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Site Name (Subject):	STEWART-WARNER CORP/BASSICK-SACK
Site ID (Document ID):	NCD024895864
Document Name (DocType):	Preliminary Assessment/Site Inspection (PA/SI)
Report Segment:	
Description:	Phase I Screening Site Inspection: References
Date of Document:	1/19/1994
Date Received:	
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Access Level:	PUBLIC
Division:	WASTE MANAGEMENT
Section:	SUPERFUND
Program (Document Group):	SERB (SERB)
Document Category:	FACILITY

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Integrated Preliminary Assessment/Site Inspection
Summit Resource Management
3481/3501Gribble Road
Stallings, Union County, North Carolina
NCD 986 232 213

REFERENCES

MEMO

Date: 01/19/94

To: File Douglas B Moore

From: Douglas Moore
Environmental Chemist
NC Superfund Section

Topic: Preliminary Assessment Site Reconnaissance

Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union Co., NC
NCD 986 232 213

On Tuesday, January 18, 1994, Harry Zinn and Doug Moore of the NC Superfund Section travelled to the subject site in order to gather target and site information for the PA. We arrived at the Oberlin Rd. office at 7:00 am, packed and left by 8:00 am. We arrived at the site at 11:20 am and met with Michael Taylor, EPA-ERRB On Scene Coordinator and Keith Burch, Four Seasons Environmental site manager for the 3481 Gribble Rd drum site. Mr. Taylor provided copies of a cleanup progress and drum inventory summary sheet, aerial photographs dated October 1993, an action memorandum outlining site details dated August 30, 1993, a summary sheet and call list of neighboring businesses and analytical data for random test samples of 10 drums from the warehouse. The site is located in a mixed industrial and residential setting. At 11:50 am, Harry Zinn and Doug Moore reviewed and signed the EPA site health and safety plan.

Beginning at 12:02 pm, Mike Taylor, Harry Zinn and Doug Moore toured the area of the warehouse. The warehouse site is a roughly rectangular lot located at 3481 Gribble Road. The site is secured by a padlocked chain link fence which was erected by EPA following commencement of the removal action. Mr. Taylor stated that the removal is proceeding according to plan and should be completed by April or May 1994. He stated that there is someone at the site 24 hours a day, including a guard on watch during non-operational hours. The property is owned by "Blazek and Teal Enterprises" of Charlotte and was leased to Summit Resources during their period of operation. There is a large blue warehouse near the west corner of the site which housed approximately 5000 drums of material. The warehouse is an unpermitted storage facility where drums were stacked two to three high with incompatible waste types located adjacent to each other creating a threat of fire and explosion. Some of the drums were stored on their side and many of the drums had corroded spilling materials onto the floor of the warehouse which leaked outside of the warehouse onto the ground. Michael Taylor stated that initial air readings taken within the confines of the warehouse indicated the presence of organic vapors at combustible levels. It was reported to EPA that the drums contained ethylene glycol waste, however, drum and soil samples taken on site around May 1993 revealed the presence of various unreported hazardous wastes. A

smaller rectangular building located east of the warehouse was reported to house numerous drums also.

EPA sampled two soil locations on the B&T site. These were biased samples taken at stained soils to determine a release of contaminants from operations at the site. The locations of the soil samples are noted on the Summit Resources-ERRB site map (Attachment 1).

The site slopes to the southeast to a low area located at the southeast corner of the warehouse site. Site runoff is intercepted by a 2-3 foot deep by 4 foot wide ditch filled with rip-rap which runs in a northeasterly direction along the border of the warehouse site and the National Petroleum Packer (NPP) site. The ditch comes to a T-intersection at the southeast corner of the site near the railroad tracks.

At 1230, Michael Taylor, Douglas Moore and Harry Zinn walked along the edge of the railroad tracks at the back of the National Petroleum Packers property to traced the drainage from the site. The border of the NPP property is secured by a padlocked chain link fence. From the southeast corner of the Blazek and Teal property, site runoff is carried in a southeast direction through a second drainage ditch within the NPP fenced property and emerges at the southeast corner of the NPP site onto the adjacent Wagoner property. From our vantage, it appeared that the NPP property contains numerous tanks.

At 1245, we traced the drainage ditch from the southeast corner of the NPP property to the adjoining Wagoner property. The ditch runs southwest across the Wagoner property approximately 150 feet to a small pond. The pond rests in a low area on the Wagoner property. The soils in the area of the pond appear to support hydrophytic vegetation due to the presence of cattails and rushes along the perimeter of the pond. The dimensions of the pond are approximately 50 feet long by 2 feet deep at the dam and approximately 30 feet from the dam to the head of the pond. There is no outfall at the dam except for a small cut ditch that directs runoff south-southeast across the Wagoner property to a small drainage pipe. The pipe carries runoff under the adjoining Rollins Truck Service parking lot.

Another small ditch is located along the border of the Wagoner property with the Rollins Trucking Co. property. This ditch intercepts runoff from the Wagoner property and directs it to a drainage ditch that parallels Gribble Road in a southeast direction. The drainage ditch crosses under Gribble Road, emerges on the southwest side of Gribble Rd and travels parallel with Gribble Rd in a southeast direction towards a unnamed intermittent tributary of South Fork Crooked Creek.

Two monitor wells are located on the Wagoner property. The approximate locations of the monitor wells are noted on the General Site Map (attachment 2). An area of stained soil which appeared to originate from the NPP site was visible on the Wagoner property along the southeastern border of the NPP property. A small earthen dike serves to intercept surface runoff from the NPP site. The dike surrounds an area identified as surface water collection sump on the site map. The collection sump is a concrete surface impoundment approximately 25 feet wide by 25 feet long by 1 foot deep. The earthen dike is approximately 25 feet long by 2 feet high and 1-2 feet wide. The dike is eroded

and does not appear to be stabilized with grass. A faint odor of ethylene glycol was detectable in the air.

One roll of film was taken of the warehouse, NPP and Wagoner property. A Photo Log is in my Site Trip Logbook. We arrived back at the EPA trailer at 13:10 pm and were advised that Mr. Leith, broker for the Wagoner property had telephoned stating that he was on his way to the site to meet with us. At 13:15 pm, Mr. Salim Boulos, official with National Petroleum Packers arrived at the EPA trailer to determine the nature of our trip to the Wagoner property. I advised Mr. Boulos that the State Superfund program was assessing the warehouse and NPP properties as one potential Superfund site since the original operators, Summit Resources, had operated at both sites. Michael Taylor also advised him that EPA-ERRB was concerned only with the warehouse site at this time. Mr. Boulos seemed very concerned about our presence and pointed out that the current process at the NPP site consisted mostly of blending products rather than processing. When I questioned him regarding whether they were currently receiving wastestreams, he stated that they were receiving wastestreams, but primarily wastestreams that consisted of ethylene glycol and water, in contrast to the former operators who received various wastestreams. I stated to Mr. Boulos that the NC Superfund section still is required to look at his active site and the warehouse site due to evidence of historical releases from the Summit Resources operations. Mr. Boulos stated that they would like to expand and are currently in negotiations with Mr. Wagoner to purchase his property.

At 13:30 pm, Mr. Herb Leith arrived at the EPA trailer to discuss his position with regards to the Wagoner property. Mr. Leith is a Charlotte based realtor and broker for Mr. Wagoner at the Gribble Road property. Mr. Leith provided three (3) copies of letters sent by DEM-Mooresville to ChemStreams, Inc., a former site operator regarding violations/releases to the environment affecting groundwater and surface water. I stated to Mr. Leith that the NC Superfund Section is currently performing an assessment of the subject site as a potential Superfund site. I explained to him that this is the first step in the regulatory process of listing a site to the National Priorities List and that it consisted of file review and an site reconnaissance to determine (a) if releases had occurred and (b) if the public health or environment could be affected. I also explained to him that the information we gather will be used to make a recommendation regarding the future disposition of the site. He asked if I could give him some indication of the recommendation. I stated that I could not since I have incomplete information at this time and stated that I would contact him after the report had been submitted to EPA.

It is Mr. Leith's contention that the site is unsalable due to contamination from activities at the Summit Resources site; that the bank is unwilling to approve loans for purchase of his clients property. I asked him about the relationship between NPP and Mr. Wagoner. Mr. Leith stated that they have contacted an attorney who visited the site and indicated that he would make recommendations for a fee of $20,000. He stated that Mr. Wagoner was not willing to pursue this course of action. I asked him if he had any serious offers to purchase the property. He stated that they have not drawn up any contracts for purchase of the property. Upon questioning, Mr. Leith also stated that Mr. Wagoner has not had an environmental assessment conducted on the property. He stated that they have had an consultant look at the property and indicated a willingness to provide an assessment, but that they have not pursued this course either. I told him that Mr. Boulos

stated to me, that he was currently in negotiations with Mr. Wagoner to purchase the property. Mr. Leith confirmed that an offer had been made, but that the offer was not considered financially "viable". Michael Taylor advised Mr. Leith that Mr. Wagoner as property owner of a potentially contaminated piece of property is considered a "potentially responsible party" to the EPA and would be considered financially liable should the EPA decide to perform a cleanup of the Wagoner property. Mr. Leith stated that his client is aware of his liability.

From 14:15 to 15:20 pm, Michael Taylor, Doug Moore and Harry Zinn broke for lunch.

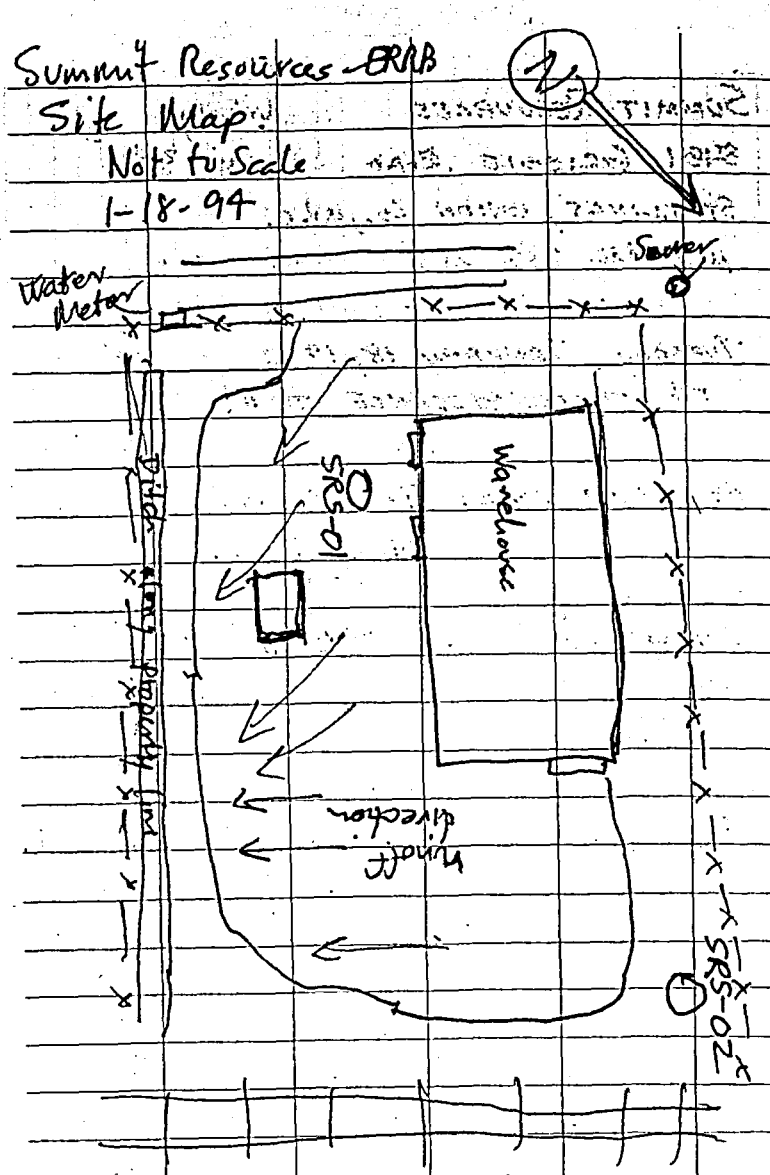
Arrived back at EPA trailer at 15:20 pm. At 15:37 pm, Harry Zinn and Doug Moore began a groundwater well survey for houses located within 0.50 miles of the subject site. The survey included houses located on Gribble Rd., Smith Farm Rd., Stallings Rd. and Matthews/Indian Trail Rd. The nearest well was located at the Jimmy Smith Farm , 3401 Smith Farm Road. The distance from the warehouse to the wellhead was estimated using a rangefinder at 150 yards 30° east of north. The wellhead lies in a clump of pine trees adjacent to the driveway on a small topographic high in the center of a large field. The Smith residence is a reddish brown vinyl sided ranch home with a small pool. Several wellheads were observed downgradient of the subject site along Gribble Rd. in the town of Indian Trail. The closest to the site was located at the Jack Cook residence at 4100 Gribble Rd. Mr. Cook stated that the well is operational, but that he is currently tapped into the Union Co. Public Works system. Mr. Cook's well is located approximately 0.45 miles 45° south of east from the site. None of the wellheads identified in Indian Trail along Gribble Road were currently being used for drinking water. Another nearby well was sampled by Mooresville in 1993. This well is owned by Donald McInnis. The McInnis well is located approximately 0.25 miles 45° west of north from the site. The McInnis well is upgradient of the site and sampling results indicated that the well is clean. Another well is located 0.3 miles due east of the site at the David Jolly residence, 4058 Matthews/ Indian Trail Rd. The well is estimated to be 80-100 feet deep and 5-6 inches in diameter. Information on this well may be obtained from Mrs. L.Z. (Dot) Hartis on the same road. There are several wells on Matthews/Indian Trail Rd. There are four confirmed wells upgradient of the site on Stallings Rd. The nearest is occupied by an elderly couple (2 people) who rent the property from Mr. Joe (Ed) Squires. The well is shared by two rental houses adjacent to each other. The well is located 0.4 miles 40° west of north from the site. All tolled, the number of houses within 0.5 miles of the site:

Stallings Rd.	4
Smith Farm Rd.	1
Matthews/I.Tr. Rd.	4
Gribble Rd.	1

The nearest school is Indian Trail elementary school. The school is located 0.7 miles 65° south of east from the site. Mr. Marcus Sutton, principal for the school stated that they have 700 students and 45 teachers at the school. He confirmed that the school gets it's drinking water from the Union Co. Public Works.

Arrived back at the EPA trailer at 17:00 pm. Mike Taylor agreed to provide a copy of the soil analytical results and site map with utility lines. We departed the site at 17:50 pm for Raleigh. At 21:05 pm, we arrived at the Oberlin Rd. office and unpacked the truck.

Summit Resources - ERAB
Site Map:
Not to Scale
1-18-94



Soil Samples taken May 93
Map drawn by: D Moore
NC Superfund
January 18, 1994

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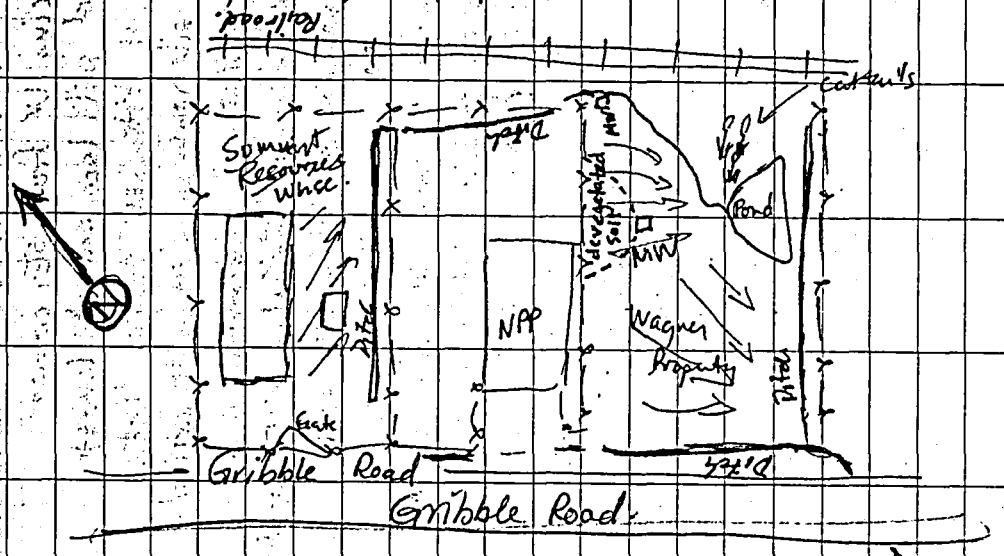
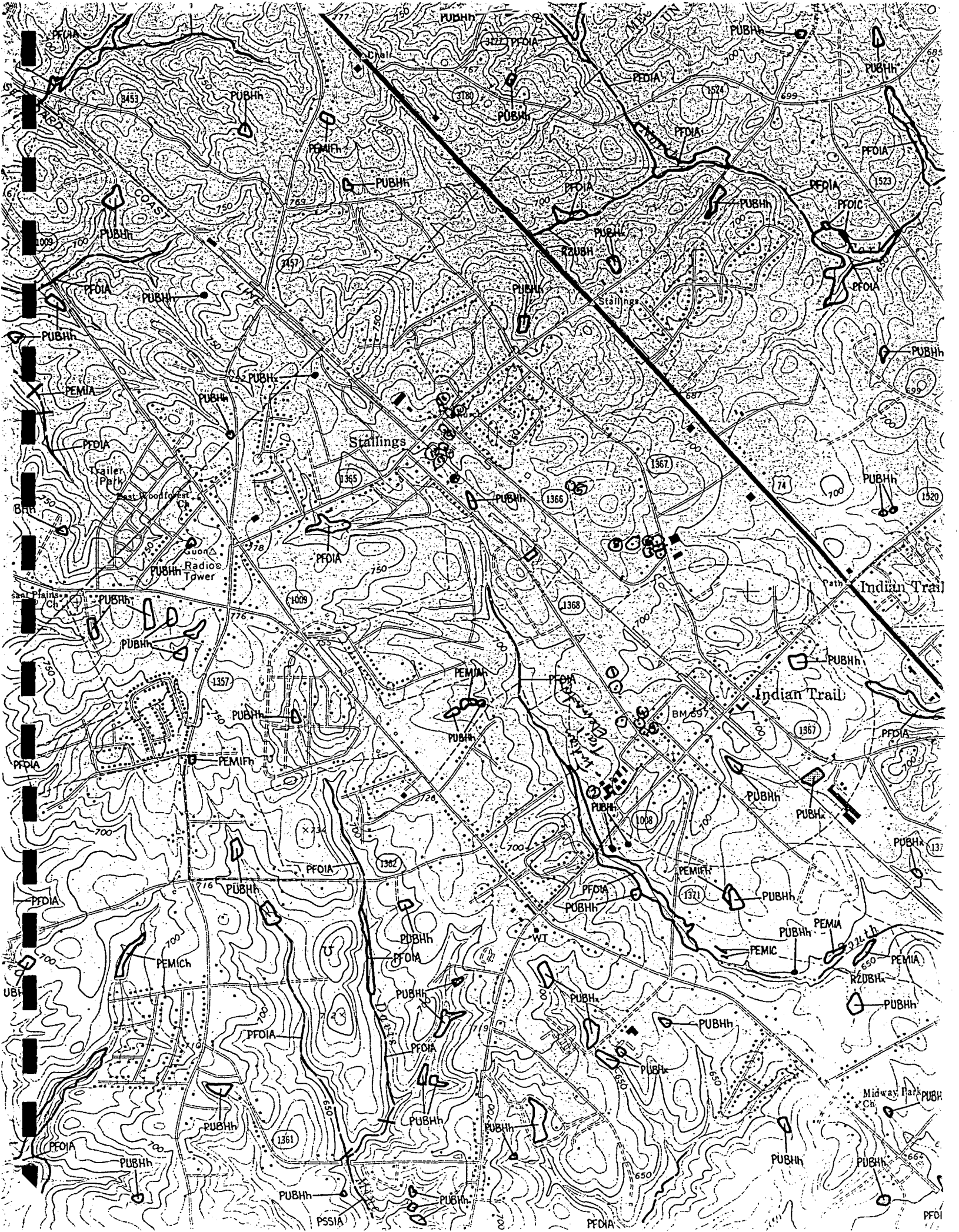
General Site Map of Summit Resources Site
including Wagner property location for Reference.



Not to Scale

Map Drawn by: DMoore
NC Superfund
Jan. 18, 1994


Stallings
Indian Trail
Trailer Park
Radio Tower
Midway Park Ch
PUBHh
PFOIA
PEMIA
PEMIFh
PEMICh
PEMIC
PFOIC
RZUBHx
PSSIA
BM 697
WT

Parameter	Unit	# 360	# 408	# 417	# 2944	# 648	# 816	# 906	# 963	# 1540	# 1902
pH		14.59	5.45	1.50	8.00	4.92	1.89	15.55	8.22	5.85	10.83
Flashpoint	F	> 150	60	> 150	80	100	< 50	> 150	85	90	80
Antimony	mg/kg		420			60				30	70
Calcium	mg/kg		60	40		180	30				
Chromium	mg/kg			6							
Iron	mg/kg		210	1400		20			20	320	
Magnesium	mg/kg					30					
Manganese	mg/kg		10	7		2					
Potassium	mg/kg	230000	400	300	2100	2000		220000	1100		5500
Sodium	mg/kg		2600	650	940	14000	70	1000	2300		1200
Zinc	mg/kg			20		6					
Arsenic	mg/kg		7	200	2						8
Lead	mg/kg								0.7		
Acetone	ug/L	1100						370	230000	15000	
Ethylene Chloride	ug/L	7	130	170	25000	160	33		1500		1400
2-Butanone	ug/L		18000						54000	45000	41000
Benzene	ug/L									1400	1700
4-Methyl-2pentanone	ug/L								12000		
Toluene	ug/L							240	43000	240	
Tetrachloroethylene	ug/L						73		2300		
Ethyl benzene	ug/l		3000				61		1900		
Xylene	ug/L				280000		4300	67000	11000	7400	7700
Styrene	ug/L									1200	
Phenol	mg/L		580		300					3600	
Benzoic Acid	mg/L			3600		660			1600		

Summit Resource Management Site Call List

A	Tire Slick, Inc.	3491 Gribble Rd.	(704) 821-6830
B	SCR Control, Inc.	3479 Gribble Rd.	(704) 821-6615
C	York Custom	3477 Gribble Rd.	----------
D	Bryant Heat & Cooling	3475 Gribble Rd.	----------
E	Luwa Service	3473 Gribble Rd.	(704) 821-6606
F	Associated Battery	3469 Gribble Rd.	(704) 821-8311
G	Heather Label Co.	3465 Gribble Rd.	(704) 821-6576
H	National Petroleum	3051 Gribble Rd.	(704) 821-6005
I	Duke Power	3494 Gribble Rd.	(704) 847-9121
J	Metralina Glass	3488 Gribble Rd.	(704) 821-8477
K	Harkey & Assoc., Inc.	3488 Gribble Rd.	(704) 821-8141
L	Dwaye's Auto Repair	3472 Gribble Rd.	(704) 821-8665
M	CEM	3310 Smith Farm Rd.	----------
N	ICP Co.	3330 Smith Farm Rd.	(704) 821-7084
N	Touring Car	3362 Smith Farm Rd.	(704) 821-7203
N	S & S	3338 Smith Farm Rd.	(704) 821-6051
N	M.F. Bank	3368 Smith Farm Rd.	----------
N	ABS Insulating	3360 Smith Farm Rd.	(704) 821-4343
N	Stevens Product, Inc.	3372 Smith Farm Rd.	(704) 821-8161
O	JJ Jenkins, Inc.	3380 Smith Farm Rd.	(704) 821-6648
P	Metroment	3400 Smith Farm Rd.	(704) 821-7197
Q	WEBL INE Co.	3650 Smith Farm Rd.	(704) 821-6960
R	North State Printing	3660 Smith Farm Rd.	----------

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MATCH MAP

Summary of Drum Inventory and Cleanup Progress
Summit Resource Mgt. Site, Matthews, NC

Waste Stream	Identified Drums	Total Volume	Cleanup Progress		
			Drums	Volume	% complete
Flammable Liquid	1,229	38,311 G	1,140	30,560 G	76 %
Aqueous ** Liquid	786	25,032 G	715	23,000 G	92 %
Stabilized *** Solids	593	600 YD	1,220	140 YD	23 %
Chlorinated Liquid	86	3,000 G	86*	3,000 G	50 %
Alkaline Liquids	126	4,770 G	126	4,400 G	100 %
Acid Liquids	24	550 G	24	550 G	100 %
Peroxide Liquid	15	523 G	0	0 G	0
Oxidizer Liquid	14	589 G	0	0 G	0
Cyanide Liquid	41	1,510 G	0	0 G	
Empty Drums	70	70	70	70	100 %
Total	3070	73,915 G+	----	----	----
Decontaminated & Crushed Drums	3070	3070	1220	1220	39 %

Note:

1. Approximately 2,000 drum remaining in the warehouse need to be staged, sampled, and hazcatted.
2. Waste PPE is not included in this summary

* Have been bulked, but not yet profiled and shipped.

** Aqueous liquid total quantity also includes decon water and one load of offspec flammable liquid.

*** Stabilized solids waste stream will include the 593 identified solids in addition to all residues from pumped drum.

\+ Total quantity of solids is not included.

C:\wp51\summit\progress.sum (TAT 01/14/94)

LATITUDE AND LONGITUDE CALCULATION WORKSHEET #2
LI USING ENGINEER'S SCALE (1/60)

SITE NAME: SUMMIT RESOURCES CERCLIS #: NCD 986 232 213

AKA: SSID:

ADDRESS: 3481 & 3501 GRIBBLE RD.

