORDATION is required.

By May 1, 1997, record a Notice of Unpermitted Solid Waste Disposal Site with the Union County Register of Deeds. The procedure for recording the Notice of Unpermitted Site follows:

The landowner(s) shall:

A. Submit to the Section an entire copy of the property deed giving the complete legal description of the property as it is registered in the index of the county where the land is located. The description will either be by metes and bounds or by reference to a recorded plat map.

B. Submit to the Section a plat of the land prepared by a registered land surveyor in with N.C.G.S. 47-30.

Mr. William L. Stogner
February 13, 1997
Page Two

The map must show:

(1) Name of owner, property lines, north arrow, scale and bearings and distances taken from the deed.

(2) Disposal area delineated.

(3) Certification and seal by registered land surveyor.

Items A and B should be sent to Mr. Rick Doby, Waste Management Specialist, Solid Waste Section, Division of Waste Management, DEHNR, 919 North Main Street, Mooresville, North Carolina 28115, telephone (704) 663-1699, ext. 310.

C. The Section will prepare a "Notice of Closed Unpermitted Solid Waste Disposal Site," which the landowner(s) shall sign and acknowledge in the form prescribed by N.C.G.S. 47-38 through 47-43.

The landowner(s) must file the Closure Notice, with the map attached where appropriate, with the Register of Deeds in the county or counties where the land is located. If the map is too large to be reduced legibly to legal size, it shall be recorded in the map index, and the Closure Notice shall reference the separately recorded plat.

The Register of Deeds shall record the Notice in the Grantor Index under the name(s) of the owner(s) of the land. After recording, the Register of Deeds shall mail the original notice instrument, affixed with the Register's seal, together with the book, page number, and the date of recording, to:

Julian M. Foscue, III
Solid Waste Section
Division of Solid Waste Management
DEHNR
585 Waughtown Street
Winston-Salem, N.C. 27107-2241

910-771-4600
ext 209

If you have any questions concerning this matter, please call me at (704) 663-1699.

Sincerely,

C. Rick Doby/kr

C. Rick Doby, Sr.
Waste Management Specialist

cc: Julian Foscue, III - WSRO
Phil Prete - Raleigh Office (N/F Union County)
Tom Ward, RS - Union County Env. Health

CRD/kr

REFERENCE 27

Ref. 27

NCDENR

North Carolina Department of Environment and Natural Resources

Dexter R. Matthews, Director

Division of Waste Management

Michael F. Easley, Governor

William G. Ross Jr., Secretary

July 27, 2004

Ms. Jennifer Wendel
NC Site Management Section
US EPA Region IV Waste Division
Atlanta Federal Building
61 Forsyth St., 11th Floor
Atlanta, GA 30303-3104

Subject: CERCLIS Site Addition Letter
(Pre-CERCLIS Site Screening)
Universal Friction Composites
NCD 049 768 658 (RCRA Handler ID)
Marshville, Union Co., NC 28103

CERCLA ID: NCD ϕϕϕ 4ϕ7 827

Dear Ms. Wendel:

From the findings of this pre-screening, it is recommended that the subject site be listed for further investigation under CERCLA.

1. The coordinates of the site are 34° 59' 19" north latitude and 80° 21' 15.30" west longitude (Ref. 1). The 18.95-acre Universal Friction Composites site (Ref. 3, p. 1), a former asbestos brake manufacturing facility, is bordered by railroad tracks to the south, Unarco Road to the West, Trawick Road to the north, and an unidentified industrial facility to the west (Ref. 3, p. 1). Residential property and a Day Care center are within 200' of the facility property (Ref. 3, p. 4).

2. The site is currently vacant, overgrown, and accessible to pedestrians and vehicles (Ref. 2). The building was constructed in 1940 (Ref. 3, p. 2), and asbestos operations were underway by 1944 (Ref. 4). Closure date of the facility is unknown at this time, but it was in operation as recently as 2000 (Ref. 5). Bankruptcy was filed in April 2004 (Ref. 2, p. 1).

3. A waterline is available in the vicinity (Ref. 3); a reconnaissance to determine the nearest drinking water well has not been conducted.

4. The property is gently sloping toward the southeast (Ref. 1). The parcel map shows that the headwaters of a stream is on the site property (Ref. 3, p. 1), but the USGS topograph map shows that overland flow from the site enters an unnamed tributary to Lick Branch about 1,500' downgradient from the site property (Ref. 1, p. 2). A reconnaissance to determine the exact point where surface water begins was not conducted. The unnamed tributary flows southerly for about 2,500' until it enters Lick Branch. At the mouth of this unnamed tributary is a sewage disposal pond. Lick Branch flows easterly for 2.5 miles and enters Lane's Creek. Lane's Creek flows in a general northeasterly direction. The 15 mile surface water pathway ends on Lane's Creek, about 1 mile downstream of Rt. 218 near Griffin's Crossroads, NC.

5. The 1925 Sanborn Fire Insurance map of the Town of Marshville was reviewed and no asbestos facility was noted. A review of the NC Directory of Manufacturing Firms shows the following facilities were in operation on this site property on the below-listed dates of publication (Ref. 4):

   1944 – Carolina Asbestos Co.
   1956 – 1964 – Union Asbestos and Rubber
   1968 – Johns Manville Products

   Other names associated with this facility are as follows:

   1988 – Raybestos-Manhattan (Ref. 6)
   Raymark (Ref. 2)
   Universal Friction Composites

   The US EPA Facility Registry System shows that on September 13, 1988, the facility was known as Raybestos-Manhattan, Inc. (NCD 049 768 658) on Asbestos-Plant Road, Marshville, NC (Ref. 6). Discussions with Carolyn Haigler, Tax Collector, Union County, revealed that Unarco Road was formerly called Asbestos Plant Road, and that before the facility operated as Universal Friction Products, it also operated under the name of Raymark (exact operational dates unknown at this time) (Ref. 2). The facility last operated under the name of Universal Friction Composites, and this is the name currently painted on the closed facility's door (Ref. 2, p. 2). The Property owner listed in August 2001 was the Phoenix Group III LLC, out of Washington, DC (Ref. 3, p. 1).

6. A review of current NPL (nationwide) sites shows two Superfund sites at former Raymark facilities – one in Stratford, CT (Raymark Industries, Inc.; CTD001186618) (Ref. 8) and one in Hatboro, PA (Raymark; PAD039017694) (Ref. 9). A RCRA corrective action is being conducted at another former Raymark / Universal Friction facility in Manheim, PA (Ref. 7).

7. In December 2000, most of the Manheim, PA Raymark property (formerly Universal Friction) was purchased by Phoenix Group, also an owner associated with the Marshville, NC property. The Manheim property is described as being part of the Raybestos-Manhattan Inc. plant operations that manufactured friction product material including automotive brake linings, clutch facings and other specialized friction products since 1908 (Ref. 7, p. 2). At the Pennsylvania site, lagoons received scrubber sludge from the mill dust collectors, containing lead and asbestos waste. Practices at the Pennsylvania facility included excavation of the accumulated material from the lagoons, loading it onto railroad cars, and taking it to lead smelters for recycling (Ref. 7, pp. 1 – 5).

8. The 34-acre Stratford, CT Raymark Industries site operated from 1919 until 1989 (Ref. 8, p. 1). The description of manufactured items is identical to those described for the Manheim, PA property. Contaminants of concern include lead, asbestos, solvents, dioxins and PCBs. The Stratford, CT facility also used a system of lagoons to capture waste lead and asbestos dust. Dredged materials from the lagoons were landfilled at numerous and other locations in the town of Stratford, CT, including a ballfield. Forty one residential properties have been contaminated with waste from the Connecticut Raymark site (Ref. 8)

9. The Hatboro, PA Raymark facility did not have a similar operational history; it was primarily a machine shop manufacturing pens and fasteners (Ref. 9).

10. The rear of the Marshville, NC facility does not show ponds or lagoons; however, the topography appears graded and unnatural (Ref. 2, p. 1). There is a pad-locked gate in the chain-link fence at the rear of the facility, and the gate is wide enough for a truck to drive through. Behind the fence, some scrap metal is visible in the tall weeds. Given the operational history of two sister facilities and the appearance of the property at the rear of the Marshville, NC site, investigation into potential past lagoons at the rear of the property is recommended.

11. The NC Groundwater Section reports that one Notice of Violation (NOV) was issued to Universal Friction due to soil contamination from an above ground storage tank (AST) release. Phoenix Group responded to this NOV (Ref. 5).

This site likely contains high levels of lead and asbestos, and has the potential to contain solvents and other contaminants. These contaminants may have been released to groundwater and surface water, and may have been distributed to nearby property. There is residential property and a Day Care Center within 200' of the facility property. The NC Superfund Section recommends that the site be added to CERCLIS so that we may initiate a combined PA/SI at the site. Attached are the Pre-CERCLIS Screening Assessment Checklist / Decision Form and References.

Please feel free to contact either Jeanette at (919) 733-2801 ext. 318 or Jim at ext. 290, or <jeanette.stanley@ncmail.net> if you have any questions.