CITY: STALLINGS STATE: NC ZIP CODE:

SITE REFERENCE POINT: CENTER OF WAREHOUSE

USGS QUAD MAP NAME: MATTHEWS, N.C. TOWNSHIP: ____ N/S RANGE: ____ E/W

SCALE: 1:24,000 MAP DATE: 1971 Photorevised 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 ° 39 ' 30 " LATITUDE: 35 ° 00 ' 00 "

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

LONGITUDE: 80 ° 40 ' 00 " LATITUDE: 35 ° 05 ' 00 "

CALCULATIONS: LATITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM LATITUDE GRID LINE TO SITE REF POINT: 18

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

A x 0.3304 = 05 . 95 "

C) EXPRESS IN MINUTES AND SECONDS (1'= 60"): 00 ' 05 . 95 "

D) ADD TO STARTING LATITUDE: 35 ° 05 ' 00 . 00 " + 00 ' 05 . 95 =

SITE LATITUDE: 35 ° 05 ' 06 . 00 "

CALCULATIONS: LONGITUDE (7.5' QUADRANGLE MAP)

A) NUMBER OF RULER GRADUATIONS FROM RIGHT LONGITUDE LINE TO SITE REF POINT: 133.5

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

A x 0.3304 = 44 . 11 "

C) EXPRESS IN MINUTES AND SECONDS (1'= 60"): 00 ' 44 . 11 "

D) ADD TO STARTING LONGITUDE: 80 ° 40 ' 00 . 00 " + 00 ' 44 . 11 =

SITE LONGITUDE: 80 ° 40 ' 44 . 00 "

INVESTIGATOR: Douglas B Moore DATE: 1-20-94

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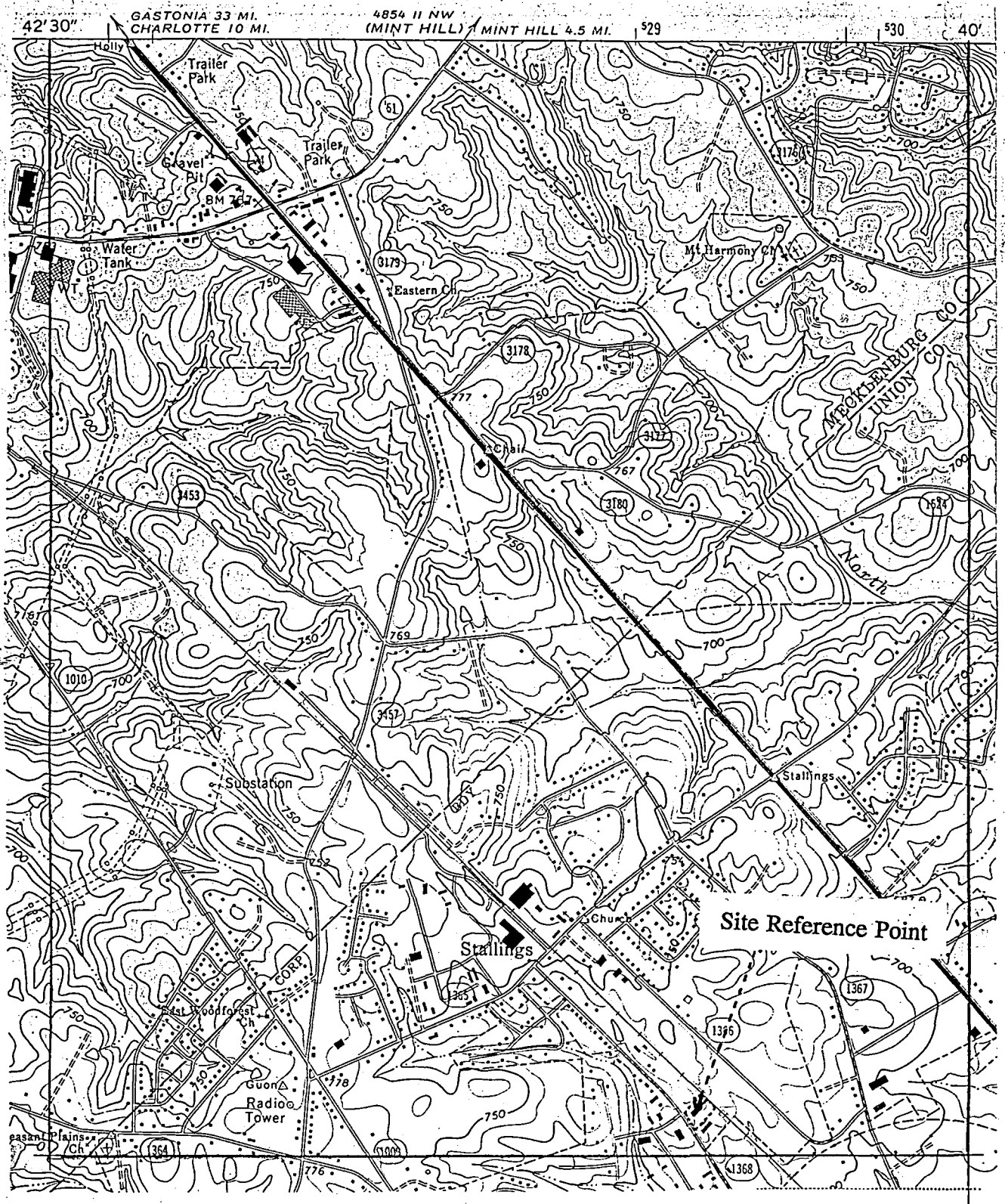
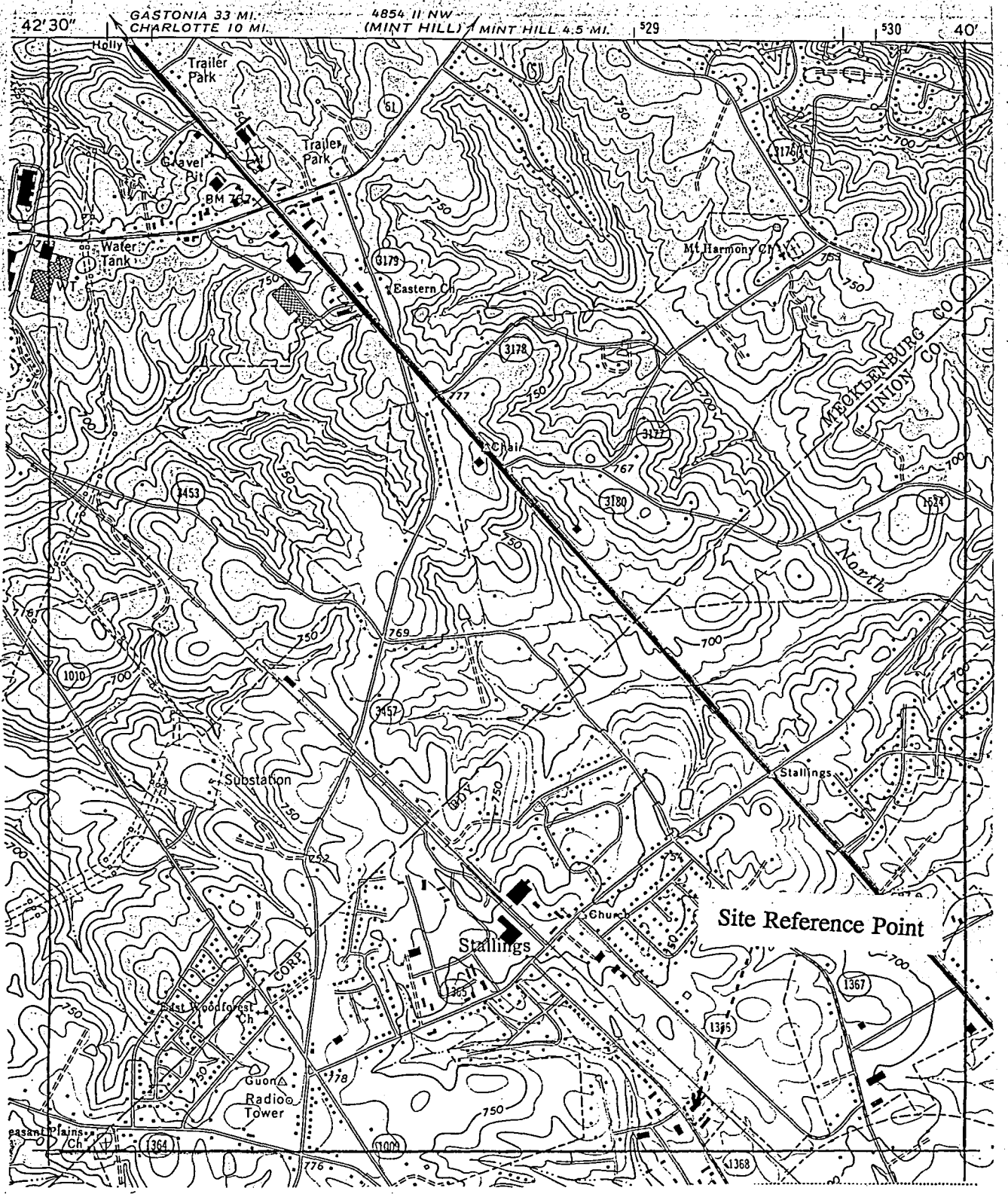


TOPOGRAPHIC MAP QUADRANGLE NAME: MATTHEWS, N.C. SCALE: 1:24,000

COORDINATES OF LOWER RIGHT-HAND CORNER OF 2.5-MINUTE GRID:

LATITUDE: 35 ° 05 ' 00 " LONGITUDE: 80 ° 40 ' 00 "

SITE NAME: SUMMIT RESOURCES NUMBER: NCD 986 232 213



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COORDINATES OF LOWER RIGHT-HAND CORNER OF 2.5-MINUTE GRID:

LATITUDE: 35 ° 05 ' 00 " LONGITUDE: 80 ° 40 ' 00 "

U. S. DEPARTMENT OF COMMERCE
Jesse H. Jones, Secretary

WEATHER BUREAU
F. W. Reichelderfer, Chief

TECHNICAL PAPER NO. 40

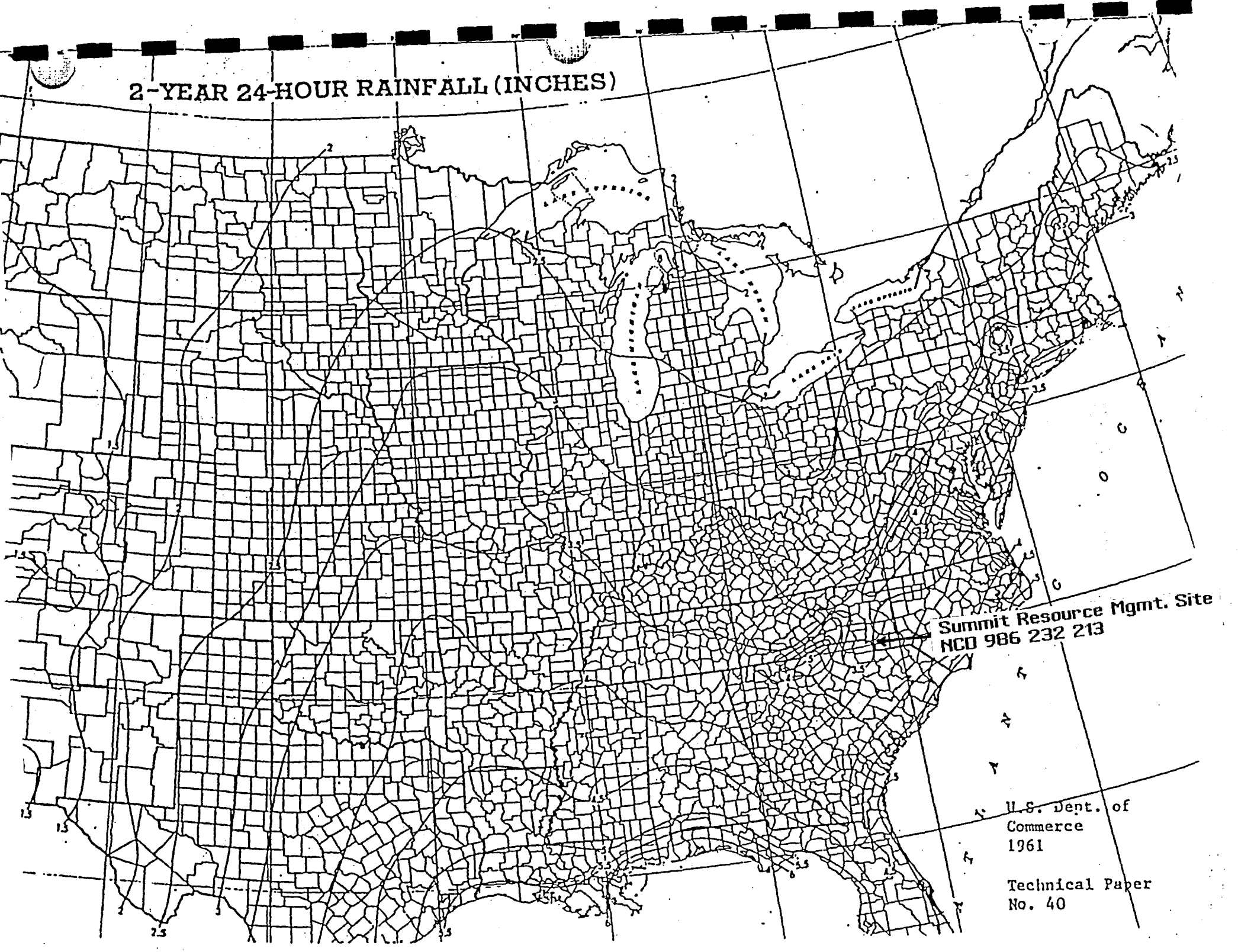
RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

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

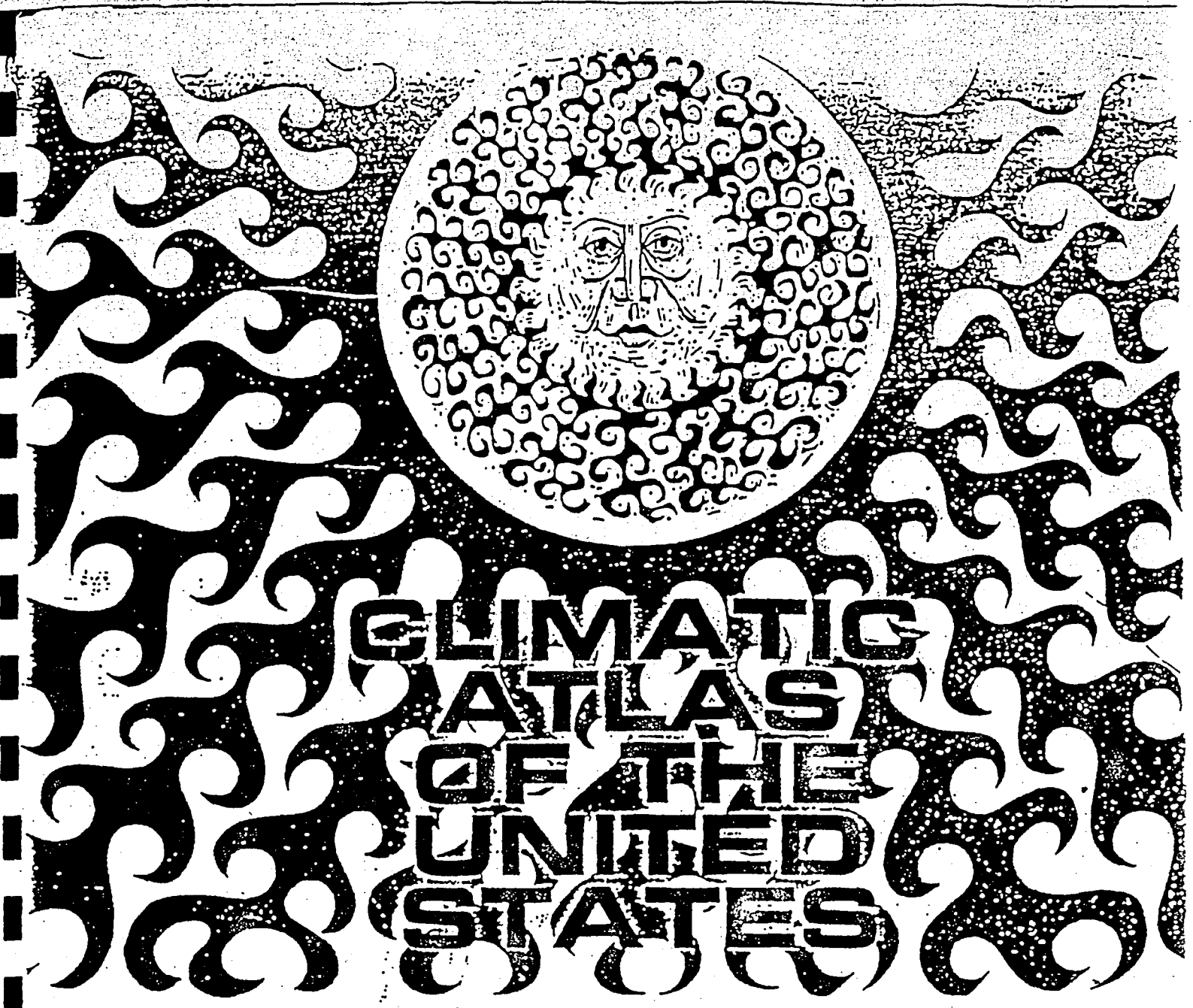
Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division
for
Engineering Division, Soil Conservation Service
U.S. Department of Agriculture

PROPERTY OF EPA
FIT IV

Ref. 3


2-YEAR 24-HOUR RAINFALL (INCHES)
Summit Resource Mgmt. Site
NCD 986 232 213
U.S. Dept. of
Commerce
1961
Technical Paper
No. 40

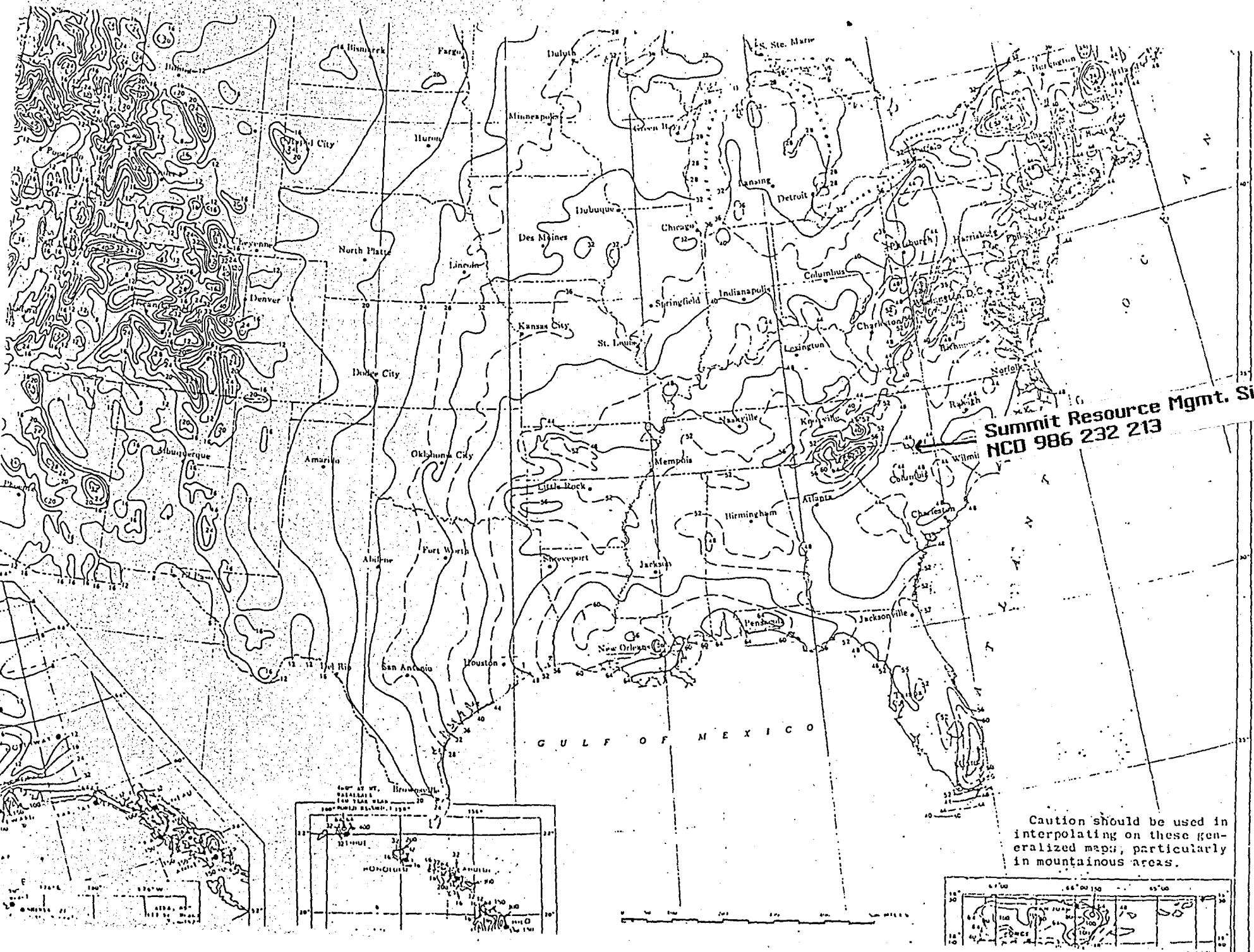
Ref. 4



CLIMATIC ATLAS OF THE UNITED STATES

RCE . Environmental Science Services Administration . Environmental Data Service

NORMAL ANNUAL TOTAL PRECIPITATION (INCHES)



KE EVAPORATION

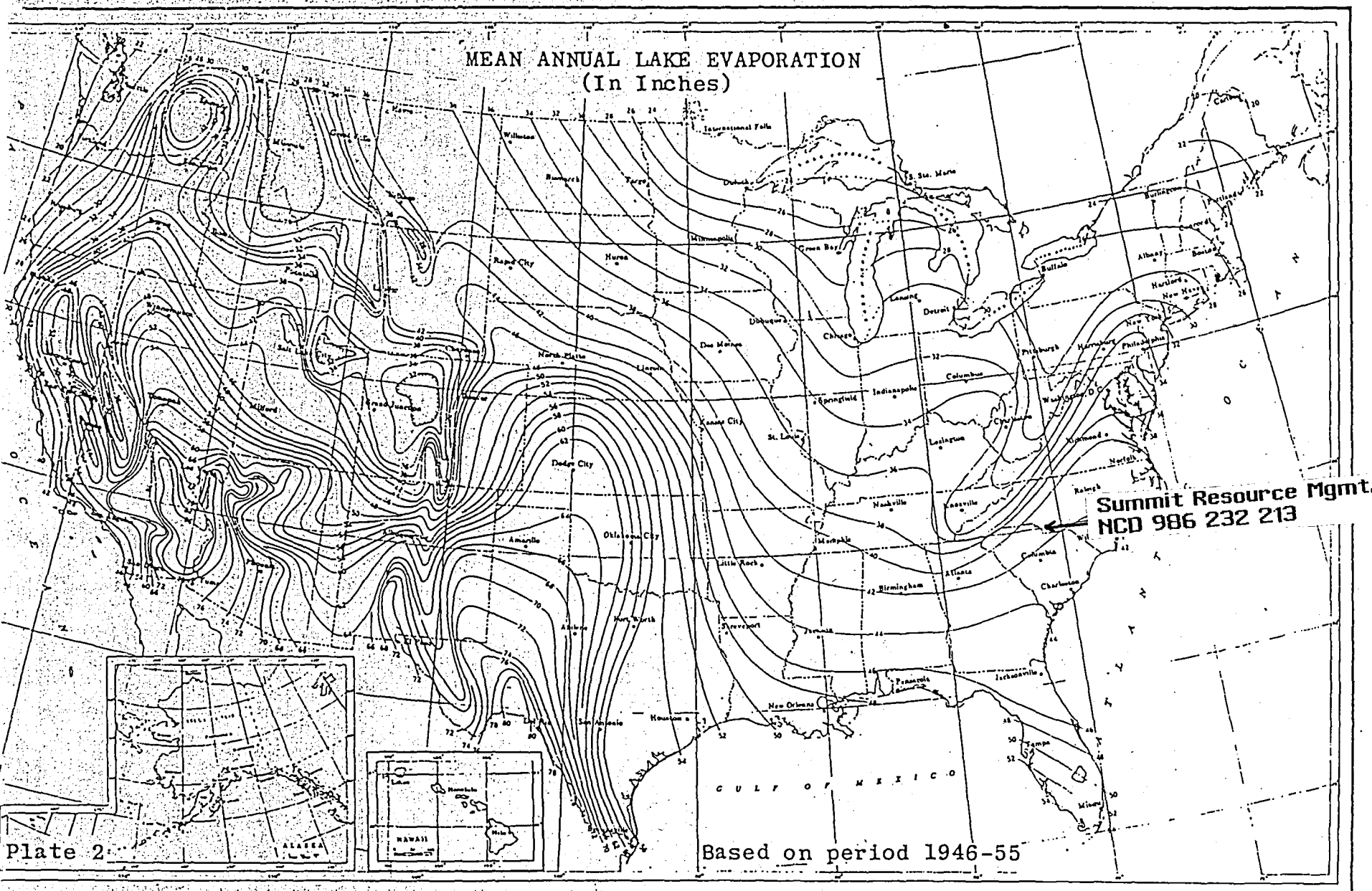
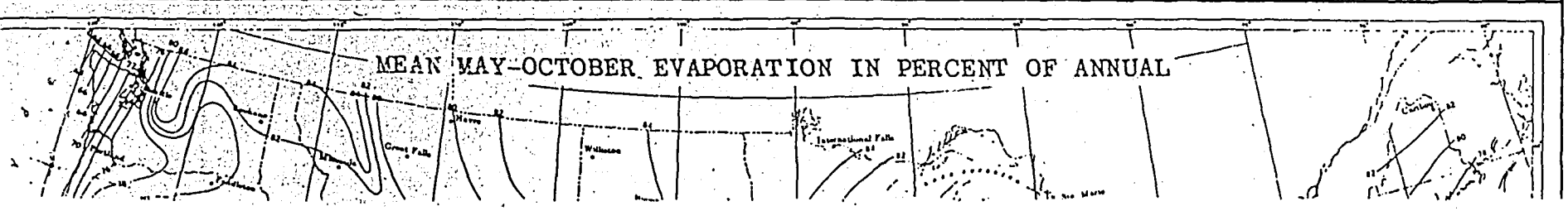


Plate 2



RMB

Ref. 5

State of North Carolina
Department of Environment, Health, and Natural Resources
Mooresville Regional Office

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Albert F. Hilton, Regional Manager
DIVISION OF ENVIRONMENTAL MANAGEMENT

November 5, 1992

Mr. Edward Kuhn, Plant Manager
Summit Resource Management, Inc.
3501 Gribble Road
Matthews, North Carolina 28105

Subject: Site Investigation and Water Column Sample Collection
Summit Resource Management and Richard Wagoner Properties
Union County, NC

Dear Mr. Kuhn:

On September 15, 1992 Richard Bridgeman, Anthony Foster, and I conducted a follow-up investigation, which included an inspection of the Summit Resource Management and adjacent Wagoner properties, and the collection of water column samples from both properties. This site inspection was conducted because of continuing concerns of this Division, the adjacent property owner, and other complainants of the impacts created by any leachate/ runoff originating on the Summit property. The possible impacts include soil, groundwater, and surface water contamination.

During the inspection of your facility it was again noted that the larger of the two concrete secondary containment structures adjacent to the Wagoner property contained cracks, which were resulting in minor releases of what is presummed to be antifreeze constituents to the surrounding ground surface. A small trench running parallel to the Summit/Wagoner property line appeared to be containing the released liquid. Such containment without further action to immediately remove the contaminant and any impacted soil is unacceptable. Given a rain event, both vertical and horizontal spread of the contaminant can be expected.

In the northeast corner of the Summit property, adjacent to the smaller of the two above cited secondary containment structures, is an earthen runoff collection area. There was evidence of minor leakage through the earthen berm surrounding this area. A grab sample was taken of the collection area's liquid fraction and forwarded to the Division's Central Laboratory using

P.O. Box 950, 919 North Main Street, Mooresville, N.C. 28115-0950 • Telephone 704-663-1699 • FAX 704-663-6040

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chain of custody procedures. The analytical report (see Attachment A) documents high concentrations of several semivolatile organics, including ethylene glycol monoacetate and triethylene glycol. Because of the relative solubility of the organics, both vertical and horizontal migration with water can be expected. Such containment without further action to immediately remove the contaminants and any impacted soil is unacceptable.

As you are aware, a previous inspection was conducted by Richard Bridgeman and Tony Parker on March 12, 1992, in response to a complaint received from the Union County Public Works Department concerning the subjective detection of ethylene glycol in the South Fork Crooked Creek. The Division analytically documented high concentrations of ethylene glycol (3,400,000 ug/l) in the unnamed tributary to the South Fork Crooked Creek, which receives runoff from the Summit property. Also during the inspection of the Summit property, an abandoned septic tank was noted. A Summit employee was observed to be pumping what subjectively appeared to contain antifreeze constituents from the septic tank into an adjacent secondary containment structure. It was the investigators' understanding that the contents of the secondary containment structure would be pumped to the on-site Concentrator-Evaporator Unit for glycol reclaimation. During the most recent on-site inspection, it was determined that the abandoned septic tank had been filled in. You indicated that this action had been taken because it had been determined that the inflow into the septic tank had actually been the result of backflow of sewerage from the municipal collection system running parallel with Gribble Road, rather than groundwater infiltration. You further indicated that it had not been analytically documented that the inflow into the septic tank contained no antifreeze constituents prior to taking this action. The contradictory information is of concern to this Office. Summit needs to immediately determine if the soil in this area is contaminated with antifreeze constituents, determine the vertical and horizontal extent of the contamination if necessary, and take action to remove any contaminated soil.

Whereas contaminated runoff (4,000,000 ug/l ethylene glycol) from the Summit property to the Wagoner property was observed during the March 12, 1992 investigation, the most recent investigation was conducted during an extended dry weather period; therefore, no direct runoff to the adjacent Wagoner property was observed. However, grab samples were collected of the liquid fraction of a shallow lagoon on the Wagoner property and forwarded to the Division's Central Laboratory and Aquatic Toxicology Unit using chain of custody procedures. As Attachment B documents, triethylene glycol and other semivolatile organics were detected. A 48-hour Acute Definitive test determined that the lethal concentration of the lagoon's liquid fraction causing fifty percent

mortality (expressed as an LC_{50}) in the test species, Ceriodaphnia dubia, was less than 5 percent. For your information, although probably indicative of existing toxic conditions, the test was recorded as a bad test because the sample temperature was greater than 4°C upon receipt by the Aquatic Toxicology Laboratory.

Based on existing available documentation, there is enough evidence to suggest the probable impact on the surface waters of the State, probable extensive soil contamination on the Summit property and the adjacent Wagoner property, and the potential for groundwater contamination. Although Summit submitted an environmental remediation action plan to this Office on November 22, 1991, other than the repair of existing facilities and improvements in operating procedures, to date no action has been taken to define the extent of any contamination (both soil and groundwater), to adequately and properly collect and retain all contaminated runoff on Summit property, or to collect and remove all contaminated soil for proper disposal. Should a groundwater impact be documented, as self-monitoring of the well on the Wagoner property suggests, then a remedial action plan must also be submitted to the Division's Groundwater Section at this Office.

It is requested that you submit a written response by no later than November 30, 1992. Your response, to the attention of Richard Bridgeman, should address all of the concerns expressed in this letter. Be aware that the Water Quality staff will continue to collect data; at such time as an enforcement recommendation seems appropriate, Summit will receive notification of our action.

Should you have questions or need assistance, please do not hesitate to contact this Office.