Sincerely,

Jeanette Stanley,
Environmental Chemist II
NC Superfund Section

Jim Bateson, Head,
Site Evaluation and Removal Branch
NC Superfund Section

Attachments
cc: Scott Ross, file
cc: (letter only)
Charlotte Jesneck
Doug Holyfield

Approved by:_____Date:_____
Jennifer Wendel, NC Site Management Section

LIST OF REFERENCES:

1. US Environmental Protection Agency, "Standard Operating Procedure to Determine Site Latitude and Longitude Coordinates," 1991. Calculation worksheet for Universal Friction. 2 pages
2. Stanley, Jeanette, Environmental Chemist, NC Superfund Section, Memo to file, July 27, 2004. SUBJECT: Universal Friction Initial visit. 6 pages.
3. Union County Parcel Information on Universal Friction Composites and surrounding properties. (Data last updated August 1, 2001.) July 27, 2004. 4 pages.
4. NC Directory of Manufacturing Firms, NC Department of Labor, Division of Statistics – 1944, 1956, 1960, 1964, 1968. Not attached.
5. Finley, Peggy, NC DWQ, Ground Water Section, email to Jeanette Stanley. July 21, 2004. 1 page.
6. US EPA Facility Registry System, Facility Detail Report, Raybestos-Manhattan (NCD 049 768 658). July 21, 2004. 2 pages.
7. Raymark Industries, Inc. (Formerly Universal Friction), RCRA Corrective Action Facility, "Current Progress at the Site". December 30, 2003; and "Composites: An Insider's Technival Guide to Corporate America's Activities, "Universal Friction Composites". 5 pages.
8. Raymark Industries, Inc., Stratford, Connecticut, Fact Sheet, NPL Site Narrative, and Site Description. 15 pages.
9. Raymark, Hatboro, Pennsylvania, NPL Site Narrative. 2 pages.

SITE DISCOVERY FORM
Part I: Information necessary to add a site to CERCLIS
ACTION:
EPA ID: NCD 049 768 658
SITE NAME: Universal Friction Composites SOURCE: T (R=EPA, T=STATE)
STREET: Unarco Rd. CONG DIST: 9
CITY: Marshville ZIP: 28103
CNTY NAME: Union Co. CNTY CODE: 90
LATITUDE: 34° / 59' / 19" LONGITUDE: 80° / 21' / 15.30"
INVENTORY IND: REMEDIAL IND: REMOVAL IND: FED FAC IND: N
RPM NAME: RPM PHONE:

SITE DESCRIPTION: The former asbestos brake manufacturing facility began operation around 1940. Bankruptcy was filed in April 2004. The approximately 19-acre site is vacant and accessible to the public, both by vehicle and pedestrian traffic. The 42,500 square foot building is open and white, fibrous material is visible within the building. The site contains one vertical, approximately 60,000 gallon AST and two horizontal, approximately 20,000 gallon ASTs. There is residential property and a Day Care Center within 200' of the facility property. There are waterlines near the facility; a reconnaissance to locate the nearest drinking water well has not been conducted.

Two sister facilities in Pennsylvania and Connecticut are NPL sites. Contaminants of concern include lead, asbestos, and solvents. One of these two NPL sites also contains SVOCs, PCBs and dioxins. The two sister facilities have been found to contain old, backfilled lagoons. From topography and appearances, this Marshville, NC site likewise contains backfilled lagoons.

Site runoff generally flows to the southeast and enters Lick Branch. Lick Branch flows easterly for 2.5 miles and enters Lane's Creek. Lane's Creek flows in a general northeasterly direction. The 15 mile surface water pathway ends on Lane's Creek, about 1 mile downstream of Rt. 218 near Griffin's Crossroads, NC.

Part 2: Other site information
DATE SITE FIRST REPORTED: 07/19/04 REPORTED BY: State (NC Superfund Section)

REASON FOR LISTING:
This site has a potential to release lead, asbestos, solvents, PCBs and other contaminants to groundwater, the adjacent stream, and local residential and Day Care property. Two sister facilities -- in Manheim, PA and Stratford, CT are on the NPL.

REFERENCE 28

February 22, 2005

MEMO

To: File

From: Melanie Bartlett Melanie Bartlett

Subject: Phone Summary
Universal Friction Composites
Marshville, Union County, NC
US EPA ID: NCN 000 407 827

On Monday, February 21, 2005, I spoke with James Bealle of the Solid Waste Section-Mooresville Regional Office concerning the above mentioned site. Mr. Bealle indicated that his office had been working with the site previously and that contaminated material had been removed from the site. He also indicated that he had no knowledge of any offsite dumping of asbestos material other than the two that were located on the property. In addition, Mr. Bealle agreed to forward copies of their files to this office for our records.

The presence of potential asbestos material remaining in a building on site was discussed with Mr. Bealle. Mr. Bealle said the issue would be addressed by his office and that the material would be removed. This office concurred with that decision. Scanned images of some remaining material on the site were emailed to Mr. Bealle immediately following the phone conversation for documentation purposes.

Subject: Universal Friction
From: Melanie Bartlett <Melanie.Bartlett@ncmail.net>
Date: Mon, 21 Feb 2005 15:45:22 -0500
To: JAMES BEALLE <JAMES.BEALLE@ncmail.net>

James-
Here are a couple of photos of an area located on the east side of the existing structures. The room is open on the north and south sides via open doorways. Hope these are helpful.
Melanie

Melanie Bartlett <melanie.bartlett@ncmail.net>

UnivFric2.jpg	Content-Type: image/jpeg Content-Encoding: base64

UnivFric1.jpg	Content-Type: image/jpeg Content-Encoding: base64

REFERENCE 29

GW-B-5

GEOLOGY AND GROUND-WATER RESOURCES

of the

MONROE AREA, NORTH CAROLINA

Division of Ground Water

GROUND-WATER BULLETIN NUMBER 5

NORTH CAROLINA
DEPARTMENT OF WATER RESOURCES

ENVIRONMENTAL DAMAGE ASSESSMENT

N. C. DEPT. OF NATURAL RESOURCES & COMM. DEV.

RALEIGH

1965

CERCLA

GEOLOGY AND GROUND-WATER RESOURCES

of the

MONROE AREA, NORTH CAROLINA

BY EDWIN O. FLOYD

GROUND-WATER BULLETIN NUMBER 5

NORTH CAROLINA
DEPARTMENT OF WATER RESOURCES
WALTER E. FULLER, *Director*

DIVISION OF GROUND WATER
HARRY M. PEEK, *Chief*

Prepared By The Geological Survey
United States Department Of The Interior
In Cooperation With The
North Carolina Department Of Water Resources

RALEIGH
1965

Table 15. Chemical analyses of ground water from Stanly County

(Well numbers correspond to well numbers in table of well data)

Well No.	Date of Collection	Silica (SiO_2)	Iron (Fe) in Total	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Hardness as ($CaCO_3$)	PH	Water Bearing Material
		Parts per million												
6	1/62	----	1.6	108	21	26	.7	216	111	78	.1	356	6.9	Tuffaceous argillite
15	6/62	----	.25	77	22	----	----	243	15.	----	.4	284	7.3	do
25	3/62	34	2.7	75	30	42	.5	200	132	66.	----	312	6.9	do
26	3/62	----	.71	10	6.8	15	1.8	28	21	23	15.	54	6.3	do
35	6/62	----	.08	19	4.9	9.8	.5	86	1.4	3.4	9.5	68	7.1	do
44	1/62	----	.14	12	7.7	7.0	.1	52	4.8	13	8.8	62	6.1	do
64	6/62	----	.27	38	4.6	7.2	.5	143	5.6	2.6	2.1	114	7.8	do
101	1/62	----	.06	44	29	18	.4	235	10	56	7.2	230	6.8	do
108	6/62	----	.08	26	6.3	.52	.01	85	4.6	24	7.7	90	6.8	do
106	1/62	----	.13	6.4	4.1	8.2	.3	51	4.6	2.5	1.7	23	6.4	do
151	----	----	.64	133	27.	----	.6	223	11.	249	1.3	532	7.0	do
166	1/62	----	.10	16	4.8	15	2.6	36	15	20	8.6	60	6.0	do
184	1/62	----	.05	27	16	13	.4	127	8.6	20	13	130	7.0	Laminated argillite
219	1/62	----	.04	52	15	19	2.4	339	14	33	9.0	316	7.0	do
228	4/55	29	.01	61	8.2	18	.4	145	64	25	.0	186	7.2	Tuffaceous argillite
229	4/55	24	.0	65	11	20	.4	157	41	54	.0	208	7.3	do
230	4/55	29	2.6	63	14	18	.2	166	55	40	.0	217	7.3	do
231	7/59	31	1.1	63	8.4	23	.3	161	55	34	.6	193	7.4	do
232	3/62	17	.06	29	5.8	13	.2	106	9.6	16	1.5	97	7.4	do

Union County

Area: 643 square miles; population in 1960: 44,416)

Geography and physiography

Union County, the southwestern part of the Monroe area, has the largest area and population of the three-county area. The county seat is the city of Monroe which has a population of 10,829 according to the 1960 U. S. Census.

Union County is bounded on the north by Cabarrus County and the Rocky River, on the east by Anson County, on the south by South Carolina, and on the west by Mecklenburg County and South Carolina.

Topographically, Union County is typical of the eastern part of the Piedmont province. It consists of a series of moderately level interstream areas which become more rugged near the larger streams. No hills stand out prominently above the general level of the upland. The highest land surface elevations in the county are along the western border near Stallings where the altitude is slightly more than 750 feet above mean sea level. The topography slopes generally toward the south and east.

About four-fifths of the county is drained towards the northeast by large streams that are tributaries of the Rocky River. The remainder of the county is drained to the southwest and south by smaller streams that empty into the Wateree River or into the Lynches River in South Carolina.

Geology

Rocks of Triassic age crop out in a small area in the extreme southeast corner of Union County. They consist largely of red, brown, and gray sandstones and siltstones with lenticular beds of red to purple mudstone. Lenticular beds of crossbedded, arkosic sandstone and conglomerate are frequently interbedded with other mineral.

Granite.—There are two granite bodies in the western part of the county. The northernmost body occupies a narrow zone, one-half to two miles in width, that extends in a southeastern direction from the county line near the village of Stallings to the South Carolina border. The second body of granite is in the extreme southwestern corner of the county. It covers an area approximately two miles wide and seven miles long, and it

extent from the South Carolina border to about one-half mile south of the town of Waxhaw. The Union County granites differ from the Anson County granites in being nonporphyritic and containing less biotite.

Diorite-gabbro.—Near the western extremity of Union County, rocks intermediate between diorite and gabbro crop out in a zone one to two miles wide. These rocks intrude a large body of granite and extend from Mecklenburg County into South Carolina. The diorite-gabbro is a massive, coarse-textured rock composed mainly of hornblende, feldspar, augite, and varying amounts of quartz and accessory minerals. Large rounded boulder outcrops are common. On the surface these rocks are black or dark gray and have a pitted surface that is apparently due to differential weathering among the constituent minerals.

Phyllite and mica schist unit.—In Union County these rocks were mapped in a zone (aureole), one-half to three and one-half miles in width, around the southernmost granite body in the county. The unit is composed chiefly of phyllite with some mica schist. It is occasionally intruded by or interlayered with other types of rock such as rhyolite, granite-gneiss, and lithic tuff. The phyllite and schist are metamorphic equivalents of the lower volcanic unit and were altered at the time of the granitic intrusion and again in conjunction with faulting in the area.

Tuffaceous Argillite unit.—About two-thirds of Union County is underlain by rocks of the tuffaceous argillite unit. As in the other counties of the Monroe area, the unit is comprised of interbedded felsic and mafic tuffaceous argillites, fine-grained tuffs, and some breccias and flows. Graywacke sandstone and siltstone are found occasionally overlying and interlayered with the argillites. The argillites are coarsely bedded with individual beds varying from three inches to several feet in thickness.

Laminated Argillite unit.—This unit was mapped in Union County in a belt-like zone varying from about one-half mile to about four miles in width. It has been traced from the southeastern corner of Cabarrus County through the western part of Union County where, in the vicinity of Mineral Springs, it wraps around a synclinal and adjacent anticlinal structure before passing into South Carolina.

The laminated argillite unit grades upward into tuffaceous

argillite unit and conformably overlies the lower volcanic unit. In general, the lower section of the laminated argillite unit consists of coarser-grained volcanic ash than does the upper section. However, the manner of deposition is apparently the same.

The flanks of the anticlines adjacent to the Gold Hill fault have been tightly folded, resulting in rocks of the lower volcanic unit and rocks of the upper and lower sections of the laminated argillite unit being adjacent to each other within short distances.

West of the Gold Hill fault in Union County, the laminated argillite has been tightly folded and compressed to form a low grade phyllite with thin, slaty clevage. The metamorphism, which accompanied the folding and faulting, has almost destroyed the original bedding planes in many places.

Lower Volcanic unit.—Rocks of this unit were found only in the western and southwestern parts of Union County. Here they occur in two separate bodies, cropping out along the axes of eroded anticlines. The westernmost body, found along the western border of Union County extends from Mecklenburg County into South Carolina. Along the Mecklenburg County border, from about one-half mile south of highway 74 and into South Carolina, this body has been intruded by granite and diorite-gabbro. In the southern part of the county, the lower volcanic unit crops out near Trinity and extends westward to within three and one-half miles of the North Carolina-South Carolina State line.

The dominant rocks of the lower volcanic unit are fine-grained felsic tuff and crystal tuff with interbedded rhyolite flows. The unit is frequently intruded by dikes of diabase, quartz, and rhyolite.

Usually, rocks of the lower volcanic unit are deeply weathered, and outcrops of fresh rock are rare. This, in itself, is one of the outstanding characteristics of the unit.

Ground water

Most domestic water supplies and one municipal water supply are obtained from wells in Union County. A few domestic supplies are obtained from one or more springs. Dug wells provide the water supply for a number of families. The springs and nearly all the dug wells obtain water from the weathered zone above unweathered rock. Both types of wells are subject to surface contamination and may go dry during droughts. No

bored wells were inventoried in Union County during this investigation. Most wells in the county are drilled wells. Data for 134 wells were used to compile Table 16, a summary of data for wells in Union County.

Table 16 indicates that the well having the highest yield in Union County was drilled in granite. Reference to the topographic section of the table indicates that wells drilled in draws apparently have the highest yield per foot, and that wells drilled on slopes apparently have the lowest yield per foot.

Analyses of 18 water samples from wells in Union County are given in Table 18. One analysis is from a well drilled in granite, three are from wells in laminated argillite, and five are from wells in rocks of the lower volcanic unit. The water from the well in granite is of excellent quality. Similar water is obtained by the town of Waxhaw from the phyllite and mica schist unit. The water is not treated prior to use. Analyses of water samples from tuffaceous argillite and laminated argillite show the quality of water from each unit to be practically identical. As a rule, the iron content is low, and the water is hard. Water from the lower volcanic unit is generally acceptable for most uses.

Municipal supplies

The town of Waxhaw has the only municipal ground-water supply in Union County. Other municipalities use surface water.

Waxhaw, population 818 (1960 census), obtains its water supply from three wells. The oldest well, Number 120 (Table 17) was drilled in 1940 to a depth of 250 feet and yields 50 gpm. Well Number 121 (Table 17) was drilled in 1949 to a depth of 200 feet and yields 40 gpm with a drawdown of about 118 feet. Well Number 122 (Table 17) was drilled in 1961 to a depth of 301 feet, at a site selected as a result of this investigation, and yields more than 90 gpm.

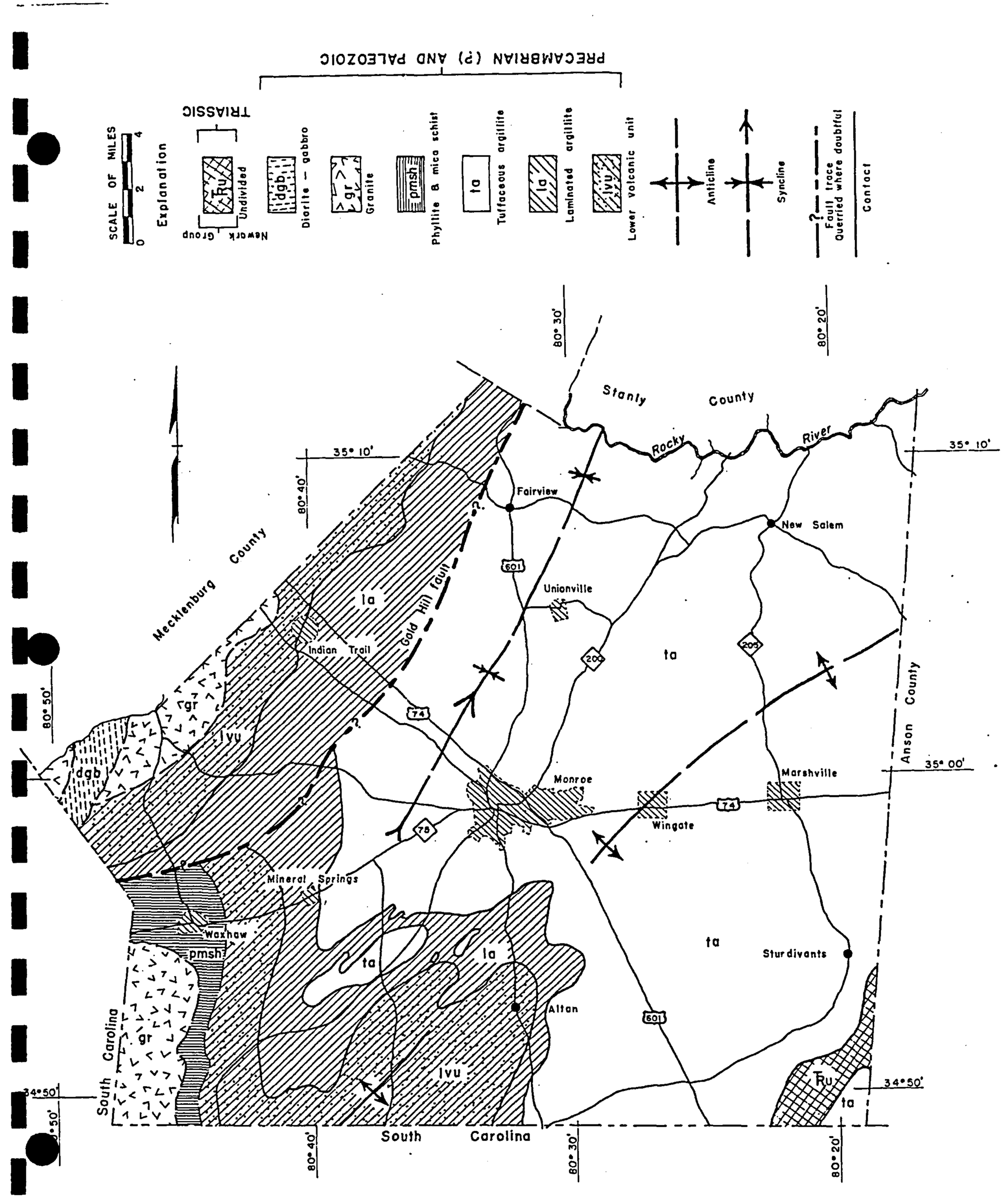
Table 16. Summary of Data for Wells in Union County