Sincerely,

D. Rex Gleason

D. Rex Gleason, P. E.
Water Quality Regional Supervisor

Enclosure

cc: Richard Wagoner
Herb Leith
Mike Shalati
Union County Health Department
MRO Groundwater Section

RMB

DIVISION OF ENVIRONMENTAL MANAGEMENT — WATER QUALITY FIELD LAB FORM (DM1)

N. C. DEPT. OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

CHAIN OF CUSTODY

COUNTY: Union

RIVER BASIN: Yadkin

REPORT TO: ARO FRO [MRO] RRO WaRO WIRO WSRO TS AT BM

Other

OCT 7 1992

DIVISION OF ENVIRONMENTAL MANAGEMENT MOORESVILLE REGIONAL OFFICE

Shipped by: Bus [Courier] Staff, Other

COLLECTOR(S): Rn Bridges

Estimated BOD Range: 0-5/5-25/25-65/40-130 or 100 plus

Seed: Yes ☐ No ☐ Chlorinated: Yes ☐ No ☐

PRIORITY: ☐ AMBIENT ☐ QA ☐ COMPLIANCE ☐ EMERGENCY

SAMPLE TYPE: ☐ STREAM ☐ EFFLUENT ☐ LAKE ☐ INFLUENT ☐ ESTUARY

For Lab Use ONLY

Lab Number: 2[redacted]

Date Received: 9/16/92 Time: 9:15

Rec'd by: DS From: Bus Courier Hand Del

DATA ENTRY BY: JH CK: JS

DATE REPORTED: 10/1/92

STATION LOCATION: Summit Resources Mngt. – Runoff/leachate collection area at NE corner to property

REMARKS:

Station #	Date Begin (yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H L	Composite T S B	Sample Type C G GNXX
SRM-2	92,09,15	11:30						G

1		BOD5 310	mg/l		Chloride 940	mg/l		NH3 as N 610	mg/l		Li-Lithium 1132 ug/l
2		COD High 340	mg/l		Chl a: Tri 32217	ug/l		TKN as N 625	mg/l		Mg-Magnesium 927 mg/l
3		COD Low 335	mg/l		Chl a: Corr 32209	ug/l		NO2 plus NO3 as N 630	mg/l		Mn-Manganese 1055 ug/l
4		Coliform: MF Fecal 31616	/100ml		Pheophytin a 32213	ug/l		P: Total as P 665	mg/l		Na-Sodium 929 mg/l
5		Coliform: MF Total 31504	/100ml		Color: True 80	Pt-Co		PO4 as P 70507	mg/l		Arsenic:Total 1002 ug/l
6		Coliform: Tube Fecal 31615	/100ml		Color:(pH) 83	ADMI		P: Dissolved as P 666	mg/l		Se-Selenium 1147 ug/l
7		Coliform: Fecal Strep 31673	/100ml		Color: pH 7.6 82	ADMI					Hg-Mercury 71900 ug/l
8		Residue: Total 500	mg/l		Cyanide 720	mg/l		Cd-Cadmium 1027	ug/l		Organochlorine Pesticides
9		Volatile 505	mg/l		Fluoride 951	mg/l		Cr-Chromium:Total 1034	ug/l		Organophosphorus Pesticides
10		Fixed 510	mg/l		Formaldehyde 71880	mg/l		Cu-Copper 1042	ug/l		
11		Residue: Suspended 530	mg/l		Grease and Oils 556	mg/l		Ni-Nickel 1067	ug/l		Acid Herbicides
12		Volatile 535	mg/l		Hardness Total 900	mg/l		Pb-Lead 1051	ug/l		
13		Fixed 540	mg/l		Specific Cond. 95	uMhos/cm²		Zn-Zinc 1092	ug/l	X	Base/ Neutral Extractable Organics
14		pH 403	units		MBAS 38260	mg/l				X	Acid Extractable Organics
15		Acidity to pH 4.5 436	mg/l		Phenols 32730	ug/l		Ag-Silver 1077	ug/l	X	Ethylene Glycol
16		Acidity to pH 8.3 435	mg/l		Sulfate 945	mg/l		Al-Aluminum 1105	ug/l		Purgeable Organics (VOA bottle req'd)
17		Alkalinity to pH 8.3 415	mg/l		Sulfide 745	mg/l		Be-Beryllium 1012	ug/l		
18		Alkalinity to pH 4.5 410	mg/l					Ca-Calcium 916	mg/l		
19		TOC 680	mg/l					Co-Cobalt 1037	ug/l		
20		Turbidity 76	NTU					Fe-Iron 1045	ug/l		Phytoplankton S

Sampling Point %	Conductance at 25 C	Water Temperature (C)	D.O. mg/l	pH	Alkalinity pH 8.3	Alkalinity pH 4.5	Acidity pH 4.5	Acidity pH 8.3	Air Temperature (C)
2	94	10	300	400	82244	431	82243	82242	20
	Salinity %	Precipition (in/day)	Cloud Cover %	Wind Direction (Deg)	Stream Flow Severity	Turbidity Severity	Wind Velocity M/H	Mean Stream Depth ft.	Stream Width ft.
	480	45	32	36	1351	1350	35	64	4

DM1/Revised 10/86

ATTACHMENT A

SEMIVOLATILE ORGANICS REPORT - DEM LAB

LAB NUMBER:2W5779 SUPERVISOR REK LAB #:2W5779
DATE : 9/30/92

REPORTED BY CW
CHECKED BY SM ENTERED BY JH
REVIEWED BY SM CHECKED BY DS

SAMPLE TYPE: WATER DILUTION FACTOR : 1:4167

CAS NUMBER	TQL X 4167	ANALYTE NAME	CONC. UG/L
108-95-2	10	PHENOL	U
111-44-4	10	BIS(2-CHLOROETHYL) ETHER	U
95-57-8	10	2-CHLOROPHENOL	U
541-73-1	10	1,3-DICHLOROBENZENE	U
106-46-7	10	1,4-DICHLOROBENZENE	U
100-51-6	20	BENZYL ALCOHOL	U
95-50-1	10	1,2-DICHLOROBENZENE	U
95-48-7	10	2-METHYL PHENOL	U
108-60-1	10	BIS(2-CHLOROISOPROPYL) ETHER	U
106-44-5	10	4-METHYL PHENOL	U
621-64-7	10	N-NITROSO-DI-N-PROPYLAMINE	U
67-72-1	10	HEXACHLOROETHANE	U
98-95-3	10	NITROBENZENE	U
78-59-1	10	ISOPHORONE	U
88-75-5	10	2-NITRO PHENOL	U
105-67-9	10	2,4-DIMETHYL PHENOL	U
65-85-0	50	BENZOIC ACID	U
111-91-1	10	BIS(2-CHLOROETHOXY) METHANE	U
120-83-2	10	2,4-DICHLORO PHENOL	U
120-82-1	10	1,2,4-TRICHLOROBENZENE	U
91-20-3	10	NAPHTHALENE	U
106-47-8	20	4-CHLOROANILINE	U
87-68-3	10	HEXACHLOROBUTADIENE	U
59-50-7	20	4-CHLORO-3-METHYL PHENOL	U
91-57-6	10	2-METHYL NAPHTHALENE	U
77-47-4	10	HEXACHLOROCYCLOPENTADIENE	U
88-06-2	10	2,4,6-TRICHLORO PHENOL	U
95-95-4	10	2,4,5-TRICHLORO PHENOL	U
91-58-7	10	2-CHLORO NAPHTHALENE	U
88-74-4	50	2-NITROANALINE	U
131-11-3	10	DIMETHYL PHTHALATE	U
208-96-8	10	ACENAPHTHYLENE	U
606-20-2	10	2,6-DINITROTOLUENE	U
99-09-2	50	3-NITROANALINE	U
83-32-9	10	ACENAPHTHENE	U
51-28-5	50	2,4-DINITRO PHENOL	U
100-02-7	50	4-NITRO PHENOL	U
132-64-9	10	DIBENZOFURAN	U
121-14-2	10	2,4-DINITROTOLUENE	U
84-66-2	10	DIETHYL PHTHALATE	U
7005-72-3	10	4-CHLOROPHENYL PHENYL ETHER	U
86-73-7	10	FLUORENE	U
100-01-6	50	4-NITROANALINE	U
534-52-1	50	4,6-DINITRO-2-METHYL PHENOL	U

86-30-6	10	N-NITROSODIPHENYLAMINE	U
101-55-3	10	4-BROMOPHENYL PHENYL ETHER	U
118-74-1	10	HEXACHLOROBENZENE	U
87-86-5	50	PENTACHLORO PHENOL	U
85-01-8	10	PHENANTHRENE	U
120-12-7	10	ANTHRACENE	U
84-74-2	10	DI-N-BUTYL PHTHALATE	U
206-44-0	10	FLUORANTHENE	U
129-00-0	10	PYRENE	U
85-68-7	10	BUTYLBENZYL PHTHALATE	U
91-94-1	20	3,3'-DICHLOROBENZIDINE	U
56-55-3	10	BENZO(A)ANTHRACENE	U
218-01-9	10	CHRYSENE	U
117-81-7	10	BIS(2-ETHYLHEXYL) PHTHALATE	U
117-84-0	10	DI-N-OCTYL PHTHALATE	U
205-99-2	10	BENZO(B)FLUORANTHENE	U
207-08-9	10	BENZO(K)FLUORANTHENE	U
50-32-8	10	BENZO(A)PYRENE	U
193-39-5	10	INDENO(1,2,3-CD)PYRENE	U
53-70-3	10	DIBENZO(A,H)ANTHRACENE	U
191-24-2	10	BENZO(G,H,I)PERYLENE	U

OTHER SEMIVOLATILE ORGANICS FOR SAMPLE NUMBER : 2W5779

METHOXY METHYLEHTOXY PROPANOL (C7 H16 O3)	120000	T
METHOXY METHYLEHTOXY PROPANOL (C7 H16 O3)	180000	T
METHYL PYRROLIDINONE (C5 H9 O N)	260000	T
MEHTYL PROPENYLOXY EHTOXY PROPANOL (C9 H18 O3)	79000	T
MEHTYL PROPENYLOXY EHTOXY PROPANOL (C9 H18 O3)	110000	T
METHOXY METHYLETHOXY METHYLETHOXY PROPANOL	90000	T
METHOXY METHYLETHOXY METHYLETHOXY PROPANOL	63000	T
BENZOIC ACID METHYL PROPYL ESTER (C11 H14 O2)	83000	T
TRIMETHYL TETRAOXATETRADECAN-OL (C13 H28 O5)	71000	T
TRIMETHYL TETRAOXATETRADECAN-OL (C13 H28 O5)	100000	T
TRIMETHYL TETRAOXATETRADECAN-OL (C13 H28 O5)	130000	T
PENTAHEXADECAN-OL (C11 H14 O6)	300000	T
BUTOXYETHOXY ETHOXY ETHANOL (C10 H22 O4)	150000	T
UNIDENTIFIED _____	88000	E
UNIDENTIFIED _____	130000	E
UNIDENTIFIED _____	180000	E
UNIDENTIFIED _____	120000	E
UNIDENTIFIED _____	130000	E
UNIDENTIFIED _____	120000	E
UNIDENTIFIED _____	120000	E
ETHYLENE GLYCOL MONOACETATE (C4 H8 O3) { GC/MS }	11000	T
TRIETHYLENE GLYCOL (C6 H14 O4) { GC/MS }	71000	T

TQL= TARGET QUANTITATION LIMIT
T= TENTATIVELY IDENTIFIED ESTIMATED CONCENTRATION
E= ESTIMATED CONCENTRATION
U= COMPOUND ANALYZED FOR NOT DETECTED
N= COMPOUND NOT ANALYZED FOR
D= DETECTED BELOW QUANTITATION LIMIT
H= HOLDING TIME EXCEEDED
TQL SUBJECT TO CHANGE DUE TO INSTRUMENT SENSITIVITY

DIVISION OF ENVIRONMENTAL MANAGEMENT — STATE LABORATORY FOR PUBLIC HEALTH (DMA)

N. C. DEPT. OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

DIVISION OF ENVIRONMENTAL MANAGEMENT
MOORESVILLE REGIONAL OFFICE

CHAIN OF CUSTODY

COUNTY: Union
RIVER BASIN: Yadkin
REPORT TO: ARO FRO [MRO] RRO WaRO WIRO WSRO TS
AT BM
Other
OCT 7 1992
Shipped by: Bus [Courier] Staff, Other
COLLECTOR(S): RnBirkymaier
Estimated BOD Range: 0-5/5-25/25-65/40-130 or 100 plus
Seed: Yes ☐ No ☐ Chlorinated: Yes ☐ No ☐

PRIORITY: ☐ AMBIENT ☐ QA ☐ COMPLIANCE ☒ CHAIN OF CUSTODY ☒ EMERGENCY

SAMPLE TYPE: ☐ STREAM ☐ EFFLUENT ☐ LAKE ☐ INFLUENT ☐ ESTUARY

STATION LOCATION: Wagner property downslope from Summit Resources Mgt.

REMARKS: Shallow pond — Suspect Glycol contamination

For Lab Use ONLY
Lab Number: 2[redacted]5[redacted]18
Date Received: 9/16/92 Time: 9:15
Rec'd by: DS | From: Bus Courier Hand Del
DATA ENTRY BY: JH CK: DS
DATE REPORTED: 10/1/92

Station #	Date Begin (yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H L	Composite T S B	Sample Type C G GNXX
WPP-1	92, 09, 15	10:15	, ,					G

1		BOD5 310	mg/l		Chloride 940	mg/l		NH3 as N 610	mg/l		Li-Lithium 1132 ug/l
2		COD High 340	mg/l		Chl a: Tri 32217	ug/l		TKN as N 625	mg/l		Mg-Magnesium 927 mg/l
3		COD Low 335	mg/l		Chl a: Corr 32209	ug/l		NO2 plus NO3 as N 630	mg/l		Mn-Manganese 1055 ug/l
4		Coliform: MF Fecal 31616	/100ml		Pheophytin a 32213	ug/l		P: Total as P 665	mg/l		Na-Sodium 929 mg/l
5		Coliform: MF Total 31504	/100ml		Color: True 80	Pt-Co		PO4 as P 70507	mg/l		Arsenic:Total 1002 ug/l
6		Coliform: Tube Fecal 31615	/100ml		Color:(pH) 83	ADMI		P: Dissolved as P 666	mg/l		Se-Selenium 1147 ug/l
7		Coliform: Fecal Strep 31673	/100ml		Color: pH 7.6 82	ADMI					Hg-Mercury 71900 ug/l
8		Residue: Total 500	mg/l		Cyanide 720	mg/l		Cd-Cadmium 1027	ug/l		Organochlorine Pesticides
9		Volatile 505	mg/l		Fluoride 951	mg/l		Cr-Chromium:Total 1034	ug/l		Organophosphorus Pesticides
10		Fixed 510	mg/l		Formaldehyde 71880	mg/l		Cu-Copper 1042	ug/l		
11		Residue: Suspended 530	mg/l		Grease and Oils 556	mg/l		Ni-Nickel 1067	ug/l		Acid Herbicides
12		Volatile 535	mg/l		Hardness Total 900	mg/l		Pb-Lead 1051	ug/l		
13		Fixed 540	mg/l		Specific Cond. 95	uMhos/cm 2		Zn-Zinc 1092	ug/l	X	Base/ Neutral Extractable Organics
14		pH 403	units		MBAS 38260	mg/l				X	Acid Extractable Organics
15		Acidity to pH 4.5 436	mg/l		Phenols 32730	ug/l		Ag-Silver 1077	ug/l	X	Ethylene Glycol
16		Acidity to pH 8.3 435	mg/l		Sulfate 945	mg/l		Al-Aluminum 1105	ug/l		Purgeable Organics (VOA bottle req'd)
17		Alkalinity to pH 8.3 415	mg/l		Sulfide 745	mg/l		Be-Beryllium 1012	ug/l		
18		Alkalinity to pH 4.5 410	mg/l					Ca-Calcium 916	mg/l		
19		TOC 680	mg/l					Co-Cobalt 1037	ug/l		S
20		Turbidity 76	NTU					Fe-Iron 1045	ug/l		Phytoplankton

Sampling Point %	Conductance at 25 C	Water Temperature (C)	D.O. mg/l	pH	Alkalinity pH 8.3	Alkalinity pH 4.5	Acidity pH 4.5	Acidity pH 8.3	Air Temperature (C)
2	94	10	300	400	82244	431	82243	82242	20
	Salinity %	Precipition (in/day)	Cloud Cover %	Wind Direction (Deg)	Stream Flow Severity	Turbidity Severity	Wind Velocity M/H	Mean Stream Depth ft.	Stream Width ft.
	480	45	32	36	1351	1350	35	64	4

DM1/Revised 10/86

ATTACHMENT B

SEMIVOLATILE ORGANICS REPORT - DEM LAB

LAB NUMBER:2W5778 SUPERVISOR RCK LAB #:2W5778
DATE : 9/30/92

REPORTED BY
CHECKED BY SM ENTERED BY JH
REVIEWED BY SM CHECKED BY DS

SAMPLE TYPE: WATER DILUTION FACTOR : 1:25

CAS NUMBER	TQL X25	ANALYTE NAME		CONC. UG/L
108-95-2	10	PHENOL	U	
111-44-4	10	BIS(2-CHLOROETHYL) ETHER	U	
95-57-8	10	2-CHLOROPHENOL	U	
541-73-1	10	1,3-DICHLOROBENZENE	U	
106-46-7	10	1,4-DICHLOROBENZENE	U	
100-51-6	20	BENZYL ALCOHOL	U	
95-50-1	10	1,2-DICHLOROBENZENE	U	
95-48-7	10	2-METHYL PHENOL	U	
108-60-1	10	BIS(2-CHLOROISOPROPYL) ETHER	U	
106-44-5	10	4-METHYL PHENOL		400 E
621-64-7	10	N-NITROSO-DI-N-PROPYLAMINE	U	
67-72-1	10	HEXACHLOROETHANE	U	
98-95-3	10	NITROBENZENE	U	
78-59-1	10	ISOPHORONE	U	
88-75-5	10	2-NITRO PHENOL	U	
105-67-9	10	2,4-DIMETHYL PHENOL	U	
65-85-0	50	BENZOIC ACID	U	
111-91-1	10	BIS(2-CHLOROETHOXY) METHANE	U	
120-83-2	10	2,4-DICHLORO PHENOL	U	
120-82-1	10	1,2,4-TRICHLOROBENZENE	U	
91-20-3	10	NAPHTHALENE	U	
106-47-8	20	4-CHLOROANILINE	U	
87-68-3	10	HEXACHLOROBUTADIENE	U	
59-50-7	20	4-CHLORO-3-METHYL PHENOL	U	
91-57-6	10	2-METHYL NAPHTHALENE	U	
77-47-4	10	HEXACHLOROCYCLOPENTADIENE	U	
88-06-2	10	2,4,6-TRICHLORO PHENOL	U	
95-95-4	10	2,4,5-TRICHLORO PHENOL	U	
91-58-7	10	2-CHLORO NAPHTHALENE	U	
88-74-4	50	2-NITROANALINE	U	
131-11-3	10	DIMETHYL PHTHALATE	U	
208-96-8	10	ACENAPHTHYLENE	U	
606-20-2	10	2,6-DINITROTOLUENE	U	
99-09-2	50	3-NITROANALINE	U	
83-32-9	10	ACENAPHTHENE	U	
51-28-5	50	2,4-DINITRO PHENOL	U	
100-02-7	50	4-NITRO PHENOL	U	
132-64-9	10	DIBENZOFURAN	U	
121-14-2	10	2,4-DINITROTOLUENE	U	
84-66-2	10	DIETHYL PHTHALATE	U	
7005-72-3	10	4-CHLOROPHENYL PHENYL ETHER	U	
86-73-7	10	FLUORENE	U	
100-01-6	50	4-NITROANALINE	U	
534-52-1	50	4,6-DINITRO-2-METHYL PHENOL	U	

86-30-6	10	N-NITROSODIPHENYLAMINE	U
101-55-3	10	4-BROMOPHENYL PHENYL ETHER	U
118-74-1	10	HEXACHLOROBENZENE	U
87-86-5	50	PENTACHLORO PHENOL	U
85-01-8	10	PHENANTHRENE	U
120-12-7	10	ANTHRACENE	U
84-74-2	10	DI-N-BUTYL PHTHALATE	U
206-44-0	10	FLUORANTHENE	U
129-00-0	10	PYRENE	U
85-68-7	10	BUTYLBENZYL PHTHALATE	U
91-94-1	20	3,3'-DICHLOROBENZIDINE	U
56-55-3	10	BENZO(A)ANTHRACENE	U
218-01-9	10	CHRYSENE	U
117-81-7	10	BIS(2-ETHYLHEXYL) PHTHALATE	U
117-84-0	10	DI-N-OCTYL PHTHALATE	U
205-99-2	10	BENZO(B)FLUORANTHENE	U
207-08-9	10	BENZO(K)FLUORANTHENE	U
50-32-8	10	BENZO(A)PYRENE	U
193-39-5	10	INDENO(1,2,3-CD)PYRENE	U
53-70-3	10	DIBENZO(A,H)ANTHRACENE	U
191-24-2	10	BENZO(G,H,I)PERYLENE	U

OTHER SEMIVOLATILE ORGANICS FOR SAMPLE NUMBER : 2W5778

METHYL PYRROLIDINONE (C5 H9 O N)	1900	T
PHENYL PROPANEDIOIC ACID (C9 H8 04)	320	T
METHOXY-METHYLETHOXY-METHYLETHOXY PROPANOL	350	T
BUTOXY ETHOXYETHOXY ETHANOL (C10 H22 O4)	1600	T
TRIMETHYL TETRAOXATETRADECANOL (C13 H28 O5)	350	T
TRIMETHYL TETRAOXATETRADECANOL (C13 H28 O5)	750	T
TRIMETHYL TETRAOXATETRADECANOL (C13 H28 O5)	450	T
PENTAOXA HEXADECANOL (C11 H24 O6)	780	T
UNIDENTIFIED _____	480	E
UNIDENTIFIED _____	520	E
UNIDENTIFIED _____	1900	E
UNIDENTIFIED _____	1200	E
UNIDENTIFIED _____	450	E
UNIDENTIFIED _____	700	E
UNIDENTIFIED _____	380	E
UNIDENTIFIED _____	950	E
UNIDENTIFIED _____	950	E
UNIDENTIFIED _____	2000	E
UNIDENTIFIED _____	1400	E
UNIDENTIFIED _____	520	E
TRIETHYLENE GLYCOL (C6 H14 O4) { BY GC.MS }	150	T

TQL= TARGET QUANTITATION LIMIT
T= TENTATIVELY IDENTIFIED ESTIMATED CONCENTRATION
E= ESTIMATED CONCENTRATION
U= COMPOUND ANALYZED FOR NOT DETECTED
N= COMPOUND NOT ANALYZED FOR
D= DETECTED BELOW QUANTITATION LIMIT
H= HOLDING TIME EXCEEDED
TQL SUBJECT TO CHANGE DUE TO INSTRUMENT SENSITIVITY

DIVISION OF ENVIRONMENTAL MANAGEMENT — WATER QUALITY FIELD-LAB FORM (DM1)

(2)

COUNTY Union

RIVER BASIN Y/AD

REPORT TO: ARO FRO MRO RRO WaRO WIRO WSRO TS AT BM

Other

Shipped by: Bus Courier Staff, Other

COLLECTOR(S): T. Parker / R. Bridgeman

Estimated BOD Range: 0-5/5-25/25-65/40-130 or 100 plus

Seed: Yes ☐ No ☐ Chlorinated: Yes ☐ No ☑

PRIORITY: ☐ AMBIENT ☐ QA ☐ COMPLIANCE ☑ CHAIN OF CUSTODY ☑ EMERGENCY

SAMPLE TYPE: ☐ STREAM ☐ EFFLUENT ☐ LAKE ☐ INFLUENT ☐ ESTUARY

Lab Number: 2W1241

Date Received: 3-13-92 Time: 8:30

Rec'd by: DS | From: Bus Courier Hand Del

DATA ENTRY BY: pg CK: DS

DATE REPORTED: 3-23-92

STATION LOCATION: U.T. to South Fork Crooked Creek near Summit Resources

REMARKS: Suspect glycol contamination

Station	Date Begin (yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H L	Composite T S B	Sample Type C G GNXX
U.T.S.F. -2	92 03 12	1330						

1		BOD5 310	mg/l		Chloride 940	mg/l		NH3 as N 610	mg/l		Li-Lithium 1132 ug/l
2		COD High 340	mg/l		Chl a: Tri 32217	ug/l		TKN as N 625	mg/l		Mg-Magnesium 927 mg/l
3		COD Low 335	mg/l		Chl a: Corr 32209	ug/l		NO2 plus NO3 as N 630	mg/l		Mn-Manganese 1055 ug/l
4		Coliform: MF Fecal 31616	/100ml		Pheophytin a 32213	ug/l		P: Total as P 665	mg/l		Na-Sodium 929 mg/l
5		Coliform: MF Total 31504	/100ml		Color: True 80	Pt-Co		PO4 as P 70507	mg/l		Arsenic:Total 1002 ug/l
6		Coliform: Tube Fecal 31615	/100ml		Color:(pH) 83	ADMI		P: Dissolved as P 666	mg/l		Se-Selenium 1147 ug/l
7		Coliform: Fecal Strep 31673	/100ml		Color: pH 7.6 82	ADMI					Hg-Mercury 71900 ug/l
8		Residue: Total 500	mg/l		Cyanide 720	mg/l		Cd-Cadmium 1027	ug/l		Organochlorine Pesticides
9		Volatile 505	mg/l		Fluoride 951	mg/l		Cr-Chromium:Total 1034	ug/l		Organophosphorus Pesticides
10		Fixed 510	mg/l		Formaldehyde 71880	mg/l		Cu-Copper 1042	ug/l		
11		Residue: Suspended 530	mg/l		Grease and Oils 556	mg/l		Ni-Nickel 1067	ug/l		Acid Herbicides
12		Volatile 535	mg/l		Hardness Total 900	mg/l		Pb-Lead 1051	ug/l		
13		Fixed 540	mg/l		Specific Cond. 95	uMhos/cm^2		Zn-Zinc 1092	ug/l	X	Base/ Neutral Extractable Organics
14		pH 403	units		MBAS 38260	mg/l				X	Acid Extractable Organics
15		Acidity to pH 4.5 436	mg/l		Phenols 32730	ug/l		Ag-Silver 1077	ug/l	X	Ethylene Glycol
16		Acidity to pH 8.3 435	mg/l		Sulfate 945	mg/l		Al-Aluminum 1105	ug/l		Purgeable Organics (VOA bottle req'd)
17		Alkalinity to pH 8.3 415	mg/l		Sulfide 745	mg/l		Be-Beryllium 1012	ug/l		
18		Alkalinity to pH 4.5 410	mg/l					Ca-Calcium 916	mg/l		
19		TOC 680	mg/l					Co-Cobalt 1037	ug/l		SEE ATTACHED ORGANICS ANALYSIS REPORT
20		Turbidity 76	NTU					Fe-Iron 1045	ug/l		Phytoplankton

N. C. DEPT. OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

MAR 25 1992

DIVISION OF ENVIRONMENTAL MANAGEMENT
MOORESVILLE REGIONAL OFFICE

Sampling Point %	Conductance at 25 C	Water Temperature (C)	D.O. mg/l	pH	Alkalinity pH 8.3	Alkalinity pH 4.5	Acidity pH 4.5	Acidity pH 8.3	Air Temperature (C)
2	94	10	300	400	82244	431	82243	82242	20
	Salinity %	Precipition (in/day)	Cloud Cover %	Wind Direction (Deg)	Stream Flow Severity	Turbidity Severity	Wind Velocity M/H	Mean Stream Depth ft.	Stream Width ft.
	480	45	32	36	1351	1350	35	64	4

DM1/Revised 10/86

SEMIVOLATILE ORGANICS REPORT - DEM LAB

LAB NUMBER: 2W1241 SUPERVISOR REK LAB #: 2W1241
DATE : 3/23/92

REPORTED BY SM
CHECKED BY PTO ENTERED BY PD
REVIEWED BY PTO CHECKED BY DS

SAMPLE TYPE: WATER DILUTION FACTOR : _____

CAS NUMBER	TOL X 1	ANALYTE NAME	CONC. UG/L
108-95-2	10	PHENOL	U
111-44-4	10	BIS(2-CHLOROETHYL) ETHER	U
95-57-8	10	2-CHLOROPHENOL	U
541-73-1	10	1,3-DICHLOROBENZENE	U
106-46-7	10	1,4-DICHLOROBENZENE	U
100-51-6	20	BENZYL ALCOHOL	U
95-50-1	10	1,2-DICHLOROBENZENE	U
95-48-7	10	2-METHYL PHENOL	U
108-60-1	10	BIS(2-CHLOROISOPROPYL) ETHER	U
106-44-5	10	4-METHYL PHENOL	U
621-64-7	10	N-NITROSO-DI-N-PROPYLAMINE	U
67-72-1	10	HEXACHLOROETHANE	U
98-95-3	10	NITROBENZENE	U
78-59-1	10	ISOPHORONE	U
88-75-5	10	2-NITRO PHENOL	U
105-67-9	10	2,4-DIMETHYL PHENOL	U
65-85-0	50	BENZOIC ACID	U
111-91-1	10	BIS(2-CHLOROETHOXY) METHANE	U
120-83-2	10	2,4-DICHLORO PHENOL	U
120-82-1	10	1,2,4-TRICHLOROBENZENE	U
91-20-3	10	NAPHTHALENE	U
106-47-8	20	4-CHLOROANILINE	U
87-68-3	10	HEXACHLOROBUTADIENE	U
59-50-7	20	4-CHLORO-3-METHYL PHENOL	U
91-57-6	10	2-METHYL NAPHTHALENE	U
77-47-4	10	HEXACHLOROCYCLOPENTADIENE	U
88-06-2	10	2,4,6-TRICHLORO PHENOL	U
95-95-4	10	2,4,5-TRICHLORO PHENOL	U
91-58-7	10	2-CHLORO NAPHTHALENE	U
88-74-4	50	2-NITROANALINE	U
131-11-3	10	DIMETHYL PHTHALATE	U
208-96-8	10	ACENAPHTHYLENE	U
606-20-2	10	2,6-DINITROTOLUENE	U
99-09-2	50	3-NITROANALINE	U
83-32-9	10	ACENAPHTHENE	U
51-28-5	50	2,4-DINITRO PHENOL	U
100-02-7	50	4-NITRO PHENOL	U
132-64-9	10	DIBENZOFURAN	U
121-14-2	10	2,4-DINITROTOLUENE	U
84-66-2	10	DIETHYL PHTHALATE	U
7005-72-3	10	4-CHLOROPHENYL PHENYL ETHER	U
86-73-7	10	FLUORENE	U
100-01-6	50	4-NITROANALINE	U
534-52-1	50	4,6-DINITRO-2-METHYL PHENOL	U