According to rock type

Type of rock	No. of wells	Average depth (feet)	Yield (gallons per minute) Range	Average	Per foot of well
Granite	1	134	-	100	0.74
Phyllite and mica schist	4	225	2½-90	46	0.20
Tuffaceous argillite	87	138	½-75	11	0.08
Laminated argillite	24	114	1½-75	17	0.15
Lower volcanic unit	18	128	1-60	12	0.09
All wells	134	135	1-100	14	0.10

According to topographic location

Topographic location	No. of wells	Average depth (feet)	Yield (gallons per minute) Range	Average	Per foot of well
Hill	82	129	3/4-75	14	0.11
Flat	17	169	½-100	15	0.09
Slope	14	105	1-14	6	0.06
Draw	5	76	5-30	14	0.18



Base map adapted from
N. C. State Highway Commission.

Figure 11. Geologic map of Union County.

REFERENCE 30

Ref. 30

Unis.

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
North Carolina
Department of
Environment, Health, and
Natural Resources;
North Carolina
Agricultural Research
Service; North Carolina
Cooperative Extension
Service; Union Soil and
Water Conservation
District; and Union
County Board of
Commissioners

Soil Survey of Union County, North Carolina

NC DENR LI
1610 MSC
RALEIGH,NC 27699-1610
919-715-4161

:U55
06
:3

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Issued January 1996

depth of about 27 inches. Hard, fractured slate bedrock is at a depth of about 32 inches. In some small areas, the surface layer is silt loam. In other areas the subsoil has less clay.

Included in this unit in mapping are small areas of Secrest, Misenheimer, and Badin soils. Secrest soils are deep over bedrock. They are in broad, nearly level areas. Misenheimer soils are shallow over bedrock. They are in slightly elevated areas where ledges of bedrock are at or near the surface. Badin soils are well drained and are on small knolls and ridges. Contrasting inclusions make up about 15 percent of this map unit.

Permeability is slow in the Cid soil. Available water capacity is low or moderate. Reaction ranges from strongly acid to extremely acid in the subsoil and underlying material. It varies widely in the surface layer and subsurface layer as a result of local liming practices. The shrink-swell potential is moderate. A seasonal high water table is perched between depths of 1.5 and 2.5 feet from December through May. The depth to hard bedrock ranges from 20 to 40 inches.

This map unit is used mainly as cropland, pasture, or woodland.

This map unit is moderately suited to cultivated crops, such as corn, soybeans, small grain, and milo. The wetness and the slow permeability are the main limitations affecting crop production. In years of low rainfall, this soil is among the most productive soils in the county. In years of above average rainfall, crops may drown. A drainage system may be needed to remove surface and subsurface water. Grassed waterways can maintain open drainage channels and remove surface water. Other applicable conservation practices are conservation tillage, crop residue management, diversions, field borders, and crop rotations.

This map unit is well suited to hay and pasture. The wetness and the slow permeability are the main limitations. Controlled grazing and applications of fertilizer are needed.

This map unit is well suited to woodland. The dominant trees are white oak, southern red oak, willow oak, blackjack oak, scarlet oak, post oak, shortleaf pine, Virginia pine, and loblolly pine. The main understory plants are blackgum, sweetgum, eastern redcedar, and red maple. The main limitation is the seasonal high water table, which restricts the use of equipment to dry periods.

This map unit is poorly suited to urban development. The wetness, the depth to bedrock, low strength, the slow permeability, and the moderate shrink-swell potential are the main limitations affecting most urban uses. The hazard of erosion is moderate on construction sites if the ground cover is removed. The wetness and the slow permeability are the main limitations affecting recreational uses.

The capability subclass is IIe. Based on shortleaf pine as the indicator species, the woodland ordination symbol is 6W.

CnB—Cid-Urban land complex, 1 to 5 percent slopes. This map unit occurs mainly as areas of a moderately deep, moderately well drained and somewhat poorly drained Cid soil and areas of Urban land. It is about 60 percent Cid soil and 25 percent Urban land. The Cid soil and Urban land occur as areas so intricately mixed that mapping them separately is not practical at the selected scale. Individual areas are irregular in shape and range from 25 to 500 acres in size.

Typically, the surface layer of the Cid soil is light brownish gray channery silt loam 4 inches thick. The subsurface layer is pale yellow channery silt loam 5 inches thick. The subsoil is 18 inches thick. In the upper part, it is brownish yellow silty clay loam that has pale yellow mottles. In the next part, it is light olive brown silty clay that has light brownish gray mottles. In the lower part, it is mottled grayish brown and light olive brown channery silty clay. Weathered, fractured slate bedrock is at a depth of about 27 inches. Hard, fractured slate bedrock is at a depth of about 32 inches. In some areas the surface layer is silt loam. In other areas the subsoil has less clay. In some places more than 20 inches of fill material covers the Cid soil. In other places more than two-thirds of the natural soil has been removed by cutting and grading.

Included in this unit in mapping are small areas of Misenheimer, Secrest, and Badin soils. Misenheimer soils are shallow over bedrock and are moderately well drained. They are in areas where the topography is highly dissected, especially on knolls and short side slopes. Secrest soils are deep over bedrock. They are in broad, nearly level areas. Badin soils are well drained and are on small knolls and ridges. Contrasting inclusions make up about 15 percent of this map unit.

Permeability is slow in the Cid soil. Available water capacity is low or moderate. Reaction ranges from strongly acid to extremely acid in the subsoil and underlying material. It varies widely in the surface layer and subsurface layer as a result of local liming practices. The shrink-swell potential is moderate. A seasonal high water table is perched between depths of 1.5 and 2.5 feet from December through May. The depth to bedrock ranges from 20 to 40 inches.

The Urban land consists of areas where the original soil has been cut, filled, graded, or otherwise altered. These areas are used for closely spaced houses or other buildings or are covered with pavement. The

slope generally has been modified. Surface runoff from rooftops and paved surfaces increases the hazard of flooding in lower downstream areas. The depth to bedrock, the clayey texture of the subsoil, low strength, and the moderate shrink-swell potential in the Cid soil are the main limitations affecting most urban uses. Onsite investigation is generally needed before use and management of these areas can be planned.

The capability subclass is IIe in areas of the Cid soil and VIIIs in areas of the Urban land. This map unit has not been assigned a woodland ordination symbol.

CoA—Colfax sandy loam, 0 to 3 percent slopes. This map unit consists mainly of very deep, somewhat poorly drained Colfax and similar soils in depressions, at the head of intermittent streams, and on toe slopes in the uplands. The slopes are slightly concave. Individual areas are irregular in shape and range from 4 to 25 acres in size.

Typically, the surface layer is light brownish gray sandy loam 7 inches thick. The subsurface layer is light gray sandy loam 7 inches thick. The subsoil is 34 inches thick. In the upper part, it is brownish yellow sandy clay loam that has gray mottles. In the next part, it is mottled brownish yellow and gray sandy clay loam. In the lower part, it is brownish yellow sandy loam that has light gray mottles. The lower part is a very firm, brittle fragipan. The underlying material extends to a depth of 61 inches. It is mottled light gray, very pale brown, and brownish yellow sandy loam that weathered from saprolite. Weathered, multicolored granite is at a depth of about 61 inches. Hard granite is at a depth of 65 inches. In some places the surface soil is as much as 18 inches thick.