SEMIVOLATILE ORGANICS REPORT - DEM LAB

86-30-6	10	N-NITROSODIPHENYLAMINE	U
101-55-3	10	4-BROMOPHENYL PHENYL ETHER	U
118-74-1	10	HEXACHLOROBENZENE	U
87-86-5	50	PENTACHLORO PHENOL	U
85-01-8	10	PHENANTHRENE	U
120-12-7	10	ANTHRACENE	U
84-74-2	10	DI-N-BUTYL PHTHALATE	U
206-44-0	10	FLUORANTHENE	U
129-00-0	10	PYRENE	U
85-68-7	10	BUTYLBENZYL PHTHALATE	U
91-94-1	20	3,3'-DICHLOROBENZIDINE	U
56-55-3	10	BENZO(A)ANTHRACENE	U
218-01-9	10	CHRYSENE	U
117-81-7	10	BIS(2-ETHYLHEXYL) PHTHALATE	U
117-84-0	10	DI-N-OCTYL PHTHALATE	U
205-99-2	10	BENZO(B)FLUORANTHENE	U
207-08-9	10	BENZO(K)FLUORANTHENE	U
50-32-8	10	BENZO(A)PYRENE	U
193-39-5	10	INDENO(1,2,3-CD)PYRENE	U
53-70-3	10	DIBENZO(A,H)ANTHRACENE	U
191-24-2	10	BENZO(G,H,I)PERYLENE	U

OTHER SEMIVOLATILE ORGANICS FOR SAMPLE NUMBER : 2W1241

ETHYLENE GLYCOL	EST. RANGE OF CONC. ---	3400000	T*
BUTOXYETHANOL (C6H14O2)		110	T
METHYL PYRROLIDINONE (C5H9ON)		79	T
BUTOXYETHOXYETHANOL (C8H18O3)		240	T
METHYL BENZOIC ACID (C8H8O2)		47	T
ETHYL BENZOIC ACID (C9H10O2)		36	T
BUTOXYETHOXY ETHOXYETHANOL (C10H22O4)		260	T
BUTOXYETHOXY ETHOXYETHANOL (C10H22O4)		250	T
UNIDENTIFIED	_____	66	E
UNIDENTIFIED	_____	23	E
UNIDENTIFIED	_____	23	E
UNIDENTIFIED	_____	31	E
UNIDENTIFIED	_____	49	E
UNIDENTIFIED	_____	94	E
UNIDENTIFIED	_____	130	E
UNIDENTIFIED	_____	22	E
UNIDENTIFIED	_____	60	E
UNIDENTIFIED	_____	160	E
UNIDENTIFIED	_____	160	E
UNIDENTIFIED	_____	32	E
UNIDENTIFIED		28	E

TQL= TARGET QUANTITATION LIMIT
T= TENTATIVELY IDENTIFIED ESTIMATED CONCENTRATION
E= ESTIMATED CONCENTRATION
U= COMPOUND ANALYZED FOR NOT DETECTED
N= COMPOUND NOT ANALYZED FOR
D= DETECTED BELOW QUANTITATION LIMIT
H= HOLDING TIME EXCEEDED
TQL SUBJECT TO CHANGE DUE TO INSTRUMENT SENSITIVITY
*DIRECT AQUEOUS INJECTION : GC/FID

[redacted] DIVISION OF ENVIRONMENTAL MANAGEMENT [redacted] WATER QUALITY FIELD-LAB FORM (DM1) [redacted]

1

[redacted] Lab [redacted] NLY [redacted]

Lab Number: 2W1240

Date Received: 3-13-92 Time: 8:30

Rec'd by: DS | From: Bus Courier Hand Del

DATA ENTRY BY: PG CK: DS

DATE REPORTED: 3-23-92

COUNTY: Union

RIVER BASIN: YAD

REPORT TO: ARO FRO MRO RRO WaRO WIRO WSRO TS AT BM

Other

Shipped by: Bus Courier, Staff, Other

COLLECTOR(S): T. Parker / R. Bridgman

Estimated BOD Range: 0-5/5-25/25-65/40-130 or 100 plus

Seed: Yes ☐ No ☐ Chlorinated: Yes ☐ No ☑

PRIORITY: ☐ AMBIENT ☐ QA ☐ COMPLIANCE ☑ CHAIN OF CUSTODY ☑ EMERGENCY

SAMPLE TYPE: ☐ STREAM ☐ EFFLUENT ☐ LAKE ☐ INFLUENT ☐ ESTUARY ☑ Rain Water runoff

STATION LOCATION: Summit Resources Management, Inc. (Formerly Chemstrand)

REMARKS: Suspect Glycol contamination, dead vegetation & sweet odor

Station #	Date Begin (yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H L	Composite T S B	Sample Type C G GNXX
S.R. - 1	92 03 12	1300						

1		BOD5 310	mg/l		Chloride 940	mg/l		NH3 as N 610	mg/l		Li-Lithium 1132 ug/l
2		COD High 340	mg/l		Chl a: Trl 32217	ug/l		TKN as N 625	mg/l		Mg-Magnesium 927 mg/l
3		COD Low 335	mg/l		Chl a: Corr 32209	ug/l		NO2 plus NO3 as N 630	mg/l		Mn-Manganese 1055 ug/l
4		Coliform: MF Fecal 31616	/100ml		Pheophytin a 32213	ug/l		P: Total as P 665	mg/l		Na-Sodium 929 mg/l
5		Coliform: MF Total 31504	/100ml		Color: True 80	Pt-Co		PO4 as P 70507	mg/l		Arsenic:Total 1002 ug/l
6		Coliform: Tube Fecal 31615	/100ml		Color:(pH) 83	ADMI		P: Dissolved as P 666	mg/l		Se-Selenium 1147 ug/l
7		Coliform: Fecal Strep 31673	/100ml		Color: pH 7.6 82	ADMI					Hg-Mercury 71900 ug/l
8		Residue: Total 500	mg/l		Cyanide 720	mg/l		Cd-Cadmium 1027	ug/l		Organochlorine Pesticides
9		Volatile 505	mg/l		Fluoride 951	mg/l		Cr-Chromium:Total 1034	ug/l		Organophosphorus Pesticides
10		Fixed 510	mg/l		Formaldehyde 71880	mg/l		Cu-Copper 1042	ug/l		
11		Residue: Suspended 530	mg/l		Grease and Oils 556	mg/l		Ni-Nickel 1067	ug/l		Acid Herbicides
12		Volatile 535	mg/l		Hardness Total 900	mg/l		Pb-Lead 1051	ug/l		
13		Fixed 540	mg/l		Specific Cond. 95	uMhos/cm 2		Zn-Zinc 1092	ug/l		Base/ Neutral Extractable Organics
14		pH 403	units		MBAS 38260	mg/l					Acid Extractable Organics
15		Acidity to pH 4.5 436	mg/l		Phenols 32730	ug/l		Ag-Silver 1077	ug/l	X	Ethylene Glycol
16		Acidity to pH 8.3 435	mg/l		Sulfate 945	mg/l		Al-Aluminum 1105	ug/l		Purgeable Organics (VOA bottle req'd)
17		Alkalinity to pH 8.3 415	mg/l		Sulfide 745	mg/l		Be-Beryllium 1012	ug/l		
18		Alkalinity to pH 4.5 410	mg/l					Ca-Calcium 916	mg/l		SEE ATTACHED ORGANICS
19		TOC 680	mg/l					Co-Cobalt 1037	ug/l		ANALYSIS REPORT
20		Turbidity 76	NTU					Fe-Iron 1045	ug/l		Phytoplankton

N.C. DEPT. OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

MAR 25 1992

DIVISION OF ENVIRONMENTAL MANAGEMENT MOORESVILLE REGIONAL OFFICE

Sampling Point %	Conductance at 25 C	Water Temperature (C)	D.O. mg/l	pH	Alkalinity pH 8.3	Alkalinity pH 4.5	Acidity pH 4.5	Acidity pH 8.3	Air Temperature (C)
2	94	10	300	400	82244	431	82243	82242	20
	Salinity %	Precipition (in/day)	Cloud Cover %	Wind Direction (Deg)	Stream Flow Severity	Turbidity Severity	Wind Velocity M/H	Mean Stream Depth ft.	Stream Width ft.
	480	45	32	36	1351	1350	35	64	4

DM1/Revised 10/86

SEMIVOLATILE ORGANICS REPORT - DEM LAB

LAB NUMBER: 2W1240 SUPERVISOR RSK LAB #: 2W1240
DATE : 3/23/92

REPORTED BY CW
CHECKED BY PD ENTERED BY PD
REVIEWED BY PD CHECKED BY DS

SAMPLE TYPE: WATER DILUTION FACTOR : X10

CAS NUMBER	TOL X10	ANALYTE NAME	CONC. UG/L
108-95-2	10	PHENOL	8900 T
111-44-4	10	BIS(2-CHLOROETHYL) ETHER	U
95-57-8	10	2-CHLOROPHENOL	U
541-73-1	10	1,3-DICHLOROBENZENE	U
106-46-7	10	1,4-DICHLOROBENZENE	U
100-51-6	20	BENZYL ALCOHOL	U
95-50-1	10	1,2-DICHLOROBENZENE	U
95-48-7	10	2-METHYL PHENOL	U
108-60-1	10	BIS(2-CHLOROISOPROPYL) ETHER	U
106-44-5	10	4-METHYL PHENOL	U
621-64-7	10	N-NITROSO-DI N-PROPYLAMINE	U
67-72-1	10	HEXACHLOROETHANE	U
98-95-3	10	NITROBENZENE	U
78-59-1	10	ISOPHORONE	U
88-75-5	10	2-NITRO PHENOL	U
105-67-9	10	2,4-DIMETHYL PHENOL	U
65-85-0	50	BENZOIC ACID	U
111-91-1	10	BIS(2-CHLOROETHOXY) METHANE	U
120-83-2	10	2,4-DICHLORO PHENOL	U
120-82-1	10	1,2,4-TRICHLOROBENZENE	U
91-20-3	10	NAPHTHALENE	U
106-47-8	20	4-CHLOROANILINE	U
87-68-3	10	HEXACHLOROBUTADIENE	U
59-50-7	20	4-CHLORO-3-METHYL PHENOL	U
91-57-6	10	2-METHYL NAPHTHALENE	U
77-47-4	10	HEXACHLOROCYCLOPENTADIENE	U
88-06-2	10	2,4,6-TRICHLORO PHENOL	U
95-95-4	10	2,4,5-TRICHLORO PHENOL	U
91-58-7	10	2-CHLORO NAPHTHALENE	U
88-74-4	50	2-NITROANALINE	U
131-11-3	10	DIMETHYL PHTHALATE	U
208-96-8	10	ACENAPHTHYLENE	U
606-20-2	10	2,6-DINITROTOLUENE	U
99-09-2	50	3-NITROANALINE	U
83-32-9	10	ACENAPHTHENE	U
51-28-5	50	2,4-DINITRO PHENOL	U
100-02-7	50	4-NITRO PHENOL	U
132-64-9	10	DIBENZOFURAN	U
121-14-2	10	2,4-DINITROTOLUENE	U
84-66-2	10	DIETHYL PHTHALATE	U
7005-72-3	10	4-CHLOROPHENYL PHENYL ETHER	U
86-73-7	10	FLUORENE	U
100-01-6	50	4-NITROANALINE	U
534-52-1	50	4,6-DINITRO-2-METHYL PHENOL	U

SEMIVOLATILE ORGANICS REPORT - DEM LAB

86-30-6	10	N-NITROSODIPHENYLAMINE	U
101-55-3	10	4-BROMOPHENYL PHENYL ETHER	U
118-74-1	10	HEXACHLOROBENZENE	U
87-86-5	50	PENTACHLORO PHENOL	U
85-01-8	10	PHENANTHRENE	U
120-12-7	10	ANTHRACENE	U
84-74-2	10	DI N-BUTYL PHTHALATE	U
206-44-0	10	FLUORANTHENE	U
129-00-0	10	PYRENE	U
85-68-7	10	BUTYLBENZYL PHTHALATE	U
91-94-1	20	3,3'-DICHLOROBENZIDINE	U
56-55-3	10	BENZO(A)ANTHRACENE	U
218-01-9	10	CHRYSENE	U
117-81-7	10	BIS(2-ETHYLHEXYL) PHTHALATE	U
117-84-0	10	DI-N-OCTYL PHTHALATE	U
205-99-2	10	BENZO(B)FLUORANTHENE	U
207-08-9	10	BENZO(K)FLUORANTHENE	U
50-32-8	10	BENZO(A)PYRENE	U
193-39-5	10	INDENO(1,2,3-CD)PYRENE	U
53-70-3	10	DIBENZO(A,H)ANTHRACENE	U
191-24-2	10	BENZO(G,H,I)PERYLENE	U

OTHER SEMIVOLATILE ORGANICS FOR SAMPLE NUMBER : 2W1240

ETHYLENE GLYCOL	EST. RANGE OF CONC. - ---	4000000	T*
BUTOXY ETHANOL	(C6H14O2)	2100	T
METHYL PYROLIDINONE	(C5H9ON)	730	T
METHYL PYROLIDINONE	(C5H9ON)	1400	T
BUTOXYETHOXY ETHANOL	(C8H18O3)	4600	T
BUTOXYETHOXY ETHOXY ETHANOL	(C10H22O4)	6300	T
BUTOXYETHOXY ETHOXY ETHANOL	(C10H22O4)	5100	T
ETHANEDIOL MONOACETATE	(C4H8O3)	530	T
UNIDENTIFIED	_____	800	E
UNIDENTIFIED	_____	740	E
UNIDENTIFIED	_____	1600	E
UNIDENTIFIED	_____	1100	E
UNIDENTIFIED	_____	1300	E
UNIDENTIFIED	_____	1900	E
UNIDENTIFIED	_____	950	E
UNIDENTIFIED	_____	2100	E
UNIDENTIFIED	_____	3000	E
UNIDENTIFIED	_____	2000	E
UNIDENTIFIED	_____	2200	E
UNIDENTIFIED	_____	1900	E
UNIDENTIFIED	_____	850	E

TQL= TARGET QUANTITATION LIMIT
T= TENTATIVELY IDENTIFIED ESTIMATED CONCENTRATION
E= ESTIMATED CONCENTRATION
U= COMPOUND ANALYZED FOR NOT DETECTED
N= COMPOUND NOT ANALYZED FOR
D= DETECTED BELOW QUANTITATION LIMIT
H= HOLDING TIME EXCEEDED
TQL SUBJECT TO CHANGE DUE TO INSTRUMENT SENSITIVITY
* BY GC/FID DIRECT AQUEOUS INJECTION

Memo

Date: January 27, 1995

To: File

From: Douglas Moore Douglas B Moore
Environmental Chemist
NC Superfund Section

Topic: Site Ownership

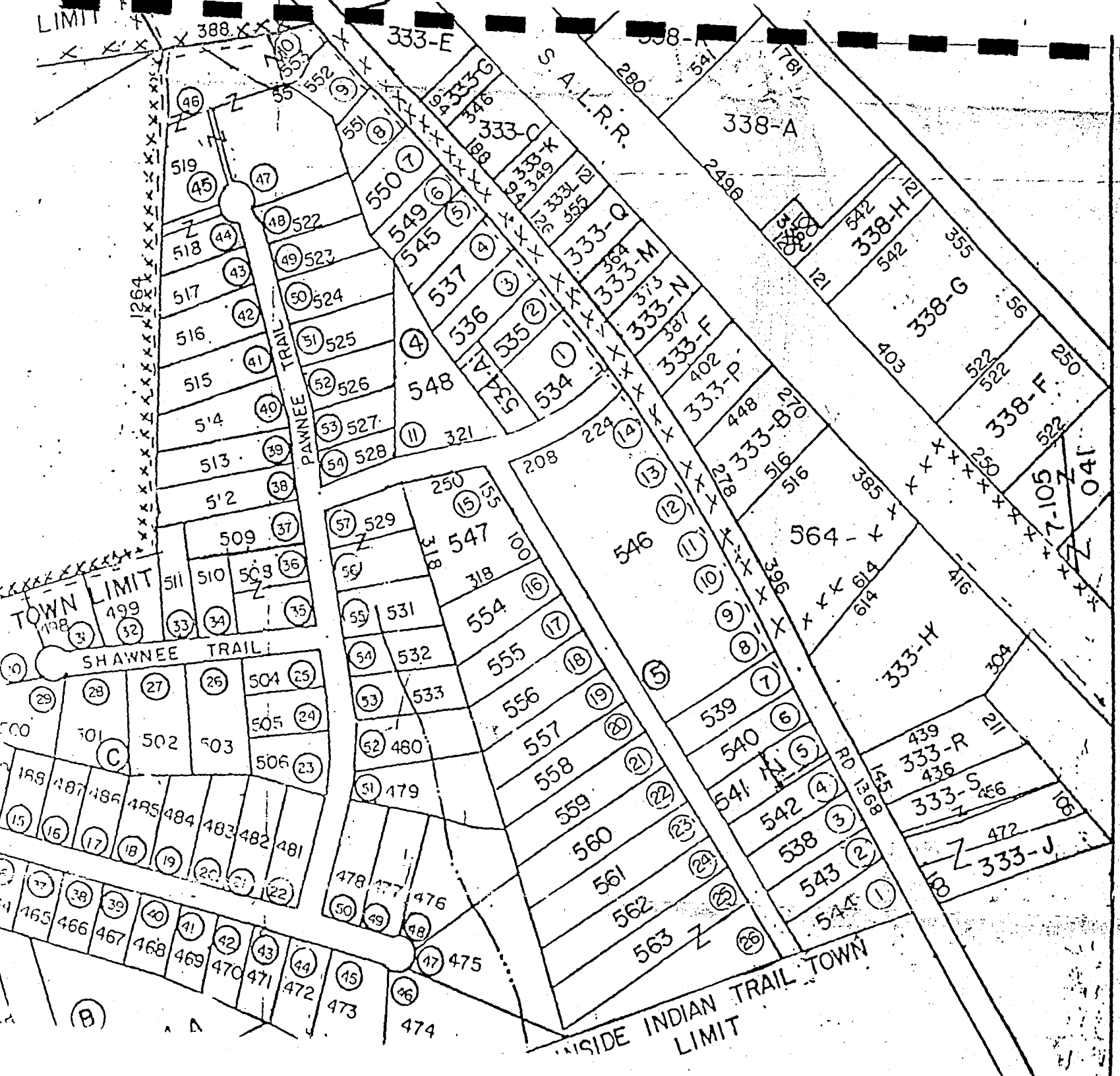
Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union County, NC
US EPA ID: NCD 986 232 213

On Friday, January 27, 1995, I spoke with Audrey Schott, Tax Clerk, Union County Public Office (704) 283-3747 about the two parcels that comprise the subject site. Mrs. Schott checked her records and determined that the two parcels are located on Map 7-129 and the parcels numbers are 333-B and 333-P. Mrs. Schott stated that parcel 333-B is a 3 acre lot registered to "Robert Schory & Jerome Dubow, P.O. Box 1565, Matthews, N.C. 28105" and was listed in 1989 under Deed Book 450, p. 358. Parcel 333-P is a 2 acre lot registered to "Blazek & Teal Enterprises, P.O. Box 1826, Matthews, N.C. 28105" and was listed in 1984 under Deed Book 383, p. 273.

I next contacted Mitzi Baucom, Tax Collector, Union County Public Office (704) 283-3691 about available tax information on the two parcels. Mrs. Baucom checked her records and determined that Parcel 333-B registered to Schory and Dubow is given the parcel description "Szany & Williamson". The taxes on the Schory and Dubow property were paid on January 19, 1995 by National Petroleum Packers. Parcel 333-P registered to Blazek and Teal Enterprises is given the parcel description "CSD". The taxes on the Blazek and Teal property have not been paid in 1993 and 1994.

I next contacted Judy Price, Register of Deeds, Union County Public Office (704) 283-3727 about current and past ownership details. Mrs. Price checked the deed book references as outlined from the Tax Assessors information and determined that Parcel 333-B was conveyed from "Patrick A. & Janice M. Szany, James H. & Elizabeth M. Williamson, Joseph R. & Patricia M. Szany" to "American Equities, Inc" on July 28, 1988 in Deed Book 440, p. 367. It was conveyed from "American Equities, Inc. & Janice M. & Patricia M. Szany, Elizabeth M. Williamson" to "Robert Schory & Jerome Dubow" on February 10, 1989 in Deed Book 450, p. 358. She also determined that Parcel 333-P was conveyed from "Dickerson Realty, Inc." to "CSD, Inc." on May 21, 1984 in Deed

Book 378, p. 688. She determined that parcel 333-P was next conveyed from "CSD, Inc." to "Blazek & Teal Enterprises" on November 5, 1984 in Deed Book 383, p. 273.


LIMIT
333-E
S. A.L.R.R.
338-A
333-G
333-C
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333-N
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333-P
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333-S
333-J
PAWNEE TRAIL
TOWN LIMIT
SHAWNEE TRAIL
INSIDE INDIAN TRAIL TOWN LIMIT

Ref. 7

GALLUCCI, HOPKINS & THEISEN, P.C.

FRANK L. GALLUCCI (IN, MI & D.C. BARS)
WILLIAM T. HOPKINS, JR. (IN & OH BARS)
JOHN C. THEISEN (IN & MO BARS)
JOHN T. MENZIE (IN & IL BARS)
JAMES D. STREIT (IN & CA BARS)
M. SCOTT HALL (IN & CT BARS)
LOREN K. ALLISON (INDIANA BAR)

229 WEST BERRY STREET, SUITE 400
P. O. BOX 12663
FORT WAYNE, INDIANA 46864-2663

TELEPHONE (219) 424-3800
FACSIMILE (219) 420-1260

GARY L. CALHOUN (IN, OH & WV BARS)
MICHAEL A. SCHEER (IN & MI BARS)
RANDOLPH L. ROEBUCK (IN & IL BARS)
THOMAS N. O'MALLEY (INDIANA BAR)
TONYA S. SHEA (INDIANA BAR)
MARK S. KITTAKA (INDIANA BAR)
KRISTEN L. MALY (INDIANA BAR)
ERIC H. J. STAHLHUT (INDIANA BAR)

June 14, 1993

VIA FACSIMILE AND
CERTIFIED MAIL

Mr. Jesse W. Wells
Department of Environment, Health
and Natural Resources
P. O. Box 950
919 North Main Street
Mooresville, North Carolina 28115

Re: Summit Resource Management, Inc. and Blazek & Teal Enterprises--3481 Gribble Road, Matthews, North Carolina (Docket #93-201 and #93-201A)

Dear Mr. Wells:

Pursuant to our conversation of June 14, 1993, enclosed please find the letter and accompanying attachments which were sent to Mr. Jerome H. Rhodes of the North Carolina Department of Environment, Health, and Natural Resources on April 21, 1993. The results of Gabbard Environmental Services, Inc.'s testing indicate that the by-product of Summit Resource Management, Inc.'s manufacturing are considered "non-hazardous" within the definition of RCRA. I hope this information is satisfactory and fulfilling of Summit's requirements of the Notice of Violation issued April 8, 1993.

If you have any questions, feel free to contact me at your convenience.

Very truly yours,

GALLUCCI, HOPKINS & THEISEN

Mark S. Kittaka

Mark S. Kittaka

MSK/er
Enclosures sent via certified mail
cc: David Johns, Summit Resource Management, Inc.

govt\epa\ltr\93614e13.161

SUMMIT RESOURCE
MANAGEMENT, INC.

April 21, 1993

Mr. Jerome H. Rhodes
North Carolina Department of Environment,
Health and Natural Resources
P.O. Box 27687
Raleigh, NC 27611-7687

Re: Summit Resource Management, Inc.
Matthews, NC, Union County,
Notice of Violation Docket # 93-201A

Dear Mr. Rhodes:

Thank you for the opportunity to respond and provide information concerning the material inventory described in your letter of April 8, 1993 (copy attached).

Although the inventory in question at the location identified as 3481 Gribble Road has not been and is not now under the care and custody of Summit Resource Management, Inc., we are pleased to provide background and technical information that may assist in the evaluation of this situation.

To this effect, we are providing the attached report describing operational and technical information associated with activities at the Matthews facility. This includes copies of laboratory analytical reports where the principal residues from the ethylene glycol recovery process were evaluated with respect to the hazardous waste determination.

We trust that this information will assist in the resolution of the inventory matters. However, should there be any additional questions, please do not hesitate to contact me.

Sincerely,

David R. Johns,
President

cc: Regional Office, P.O. Box 950, Mooresville, NC 28115
Mr. Masters, Mr. Wells, Mr. Penny, Mr. Holyfield

6325 Constitution Drive, Fort Wayne, Indiana 46804 • Phone: 219-432-5339 • Fax 219-432-2169
3501 Gribble Road, Matthews, North Carolina 28105 • Phone: 704-821-4766 • Fax 704-821-4772

Summit Resource Management, Inc.
6325 Constitution Drive
Fort Wayne, Indiana 46802
(219) 432-5339

TECHNICAL INFORMATION - MATTHEWS RECOVERY PROCESS

1. General Information

This report contains background information and technical data associated with prior studies and evaluations concerning the regulatory status of residues left over from ethylene glycol recovery operations conducted by Summit Resource Management. Inc. (Summit) at the Matthews North Carolina facility.

This investigation was conducted by Summit shortly after its 1991 acquisition of certain equipment and business activities at the location. Samples from the two principal residues generated during ethylene glycol recovery processing were analyzed for properties, characteristics and ingredients or compounds that would subject the residues to being handled as regulated hazardous wastes.

Laboratory evaluation results were negative. However, Summit made a protective filing with the Hazardous Waste Section, North Carolina Division of Environmental Management for registration an a generator of hazardous waste. This action would then allow regulatory coverage for any unanticipated special situations where ingredient or component concentrations might change, special additional materials might be encountered, the process equipment may require special cleaning or maintenance work or related situations.

2. Description of Recovery Process

The Matthews facility receives coproduct and byproduct streams from textile and fibers industry plants in North Carolina and other nearby states. Principally, the materials are mixtures of ethylene glycol and water and can contain polymers and polyesters representing the fiber content.

Process operations have included filtering and distillation to recover the ethylene glycol portions which are then blended and sold as anti freeze. Residues include filter press solids, water and distillation operation solids containing fiber components and some glycols.

3. Regulatory Evaluation

It is Summit's understanding that the regulatory status of ethylene glycol-water byproduct materials has been thoroughly evaluated in North Carolina due to the substantial concentration of synthetic fiber industry manufacturing in the state. The result is that the mixtures moving from the fibers manufacturing location to the anti freeze recovery facility are not regulated as RCRA hazardous wastes. Therefore, the "derived-from rule" would not be a factor associated with ethylene glycol recovery process residues.

Attachments A, B and C provide technical and material properties information for ethylene glycol, diethylene glycol and triethylene glycol. These materials are not associated with such properties as low flash point, high or low liquid pH, acute toxicity, etc., which might translate to a designation of "characteristic hazardous waste".

Ethylene glycol in not identified as an "Appendix VIII Hazardous Constituent". Anti freeze recovery process residues are not included in "Subpart D Lists of Hazardous Wastes".

4. Analytical Evaluation

Summit organized a sampling and analysis program to verify that the ethylene glycol recovery process did not generate residues that might exhibit properties which could classify the material as a hazardous waste due to properties (Ignitability, Corrosivity and Reactivity) or ingredients or constituents concentrations identified under the "Toxicity Characteristic".

One sample was identified as "Filter Cake" and covered the polymers and polyesters from synthetic fiber manufacturing which had been filtered out of the incoming mixture.

The other sample was identified as "EG Bottoms" and covered distillation process residues.

Attachment D and E are copies of the original laboratory analytical reports for the evaluation of the two samples. It should be noted that both samples resulted in a "negative finding" with respect to the issue of hazardous waste regulations.

5. Additional Material Evaluations

Summit did not attempt to develop a representative sample covering the inventory of containers identified at the 3481

Gribble Road location, since this inventory was not under Summit's care, custody or control.

6. Summary

The information included in this report is not intended to suggest that ethylene glycol recovery processing activities are not subject to certain federal, State of North Carolina and local environmental regulations. Summit devoted considerable attention to compliance with Clean Air Act permitting rules, to Community Right-to-Know Program notification and communication regulations and others.

In addition, Summit encountered a few special material processing situations which resulted in the generation of regulated hazardous waste. Attachment F is a copy of the 1992 North Carolina Hazardous Waste Activity report for the Matthews facility indicating that a flammable liquid mixture from prior operations was sent off site for handling.

Memo

Date: March 23, 1995

To: File

From: Douglas Moore Douglas B Moore
Environmental Chemist
NC Superfund Section

Topic: Site Chemicals

Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union County, NC
US EPA ID: NCD 986 232 213

Attached to this memo are two Notice of Hazardous Waste Activity forms submitted by Summit Resource Management in 1991 and 1992 (Attachements A and B). The following RCRA waste codes were reported by Summit:

D-listed wastes
D018 (benzene)
D039 (tetrachloroethylene)
D040 (trichloroethylene)

F-listed wastes
F002 (spent halogenated solvents, see attachment C)
F003 (spent non-halogenated solvents, see attachement C)
F005 (spent non-halogenated solvents, see attachment C)

U-listed wastes
U031 (n-butyl alcohol)
U044 (chloroform, or trichloromethane)
U069 (dibutyl phthalate)
U080 (methylene chloride)
U102 (Dimethyl phthalate)
U108 (1,4-Diethylene oxide, or 1,4-Dioxane)
U117 (Ethyl ether, or 1,1'-oxybis-(I)-ethane)
U122 (Formaldehyde)
U133 (Hydrazine [R,T])
U147 (2,5-Furandione, or Maleic anhydride)
U188 (Phenol)

U201 (1,3-Benzenediol)
U211 (Carbon tetrachloride, or tetrachloromethane)
U213 (Tetrahydrofuran [I])
U223 (Toluene diisocyanate [R,T], or 1,3-Diisocyanatomethyl benzene [R,T])
U246 (Cyanogen bromide)

P-listed wastes
P005 (allyl alcohol)
P012 (Arsenic trioxide, As_2O_3)
P030 (Cyanides [soluble cyanide salts])
P048 (2,4-Dinitrophenol)
P068 (Methyl hydrazine)
P087 (Osmium tetroxide, OsO_4)
P105 (Sodium Azide)
P121 (Zinc cyanide)

Also attached to this memo is a copy of the Tier II reports submitted to the Union County Emergency Management by Summit Resource Management for 1992 and 1993 (attachment D). Chemicals stored or used at the site may include ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol, methyl alcohol, isopropyl alcohol and tetrachloroethylene. In addition, Summit's air quality permit application has a listing for n-methyl-2-pyrrolidone (attachment E, p. 4).

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved. OMB No. 2050-0028. Expires 10-31-91
GSA No. 0246-EPA-OT

Please refer to the *Instructions for Filing Notification* before completing this form. The information requested here is required by law *(Section 3010 of the Resource Conservation and Recovery Act)*.

EPA Notification of Regulated Waste Activity

United States Environmental Protection Agency

Date Received (For Official Use Only)

6

I. Installation's EPA ID Number *(Mark 'X' in the appropriate box)*

[x] A. First Notification [ ] B. Subsequent Notification *(complete item C)*

C. Installation's EPA ID Number: NCD986205060

II. Name of Installation *(Include company and specific site name)*

Summit Resource Management Inc

III. Location of Installation *(Physical address not P.O. Box or Route Number)*

Street: 3501 Fiddle Road

Street (continued):

City or Town: Matthews | State: NC | ZIP Code: 28105

County Code: | County Name: Union

IV. Installation Mailing Address *(See Instructions)*

Street or P.O. Box: P O Box 1565

City or Town: Matthews | State: NC | ZIP Code: 28106-1565

V. Installation Contact *(Person to be contacted regarding waste activities at site)*

Name *(last)*: Kendall | *(first)*: Brian

Job Title: Plant Manager | Phone Number *(area code and number)*: 704-821-4766

VI. Installation Contact Address *(See Instructions)*

A. Contact Address Location [ ] Mailing [x]

B. Street or P.O. Box: P O Box 1565

City or Town: Matthews | State: NC | ZIP Code: 28106-1565

VII. Ownership *(See Instructions)*

A. Name of Installation's Legal Owner: (See attached information)

Street, P.O. Box, or Route Number:

City or Town: | State: | ZIP Code: -

Phone Number *(area code and number)*: -

B. Land Type: P

C. Owner Type: P

D. Change of Owner Indicator: Yes [ ] No [x]

(Date Changed) Month Day Year

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved. OMB No. 2050-0028. Expires 10-31-91
GSA No. 0246-EPA-OT

ID - For Official Use Only

VIII. Type of Regulated Waste Activity *(Mark 'X' in the appropriate boxes. Refer to instructions.)*

A. Hazardous Waste Activity

1. Generator (See Instructions)
   - [X] a. Greater than 1000kg/mo (2,200 lbs.)
   - [ ] b. 100 to 1000 kg/mo (220 - 2,200 lbs.)
   - [ ] c. Less than 100 kg/mo (220 lbs.)
2. Transporter (Indicate Mode in boxes 1-5 below)
   - [ ] a. For own waste only
   - [ ] b. For commercial purposes

   Mode of Transportation
   - [ ] 1. Air
   - [ ] 2. Rail
   - [ ] 3. Highway
   - [ ] 4. Water
   - [ ] 5. Other - specify
3. [ ] Treater, Storer, Disposer (at installation) Note: A permit is required for this activity; see instructions.
4. Hazardous Waste Fuel
   - [X] a. Generator Marketing to Burner
   - [ ] b. Other Marketers
   - [ ] c. Burner - indicate device(s) - Type of Combustion Device
     - [ ] 1. Utility Boiler
     - [ ] 2. Industrial Boiler
     - [ ] 3. Industrial Furnace
5. [ ] Underground Injection Control

B. Used Oil Fuel Activities

1. Off-Specification Used Oil Fuel
   - [ ] a. Generator Marketing to Burner
   - [ ] b. Other Marketer
   - [ ] c. Burner - indicate device(s) - Type of Combustion Device
     - [ ] 1. Utility Boiler
     - [ ] 2. Industrial Boiler
     - [ ] 3. Industrial Furnace
2. [ ] Specification Used Oil Fuel Marketer (or On-site Burner) Who First Claims the Oil Meets the Specification

IX. Description of Regulated Wastes *(Use additional sheets if necessary)*

A. Characteristics of Nonlisted Hazardous Wastes. Mark 'X' in the boxes corresponding to the characteristics of nonlisted hazardous wastes your installation handles. *(See 40 CFR Parts 261.20 - 261.24)*

1. Ignitable (D001)	2. Corrosive (D002)	3. Reactive (D003)	4. EP Toxic (D000)	(List specific EPA hazardous waste number(s) for the EP Toxic contaminant(s))			
X			X	D040	D039	D018	

B. Listed Hazardous Wastes. (See 40 CFR 261.31 - 33. See instructions if you need to list more than 12 waste codes.)

1	2	3	4	5	6
F002	F003	F005			
7	8	9	10	11	12

C. Other Wastes. (State or other wastes requiring an I.D. number. See instructions.)

1	2	3	4	5	6

X. Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

Signature	Name and Official Title *(type or print)*	Date Signed
	Brian R. Kendall, Plant Manager	12-30-91

XI. Comments

Note: Mail completed form to the appropriate EPA Regional or State Office. (See Section III of the booklet for addresses.)

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved. OMB No. 2050-0028. Expires 9-30-92
GSA No. 0246-EPA-OT

ID - For Official Use Only

IX. Description of Regulated Wastes Continued *(Additional sheet)*

B. Listed Hazardous Wastes. (See 40 CFR 261.31 – 33. Use this page only if you need to list more than 12 waste codes.)

13	14	15	16	17	18
U031	U044	U080	U069	U102	U122
19	20	21	22	23	24
U197	U133	U147	U188	U117	U108
25	26	27	28	29	30
U211	U213	U201	U223	U246	P005
31	32	33	34	35	36
P068	P048	P105	P030	P087	P012
37	38	39	40	41	42
P121					
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
73	74	75	76	77	78
79	80	81	82	83	84
85	86	87	88	89	90
91	92	93	94	95	96
97	98	99	100	101	102
103	104	105	106	107	108
109	110	111	112	113	114
115	116	117	118	119	120

Summit Resource Management, Inc.
3501 Gribble Road
Matthews, North Carolina 28105
(704) 821-4766

JUN 1993
ENTERED
RCRIS

OWNERSHIP INFORMATION FOR EPA NOTIFICATION FORM

The following information is provided via this attachment to EPA form 8700-12 "Notification of Regulated Waste Activity":

Section VII. Ownership

add
- Jerome Dubow and Linda M. Dubow
  217 Gatewood Lane
  Matthews, North Carolina 28105
  (704) 846-1475

add
- Robert G. Schory and Margaret H. Schory
  1840 Tanglebriar Court
  Matthews, North Carolina 28105
  (704) 821-4766

Summit Resource Management, Inc.
3501 Gribble Road
Matthews, North Carolina 28105
(704) 821-4766

Date 12-30-91

U S EPA Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365

Re: Notification of Possible Hazardous Waste Activity

The Summit Resource Management facility in Matthews, NC receives coproduct and byproduct streams from North Carolina and other nearby textiles and fibers industry plants. Principally, the materials are mixtures of ethylene glycol and water and can contain polymers and polyesters representing the fiber content.

At the Matthews plant, the process operations include filtering and distillation to recover the ethylene glycol portions which are then blended and sold as anti freeze. Process residues include filter press solids, water and distillation solids containing fiber components and some glycols.

The incoming materials are not subject to regulation as RCRA hazardous wastes. We do not anticipate that any process residue would routinely exhibit hazardous waste characteristics or would be identified in a specific listing or category.

However, there is preliminary evidence that certain processing situations or combinations of process operations might occasionally concentrate traces of regulated compounds above their threshold levels. Therefore, we are making a provisional "Notification of Hazardous Waste Activity" via the enclosed forms to cover any possible situation.

In addition, we will also develop and install the contingency plan, employee training, facility inspection and related programs or activities associated with hazardous waste generation operations.

Thank you for processing the enclosed documents. Please contact me if there are any questions.

Sincerely,

Brian R. Kendall,
Plant Manger

cc: Hazardous Waste Section, North Carolina Division of Environmental Management, Raleigh, NC

7188

Please print or type with ELITE type (12 charac per inch) in the unshaded areas only

Approved. OMB No. 2050-0028. Expires 10-31-91
GSA No. 0246-EPA-OT

Please refer to the *Instructions for Filing Notification* before completing this form. The information requested here is required by law (*Section 3010 of the Resource Conservation and Recovery Act*).

EPA Notification of Regulated Waste Activity

United States Environmental Protection Agency

Date Received (For Official Use Only)
MAR 09 1990

(2)

I. Installation's EPA ID Number (*Mark 'X' in the appropriate box*)

[X] A. First Notification [ ] B. Subsequent Notification (*complete item C*)

C. Installation's EPA ID Number: NCD982605060

II. Name of Installation (*Include company and specific site name*)

SUMMIT RESOURCE MGMT./N. CAROLI NA

III. Location of Installation (*Physical address not P.O. Box or Route Number*)

Street: 3501 GRIBBLE ROAD

Street (continued):

City or Town: MATTHEWS | State: NC | ZIP Code: 28105-

County Code: 179 | County Name: UNION

IV. Installation Mailing Address (*See Instructions*)

Street or P.O. Box: 3501 GRIBBLE ROAD

City or Town: MATTHEWS | State: NC | ZIP Code: 28105-

V. Installation Contact (*Person to be contacted regarding waste activities at site*)

Name (*last*): KUHN | (*first*): EDWARD

Job Title: PLANT MANAGER | Phone Number (*area code and number*): 704-821-4766

VI. Installation Contact Address (*See Instructions*)

A. Contact Address: Location [ ] Mailing [X]

B. Street or P.O. Box: 3501 GRIBBLE ROAD

City or Town: MATTHEWS | State: NC | ZIP Code: 28105-

VII. Ownership (*See Instructions*)

A. Name of Installation's Legal Owner: ROBERT G. & MARARET H. SCHORY

Street, P.O. Box, or Route Number: 1840 TANGLEBRIAR COURT

City or Town: MATTHEWS | State: NC | ZIP Code: 28105-

Phone Number (*area code and number*): 704-821-4766

B. Land Type: P

C. Owner Type: P

D. Change of Owner Indicator: Yes [ ] No [ ] (Date Changed) Month Day Year

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved. OMB No. 2050-0028. Expires 10-31
GSA No. 0246-EPA

ID - For Official Use Only

VIII. Type of Regulated Waste Activity *(Mark 'X' in the appropriate boxes. Refer to Instructions.)*

A. Hazardous Waste Activity

1. Generator (See Instructions)
   - [ ] a. Greater than 1000kg/mo (2,200 lbs.)
   - [X] b. 100 to 1000 kg/mo (220 - 2,200 lbs.)
   - [ ] c. Less than 100 kg/mo (220 lbs.)
2. Transporter (Indicate Mode in boxes 1-5 below)
   - [ ] a. For own waste only
   - [ ] b. For commercial purposes

   Mode of Transportation
   - [ ] 1. Air
   - [ ] 2. Rail
   - [ ] 3. Highway
   - [ ] 4. Water
   - [ ] 5. Other - specify
3. Treater, Storer, Disposer (at installation) Note: A permit is required for this activity, see instructions
4. Hazardous Waste Fuel
   - [ ] a. Generator Marketing to Burner
   - [ ] b. Other Marketers
   - [ ] c. Burner - Indicate device(s)

   Type of Combustion Device
   - [ ] 1. Utility Boiler
   - [ ] 2. Industrial Boiler
   - [ ] 3. Industrial Furnace
5. Underground Injection Control

B. Used Oil Fuel Activities

1. Off-Specification Used Oil Fuel
   - [ ] a. Generator Marketing to Burner
   - [ ] b. Other Marketer
   - [ ] c. Burner - Indicate device(s)

   Type of Combustion Device
   - [ ] 1. Utility Boiler
   - [ ] 2. Industrial Boiler
   - [ ] 3. Industrial Furnace
2. Specification Used Oil Fuel Marketer (or On-site Burner) Who First Claims the Oil Meets the Specification

IX. Description of Regulated Wastes *(Use additional sheets if necessary)*

A. Characteristics of Nonlisted Hazardous Wastes. Mark 'X' in the boxes corresponding to the characteristics of nonlisted hazardous wastes your installation handles. *(See 40 CFR Parts 261.20 - 261.24)*

1. Ignitable (D001)	2. Corrosive (D002)	3. Reactive (D003)	4. Toxicity Characteristic (D000)	(List specific EPA hazardous waste number(s) for the Toxicity Characteristic contaminant(s))			
X							

B. Listed Hazardous Wastes. (See 40 CFR 261.31 - 33. See instructions if you need to list more than 32 wastes here.)

1	2	3	4	5	6
F002	F003	F005			
7	**8**	**9**	**10**	**11**	**12**

MAR 1992
ENTERED RCRIS

C. Other Wastes. (State or other wastes requiring an I.D. number. See Instructions.)

1	2	3	4	5	6

X. Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment.

Signature	Name and Official Title *(type or print)*	Date Signed
Edward Kuhn	Edward Kuhn, Plant Manager	2/28/92

XI. Comments

Note: Mail completed form to the appropriate EPA Regional or State Office. (See Section III of the booklet for addresses.)

RECEIVED
MAR 0 9 1992
HAZARDOUS WASTE SECTION

RECEIVED
FEB 1 9 1992
HAZARDOUS WASTE SECTION

Summit Resource Management, Inc.
3501 Gribble Road
Matthews, North Carolina 28105
(704) 821-4766

(1)

OWNERSHIP INFORMATION FOR EPA NOTIFICATION FORM

The following information is provided via this attachment to EPA form 8700-12 "Notification of Regulated Waste Activity":

MAR 1992
ENTERED
RCRIS

Section VII. Ownership

- Jerome Dubow and Linda M. Dubow
  217 Gatewood Lane
  Matthews, North Carolina 28105
  (704) 846-1475

- Robert G. Schory and Margaret H. Schory
  1840 Tanglebriar Court
  Matthews, North Carolina 28105
  (704) 821-4766

EPA HAZARDOUS WASTE CODES

Code	Waste description
CHARACTERISTIC HAZARDOUS WASTE	
D001	Ignitable waste
D002	Corrosive waste
D003	Reactive waste
D004	Arsenic
D005	Barium
D006	Cadmium
D007	Chromium
D008	Lead
D009	Mercury
D010	Selenium
D011	Silver
D012	Endrin(1,2,3,4,10,10-hexachloro-1,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo, endo-5,8-dimeth-ano-naphthalene)
D013	Lindane (1,2,3,4,5,6-hexa-chlorocyclohexane, gamma isomer)
D014	Methoxychlor (1,1,1-trichloro-2,2-bis [p-methoxyphenyl] ethane)
D015	Toxaphene (C_{10} H_{10} Cl_N, Technical chlorinated camphene, 67-69 percent chlorine)
D016	2,4-D (2,4-Dichlorophenoxyacetic acid)
D017	2,4,5-TP Silvex (2,4,5-Trichlorophenoxypropionic acid)
D018	Benzene
D019	Carbon tetrachloride
D020	Chlordane
D021	Chlorobenzene
D022	Chloroform
D023	o-Cresol
D024	m-Cresol
D025	p-Cresol
D026	Cresol
D027	1,4-Dichlorobenzene
D028	1,2-Dichloroethane
D029	1,1-Dichloroethylene
D030	2,4-Dinitrotoluene
D031	Heptachlor (and its epoxide)
D032	Hexachlorobenzene
D033	Hexachlorobutadiene
D034	Hexachloroethane
D035	Methyl ethyl ketone
D036	Nitrobenzene
D037	Pentachlorophenol
D038	Pyridine
D039	Tetrachloroethylene
D040	Trichloroethylene
D041	2,4,5-Trichlorophenol
D042	2,4,6-Trichlorophenol
D043	Vinyl chloride
HAZARDOUS WASTE FROM NONSPECIFIC SOURCES	
F001	The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichlorethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

EPA HAZARDOUS WASTE CODES
(Continued)

Code	Waste description
F002	The following spent halogenated solvents: Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2, trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F001, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F003	The following spent non-halogenated solvents: Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/ blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F004	The following spent non-halogenated solvents: cresols, cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F005	The following spent non-halogenated solvents: toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc, and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.
F007	Spent cyanide plating bath solutions from electroplating operations.
F008	Plating bath residues from the bottom of plating baths from electroplating operations in which cyanides are used in the process.
F009	Spent stripping and cleaning bath solutions from electroplating operations in which cyanides are used in the process.
F010	Quenching bath residues from oil baths from metal heat treating operations in which cyanides are used in the process.
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.
F012	Quenching wastewater treatment sludges from metal heat treating operations in which cyanides are used in the process.

UNION COUNTY 1842 NORTH CAROLINA

RECEIVED
MAR 2 2 1995
SUPERFUND SECTION

FAX DATE 3-22-95

FAX TO: Doug Moore

COMPANY:

CITY: Raleigh

FAX NO.: 919-733-4811

FAX FROM: Janet Tucker

DEPARTMENT: Em. Mgt.

TELEPHONE: 704-283-3536

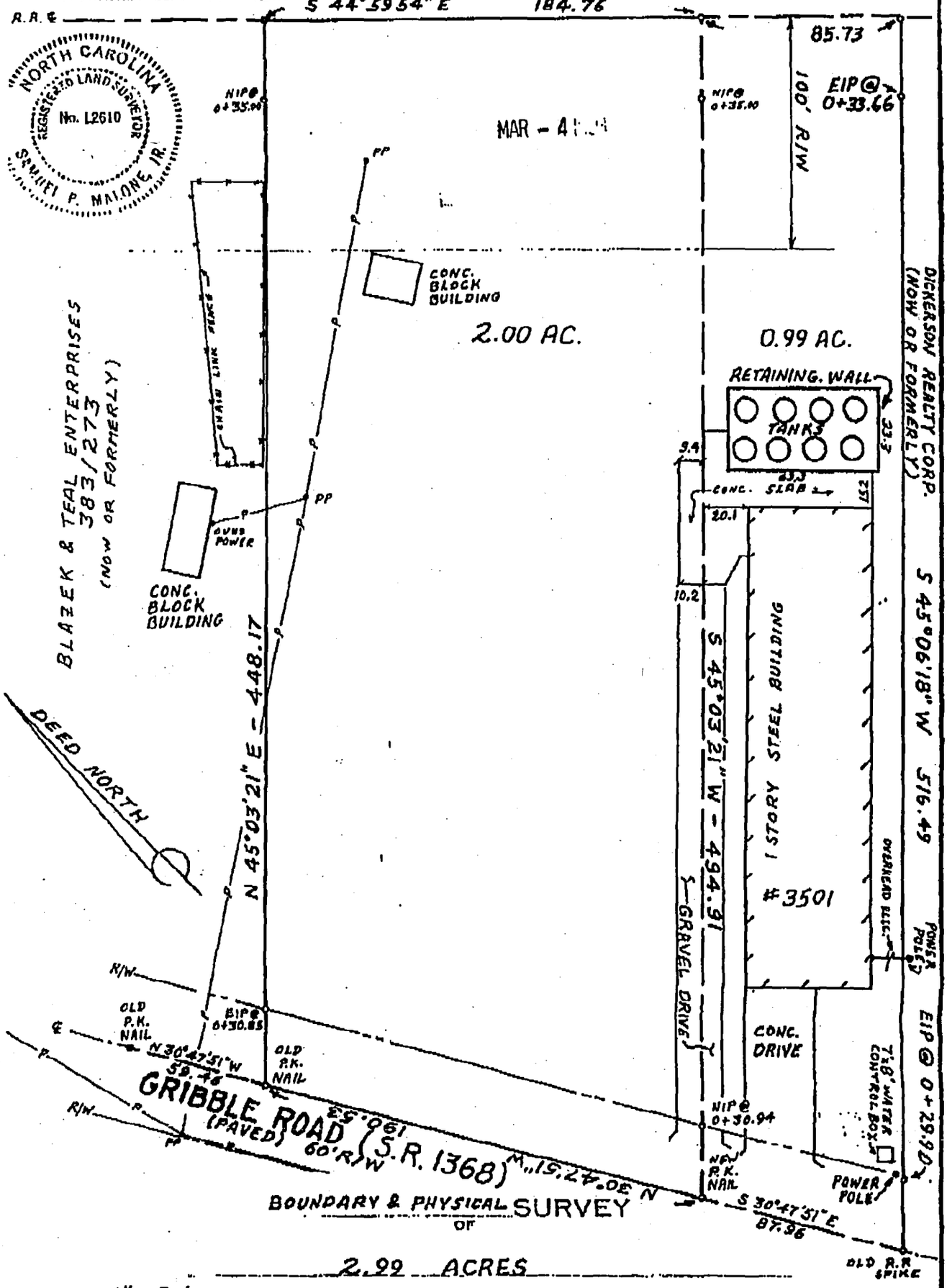
FAX NO.: (704) 289-4369

6 PAGES TO FOLLOW

THIS IS TO CERTIFY THAT ON THE 14TH DAY OF MARCH 19 87 I SURVEYED THE PROPERTY SHOWN ON THIS PLAT, AND THAT THE TITLE LINES AND THE WALLS OF THE BUILDINGS IF ANY ARE AS SHOWN HEREON

Sam Malone & Associates

SIGNED REGISTERED SURVEYOR



BOUNDARY & PHYSICAL SURVEY OF

2.99 ACRES

SCALE 1" = 50' VANCE TOWNSHIP, UNION COUNTY, N.C.

THE PROPERTY OF CSD, INC.

MAP RECORDED IN BOOK N/A AT PAGE ..... DEED RECORDED IN BOOK 378 PAGE 688

TAX # 7-129-333 P

LE

FOLDER 11-24-86

EIP = EXISTING IRON PIN
NIP = NEW IRON PIN
PP = POWER POLE

Tier Two
EMERGENCY AND HAZARDOUS CHEMICAL INVENTORY

Specific Information by Chemical

Facility Identification

Name: Summit Resource Management, Inc.
Street: 3501 Gribble Road
City: Matthews County: Union State: NC Zip: 28105
SIC Code: 7398 Dun & Brad Number: 78-331-4396

FOR OFFICIAL USE ONLY — ID #: ; Date Received:

Owner/Operator Name

Name: Summit Resource Management Phone: (704) 821-4766
Mail Address: P O Box 1565 Matthews, NC 28106

Emergency Contact

Name: E S Kuhn Title: Plant Manager
Phone: (704) 821-4766 24 Hr. Phone: (704) 588-1631

Name: C D Patton Title: Vice President
Phone: (704) 821-4766 24 Hr. Phone: (219) 625-4306

Important: Read all instructions before completing form

Reporting Period From January 1 to December 31, 19 91

☐ Check if information below is identical to the information submitted last year.

Chemical Description	Physical and Health Hazards (check all that apply)	Inventory	Container Type / Temperature / Pressure	Storage Codes and Locations (Non-Confidential) Storage Locations	Optional
CAS 107211 Trade Secret ☐ Chem. Name: Ethylene Glycol Check all that apply: Pure [X] Mix [X] Solid [X] Liquid [X] Gas [ ] EHS [ ] EHS Name:	☐ Fire ☐ Sudden Release of Pressure ☐ Reactivity [X] Immediate (acute) [X] Delayed (chronic)	06 Max. Daily Amount (code) 06 Avg. Daily Amount (code) 365 No. of Days On-site (days)	A 1 4 D 1 4	Site Plan Attached	☐
CAS 111466 Trade Secret ☐ Chem. Name: Diethylene Glycol Check all that apply: Pure [X] Mix [X] Solid [X] Liquid [X] Gas [ ] EHS [ ] EHS Name:	☐ Fire ☐ Sudden Release of Pressure ☐ Reactivity ☐ Immediate (acute) [X] Delayed (chronic)	04 Max. Daily Amount (code) 03 Avg. Daily Amount (code) 365 No. of Days On-site (days)	A 1 4 D 1 4	Site Plan Attached	☐
CAS 112276 Trade Secret ☐ Chem. Name: Triethylene Glycol Check all that apply: Pure [X] Mix [X] Solid [X] Liquid [X] Gas [ ] EHS [ ] EHS Name:	☐ Fire ☐ Sudden Release of Pressure ☐ Reactivity [X] Immediate (acute) ☐ Delayed (chronic)	04 Max. Daily Amount (code) 03 Avg. Daily Amount (code) 365 No. of Days On-site (days)	A 1 4 D 1 4	Site Plan Attached	☐

Certification (Read and sign after completing all sections)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in pages one through 5, and that based on my inquiry of those individuals responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Edward S Kuhn, Plant Manager — Name and official title of owner/operator OR owner/operator's authorized representative
Signature: [signature] Date signed: 2/28/92

Optional Attachments
[X] I have attached a site plan
☐ I have attached a list of site coordinate abbreviations
☐ I have attached a description of dikes and other safeguard measures

03/22/95 14:11 ☎ 7042894369 UNION CO. E.M. 01

Tier Two
EMERGENCY AND HAZARDOUS CHEMICAL INVENTORY

Specific Information by Chemical

Facility Identification

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Street: 3501 Gribble Road
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SIC Code: 7398 Dun & Bradstreet Number: 78-331-4396

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Name: Summit Resource Management Phone: (704) 821-4766
Mail Address: P O Box 1565 Matthews, NC 28106

Emergency Contact

Name: E S Kuhn Title: Plant Manager
Phone: (704) 821-4766 24 Hr. Phone: (704) 588-1631

Name: D D Patton Title: Vice President
Phone: (704) 821-4766 24 Hr. Phone: (219) 625-4306

Important: Read all instructions before completing form

Reporting Period From January 1 to December 31, 19 91

☐ Check if information below is identical to the information submitted last year.

Chemical Description	Physical and Health Hazards (check all that apply)	Inventory	Storage Codes and Locations (Non-Confidential) Storage Locations	Confidential
CAS 67561 Trade Secret ☐ Chem. Name: Methyl Alcohol (Methanol) Check all that apply: Pure ☐ Mix ☒ Solid ☐ Liquid ☒ Gas ☐ EHS ☐ EHS Name:	☒ Fire ☐ Sudden Release of Pressure ☐ Reactivity ☒ Immediate (acute) ☒ Delayed (chronic)	Max. Daily Amount (code): 05 Avg. Daily Amount (code): 05 No. of Days On-site (days): 365	Storage Codes: A14, D14 Site Plan Attached	☐
CAS 127184 Trade Secret ☐ Chem. Name: Perchloroethylene (Tetrachloroethylene) Check all that apply: Pure ☒ Mix ☒ Solid ☐ Liquid ☒ Gas ☐ EHS ☐ EHS Name:	☐ Fire ☐ Sudden Release of Pressure ☐ Reactivity ☒ Immediate (acute) ☒ Delayed (chronic)	Max. Daily Amount (code): 04 Avg. Daily Amount (code): 04 No. of Days On-site (days): 365	Storage Codes: A14, D14 Site Plan Attached	☐
CAS 74986 Trade Secret ☐ Chem. Name: Propane Check all that apply: Pure ☒ Mix ☐ Solid ☐ Liquid ☒ Gas ☒ EHS ☐ EHS Name:	☒ Fire ☒ Sudden Release of Pressure ☐ Reactivity ☒ Immediate (acute) ☐ Delayed (chronic)	Max. Daily Amount (code): 04 Avg. Daily Amount (code): 04 No. of Days On-site (days): 365	Storage Codes: A24 Site Plan Attached	☐

Certification (Read and sign after completing all sections)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in pages one through 5, and that based on my inquiry of those individuals responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Edward Kuhn, Plant Manager — Name and official title of owner/operator OR owner/operator's authorized representative
Signature — Date signed: 7/28/92

Optional Attachments

☒ I have attached a site plan
☐ I have attached a list of site coordinate abbreviations
☐ I have attached a description of dikes and other safeguard measures

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Revised June 1990

Page 3 of 3 pages
Form Approved OMB No. 2050-0072

Tier Two
EMERGENCY AND HAZARDOUS CHEMICAL INVENTORY

Specific Information by Chemical

Facility Identification

Name: Summit Resource Management, Inc.
Street: 3501 Gribble Road
City: Matthews County: Union State: NC Zip: 28105
SIC Code: 7398 Dun & Brad Number: 78-331-4396

FOR OFFICIAL USE ONLY
ID #:
Date Received:

Owner/Operator Name

Name: Summit Resource Management Phone: (704) 821-4766
Mail Address: P O Box 3565 Matthews, NC 28106

Emergency Contact

Name: E S Kuhn Title: Plant Manager
Phone: (704) 821-4766 24 Hr. Phone: (704) 588-1631
Name: J D Patton Title: Vice President
Phone: (704) 821-4766 24 Hr. Phone: (219) 625-4306

Important: Read all instructions before completing form

Reporting Period: From January 1 to December 31, 19 91

☐ Check if information below is identical to the information submitted last year.