Included in this unit in mapping are small areas of Appling and Helena soils. Appling soils are very deep over bedrock and are well drained. Helena soils are very deep over bedrock and are moderately well drained. Appling and Helena soils commonly are on toe slopes. Also included are some small areas of poorly drained soils in depressions. Contrasting inclusions make up about 15 percent of this map unit.

Permeability is slow in the Colfax soil. Available water capacity is moderate. Reaction ranges from extremely acid to strongly acid in the subsoil and underlying material. It varies widely in the surface layer and subsurface layer as a result of local liming practices. The shrink-swell potential is moderate. A seasonal high water table is perched between depths of 0.5 foot and 1.5 feet from November through June. A fragipan is between depths of 16 and 36 inches. The depth to weathered bedrock ranges from 40 to 60 inches. The depth to hard bedrock is more than 60 inches.

This map unit is used mainly as cropland, woodland, or pasture.

This map unit is well suited to corn, soybeans, and milo. The wetness and the slow permeability are the main limitations affecting crop production. In years of above average rainfall, crops may drown. A drainage system may be needed to remove surface and subsurface water. Grassed waterways can maintain open drainage channels and remove surface water. Other applicable conservation practices are conservation tillage, crop residue management, diversions, field borders, and crop rotations.

This map unit is well suited to hay and pasture. The wetness and the slow permeability are the main limitations. Controlled grazing and applications of fertilizer are needed.

This map unit is well suited to woodland. The dominant trees are loblolly pine, yellow-poplar, shortleaf pine, and sweetgum. The main understory plants are cottonwood, dogwood, sourwood, birch, alder, and red maple. The main limitation is the seasonal high water table, which restricts the use of equipment to dry periods.

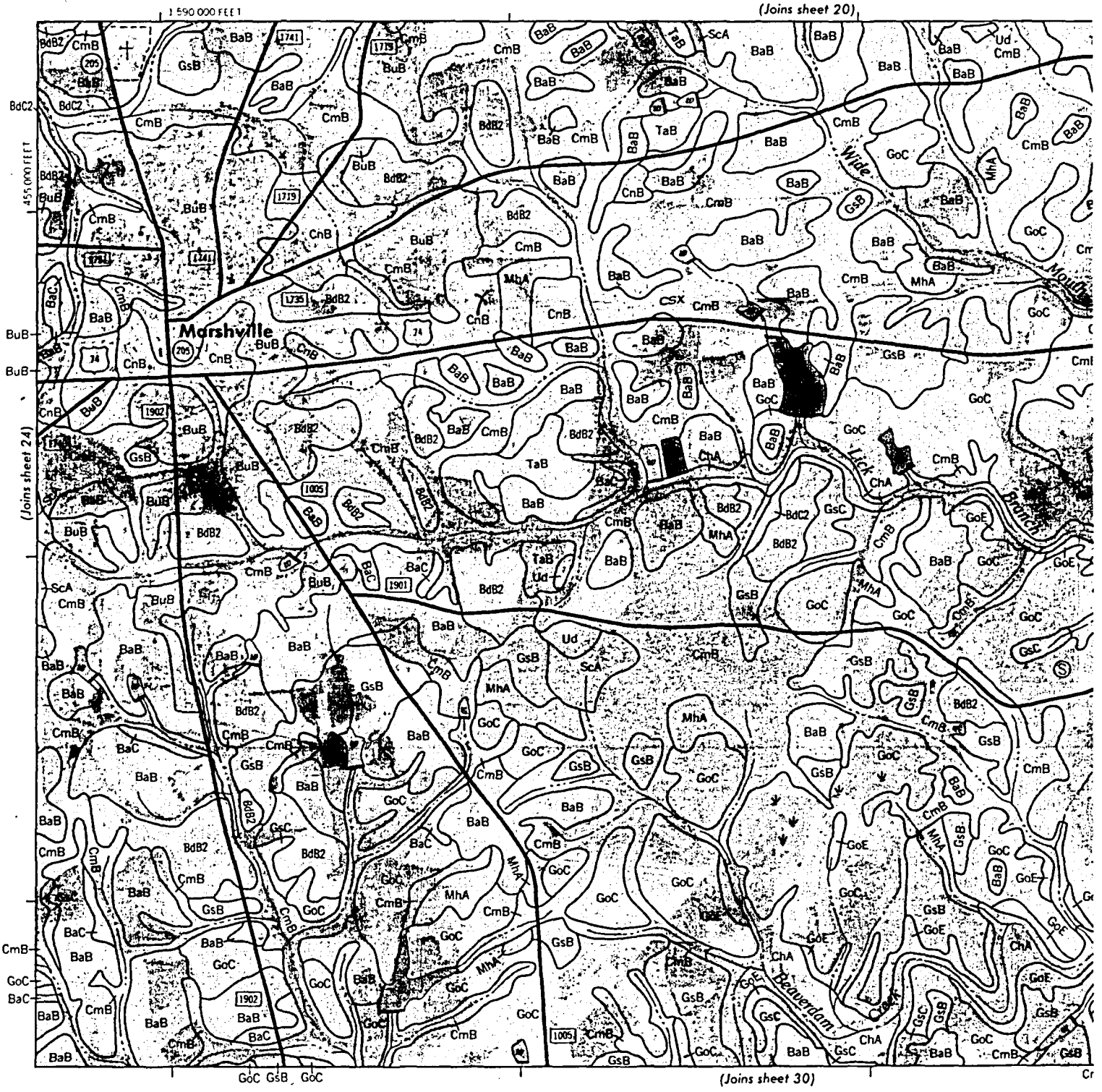
This map unit is poorly suited to urban development. The wetness, the slow permeability, the moderate shrink-swell potential, and low strength are the main limitations affecting urban uses. The wetness is the main limitation affecting recreational uses.

The capability subclass is IIIw. Based on loblolly pine as the indicator species, the woodland ordination symbol is 8W.

CrB—Creedmoor loam, 2 to 8 percent slopes. This map unit consists mainly of very deep, moderately well drained and somewhat poorly drained, slightly undulating Creedmoor and similar soils on broad ridges in the uplands. It is in slightly convex areas. Individual areas are irregular in shape and range from 4 to more than 50 acres in size.

Typically, the surface layer is yellowish brown loam 7 inches thick. The subsurface layer is very pale brown loam 3 inches thick. The subsoil is 40 inches thick. In the upper part, it is brownish yellow sandy clay loam that has very pale brown mottles. In the next part, it is yellowish brown clay that has light gray mottles. In the lower part, it is mottled light gray, yellowish brown, and yellowish red clay loam. The underlying material extends to a depth of 56 inches. It is dark reddish brown sandy clay loam. Weathered, fine grained sandstone bedrock is at a depth of about 56 inches. Hard sandstone bedrock is at a depth of 62 inches. In some areas the surface layer is gravelly loam.

Included in this unit in mapping are small areas of the very deep, moderately well drained White Store



1 3/4 1/2 1/4 0

1 0.5 0

REFERENCE 31

January 11, 2005

MEMO

To: File

From: Melanie Bartlett Melanie Bartlett

Subject: Community Wells
Universal Friction Composites
Marshville, Union County, NC
US EPA ID: NCN 000 407 827

Today, I received an email response from Martha Fillinger with the NC Public Water Supply Section. A request was made information concerning wells in the following range:

Lat: 345500 min 350230 max
Long: 801500 min 802730 max

Based on Public Water Supply records, there are no community wells located within the four-mile radius of the site.

REFERENCE 32

November 4, 2004

MEMO

To: File

From: Melanie Bartlett Melanie Bartlett

Subject: Union County Water Lines
Universal Friction Composites
Marshville, Union County, NC
US EPA ID: NCN 000 407 827

Information of the locations of the Union County water system's water lines was taken from the following website:

http://maps.co.union.nc.us/sdx/viewer.htm

REFERENCE 33

Ref. 33

Profiles of General Demographic Characteristics 2000

Issued May 2001

2000 Census of Population and Housing

North Carolina

U.S. Department of Commerce
Donald L. Evans,
Secretary

Economics and Statistics Administration
J. Lee Price,
Acting Under Secretary for Economic Affairs

U.S. CENSUS BUREAU
William G. Barron, Jr.,
Acting Director

Table DP-1. Profile of General Demographic Characteristics: 2000

Geographic Area: Union County, North Carolina

[For information on confidentiality protection, nonsampling error, and definitions, see text]