Chemical Description	Physical and Health Hazards (check all that apply)	Inventory	Container Type / Temperature / Pressure	Storage Codes and Locations (Non-Confidential) Storage Locations	Optional
CAS 78 00 2; Trade Secret ☐ Chem. Name: Gasoline Check all that apply: Pure ☒ Mix ☐ Solid ☐ Liquid ☒ Gas ☐ EHS ☐ EHS Name:	☒ Fire ☐ Sudden Release of Pressure ☐ Reactivity ☒ Immediate (acute) ☐ Delayed (chronic)	Max. Daily Amount (code): 03 Avg. Daily Amount (code): 03 No. of Days On-site (days): 365	A 1 4	Site Plan Attached 24	☐
(Typical) CAS 64742 54 7; Trade Secret ☐ Chem. Name: Oils (Lubricating, Hydraulic, Heat Transfer, etc) Check all that apply: Pure ☒ Mix ☒ Solid ☐ Liquid ☒ Gas ☐ EHS ☐ EHS Name:	☒ Fire ☐ Sudden Release of Pressure ☐ Reactivity ☒ Immediate (acute) ☐ Delayed (chronic)	Max. Daily Amount (code): 05 Avg. Daily Amount (code): 04 No. of Days On-site (days): 365	A 1 4 D 1 4	Site Plan Attached	☐
CAS 67 63 0; Trade Secret ☐ Chem. Name: Isopropyl Alcohol (Isopropanol) Check all that apply: Pure ☒ Mix ☒ Solid ☐ Liquid ☒ Gas ☐ EHS ☐ EHS Name:	☒ Fire ☐ Sudden Release of Pressure ☐ Reactivity ☒ Immediate (acute) ☒ Delayed (chronic)	Max. Daily Amount (code): 04 Avg. Daily Amount (code): 03 No. of Days On-site (days): 365	A 1 4	Site Plan Attached	☐

Certification (Read and sign after completing all sections)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in pages one through 3 and that based on my inquiry of those individuals responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Edward S. Kuhn, Plant Manager — Name and official title of owner/operator OR owner/operator's authorized representative
Signature — Date signed: 2/28/92

Optional Attachments
☒ I have attached a site plan
☐ I have attached a list of site coordinate abbreviations
☐ I have attached a description of dikes and other safeguard measures

03/22/95 14:14 ☎ 7042894369 UNION CO. E.M. 03

Revised June 1990

Form Approved OMB No. 2050-0072

Tier Two
EMERGENCY AND HAZARDOUS CHEMICAL INVENTORY

Specific Information by Chemical

Facility Identification

Name: Summit Resource Management, Inc.
Street: 3507 Gribble Road
City: Stallings County: Union State: NC Zip: 28105
SIC Code: 7398 Dun & Bradstreet Number: 78-331-4396

FOR OFFICIAL USE ONLY — ID #: Date Received:

Owner/Operator Name

Name: Summit Resource Management Phone: (704) 821-4766
Mail Address: P. O. Box 1565, Matthews, NC 28106

Emergency Contact

Name: Keith Bloomer Title: General Manager
Phone: (704) 821-4766 24 Hr. Phone: (803) 831-7328
Name: George Schlager Title: Plant Manager
Phone: (704) 821-4766 24 Hr. Phone: (704) 365-9630

Important: Read all instructions before completing form

Reporting Period: From January 1 to December 31, 19 92

☐ Check if information below is identical to the information submitted last year.

Chemical Description	Physical and Health Hazards (check all that apply)	Inventory	Storage Codes and Locations (Non-Confidential) Storage Locations	Optional
CAS 107211 Trade Secret ☐ Chem. Name: Ethylene Glycol Check all that apply: Pure ☐ Mix X Solid X Liquid X Gas ☐ EHS ☐ EHS Name:	☐ Fire ☐ Sudden Release of Pressure ☐ Reactivity X Immediate (acute) X Delayed (chronic)	Max. Daily Amount (code): 06 Avg. Daily Amount (code): 06 No. of Days On-site (days): 365	Container Type / Pressure / Temperature: A 1 4 D 1 4 Site Plan Attached	☐
CAS 111466 Trade Secret ☐ Chem. Name: Diethylene Glycol Check all that apply: Pure ☐ Mix X Solid X Liquid X Gas ☐ EHS ☐ EHS Name:	☐ Fire ☐ Sudden Release of Pressure ☐ Reactivity ☐ Immediate (acute) X Delayed (chronic)	Max. Daily Amount (code): 04 Avg. Daily Amount (code): 03 No. of Days On-site (days): 365	A 1 4 D 1 4 Site Plan Attached	☐
CAS 112276 Trade Secret ☐ Chem. Name: Triethylene Glycol Check all that apply: Pure ☐ Mix X Solid X Liquid X Gas ☐ EHS ☐ EHS Name:	☐ Fire ☐ Sudden Release of Pressure ☐ Reactivity X Immediate (acute) ☐ Delayed (chronic)	Max. Daily Amount (code): 04 Avg. Daily Amount (code): 03 No. of Days On-site (days): 365	A 1 4 Site Plan Attached NOR - 4	☐

Certification (Read and sign after completing all sections)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in pages one through 4, and that based on my inquiry of those individuals responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Keith G. Bloomer, General Manager — Name and official title of owner/operator OR owner/operator's authorized representative

Signature — Date signed: 3/4/93

Optional Attachments

X I have attached a site plan
☐ I have attached a list of site coordinate abbreviations
☐ I have attached a description of dikes and other safeguard measures

Tier Two

EMERGENCY AND HAZARDOUS CHEMICAL INVENTORY

Specific Information by Chemical

Facility Identification

Name: Summit Resource Management, Inc.
Street: 3501 Gribble Road
City: Stallings County: Union State: NC Zip: 28105

SIC Code: 7398 Dun & Brad Number: 78-331-4396

FOR OFFICIAL USE ONLY — ID: ____ Date Received: ____

Owner/Operator Name

Name: Summit Resource Management Phone: (704) 821-4766
Mail Address: P. O. Box 1565, Matthews, NC 28106

Emergency Contact

Name: Keith Bloomer Title: General Manager
Phone: (704) 821-4766 24 Hr. Phone: (803) 831-7328

Name: George Schlager Title: Plant Manager
Phone: (704) 821-4766 24 Hr. Phone: (704) 365-9630

Important: Read all instructions before completing form

Reporting Period: From January 1 to December 31, 19 92

☐ Check if information below is identical to the information submitted last year.

Chemical Description (Typical)	Physical and Health Hazards (check all that apply)	Inventory	Container Types / Pressure / Temperature	Storage Codes and Locations (Non-Confidential) Storage Locations	Optional
CAS 647454-7 Trade Secret ☐ Chem. Name: Oils (Lubricating, Hydraulic, Heat Transfer, etc.) Check all that apply: Pure [X] Mix [X] Solid ☐ Liquid [X] Gas ☐ EHS ☐ EHS Name:	[X] Fire ☐ Sudden Release of Pressure ☐ Reactivity [X] Immediate (acute) ☐ Delayed (chronic)	Max. Daily Amount (code): 05 Avg. Daily Amount (code): 04 No. of Days On-site (days): 365	A 1 4 D 1 4	Site Plan Attached	☐
CAS ____ Trade Secret ☐ Chem. Name: Check all that apply: Pure ☐ Mix ☐ Solid ☐ Liquid ☐ Gas ☐ EHS ☐ EHS Name:	☐ Fire ☐ Sudden Release of Pressure ☐ Reactivity ☐ Immediate (acute) ☐ Delayed (chronic)	Max. Daily Amount (code): Avg. Daily Amount (code): No. of Days On-site (days):			☐
CAS ____ Trade Secret ☐ Chem. Name: Check all that apply: Pure ☐ Mix ☐ Solid ☐ Liquid ☐ Gas ☐ EHS ☐ EHS Name:	☐ Fire ☐ Sudden Release of Pressure ☐ Reactivity ☐ Immediate (acute) ☐ Delayed (chronic)	Max. Daily Amount (code): Avg. Daily Amount (code): No. of Days On-site (days):		MAR 4	☐

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Keith G. Bloomer, General Manager — Name and official title of owner/operator or owner/operator's authorized representative

Signature: Keith G. Bloomer — Date signed: 3/4/93

Optional Attachments

[X] I have attached a site plan
☐ I have attached a list of the coordinate abbreviations
☐ I have attached a description of dikes and other safeguard measures

03/22/95 14:17 ☎ 7042894369 UNION CO. E.M. 05

Summit Resource Management, Inc.
3501 Gribble Road
Matthews, North Carolina 28105
(704) 821-4766

AIR PERMIT APPLICATION NARRATIVE INFORMATION

1. General Information

The North Carolina Division of Environmental Management issued the air permit covering emission sources at the Matthews plant effective December 3, 1990. At that time, the operation was under the management and direction of Chemstreams, Inc. The air permit identification number assigned was 6640R2.

Action was pending on the reassignment of the air permit to designate that certain operations were being managed by Distech, Inc. Also, documents had been filed to reflect the addition of two new bulk storage tanks.

In November, 1991, the Matthews facility operations were transferred to Summit Resource Management, Inc. Discussions with personnel from the Mooresville Regional Office resulted in the decision to submit a revised air permit application which would:

- Reflect the new company name (Summit Resource Management, Inc.).
- Bring the list of equipment and emission sources up to date with current plans, facilities and operations.

2. Description of Operations

Attachment A is a site location map for the facility at 3501 Gribble Road, Matthews, North Carolina. Attachment B is the Vicinty Map for the plant. A facility Site Plan/Plot Plan has been included as Attachment C. Attachment D contains the results of a 1987 Boundry and Physical Survey of the property.

Current and near term planned emission point sources are identified by Attachment E, and Attachment F contains physical data for the bulk storage tanks.

Principal facility operations focus on the recovery processing of ethylene glycol and water mixtures received from the fibers and textiles industries. Operations include:

- A filter press unit operation for removing solids from the

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liquid mixtures to be processed.

- A hot oil media distillation operation for separating the glycols from water.

The recovered ethylene glycol then becomes an ingredient in the formulation of anti freeze compounds. Other formulation components include a coloring agent and additives and enhancers. The completed anti freeze mixtures are shipped in bulk or packaged for sale to distributors.

The hot oil distillation unit has capabilities for separation processing of more than just anti freeze ingredients. Glycols, lubricating oils and similar petroleum products can be processed for formulating into brake fluid compounds. Methanol and water mixtures can be processed for windshield wash fluid compounds. It is anticipated that other relatively high boiling distillation situations will continue to be available for business evaluation at the Matthews plant.

3. Emission Calculations - Fuel Burning Sources

Attachment G is the US EPA AP-42 reference section for air emission factors associated with natural gas combustion. The hot oil furnace (identification H-1) is fired with natural gas. The glycol concentrator (identification H-2) is being modified for firing with natural gas. The unit previously used propane fuel.

US EPA AP-42 factors used for the hot oil furnace and for the glycol concentrator emission calculations are summarized:

Pollutant	Emission Factor
Particulate	4.7 lb/million CF burned.
Sulfur dioxide	0.6 lb/million CF burned.
Nitrogen oxides	100 lb/million CF burned.
Carbon monoxide	20 lb/million CF burned.
Volatile organics	2.7 lb/million CF burned.

Annual emission totals for the hot oil furnace based on maximum operating conditions (8,736 hours per year) would be:

Particulate - 0.17 tons per year.

Sulfur dioxide - 0.02 tons per year.

Nitrogen oxides - 3.36 tons per year.

Carbon monoxide - 0.66 tons per year.

VOC - 0.09 tons per year.

Annual emission totals for the glycol concentrator based on maximum operating conditions (8,736 hours per year) would be:

Particulate - 0.09 tons per year.

Sulfur dioxide - 0.01 tons per year.

Nitrogen oxides - 2.1 tons per year.

Carbon monoxide - 0.4 tons per year.

VOC - 0.06 tons per year.

4. Emission Calculations - Distillation Operations

Three emission points are associated with distillation system operations:

- (C-1) -- The bleed line for the reactor vessel, for the exhausting of at rest vessel air volume during charging operations, where the reactor receives a liquid transfer from a feed stock tank.
- (V-1) -- The exhaust discharge from the vacuum pump.
- (CT-1) -- Representing emissions associated with reuse of collected storm water as cooling tower make up water supply.

5. Emission Calculations - Bulk Storage Tanks

Attachment H contains the US EPA AP-42 section with emission estimating calculations for bulk tanks in organic liquid storage service. Properties of typical materials are summarized:

Material	Molecular Weight	Vapor Pressure
Ethylene Glycol	62 lb/lb mol.	0.0023 psi.
Methanol	32 "	2.32 "
Isopropyl Alcohol	60 "	0.81 "

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Material	Molecular Weight	Vapor Pressure
N-Methylpyrrolidone	99 lb/lb mol.	0.0056 psi

Many of the storage tanks can be in service for different materials. In addition, many of the storage applications will involve mixtures of the above listed compounds with water.

The emission calculations are based on properties of the pure component ignoring any water fraction present in order to represent maximum conditions for emission potential. In addition, a volume or thruput factor of one load, receipt or transfer per tank each day has been assigned for emission calculations for most tanks. This will represent an activity volume well in excess of current operations.

5. Summary

North Carolina air permit application forms are included as follows:

Form Identification	Description
A	General Information.
B	Fuel Burning Sources.
B	Distillation System.
B	Bulk Storage Tanks.
D	Area Diagram.

There are no defined air pollution control systems or devices attached to the emission points identified in the above information.

Prepared By:

W. D. Gabbard

William D. Gabbard
December 30, 1991

Memo

Date: April 12, 1995

To: File

From: Douglas Moore Douglas B Moore
Environmental Chemist
NC Superfund Section

Topic: Site Operators

Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union County, NC
US EPA ID: NCD 986 232 213

File review of historic information indicates that at least five (5) companies have been associated with operations at the site since 1991. These company names are Distech, NovaChem, Chemstreams, Summit Resource Management and National Petroleum Packers. This conclusions is based on the following attachments copied from Mooresville Regional Office and NC Superfund files:

(a) An April 20, 1992 emergency management report of a spill at the site from tankers leased by "Distech or NovaChem" (see Ref. 15, attachment O).
(b) A January 11, 1991 report of wastewater discharge from the site operated by "Chemstreams, Inc." (see Ref. 15, attachment A).
(c) A February 14, 1992 report of a fire at the site operated by "Summit Resource Management, Inc." (see Ref. 15, attachment J).
(d) "National Petroleum Packers, Inc." are the current site operators (see Ref. 1, p. 2-3).

Ref. 10

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

William L. Meyer
Director

July 25, 1991

MEMORANDUM

TO: Mr. Keith Masters, Western Area Supervisor
Hazardous Waste Compliance Unit

FROM: Mr. Scott Readling, Waste Management Specialist
Hazardous Waste Compliance Unit

RE: Site investigation of Chemstreams, Incorporated located in Matthews, Union County.

COPIES: Mr. Tony Parker

As a result of a previous investigation dated February 15, 1991 been conducted by the Division of Environmental Management specifically Mr. Tony Parker and a prior visit by Mr. Ron Phelps and at the request from the Division an investigation by the Division of Solid Waste Management, Hazardous Waste Section was made. The purpose of this facility audit was to determine applicability and compliance with the Resource Conservation and Recovery Act regarding the generation, accumulation, treatment, storage and disposal of any and all hazardous waste located at the facility. During previous site visits by the Division of Environmental Management several drums were noted as being stored on-site the contents of which were unknown or unidentifiable. It was also indicated that drums of ethylene glycol and methanol stored on-site. It was not indicated if the methanol was a waste or a raw product to be used in the processes. As a result of this request a visit was scheduled with Mr. Tony Parker with the Division of Environmental Management to review the facility.

On Thursday, July 11, 1991 I met with Mr. Tony Parker, Environmental Technician IV, Division of Environmental Management, Water Quality Section. The meeting took place at the Chemstreams Incorporated facility (704)821-6727 site located at 3501 Gribble Road in Matthews, North Carolina. Also participating in the site survey was Mr. Will Oliver (704)821-4311 a consultant for Chemstreams. As noted in a previous complaint investigation report dated December 19, 1988 chemstreams Incorporated has been operating at this location for approximately four years. Chemstreams receives ethylene glycol from various textile and fiber industries (i.e. Dupont, Cape Industries, Celanese). The majority of glycols

are received in fifty-five gallon drums marked nonhazardous waste and is stored on-site prior to processing. Ethylene glycol, Dieithlyene glycol and Triethylene glycols are received and processed which generates terephthalic acid. The terephthalic acid is collected from a filter press as well as a vacuum distillation unit located on-site. The terephthalic acid is in both a liquid and semi-solid state and is stored on-site in fifty-five gallon drums. The terephthalic acid is considered nonhazardous and is sold in these various forms to both textile and polyester manufacturing companies as a raw product. The various forms of glycols which are processed are repackaged and sold as antifreeze. The stored drums of glycols are high in dissolved polymers and is considered a crude product in this unprocessed state. The processes used to recover the glycols such as the filter press and the distillation generate large amounts of wastewaters. The glycol waste producing the wastewaters are collected and stored in both tanks and within containment walls designed as secondary containment for the storage tanks located on-site. The wastewaters are high in BOD's, COD's and ethylene glycol. Other activities at the site include the reprocessing and repackaging of brake fluids and the purchase of methanol which is distilled on-site which removes the waters and salts. Once removal has occurred the methanol is used in a window washer product which is packaged and sold. Mr. Oliver stated that no materials are manifested on-site and that methanol is rarely distilled because of the relatively low cost of the raw product makes it not cost effective. Mr. Oliver also stated that no hazardous waste is generated by this process nor by any other of the activities which are performed on-site.

As noted in the Division of Environmental Management report the majority of concerns evolved around spillage and runoff from the area which had occurred and the possibility of groundwater contamination resulting from these areas. Evidence of spillage and leakage and contamination was noted from the drum storage area, wastewater containment area, unloading area, conveyance ditches and earthen berms containment areas.

The adjacent property identified as the Wagner Property showed visible contamination. The contamination was located along the east side of the Chemstreams fence line. The discolored area observed was thought to be seeping out of the ground as opposed to being runoff from the Chemstreams property. Mr. Oliver stated that prior to Chemstreams an asphalt company had occupied the site and as a result of earlier runoff from Chemstreams analysis indication of the area revealed possible hydrocarbon, ethanol and glycol contamination as well. The area appeared to have anaerobic activity as evidence of gaseous release and fermenting odor present at the location. Mr. Oliver confirmed this by stating that the breakdown of the glycols would cause the fermentation to occur.

Both water and soil samples were collected from the site by Mr. Parker and are to be analyzed for organics, metals and cyanides. Pending the analysis results will determine further action and any future Hazardous Waste Section involvement. The

Groundwater Section may perform an additional site investigation in order to determine groundwater contamination and resulting impact from previous activities and releases. Further action pending review of analysis data results.

Ref. 11

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RECOGNITION OF HEALTH HAZARDS IN INDUSTRY

A Review of Materials and Processes

WILLIAM A. BURGESS
Associate Professor of Occupational Health Engineering
Harvard School of Public Health
Boston, Massachusetts

9-5-85 $32.00 Hoz White (M.G.)

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short-term exposures. Wet methods of removal are helpful in controlling this problem (13).

REFERENCES

1 Committee on Air Pollution, American Conference of Governmental Industrial Hygienists, *Process Flow Diagrams and Air Pollution Emission Estimates*, ACGIH, Cincinnati, OH, 1973.

2 "Control of Asbestos Dust," Technical Data Note 35, Department of Employment, HM Factory Inspectorate, London, December 1972.

3 "Recommended Code of Practice for the Handling and Disposal of Asbestos Waste Materials," Asbestos Research Council, London, 1973.

4 G. S. Rajhans and G. M. Bragg, *Engineering Aspects of Asbestos Dust Control*, Ann Arbor Science, Ann Arbor, MI, 1978.

5 Committee on Industrial Ventilation, American Conference of Governmental Industrial Hygienists, *Industrial Ventilation: A Manual of Recommended Practice*, 16th ed., ACGIH, Lansing, MI, 1980.

6 L. A. Schutz, W. Bank, and G. Weems, "Airborne Asbestos Fiber Concentrations in Asbestos Mines and Mills in the United States," Unites States Bureau of Mines, Technical Progress Report 72, July 1973.

7 *Handbook of Asbestos Textiles*, 3rd ed., Asbestos Textile Institute, Pampton Lakes, NJ, 1967.

8 J. Goldfield and F. Brandt, *Am. Ind. Hyg. Assoc. J.*, **36**, 799 (1974).

9 W. J. Smither and H. C. Lewinsohn, "Asbestosis in Textile Manufacturing," *Biological Effects of Asbestosis*, International Agency for Research on Cancer, Lyon, 1973.

10 G. Slwis-Gremer, *Ann. N.Y. Acad. Sci.*, **132**, 215 (1974).

11 "Criteria for a Recommended Standard—Occupational Exposure to Asbestos," U.S. Department of Health, Education and Welfare, Report HSM 72-10207, NIOSH, Cincinnati, OH, 1972.

12 *Recommendations for Handling Asbestos*, Engineering Equipment Users Association Handbook No. 33, EEUA, London, 1969.

13 J. Fontaine and D. Trayer, *Am. Ind. Hyg. Assoc. J.*, **36**, 126, (1975).

3.7 ASPHALT PRODUCTS

The term "asphalt" applies to a naturally-occurring deposit or a product recovered from crude petroleum by a refinery process. The material can be separated into three groups: asphaltenes, resins, and oils. The resins form a cover over the particulate asphaltenes, and the paraffinic, naphthenic, or naphtha-aromatic oils are the suspending oils. The great bulk of asphalt is now obtained from petroleum, and the refinery process permits production of material ranging from viscous liquids to solids.

In the United States, straight petroleum asphalt is used; in Europe, coal tar pitch is used to "cut" the petroleum-based asphalt. The difference in toxicity between these asphalts is significant (1). The petroleum asphalt is not considered highly toxic. The principal health problems appear to be thermal

burns from skin contact and possibly skin sensitization. The carcinogenicity of petroleum asphalt has not been demonstrated in human beings. European asphalt containing coal tar pitch, however, presents a potential hazard to polycyclic aromatic hydrocarbons and warrants entirely different controls due to its possible carcinogenicity.

A summary of handling procedures for asphalts based on petroleum asphalt "cut" with coal tar pitch from Sanderson and Jelfs (1) is quoted later. Although the level of hazard connected with asphalts in the United States is not as great as the hazard for European products, for which these guidelines were prepared, precautions seem appropriate for all asphalts based on present knowledge.

1 Avoid prolonged and repeated skin contact with bitumen materials.
2 Wear suitable protective clothing, especially gloves, and do not wear heavily soiled garments. Dry cleaning is recommended for soiled clothing.
3 Never put dirty rags or towels in pockets.
4 Remove bitumen contamination from the skin by thorough washing with skin cleanser and warm water. Wash hands thoroughly before and after going to the lavatory. Kerosene and other solvents must not be used for normal skin-cleansing purposes.
5 Obtain medical advice if any skin changes are noticed, particularly if these occur in areas that have been exposed to contact with bitumen/coal tar products.

3.7.1 Paving Plants

A major use of petroleum asphalt is in paving products for roads and runways. Since the final product cannot be shipped long distances, a large number of paving plants of the type shown in Figure 3.7-1 are scattered throughout the United States (2). Sand and gravel, the major aggregates, are quarried near the plant and dumped directly onto hoppers by truck or the aggregate is stockpiled and transferred to hoppers by crane or front-end loaders.

The granular material is dried in an oil-or gas-fired rotary drier. The hot aggregate is screened and held in a bin directly over the mill. When a truckload of asphalt is to be prepared, a given blend by weight of aggregate, filler such as fly ash, limestone or Portland cement, and hot asphalt from a heated asphalt storage tank is dumped into the mixer and blended for 1–2 min. The blended mix is dropped onto a truck for transport to the paving site.

During this sequence the operator of the plant may have a serious heat, noise, dust, and asphalt fumes exposure depending on the design of the facility and the availability of enclosed, conditioned control rooms. Equipment operators may be exposed to significant dust concentrations if they operate with open cabs. Maintenance personnel may have serious exposures to heat,

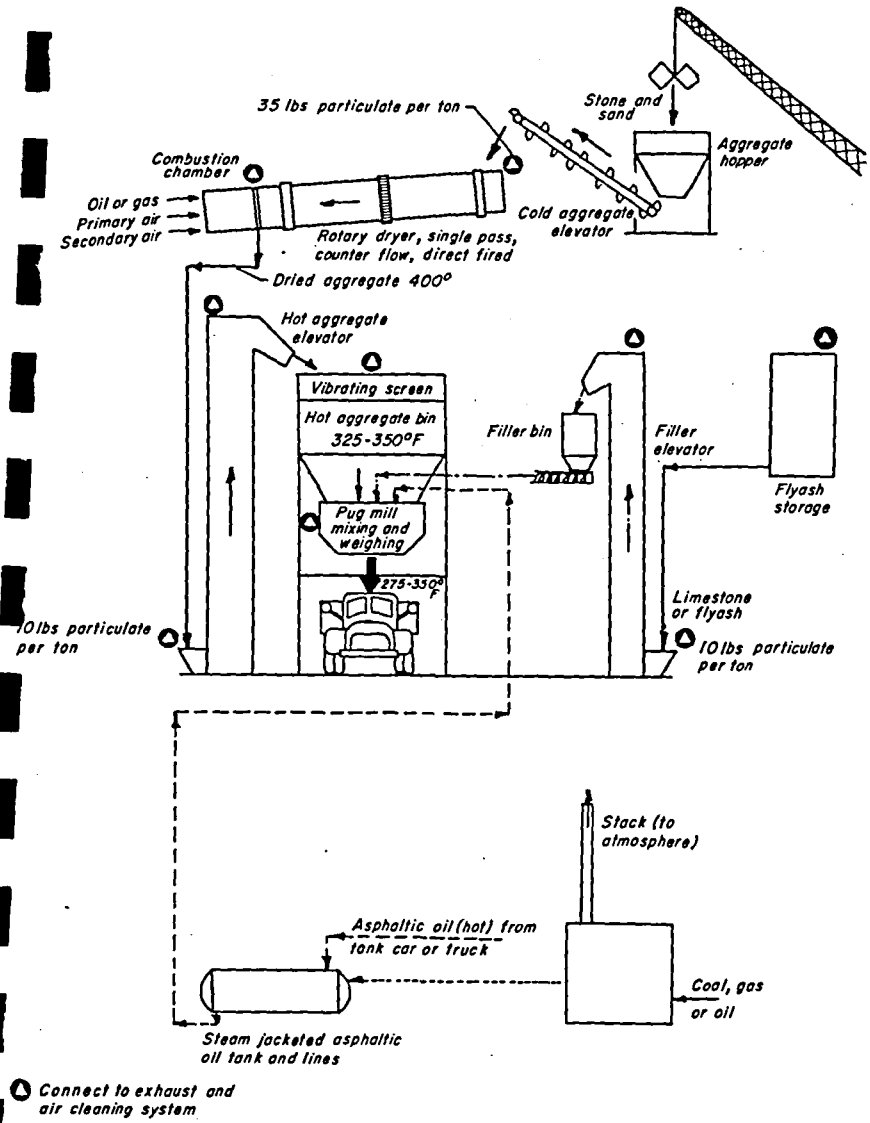

Figure 3.7-1 Flow diagram for asphalt paving plant. (From Reference 2, courtesy of American Conference of Governmental Industrial Hygienists)

noise, dust, and asphalt fume exposure depending on the design of the facility equipment during plant operation. The health hazard from the exposure to mineral dust depends on the free silica content of the rock and sand. Air concentration data are not available in the open literature on asphalt paving

plants. The principal dust control technique is local exhaust ventilation at the material transfer points identified in Figure 3.7-1 (3).

3.7.2 Roofing Plants

A second major application of asphalt is the production of asphalt roofing products. In this process, felted paper is impregnated with asphalt, coated with mineral granules to improve weathering characteristics, and cut to form conventional roof shingles, roll covering, or side wall shingles. The felt is a paper with wood or cloth fiber added for strength; fire retardant shingles may contain asbestos or fibrous glass. The impregnant is a petroleum asphalt prepared at the plant site by "air blowing." In this process air is bubbled through liquid asphalt for 8 to 16 hrs to oxidize the asphalt and increase its melting point.

A schematic of a continuous roofing product manufacturing line is shown in Figure 3.7-2 (4). Four component preparation lines meet to form the final product: rock dust, mineral granules approximately 1–2 mm in diameter, felt, and asphalt. The felt is fed from an unwind station to a saturator where it is impregnated by asphalt spray, dip, or in some cases by both techniques as shown in Figure 3.7-2. The impregnated felt is dried on steam heated drums and is fed to a wet looper or accumulator. The saturation process usually results in worker exposure to asphalt fumes. Control normally is achieved by an enclosed canopy with roof exhauster.

The warm asphalt is then "filled" with mineral dust obtained as a by-product during crushing of the granules. Talc, soapstone, mica, or sand is applied to the rear of the felt to keep it from sticking. The filled felt then passes to a granule applicator station where pigmented granules are pressed into the dust-filled asphalt on the felt. These two operations may be dusty and involve dust exposure to the range of minerals used in the coater and granule applicator. After cooling, the continuous roll is cut to form either roll roofing or shingles.

The acceptable exposure limit to mineral dust depends on its mineralogical identity and its crystalline silica content. If special fillers such as asbestos and fibrous glass are used, these exposures must be evaluated. If talc is used as an antisticking agent on the rear of the product, it should be evaluated to ensure that it is nonfibrous and to determine its free silica content. Nonasbestos talcs with less than 1% free silica are available for this application. The adhesive used to seal one shingle to another on the roof is applied in the plant and its composition should be identified. In many cases it is merely a dab of asphalt.

In a NIOSH Health Hazard Evaluation of an asphalt shingle plant, air samples were collected for asbestos, crystalline silica, formaldehyde, asphalt, aromatic hydrocarbons, and total aliphatic hydrocarbons (5). The percentage of crystalline quartz in respirable dust samples taken on various operations in

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July 1985

Air

EPA

A Review of Standards of Performance for New Stationary Sources - Asphalt Concrete Plants

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A Review of Standards of Performance for New Stationary Sources - Asphalt Concrete Plants

EMISSION STANDARDS AND ENGINEERING DIVISION

U. S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF AIR AND RADIATION
OFFICE OF AIR QUALITY PLANNING AND STANDARDS
RESEARCH TRIANGLE PARK, NORTH CAROLINA 27711

July 1985

specifications for the asphalt concrete product. These specifications are usually stipulated by the applicable State department of transportation. A State may permit the use of a rejuvenating agent at the contractor's discretion or may require the use of a rejuvenating agent.

2.2.5 Sulfur

Sulfur has been used on an experimental basis as a substitute for a portion of the asphalt cement in asphalt concrete mixes. Tests show that the asphalt cement/sulfur combination is better able to bind with aggregate than is asphalt cement alone.[19] Also, asphalt concrete pavements containing the asphalt cement/sulfur combination appear to be stronger and less susceptible to temperature changes than those containing asphalt cement alone.[19]

The use of sulfur is not competitive with asphalt cement in asphalt concrete mixes for several reasons, including environmental questions, worker objections (odor), and corrosion, all of which result from emissions of hydrogen sulfide (H_2S), sulfur dioxide (SO_2), and elemental sulfur (S). In addition, sulfur is almost twice as dense as asphalt cement. Consequently, to make the use of sulfur economically feasible, the cost of sulfur must be less than half the cost of asphalt cement.[20] The resolution of these issues will determine the future use of sulfur in the production of asphalt concrete.

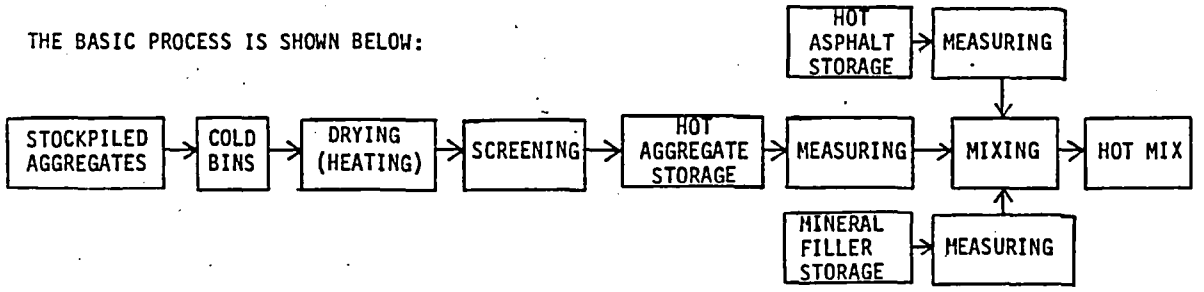
2.3 OPERATIONS OF ASPHALT CONCRETE PLANTS

2.3.1 Batch Plants

Figure 2-2 is a schematic of a typical batch plant operation. Aggregate of various sizes is stockpiled at the plant for easy access. The moisture content of the stockpiled aggregate usually ranges from 3 to 5 percent.[23] (Because aggregate piles are typically not covered, the moisture content can be higher after rainfall.) The moisture content of RAP is usually from 2 to 3 percent.[24]

The different sizes of aggregate are typically transported by front-end loader to separate cold feed bins and metered onto a feeder conveyor belt through gates at the bottom of the bins. The aggregate is screened before it is fed to the dryer to keep oversized material out of the mix.

THE BASIC PROCESS IS SHOWN BELOW:



1. Cold storage bins
2. Cold elevator
3. Dryer
4. Dust collector
5. Hot elevator
6. Screening unit
7. Hot bins
8. Weigh box
9. Pugmill
10. Baghouse

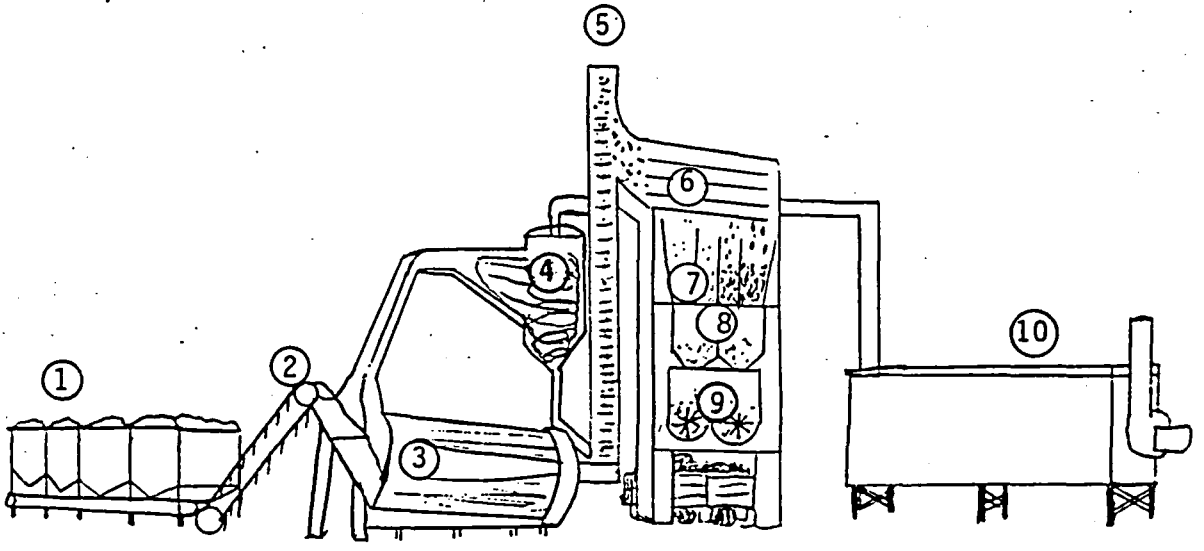


Figure 2-2. Operation flow chart and main parts of typical batch plant.[21,22]

The screened aggregate is fed to a rotating dryer with a burner at its lower (discharge) end that is fired with fuel oil, natural gas, or propane. The dryer removes moisture from the aggregate and heats the aggregate to the proper mix temperature. Inside the dryer are longitudinal flights (metal slats) that lift and tumble the aggregate, causing a curtain (veil) of material to be exposed to the heated gas stream. This curtain of material provides greater heat transfer to the aggregate than would occur if the aggregate tumbled along the bottom of the drum towards the discharge end. Typical aggregate temperature at the discharge end of the dryer is about 149°C (300°F). The amount of aggregate that a dryer can heat depends on the size of the drum, the size of the burner, and the moisture content of the aggregate. As the amount of moisture to be removed from the aggregate increases, the effective production capacity of the dryer decreases. Figure 2-3 shows a typical relationship between effective dryer production capacity and amount of moisture to be removed from the aggregate. As the figure demonstrates, a 2 percent increase in moisture content in the aggregate can decrease dryer production capacity by 25.3 percent.

Vibrating screens segregate the heated aggregate into bins according to size. A weigh hopper meters the desired amount of the various sizes of aggregate into a pugmill mixer. The pugmill typically mixes the aggregate for approximately 15 seconds before hot asphalt cement from a heated tank is sprayed into the pugmill.[26] The pugmill thoroughly mixes the aggregate and hot asphalt cement for 25 to 60 seconds.[26] The finished asphalt concrete is either directly loaded into trucks or held in insulated and/or heated storage silos. Depending on the production specifications, the temperature of the asphalt concrete mix can range from 107° to 177°C (225° to 350°F) at the end of the production process.[27]

When mix containing RAP is produced, the aggregate is superheated (compared to conventional operation) to about 315°C (600°F) to ensure sufficient heat transfer to the RAP when it is mixed with the virgin materials.[28] As shown in Figure 2-4, RAP may be added either to the pugmill mixer or at the discharge end of the dryer. Rarely is more than 30 percent RAP used in batch plants for the production of asphalt concrete.[18]

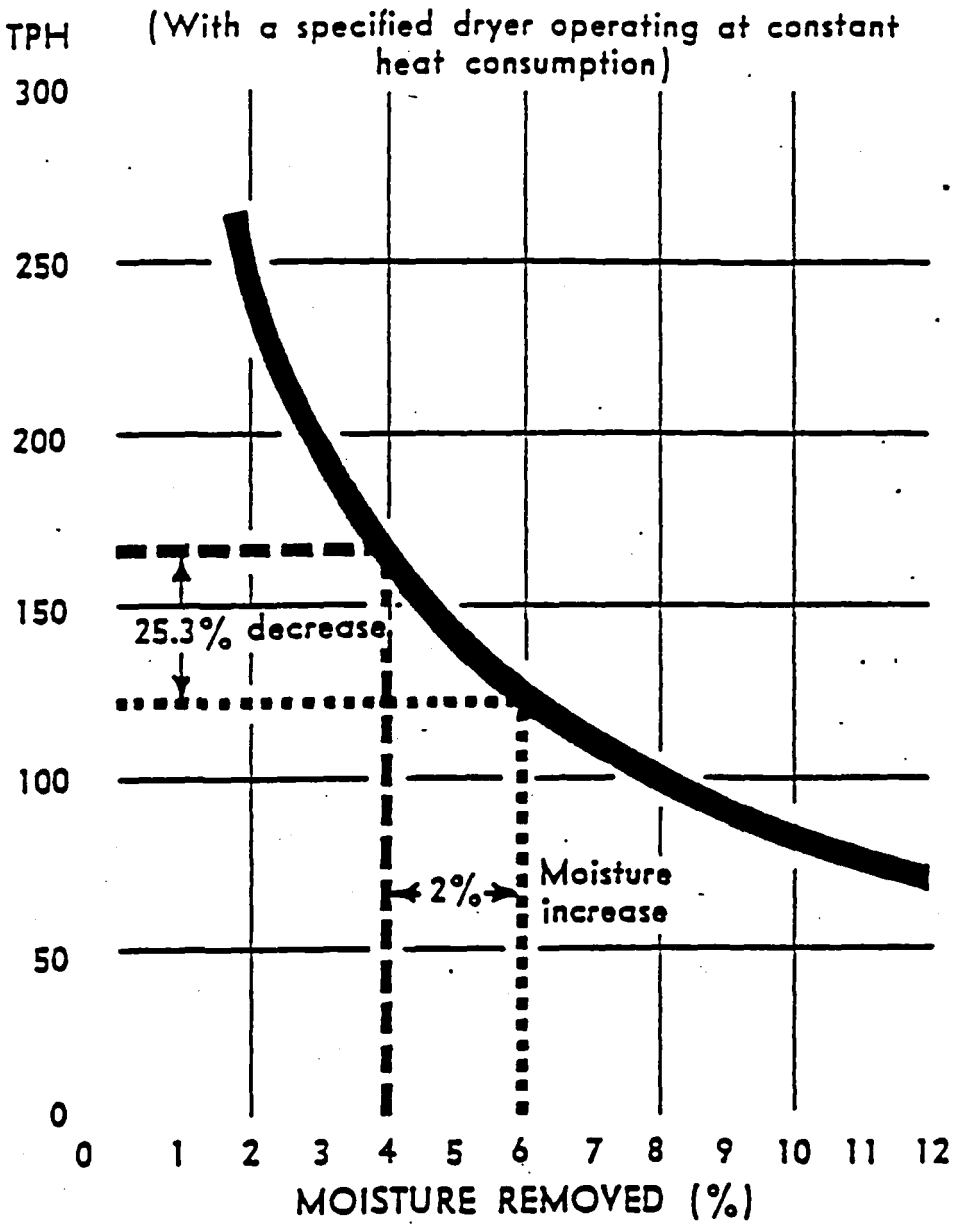
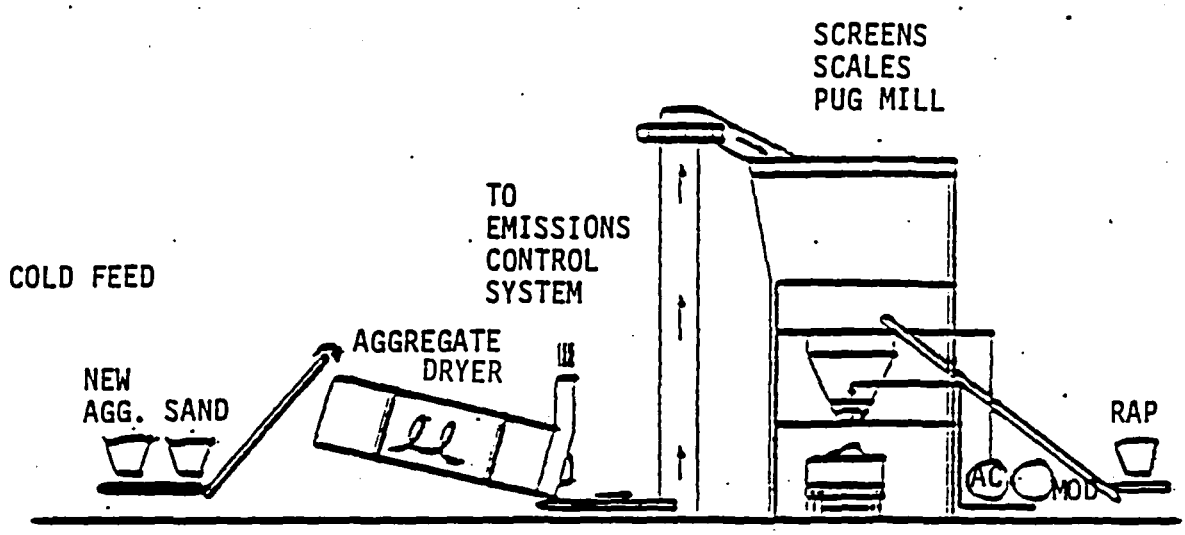
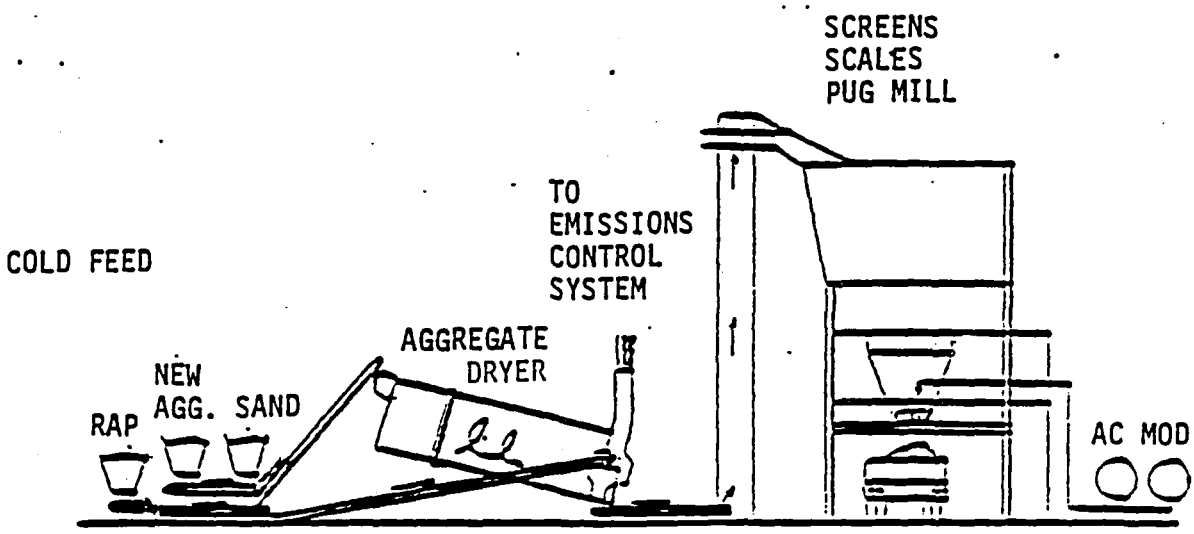


Figure 2-3. Typical tons per hour capacity at various moisture contents.[25]



(A) Standard batch plant with RAP added to superheated aggregate at the pug mill.



(B) Standard batch plant with RAP added to superheated aggregate at dryer discharge.

Figure 2-4. Recycling asphalt pavement in a batch plant.[29]

Many batch plants have some form of mechanical dust collector that recovers particulate matter generated during the drying of the aggregate. The recovered fines are recycled to the production process, thus decreasing aggregate costs for the plant.

2.3.2 Continuous-Mix Plants

Continuous-mix plants are similar to batch plants. Continuous-mix plants have smaller hot bins (for holding the heated aggregate) than do batch plants. Little surge capacity is required of these bins because the aggregate is continuously metered and transported to the mixer inlet by a conveyor belt. Asphalt cement is continuously added to the aggregate at the inlet of the mixer. The aggregate and asphalt cement are mixed by the action of rotating paddles while being conveyed through the mixer. An adjustable dam at the outlet end of the mixer regulates the mixing time and also provides some surge capacity. The finished mix is transported by a conveyor belt to either a storage silo or surge bin.

2.3.3 Drum-Mix Plants

Figure 2-5 depicts a typical drum-mix plant equipped for production using only virgin raw materials. Drum-mix plants dry the aggregate and mix it with the asphalt cement in the same drum, eliminating the need for the extra conveyor belt, hot bins and screens, weigh hopper, and pugmill. Although the drum of a drum-mix plant is much like the dryer of a batch plant, the burner is at the aggregate feed end rather than at the aggregate discharge end. The veil of aggregate is heated as it flows with the heated gas stream instead of countercurrent to the gas stream as in a batch plant.

The burner in a drum-mix plant emits a much bushier flame than does the burner in a batch plant. The bushier flame is designed to provide earlier and greater exposure of the virgin aggregate to the heat of the flame. This design also protects the asphalt cement, which is injected approximately two thirds of the way down the length of the drum, from the direct heat of the flame. Drum-mix plants typically have more flights in their drums than do batch dryers to increase veiling of the aggregate and to improve heat transfer.[31]

COMPILATION

OF

AIR POLLUTANT EMISSION FACTORS

Third Edition

(Including Supplements 1-7)

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Office of Air Quality Planning and Standards
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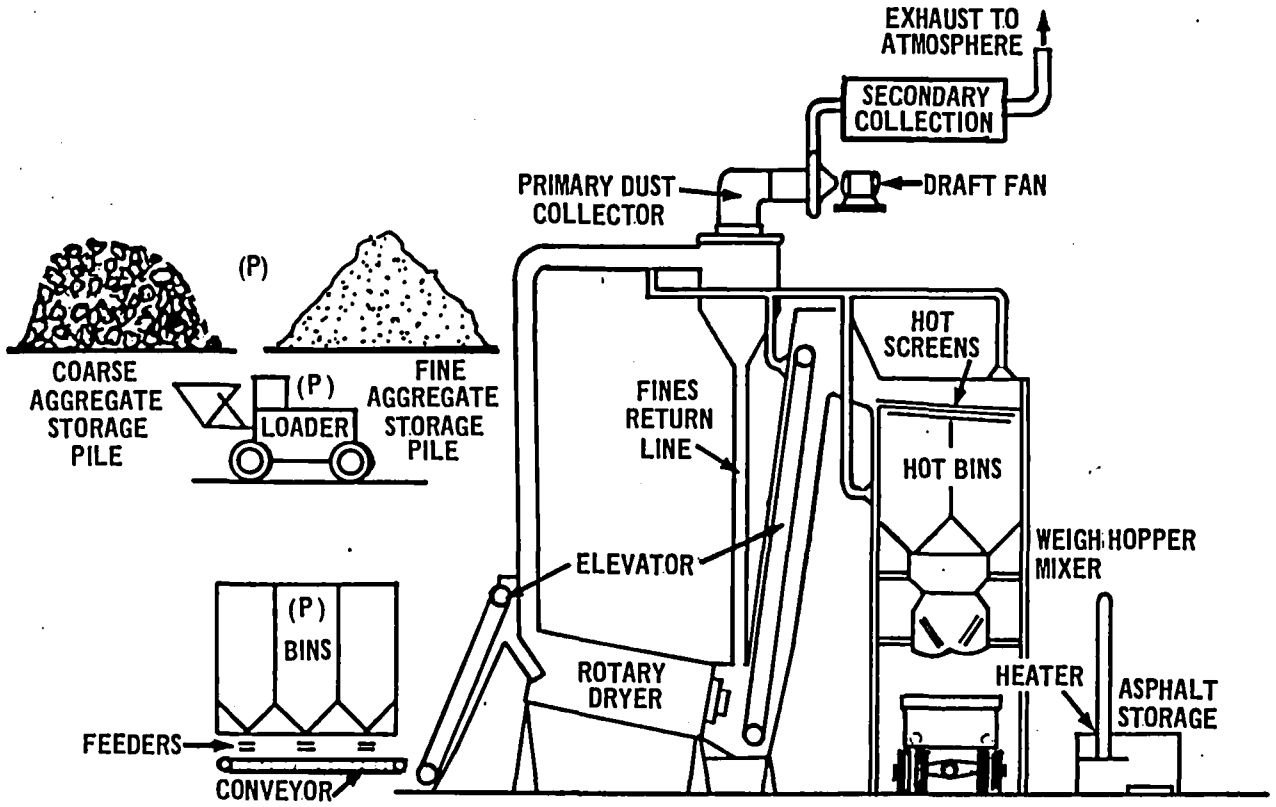

8.1-1. Batch hot mix asphalt plant. "P" denotes particulate emission points.[1]

Ref. 12

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Condensed Chemical

Dictionary

TWELFTH EDITION

Revised by

Richard J. Lewis, Sr.

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CIP

***L*-asparaginase.** (*l*-asnase; colaspase; elspar). CAS: 9015-68-3. An enzyme used in the treatment of certain types of leukemia. Produced by biochemical activity of certain bacteria, yeasts, and fungi. Yields are in excess of 3500 units/g of source.

asparagine. (α-aminosuccinamic acid; β-asparagine; althein; aspartamic acid; aspartamide). $NH_2COCH_2CH(NH_2)COOH$. The β-amide of aspartic acid, a nonessential amino acid, existing in the D(+)- and L(-)-isomeric forms as well as the DL-racemic mixture. L(-)-asparagine is the most common form.
Properties: L(-)-Asparagine monohydrate: White crystals; mp 234–235C; acid to litmus; nearly insoluble in ethanol, methanol, ether, and benzene; soluble in acids and alkalies.
Derivation: Widely distributed in plants and animals both free and combined with proteins.
Use: Biochemical research, preparation of culture media, medicine.

asparaginic acid. See aspartic acid.

"Aspartame". $C_{14}H_{18}N_2O_5$. TM for a synthetic nonnutritive sweetener approved by FDA for tabletop use and as a packaged food additive. The U.S., Canada, and South Africa permit its use in carbonated beverages. A combination of aspartic acid and L-phenylalanine, it is said to be 200 times sweeter than sugar.
See also sweetener, nonnutritive.

aspartamic acid. See asparagine.

aspartamide. See asparagine.

aspartic acid. (asparaginic acid; asparagic acid; aminosuccinic acid).
$COOHCH_2CH(NH_2)COOH$. A naturally occurring nonessential amino acid. The common form is L(+)-aspartic acid.

$$\begin{array}{c} HO_2CCH_2CHCO_2H \\ | \\ NH_2 \end{array}$$

Properties: Colorless crystals, soluble in water, insoluble in alcohol and ether, optically active. DL-aspartic acid: mp 278–280C (decomposes), d 1.663 (12/12C). L(+)-aspartic acid: mp 251C. D(−)-aspartic acid: mp 269–271C (decomposes), d 1.6613.
Source: Young sugar cane, sugar beet molasses.
Derivation: Hydrolysis of asparagine, reaction of ammonia with diethyl fumarate.
Use: Biological and clinical studies, preparation of culture media, organic intermediate, ingredient of aspartame, detergents, fungicides, germicides, metal complexation. Available commercially as D(-)-, L(+)-, and DL-aspartic acid.

aspartocin. USAN for antibiotic produced by *Streptomyces griseus*.

aspergillic acid. (2-hydroxy-3-isobutyl-6-(1-methylpropyl)pyrazine-1-oxide). $C_{12}H_{20}N_2O_2$.
An antibiotic from strains of *Aspergillus flavus*.
Properties: Yellow crystals, mp 97C, insoluble in cold water, soluble in common organic solvents and dilute acids. Hydrochloride melts at 178C, and is soluble in water.
Use: Antibiotic.

Aspergillus. A genus of small molds and fungi used in industry to ferment carbohydrates for producing citric and other organic acids.

ASPET. See American Society of Pharmacology and Experimental Therapeutics.

asphalt. (petroleum asphalt; Trinidad pitch; mineral pitch). CAS: 8052-42-4.
A dark-brown to black cementitious material, solid or semisolid in consistency, in which the predominating constituents are bitumens which occur in nature as such or are obtained as residua in petroleum refining (ASTM). It is a mixture of paraffinic and aromatic hydrocarbons and heterocyclic compounds containing sulfur, nitrogen, and oxygen.
Properties: Black solid or viscous liquid, d approximately 1.0, soluble in carbon disulfide. Flash p 450F (132C), autoign temp. 900F (482C), solid, softens to viscous liquid at approximately 93C, penetration value (paving) 40–300, (roofing) 10–40. Good electrical resistivity. Combustible.
Occurrence: California, Trinidad, Venezuela, Cuba, Canada (Athabasca tar sands).
Hazard: Toxic by inhalation of fume. TLV (fume) 5 mg/m^3.
Use: Paving and road-coating, roofing, sealing, and joint filling, special paints, adhesive in electrical laminates and hot-melt compositions, diluent in low-grade rubber products, fluid loss control in hydraulic fracturing of oil wells, medium for radioactive waste disposal, pipeline and underground cable coating, rust-preventive hot-dip coatings, base for synthetic turf, water-retaining barrier for sandy soils, supporter of rapid bacterial growth in converting petroleum components to protein.
See also bacteria, protein, oil sands.

asphalt (blown). (mineral rubber; oxidized asphalt; hard hydrocarbon). Black, friable solid obtained by blowing air at high temperature through petroleum-derived asphalt with subse-

Memo

Date: March 23, 1995

To: File

From: Douglas Moore
Environmental Chemist
NC Superfund Section

Topic: Site Operator EPA ID # and RCRA status

Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union County, NC
US EPA ID: NCD 986 232 213

Summit Resource Management filed a "Notice of Hazardous Waste Activity" as a RCRA generator on December 30, 1991. Summit later amended its "Notice of Hazardous Waste Activity" to change it's status from a generator to a small quantity generator on February 28, 1992. On July 8, 1993, the facilities status was upgraded to a RCRA large generator. In 1991, Summit Resource Management, Inc. was granted EPA ID # NCD 986 205 060.

On Wednesday, March 8, 1995, I contacted Mooresville Regional Office - Waste Management Specialist Jesse Wells (704) 663-1699 for information on the RCRA status of National Petroleum Packers, Inc (NPP). According to Mr. Wells, NPP is considered a RCRA "conditionally exempt small quantity generator". This status is based upon the determination that NPP receives only Safety-Kleen wastes generated at gas stations. These wastes would contain waste oil, brake fluid, and anti-freeze. It is believed that these wastes are non hazardous under RCRA. Mr. Wells explained that the process employed at NPP would reuse the by-product generated from distillation of the wastestream. As a result, NPP's status under RCRA is "conditionally exempt small quantity generator". Due to their RCRA status, NPP is not required to file for an EPA identification number.

No information was found in the available files regarding the RCRA status or EPA identification number for Distech, Inc., Novachem, Inc., or Chemstreams, Inc.

The current EPA ID # NCD 986 232 213 was assigned by EPA Region IV, Emergency Response and Removal Branch (ERRB) prior to commencement of removal actions at the 3481 Gribble Road location.

Memo

Date: March 23, 1995

To: File

From: Douglas Moore
Environmental Chemist
NC Superfund Section

Topic: Air Quality File Information

Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union County, NC
US EPA ID: NCD 986 232 213

Reference to three (3) air quality permits was located in files from the Mooresville Regional Office. These are permits No. 6640R2, 6640R3 and 6640R4. Permit 6640R2 was originally issued to Chemstreams, Inc. (attachment A) and later amended to reflect changes in ownership from Chemstreams, Inc. to Summit Resource Management, Inc. on January 17, 1992. Attachment A outlines the estimated emissions from the facility. A estimated 3 tons per year of NOx emission were calculated for the natural gas fired boilers, 2 tons per year of NOx emissions for the natural gas fired ethylene glycol/concentrator/water evaporator and 8.8 tons per year of VOC (volatile organic compounds) emissions for the distillation column and storage tanks.