Subject	Number	Percent
Total population	**123,677**	**100.0**
SEX AND AGE		
Male	61,756	49.9
Female	61,921	50.1
Under 5 years	10,040	8.1
5 to 9 years	10,103	8.2
10 to 14 years	9,595	7.8
15 to 19 years	8,116	6.6
20 to 24 years	7,035	5.7
25 to 34 years	19,166	15.5
35 to 44 years	21,902	17.7
45 to 54 years	16,185	13.1
55 to 59 years	5,956	4.8
60 to 64 years	4,431	3.6
65 to 74 years	6,512	5.3
75 to 84 years	3,521	2.8
85 years and over	1,115	0.9
Median age (years)	34.0	(X)
18 years and over	88,923	71.9
Male	43,814	35.4
Female	45,109	36.5
21 years and over	84,300	68.2
62 years and over	13,692	11.1
65 years and over	11,148	9.0
Male	4,581	3.7
Female	6,567	5.3
RACE		
One race	122,410	99.0
White	102,441	82.8
Black or African American	15,480	12.5
American Indian and Alaska Native	475	0.4
Asian	720	0.6
Asian Indian	163	0.1
Chinese	113	0.1
Filipino	90	0.1
Japanese	32	-
Korean	151	0.1
Vietnamese	93	0.1
Other Asian [1]	78	0.1
Native Hawaiian and Other Pacific Islander	30	-
Native Hawaiian	4	-
Guamanian or Chamorro	13	-
Samoan	3	-
Other Pacific Islander [2]	10	-
Some other race	3,264	2.6
Two or more races	1,267	1.0
Race alone or in combination with one or more other races: [3]		
White	103,514	83.7
Black or African American	15,835	12.8
American Indian and Alaska Native	859	0.7
Asian	966	0.8
Native Hawaiian and Other Pacific Islander	59	-
Some other race	3,757	3.0

Subject	Number	Percent
HISPANIC OR LATINO AND RACE		
Total population	**123,677**	**100.0**
Hispanic or Latino (of any race)	7,637	6.2
Mexican	5,909	4.8
Puerto Rican	318	0.3
Cuban	87	0.1
Other Hispanic or Latino	1,323	1.1
Not Hispanic or Latino	116,040	93.8
White alone	98,612	79.7
RELATIONSHIP		
Total population	**123,677**	**100.0**
In households	122,011	98.7
Householder	43,390	35.1
Spouse	28,338	22.9
Child	38,957	31.5
Own child under 18 years	31,487	25.5
Other relatives	6,495	5.3
Under 18 years	2,634	2.1
Nonrelatives	4,831	3.9
Unmarried partner	1,743	1.4
In group quarters	1,666	1.3
Institutionalized population	931	0.8
Noninstitutionalized population	735	0.6
HOUSEHOLD BY TYPE		
Total households	**43,390**	**100.0**
Family households (families)	34,280	79.0
With own children under 18 years	17,141	39.5
Married-couple family	28,338	65.3
With own children under 18 years	13,939	32.1
Female householder, no husband present	4,249	9.8
With own children under 18 years	2,356	5.4
Nonfamily households	9,110	21.0
Householder living alone	7,357	17.0
Householder 65 years and over	2,635	6.1
Households with individuals under 18 years	18,665	43.0
Households with individuals 65 years and over	7,772	17.9
Average household size	2.81	(X)
Average family size	3.15	(X)
HOUSING OCCUPANCY		
Total housing units	**45,695**	**100.0**
Occupied housing units	43,390	95.0
Vacant housing units	2,305	5.0
For seasonal, recreational, or occasional use	178	0.4
Homeowner vacancy rate (percent)	2.0	(X)
Rental vacancy rate (percent)	4.6	(X)
HOUSING TENURE		
Occupied housing units	**43,390**	**100.0**
Owner-occupied housing units	34,937	80.5
Renter-occupied housing units	8,453	19.5
Average household size of owner-occupied units	2.80	(X)
Average household size of renter-occupied units	2.87	(X)

- Represents zero or rounds to zero. (X) Not applicable.

[1] Other Asian alone, or two or more Asian categories.

[2] Other Pacific Islander alone, or two or more Native Hawaiian and Other Pacific Islander categories.

[3] In combination with one or more of the other races listed. The six numbers may add to more than the total population and the six percentages may add to more than 100 percent because individuals may report more than one race.

Source: U.S. Census Bureau, Census 2000.

REFERENCE 34

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

UNION COUNTY, NORTH CAROLINA AND INCORPORATED AREAS

PANEL 120 OF 200

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
UNINCORPORATED AREAS	370234	0120	C

Notice To User: The MAP NUMBER shown below should be used when placing map orders; the COMMUNITY NUMBER shown above should be used on insurance applications for the subject community.

MAP NUMBER
37179C0120 C

EFFECTIVE DATE:
JULY 5, 1994

Federal Emergency Management Agency

J

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

ZONE A No base flood elevations determined.

ZONE AE Base flood elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding; velocities also determined.

ZONE A99 To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.

ZONE V Coastal flood with velocity hazard (wave action); no base flood elevations determined.

ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

ZONE X Areas determined to be outside 500-year floodplain.

ZONE D Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS†

Identified 1983 | Identified 1990 or later | Otherwise Protected Areas

†Coastal barrier areas are normally located within or adjacent to special flood hazard areas.

Floodplain Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet*

D — D — Cross Section Line

(EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone*

RM7X — Elevation Reference Mark

•M1.5 — River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for possible updated flood hazard information prior to use of this map for property purchase or construction purposes.

Coastal base flood elevations apply only landward of 0.0 NGVD, and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of special flood hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Union County

REFERENCE 35

Ref. 35

Subject: Re: Surface Water Intakes
From: Mark Hahn <Mark.Hahn@ncmail.net>
Date: Fri, 22 Oct 2004 08:56:45 -0400
To: Melanie Bartlett <Melanie.Bryson@ncmail.net>

Melanie,

The only intakes in union county is the City of Monroe's intake and it is located on Lake Twitty. Near the dam. There are also some intakes on the other two city owned lakes - Lake Lee and Lake Monroe. I am not aware of the exact locations of the streams you are referring to so you might want to trace them out on a map to see if they flow downstream to any of the intakes I've mentioned.

I know of only two intakes in Mecklenburg County one is at the dam end on Lake Norman. The other is called the Catawba river pump station and is located on Mt. Island Lake. No other intakes for drinking water are present in either Meck. or Union counties. The next intakes downstream of Charlotte's intake is City of Gastonia and City of Mt. Holly both of which are located at the dam on Mt. Island Lake. The next intake on the upper end of Lake Wylie is the City of Belmont. It is located about 1 mile south of Mt. Island dam on the Catawba River. After that, the next intake is located in SC and it provids water to both SC residents and NC residents (Union County Water system) Union County owns 1/2 of the SC plant. Please feel free to call me at the number below if you need more info.

Mark Hahn

Melanie Bartlett wrote:

> My name is Melanie Bartlett and I work in the Division of Waste Management's Superfund Section. I am investigating three sites in Mecklenburg/Union County. As part of my background research on the sites, I am interested in any potential surface water intakes along the fifteen mile surface pathways downstream of these sites. The surface water bodies of concern are as follows:
>
> 1) Site name is Rhoderia Drive Wells and is located in Stallings, Union County. My surface water pathway begins with Davis Mine Creek (from the headwaters) and includes Davis Mine Creek, Price Mill Creek and East Fork of Twelvemile Creek. The fifteen miles end on the East Fork of Twelvemile Creek near SR 1324.
>
> 2) Site name is Universal Friction Composites and is located in Marshville, Union County. My surface water pathway begins with Lick Branch (from the headwaters) and includes Lick Branch and Lanes Creek. The fifteen miles end on Lanes Creek, approximately two miles northeast of Hwy 218.
>
> 3) Site name is Clorox Chemical and is located in Charlotte, Mecklenburg County. My surface water beings with Stewart Creek, approximately one mile north of Hwy 27, and includes Stewart Creek, Irwin Creek, and Sugar Creek. The fifteen miles end on Sugar Creek,

approximately 1/2 north of Hwy 51.

Are there any surface water intakes located on any of these water bodies, and if so, where exactly are they located? Your assistance in this matter is greatly appreciated.

Melanie Bartlett

--

Mark Hahn - Mark.Hahn@ncmail.net
North Carolina Dept. of Environment & Natural Resources
Dept. of Environmental Health - Public Water Supply - Suite 301
610 East Center Avenue
Mooresville, NC 28115
Ph: (704) 663-1699 Fax: (704) 663-3772

Mark Hahn <Mark.Hahn@ncmail.net>
%TITLE%
NC DENR - Mooresville
Dept. of Environmental Health - Public Water Supply

REFERENCE 36

Ref. 36

Subject: Possibly spam: RE: [Fwd: Mecklenburg/Union Counties -- Fishery information]
From: "Lawrence Dorsey" <dorseylg@vnet.net>
Date: Fri, 3 Dec 2004 09:07:46 -0500
To: "'Melanie Bartlett'" <Melanie.Bartlett@ncmail.net>

Melanie,

Good news...I was able to get some information from Sgt. Perry Smith of our Enforcement Division. He supervises the wildlife officers in Mecklenburg and Union counties so I figured if anyone knew anything about the area it would be him. See his comments below...

Thanks,

Lawrence

-----Original Message-----

Sent: Friday, December 03, 2004 7:04 AM
To: dorseylg@vnet.net
Subject: Re: FW: [Fwd: Mecklenburg/Union Counties -- Fishery information]

There is some bank fishing and occasionally wading fishing that occurs on Lanes Creek at Site # 2. The species of fish most often caught are bream, large-mouth bass and catfish. Site # 3 on Sugar Creek has occasional bank fishing activity. The species of fish of fish most often caught are bream and large-mouth bass. I do not recall ever checking any fishermen in the areas mentioned as Site # 1. Thanks, Perry.

Lawrence G. Dorsey
District 6 Fisheries Biologist
North Carolina Wildlife Resources Commission
(704)986-6109
dorseylg@vnet.net

-----Original Message-----
From: Melanie Bartlett [mailto:Melanie.Bartlett@ncmail.net]
Sent: Thursday, December 02, 2004 2:20 PM
To: Lawrence Dorsey
Subject: Re: [Fwd: Mecklenburg/Union Counties -- Fishery information]

Lawrence-
Thanks for getting back with me. If you do find out anything, please do let me know. Any information I can get will be most helpful.

Melanie

Lawrence Dorsey wrote:

Melanie,

Sorry about letting this one fall under the radar screen. Unfortunately, I don't have any direct information regarding any of these streams. Most (80%) of my work area consists of large reservoirs and their

associated fisheries. The remainder is focused on municipal impoundments and large rivers. We don't sample these streams and although I am aware of their location, I have never worked on them.

I have forwarded this information to colleagues of mine who might have some knowledge of these areas. If they can help, I'll pass along their response.

Thanks,

Lawrence

Lawrence G. Dorsey
District 6 Fisheries Biologist
North Carolina Wildlife Resources Commission
(704)986-6109
dorseylg@vnet.net

-----Original Message-----
From: Melanie Bartlett [mailto:Melanie.Bryson@ncmail.net]
Sent: Thursday, December 02, 2004 12:02 PM
To: dorseylg@vnet.net
Subject: [Fwd: Mecklenburg/Union Counties -- Fishery information]

Please refer to below request.

Melanie Bartlett
919-733-2801 ext. 315

-------- Original Message --------
Subject: Mecklenburg/Union Counties -- Fishery information
Date: Mon, 18 Oct 2004 15:37:02 -0400
From: Melanie Bartlett <Melanie.Bryson@ncmail.net>
To:dorseylg@vnet.net

My name is Melanie Bartlett and I work in the Division of Waste Management's Superfund Section. I am investigating three sites in Mecklenburg/Union County. As part of my background research on the sites, I am interested in any potential fisheries along the fifteen mil surface pathways downstream of these sites. The surface water bodies o concern are as follows:

1) Site name is Rhoderia Drive Wells and is located in Stallings, Union County. My surface water pathway begins with Davis Mine Creek (from the headwaters) and includes Davis Mine Creek, Price Mill Creek and East Fork of Twelvemile Creek. The fifteen miles end on the East Fork of Twelvemile Creek near SR 1324.

2) Site name is Universal Friction Composites and is located in Marshville, Union County. My surface water pathway begins with Lick Branch (from the headwaters) and includes Lick Branch and Lanes Creek. The fifteen miles end on Lanes Creek, approximately two miles northeast of Hwy 218.

3) Site name is Clorox Chemical and is located in Charlotte, Mecklenburg County. My surface water beings with Stewart Creek,

approximately one mile north of Hwy 27, and includes Stewart Creek, Irwin Creek, and Sugar Creek. The fifteen miles end on Sugar Creek, approximately 1/2 north of Hwy 51.

Are any of the above-mentioned water body sections used for fishing? I so, which ones? In addition, if possible, which species of fish are fished on any of these sections? Your assistance in this matter is greatly appreciated.

Melanie Bartlett

REFERENCE 37

April 8, 2005

MEMO

To: File

From: Melanie Bartlett Melanie Bartlett

Subject: Wetlands
Universal Friction Composites
Marshville, Union County, NC
US EPA ID: NCN 000 407 827

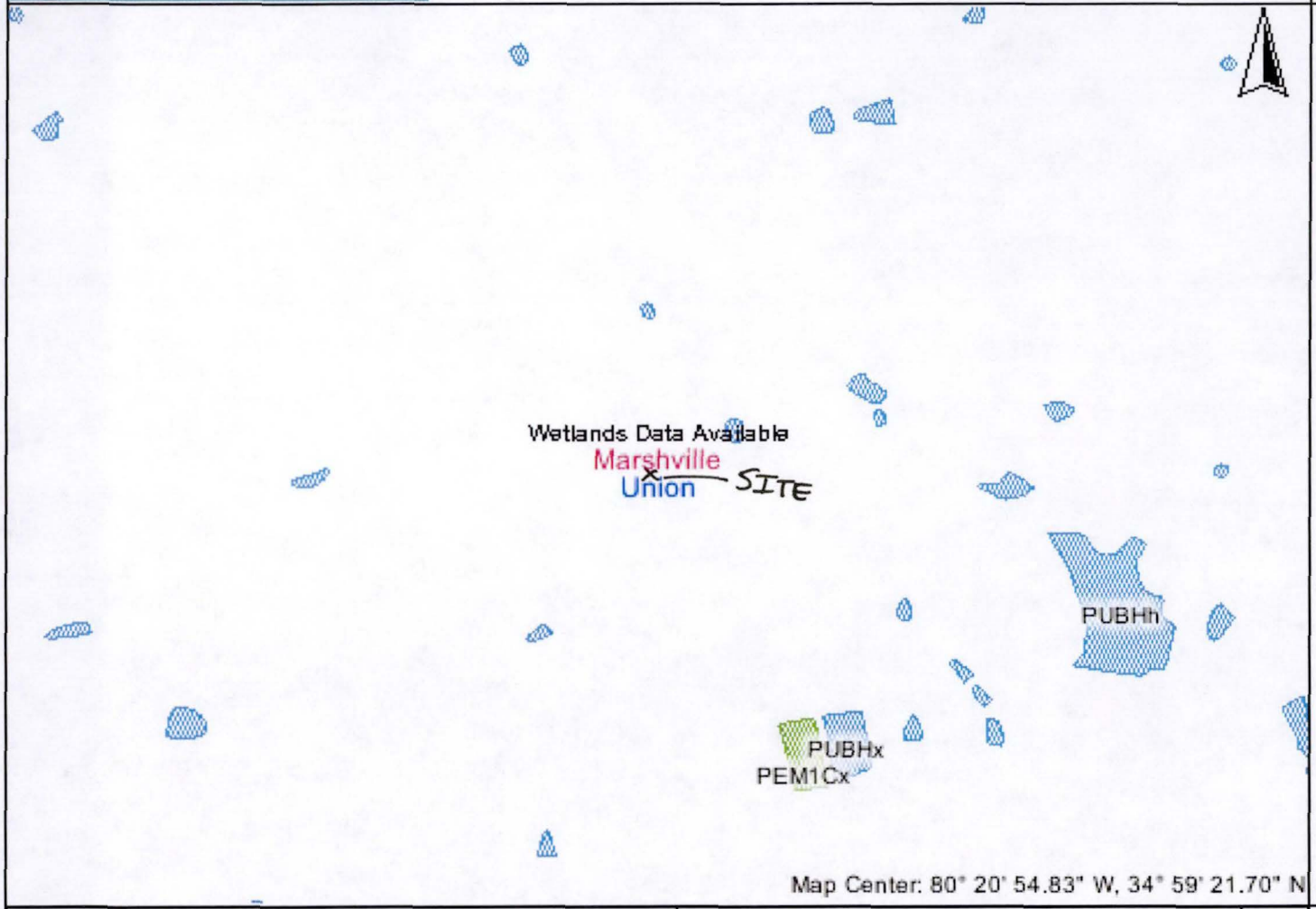
Information concerning wetlands near the site and along the 15-mile surface water pathway was obtained from the following website:

http://www.nwi.fws.gov/

Based on information provided, there is less than a total of one mile of wetland frontage along the 15-mile surface water pathway. The nearest wetlands to the site are located approximately 3,800 feet south of the site. The first wetland along the surface water pathway, a PFO1A wetland, is located approximately 10 miles downstream of the probable point of entry (PPE).

U.S. Fish & Wildlife Service
Wetlands Online Mapper

U.S. Fish and Wildlife Service



Map Center: 80° 20' 54.83" W, 34° 59' 21.70" N

- CONUS Cities
- CONUS USGS Quad Index 24K
- CONUS States 100K
- CONUS Counties 100K

Lower 48 Wetland Polygons

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Lower 48 Available Wetland Data

- No Wetlands Data Available
- Wetlands Data Available

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

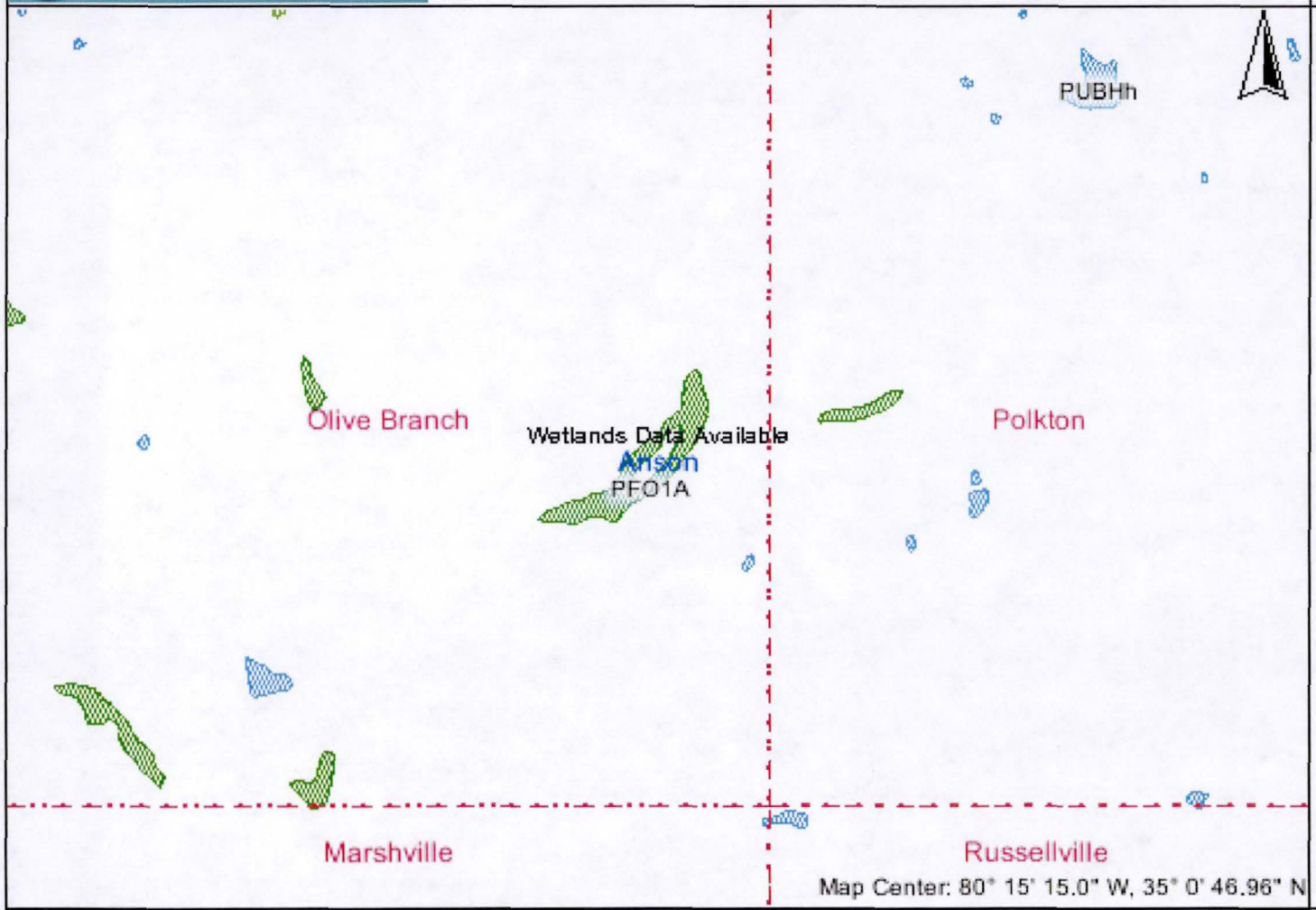
www.nwi.fws.gov

N

Map Scale Unavailable (unprojected data)

U.S. Fish & Wildlife Service
Wetlands Online Mapper

U.S. Fish and Wildlife Service



CONUS Cities
CONUS USGS Quad Index 24K
CONUS States 100K
CONUS Counties 100K
Lower 48 Wetland Polygons
Estuarine and Marine Deepwater
Estuarine and Marine Wetland
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Other
Riverine
Lower 48 Available Wetland Data
No Wetlands Data Available
Wetlands Data Available

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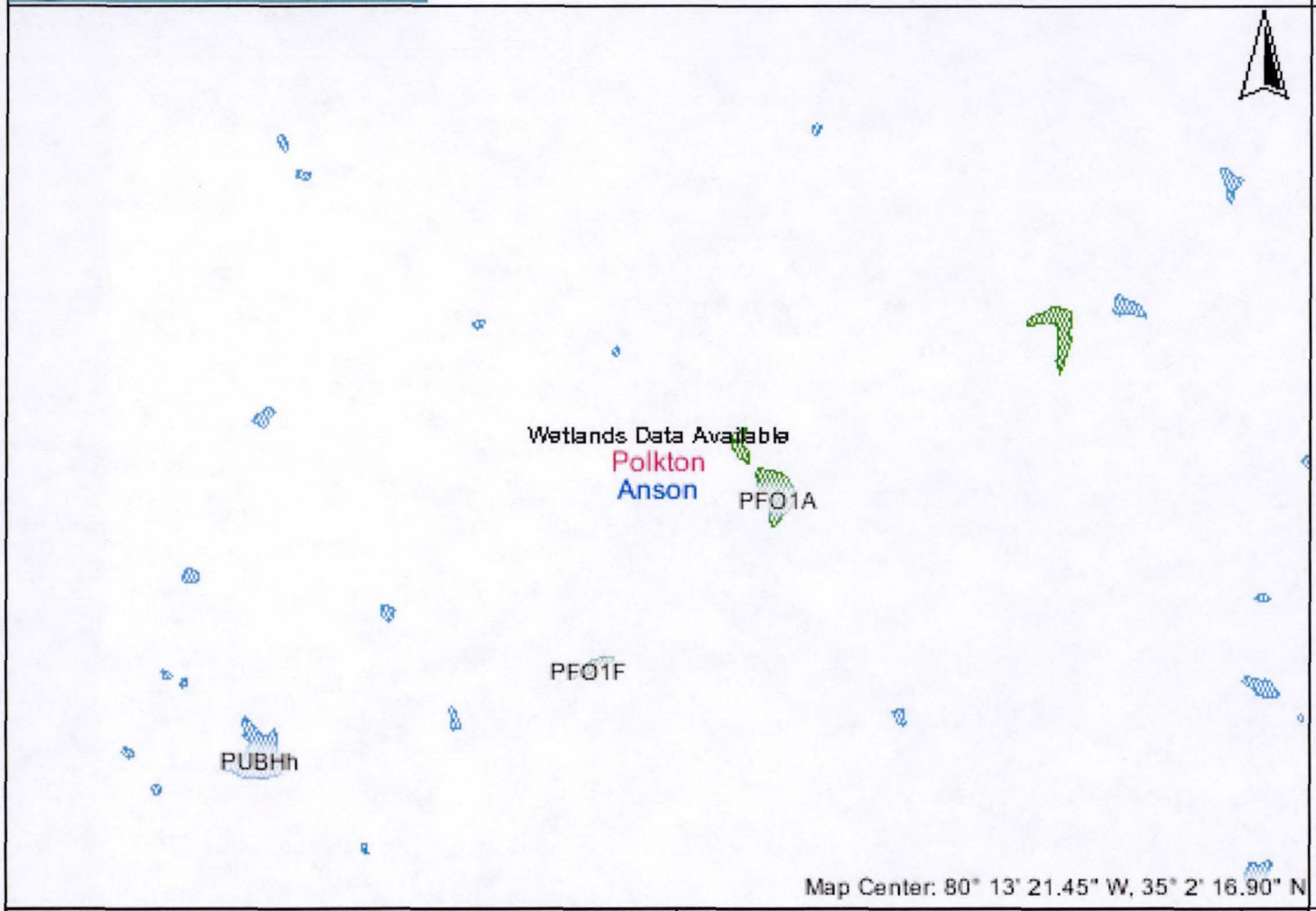
N

Map Scale Unavailable (unprojected data)

U.S. Fish & Wildlife Service
Wetlands Online Mapper

U.S. Fish and Wildlife Service



CONUS Cities
CONUS USGS Quad Index 24K
CONUS States 100K
CONUS Counties 100K

Lower 48 Available Wetland Data
No Wetlands Data Available
Wetlands Data Available

Lower 48 Wetland Polygons

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- *Riverine*

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

N

Map Scale Unavailable (unprojected data)

REFERENCE 38

September 22, 2004

MEMO

To: File

From: Melanie Bryson Melanie Bryson

Subject: Natural Heritage Sites – Trip Report
Universal Friction Composites
Marshville, Union County, NC
US EPA ID: NCN 000 407 827

On September 22, 2004, Melanie Bryson of the NC Superfund Section reviewed the topographic maps located at the NC Natural Heritage Program in the Archdale Building in downtown Raleigh, NC. The purpose of the trip was to identify and record the locations of endangered or threatened species within a 4-mile radius of the subject site, as well as those located along the 15-mile surface water pathway for the subject site.

No endangered or threatened species are located within the four-mile radius of the site or along the 15-mile surface water pathway.