On March 2, 1992, a new air quality permit application for Summit Resource Management, Inc. was received for the subject facility to reflect changes in ownership status and facility equipment (attachment B). Included in this application are air source descriptions, a facility diagram showing their locations and estimates of pollutant emissions produced at the facility. The air sources identified at the site include pressure relief vents on 21 bulk storage tanks, a natural gas fired hot oil furnace, a natural gas fired ethylene glycol concentrator/water evaporator and three air sources associated with a distillation column.

On July 13, 1993, air quality permit 6640R4 was issued to National Petroleum Packers, Inc. for operation of air emission sources (attachment C). Additional air quality sources were included in this permit.

The NC DEM - Air Quality staff investigated five (5) complaints received from workers or neighbors near the site (attachments D through H). Complaints were received on April

24, 1992, June 12, 1992, August 7, 1992, September 23, 1992 and October 6, 1992. All the complaints involve a strong chemical odor originating at the facility. In one instance, August 7, 1992, several employees of Duke Power Operations Center (approximately 200 feet west of the facility) reportedly became ill from the emissions from the company. No violations of NC air quality standards were reported during the investigations.

AQ-16 Revised 3/1/84

NORTH CAROLINA DIVISION OF ENVIRONMENTAL MANAGEMENT

Air Quality Action Request

Computer ____

Name	**Location**	**Reg/Co./Prem. No.**
Summit Resource Management, Inc.	Matthews, Union County	3-90-00134

Contact Brian Kendall, Plt Mgr. **Telephone**

Type Action: CI EE SR PC VE PI Other Permit Revision

Air Program Status 03 93 **Class** A1a **Chg**

Action Requested By: **Address/Phone** **Rec'd Date**

Last Insp. Date **Action Date** 1-17-92 **Next Insp. Date**

Permit # 6640R3 **Issued** 2-24-92 **Expires** 10-31-94 **Stip. #** **Met Y/N**

Recommendations: Issue Permit No. 6640R3 **Signature:** Michael Landis Michael Landis **Date:** 2-21-92

Dist: Yellow (Central File) - Blue (Region) - White (Opt.) Specify_____

1. This application is for the following changes and additions to Permit No. 6640R2:

a. Company ownership change from Chemstreams, Inc. to Summit Resource Management, Inc.

b. The addition of one 20,000 gallon (Tank No. T-16) and a 25,000 gallon (Tank No. T-17) ethylene glycol, methanol, isopropyl alcohol, or N-methylpyrrolidone containing product storage tanks.

c. The removal of the following previously permitted but never installed emission sources and pollution control devices: Permit Item No. 2 - one water eductor venturi scrubber (27.3 gallons per minute water injection rate,) installed on a methanol-water distillation column; Permit Item No. 3 - one water eductor venturi scrubber (173 gallons per minute water injection rate) installed on a mono-ethylene glycol distillation/refining column vent; Permit Item No. 8 - one methanol tank with internal floating roof with relief vent; and Permit Item No. 9 - one methanol product tank with internal floating roof with relief vent.

d. A reduction in the maximum Btu heat input of the hot oil boiler from 38 MBtu/hr to 8 MBtu/hr. Mr. Bill Gabbard, of the Company, stated that the larger unit has never been installed.

e. The addition of natural gas firing (5 MBtu/hr) to an existing ethylene glycol (EG) concentrator/water evaporator.

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2. The following regulations apply to this facility:

NCAC .0503 "Particulates from Fuel Burning Indirect Heat Exchangers"
NCAC .0518 "Miscellaneous Volatile Organic Compound Emissions"
NCAC .0521 "Control of Visible Emissions"
NCAC .0522 "Control and Prohibition of Odorous Emissions"
NCAC .0524(57) NSPS Subpart Kb
NCAC .0535 "Excess Emissions Reporting and Malfunctions"

3.a. One Natural gas fired 8 million Btu/hour hot oil boiler with a maximum firing rate of 7700 cu.ft./hr

This boiler does not require permitting under 2H .0600. However since the application listed the boiler, it will be included in the permit.

Actual Emissions

Based on the emission factors in AP-42 for Particulate, SO2, and VOC emissions from natural gas fired boilers, these emissions would be negligible. NOx emissions would be calculated as follows:

7700 cu.ft./hr x 8760 hr/yr x 100 lb/1,000,000 cu.ft. = 6745 lb/yr

$\frac{6745 \text{ lb/yr}}{2000 \text{ lb/ton}}$ = 3 TPY NOx

Natural gas fired boilers are considered to operate in compliance with applicable regulations. On 11-7-91, the writer observed this boiler in operation with no visible emissions. Compliance with .0521 is indicated.

b. Natural gas fired EG concentrator/water evaporator.

The maximum Btu heat input for this unit is 5 MBtu/hr with a maximum firing rate of 4812 cu.ft./hr.

Actual Emissions

Based on emission factors for natural gas firing, particulate, SO2, and VOC emissions from fuel burning would be negligible.

NOx emissions:

4812 cu.ft/hr. x 8760 hr/yr x 100 lb/1,000,000 cu.ft = 4215 lb/yr

$\frac{4214 \text{ lb/yr}}{2000 \text{ lb/ton}}$ = 2 TPY NOx

VOC emissions from the process:

According to Mr. Bill Gabbard, the only emissions from this process would be water. He indicated that there would be no VOC (ethylene glycol) emissions from this process since the temperature of the EG/water mixture is maintained at about 220 to 250 degrees F, which is about 1/2 of the boiling point of EG (425 degrees F.). The water in the EG is driven off and the EG goes on for further processing.

Since this process uses natural gas as fuel and has no process emissions other than water, this process would not be required to be permitted; however, since it is listed in the application, it will be included in the permit. Compliance with .0503, and .0518 are indicated. On 11-7-92, the writer observed this process in operation with no visible emissions. Compliance with .0521 is indicated.

c. Distillation Column - According to Mr. Gabbard, this column will only operate under vacuum; therefore, the scrubbers noted in Permit No. 6640R2 Item Nos. 2 & 3 have never been installed. In addition, since the distillation column only operates under vacuum, there would be no potential for VOC leaks so NSPS Subpart VV would not apply.

VOC Emissions:

According to the applications, there are three emission points associated with the distillation column: the reaction tank fill vent, the vacuum pump vent, and the cooling tower. EG has a vapor pressure at 70 degrees F of 0.1 mm Hg and a vapor density of 0.16 lb/cu.ft.

c.1. Reactor vessel has a capacity of 3200 gallons. The reactor is charged 728 times per year.

728 charges x 3200 gal/charge x 0.1 mm Hg/760 mm Hg x 1 cu.ft./7.48 gal x 0.16 lb/cu.ft. = 7 lb EG/year

c.2. Vacuum Pump - according to the application, the average exhaust rate of the vacuum pump is 47 cfm over the entire 9-hour batch cycle.

47 cfm x 60 min/hr x 9 hr/batch x 0.1 mm Hg/760 mm Hg x 0.16 lb/cu.ft. x 728 batches = 389 lb EG/yr.

c.3. Cooling tower - the EG emissions from this unit are due to the EG that spills on the ground and becomes dissolved in the collected storm water. The collected storm water is used in the cooling tower as make-up water. For the sake of simplicity, all of the EG in this water is assumed to evaporate. The Company estimates an EG concentration of 75 mg/liter of storm water. The water make-up rate is 5000 gal/day.

5000 gal/day x 3.79 liter/gal x 75 mg/liter x 1 kg/1,000,000 mg x 2.2 lb/kg x 365 day/yr = 1141 lb EG/yr.

Total VOC emissions from the distillation column =

7 lb/yr + 389 lb/yr + 1141 lb/yr = 1537 lb/yr or 0.8 TPY

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d. Storage tanks - two 30,000 gal EG tanks, one 30,000 gal methanol, isopropyl, N-methylpyrrolidone type product tank, three 7,500 gal EG tanks, three 15,000 gal EG tanks, one 5,000 gal EG tank, one 25,000 gal EG tank, four 25,000 gal alcohol type product tanks, one 20,000 gal alcohol type product tank, one 25,000 gal methylpyrrolidone type product tank, three 10,000 gal EG tanks, and one 2,000 EG tank. The tanks of a size of less than 10,568 gallons are not required to be permitted; however, since they are listed in the application, they will be included in the permit. All raw materials processed at this facility are placed in the three largest tanks. Therefore, rather than performing the same calculations for each of the tanks for breathing losses and working losses, they will be calculated only for the largest tanks and the writer will check the calculations provided by the Company for the rest of the tanks for accuracy. The following formulae for breathing and working losses were obtained from AP-42 and will be used for calculating VOC emissions.

Breathing losses

$$L = 2.26 \times .01 \times M \times \frac{P}{P - P} \times D \times H \times dT \times F \times C \times K$$

where: L = fixed roof breathing loss (lb/yr)

M = molecular weight of vapor in storage tank (lb/lb-mole)

P = average atmospheric pressure at tank location (psia)

P = true vapor pressure at bulk liquid conditions (psia)

D = tank diameter (ft)

H = average vapor space height, including roof volume correction

dT = average ambient diurnal temperature change (degrees F)

F = paint factor

C = adjustment factor for small diameter tanks

K = product factor

Fixed tank working losses

$$L = 2.4 \times .00001 \times M \times P \times V \times N \times K \times K$$

where: L = fixed roof working loss (lb/yr)

M = molecular weight of vapor in storage tank (lb/lb-mole)

P = true vapor pressure at bulk liquid temperature

V = tank capacity (gal)

N = number of turnovers per year

K = turnover factor

K = Product factor

The temperature change, atmospheric pressure, and product factor are the same for all tanks and all products. In addition, the vapor pressure and molecular weight of EG, Methanol, isopropyl alcohol, and N-Methylpyrrolidone do not change with tank sizes. Therefore, the writer has already substituted these numbers in the above formulae to generate "constants" for each product.

They are listed as follows:

EG Breathing loss = 0.0154; working loss = 0.00000342

Isopropyl Alcohol breathing loss = 0.8325; working loss = .00117

Methanol breathing loss = 0.9819; working loss = .00178

N-methylpyrrolidone breathing loss = 0.0446; working loss = 0.0000133

Tanks T-1 and T-2 are 30,000-gal capacity and handle only EG and have tank height of 35 feet, diameter of 12 feet, paint factor of 1.0, small tank factor of 0.6, an average liquid level of 17.5 feet, a turnover factor of 0.7,and a throughput of 1,500,000 gallons each.

Predicted VOC emissions:

Breathing loss = 0.0154 x D x H x F x C
= 0.0154 x 73.618 x 4.3 x 1 x .6 = 2.92 lb/yr

Working loss = .00000342 x V x N x K
= .00000342 x 30,000 x 50 x .7 = 3.59 lb/yr

Total VOC loss from both tanks = (3.59 lb/yr + 2.92 lb/yr) x 2 tanks = 13 lb/yr

Tank T-3 is a 30,000-gal capacity tank, handles Methanol, isopropyl alcohol, and N-methylpyrrolidone products, has a height of 35 ft., diameter of 12 ft., a paint factor of 1, a small tank factor of 0.6, an average liquid level of 17.5 ft., a turn over factor of 0.7, and a throughput of 500,000 gal of methanol, 500,000 gal of isopropyl alcohol and 500,000 gal of N-methylpyrrolidone products.

Predicted VOC emissions:

Breathing loss methanol = 0.9819 x D x H x F x C
= 0.9819 x 73.618 x 4.30 x 1 x 0.6 = 186 lb/yr

Breathing loss isopropyl = 0.8325 x 73.618 x 4.3 x 1 x 0.6 = 158 lb/yr

Breathing loss N-methylpyrrolidone = .0446 x 73.618 x 4.3 x 1 x 0.6 = 85 lb/yr

Working loss methanol = 0.00178 x V x N x K
0.00178 x 30,000 x 16.67 x 0.7 = 623 lb/yr

Working loss isopropyl = 0.00117 x 30,000 x 16.67 x 0.7 = 410 lb/yr

Working loss N-methylpyrrolidone = .0000133 x 30,000 x 16.67 x 0.7 = 5 lb/yr

Total VOC emissions from tank T-3 =

186 lb/yr + 158 lb/yr + 85 lb/yr + 623 lb/yr + 410 lb/yr + 5 lb/yr = 1467 lb/yr

The total breathing and working loss VOC emissions for the remaining tanks are listed as follows:

Tank T-4 (7,500 gal capacity) = 3 lb/yr EG

Tank T-5 (5,000 gal capacity) = 3 lb/yr EG

Tank T-6 (7,500 gal capacity) = 3 lb/yr EG

Tank T-7 (15,000 gal capacity) = 5 lb/yr EG

Tank T-8 (7,500 gal capacity) = 3 lb/yr EG

Tank T-9 (15,000 gal capacity) = 4 lb/yr EG

Tank T-10 (15,000 gal capacity) = 4 lb/yr EG

Tank T-11 (25,000 gal capacity) = 25 lb/yr EG

Tank T-12 (25,000 gal capacity) = 3,579 lb/yr methanol

Tank T-13 (25,000 gal capacity) = 2,604 lb/yr isopropyl alcohol

Tank T-14 (25,000 gal capacity) equipped with a moisture trap to keep ambient moisture out of the product = 78 lb/yr N-methylpyrrolidone

Tank T-15 (25,000 gal capacity) = 2927 lb/yr methanol

Tank T-16 (20,000 gal capacity) = 1689 lb/yr isopropyl alcohol

Tank T-17 (25,000 gal capacity) = 3402 lb/yr isopropyl alcohol

Tank T-18 (10,000 gal capacity) = 4 lb/yr EG

Tank T-19 (10,000 gal capacity) = 4 lb/yr EG

Tank T-22 (10,000 gal capacity) = 4 lb/yr EG

Tank T-23 (2,000 gal capacity) = 4 lb/yr EG

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Total VOC emissions from all of the above storage tanks =

7 lb/yr + 7 lb/yr + 810 lb/yr + 567 lb/yr + 13 lb/yr + 3 lb/yr + 3 lb/yr + 3 lb/yr + 5 lb/yr + 3 lb/yr + 4 lb/yr + 4 lb/yr + 25 lb/yr + 3580 lb/yr + 2605 lb/yr + 78 lb/yr + 2927 lb/yr + 1688 lb/yr + 3402 lb/yr + 4 lb/yr + 4 lb/yr + 4 lb/yr + 4 lb/yr = 15,750 lb/yr or 8 TPY.

Total plant wide VOC emissions = 8 TPY + 0.8 TPY = 8.8 TPY

None of the VOC's emitted from these tanks are considered to be photochemically reactive nor are they on the toxics list. Therefore, compliance with .0518 is demonstrated and the toxics regulation does not apply.

On November 7, 1991, the writer observed all of the above tanks (except for tank Nos. T-16 and T-17) and processes in operation with no visible emissions or excessive odors. Compliance with .0521 and .0522 is indicated.

The application indicates that Tank Nos. T-16 and T-17 will be storing similar materials to those stored in the storage tanks presently at the plant; therefore, they are expected to operate with no visible emissions or excessive odors and will not emit any photochemically reactive or toxic compounds. Since no toxic compounds will be emitted, the toxics regulation will not apply to these two new tanks. Compliance with .0518, .0521, and .0522 is indicated. In addition, these two new tanks will be subject NSPS Subpart Kb, but since the capacities of the tanks are greater than 75 cu. meters but less than 151 cu. meters and all materials stored in them have vapor pressures less than 15 kPa, the Company only needs to keep records of the tank capacities and dimensions at the site to comply with NSPS Subpart Kb.

NSPS Subpart Kb also applies to all of the other tanks larger than 10,568 gallons (Tank Nos. T-2, T-2, T-3, T-7, T-9, T-10, T-11, T-12, T-13, T-14, and T-15) located at this facility. These tanks have capacities less than 151 cu. meters and greater than 75 cu. meters and all materials stored in them have vapor pressures less than 15 kPa. Therefore, the Company only needs to keep records at the plant relative to the tank dimensions and capacity. On November 7, 1991, the writer determined that these records were at the plant. Compliance with NSPS Subpart Kb is indicated.

3. NSR, PSD, NESHAP do not apply.

4. Issue Permit No. 6640R3 to Summit Resource Management, Inc.

MSL/fk

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Summit Resource Management, Inc.
3501 Gribble Road
Matthews, North Carolina 28105
(704) 821-4766

AIR PERMIT APPLICATION NARRATIVE INFORMATION

1. General Information

The North Carolina Division of Environmental Management issued the air permit covering emission sources at the Matthews plant effective December 3, 1990. At that time, the operation was under the management and direction of Chemstreams, Inc. The air permit identification number assigned was 6640R2.

Action was pending on the reassignment of the air permit to designate that certain operations were being managed by Distech, Inc. Also, documents had been filed to reflect the addition of two new bulk storage tanks.

In November, 1991, the Matthews facility operations were transferred to Summit Resource Management, Inc. Discussions with personnel from the Mooresville Regional Office resulted in the decision to submit a revised air permit application which would:

- Reflect the new company name (Summit Resource Management, Inc.).
- Bring the list of equipment and emission sources up to date with current plans, facilities and operations.

2. Description of Operations

Attachment A is a site location map for the facility at 3501 Gribble Road, Matthews, North Carolina. Attachment B is the Vicinty Map for the plant. A facility Site Plan/Plot Plan has been included as Attachment C. Attachment D contains the results of a 1987 Boundry and Physical Survey of the property.

Current and near term planned emission point sources are identified by Attachment E, and Attachment F contains physical data for the bulk storage tanks.

Principal facility operations focus on the recovery processing of ethylene glycol and water mixtures received from the fibers and textiles industries. Operations include:

- A filter press unit operation for removing solids from the

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liquid mixtures to be processed.

- A hot oil media distillation operation for separating the glycols from water.

The recovered ethylene glycol then becomes an ingredient in the formulation of anti freeze compounds. Other formulation components include a coloring agent and additives and enhancers. The completed anti freeze mixtures are shipped in bulk or packaged for sale to distributors.

The hot oil distillation unit has capabilities for separation processing of more than just anti freeze ingredients. Glycols, lubricating oils and similar petroleum products can be processed for formulating into brake fluid compounds. Methanol and water mixtures can be processed for windshield wash fluid compounds. It is anticipated that other relatively high boiling distillation situations will continue to be available for business evaluation at the Matthews plant.

3. Emission Calculations - Fuel Burning Sources

Attachment G is the US EPA AP-42 reference section for air emission factors associated with natural gas combustion. The hot oil furnace (identification H-1) is fired with natural gas. The glycol concentrator (identification H-2) is being modified for firing with natural gas. The unit previously used propane fuel.

US EPA AP-42 factors used for the hot oil furnace and for the glycol concentrator emission calculations are summarized:

Pollutant	Emission Factor
Particulate	4.7 lb/million CF burned.
Sulfur dioxide	0.6 lb/million CF burned.
Nitrogen oxides	100 lb/million CF burned.
Carbon monoxide	20 lb/million CF burned.
Volatile organics	2.7 lb/million CF burned.

Annual emission totals for the hot oil furnace based on maximum operating conditions (8,736 hours per year) would be:

Particulate - 0.17 tons per year.

Sulfur dioxide - 0.02 tons per year.

Nitrogen oxides - 3.36 tons per year.

Carbon monoxide - 0.66 tons per year.

VOC - 0.09 tons per year.

Annual emission totals for the glycol concentrator based on maximum operating conditions (8,736 hours per year) would be:

Particulate - 0.09 tons per year.

Sulfur dioxide - 0.01 tons per year.

Nitrogen oxides - 2.1 tons per year.

Carbon monoxide - 0.4 tons per year.

VOC - 0.06 tons per year.

4. Emission Calculations - Distillation Operations

Three emission points are associated with distillation system operations:

- (C-1) -- The bleed line for the reactor vessel, for the exhausting of at rest vessel air volume during charging operations, where the reactor receives a liquid transfer from a feed stock tank.
- (V-1) -- The exhaust discharge from the vacuum pump.
- (CT-1) -- Representing emissions associated with reuse of collected storm water as cooling tower make up water supply.

5. Emission Calculations - Bulk Storage Tanks

Attachment H contains the US EPA AP-42 section with emission estimating calculations for bulk tanks in organic liquid storage service. Properties of typical materials are summarized:

Material	Molecular Weight	Vapor Pressure
Ethylene Glycol	62 lb/lb mol.	0.0023 psi.
Methanol	32 "	2.32 "
Isopropyl Alcohol	60 "	0.81 "

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Material	Molecular Weight	Vapor Pressure
N-Methylpyrrolidone	99 lb/lb mol.	0.0056 psi

Many of the storage tanks can be in service for different materials. In addition, many of the storage applications will involve mixtures of the above listed compounds with water.

The emission calculations are based on properties of the pure component ignoring any water fraction present in order to represent maximum conditions for emission potential. In addition, a volume or thruput factor of one load, receipt or transfer per tank each day has been assigned for emission calculations for most tanks. This will represent an activity volume well in excess of current operations.

5. Summary

North Carolina air permit application forms are included as follows:

Form Identification	Description
A	General Information.
B	Fuel Burning Sources.
B	Distillation System.
B	Bulk Storage Tanks.
D	Area Diagram.

There are no defined air pollution control systems or devices attached to the emission points identified in the above information.

Prepared By:

W D Gabbard

William D. Gabbard
December 30, 1991

Attachment E

Summit Resource Management, Inc.
3501 Gribble Road
Matthews, North Carolina 28105
(704) 821-4766

LIST OF EMISSION SOURCES

Description	Identification
Natural gas-fired hot oil furnace.	H-1
Natural gas fired ethylene glycol concentrator/water evaporator.	H-2
Distillation system, including the distillation column, stainless steel, 2 ft diameter by 30 ft., packed type, with reactor, heat exchangers, accumulator and cooling tower and air fan type product cooler.	C-1 V-1 CT-1
Bulk storage tank, 30,000 gallons capacity, for feed materials.	T-1
Bulk storage tank, 30,000 gallons capacity, for feed materials.	T-2
Bulk storage tank, 30,000 gallons capacity, for feed materials.	T-3
Bulk storage tank, 7,500 gallons capacity, for blend use.	T-4
Bulk storage tank, 5,000 gallons capacity, for blend use.	T-5
Bulk storage tank, 7,500 gallons capacity, for blend ingredient service.	T-6
Bulk storage tank, 15,000 gallons capacity, for blend use.	T-7
Bulk storage tank, 7,500 gallons capacity, for blend use.	T-8
Bulk storage tank, 15,000 gallons capacity, for blend use.	T-9
Bulk storage tank, 15,000 gallons capacity, for blend use.	T-10

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Description	Identification
Bulk storage tank, 25,000 gallons capacity, for raw material or product service.	T-11
Bulk storage tank, 25,000 gallons capacity, for raw material or product service.	T-12
Bulk storage tank, 25,000 gallons capacity, for raw material or product service.	T-13
Bulk storage tank, 25,000 gallons capacity, for raw material or product service.	T-14
Bulk storage tank, 25,000 gallons capacity, for raw material or product service.	T-15
Bulk storage tank, 20,000 gallons capacity, for raw material or product service.	T-16
Bulk storage tank, 25,000 gallons capacity, for raw material or product service.	T-17
Bulk storage tank, 10,000 gallons capacity, for distillation process residues.	T-18
Bulk storage tank, 10,000 gallons capacity, for distillation process residues.	T-19
Bulk storage tank, 10,000 gallons capacity, for filter press unit operation service.	T-22
Bulk storage tank, 2,000 gallons capacity, for filter press unit operation service.	T-23

Summit Resource Management, Inc.
3501 Gribble Road
Matthews, North Carolina 28105
(704) 821-4766

BULK STORAGE TANK LIST

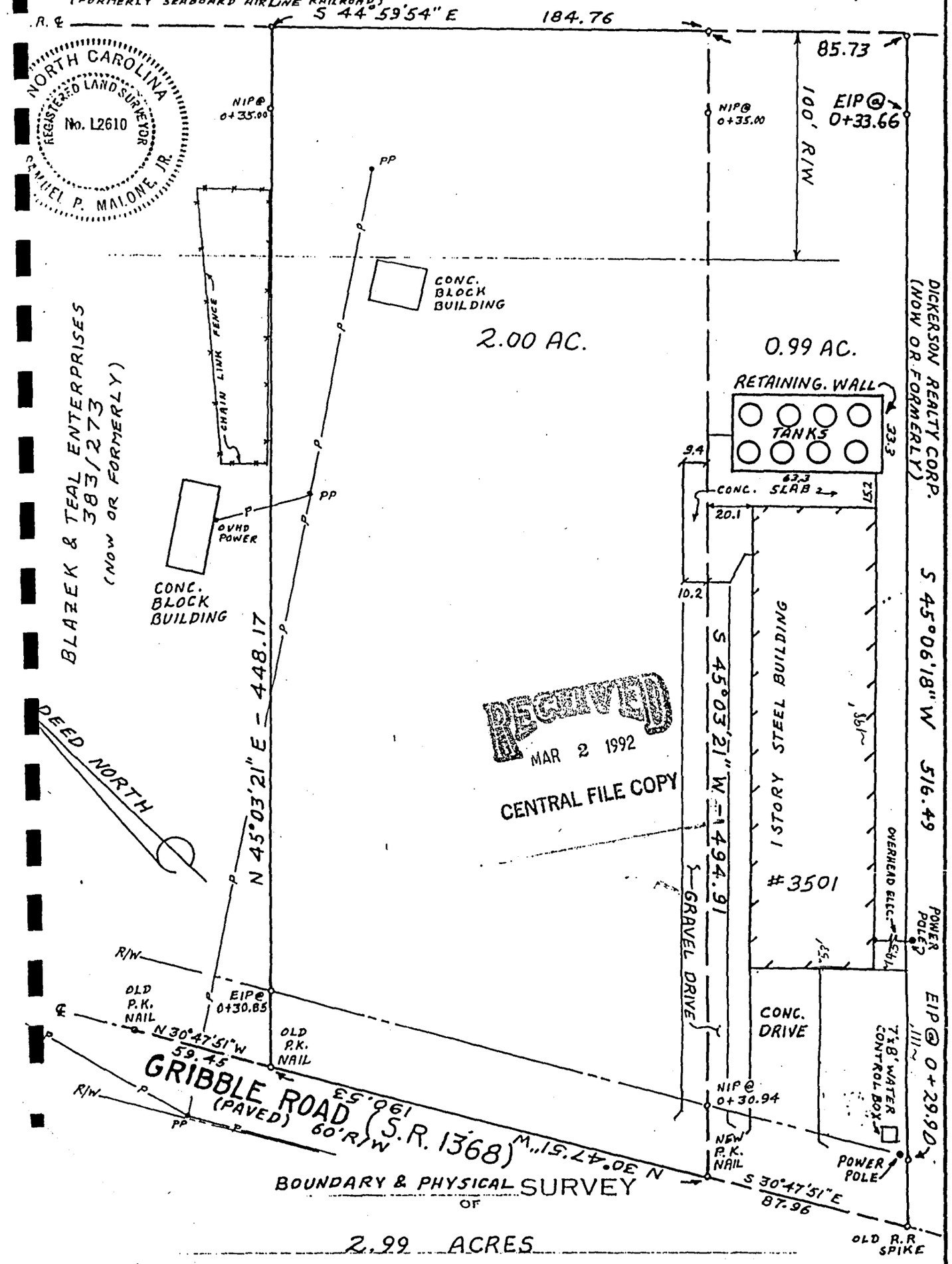
Tank Id. No.	Capacity (Gallons)	Diameter (Feet)	Height (Feet)	Design Type
T - 1	30,000	12	35	Vertical, flat bottom
T - 2	30,000	12	35	Vertical, flat bottom
T - 3	30,000	12	35	Vertical, flat bottom
T - 4	7,500	10	13	Vertical, flat bottom
T - 5	5,000	8	16	Vertical, flat bottom
T - 6	7,500	8	21	Vertical, cone bottom
T - 7	15,000	10	26	Vertical, flat bottom
T - 8	7,500	8	21	Vertical, dish bottom
T - 9	15,000	10	26	Vertical, flat bottom
T - 10	15,000	10	26	Vertical, flat bottom
T - 11	25,000	10.5	40	Horizontal, dish ends
T - 12	25,000	10.5	40	Horizontal, dish ends
T - 13	25,000	10.5	40	Horizontal, dish ends
T - 14	25,000	10.5	40	Horizontal, dish ends
T - 15	25,000	10.5	40	Horizontal, dish ends
T - 16	20,000	10.5	30	Vertical, flat bottom
T - 17	25,000	12	30	Vertical, flat bottom
T - 18	10,000	10.5	15	Vertical, cone bottom
T - 19	10,000	10.5	15	Vertical, cone bottom
T - 22	10,000	10	16	Horizontal, flat ends
T - 23	2,000	5.25	12	Vertical, flat bottom

Attachment D

THIS IS TO CERTIFY THAT ON THE 14 TH DAY OF MARCH 1987 I SURVEYED THE PROPERTY SHOWN ON THIS PLAT, AND THAT THE TITLE LINES AND THE WALLS OF THE BUILDINGS IF ANY ARE AS SHOWN HEREON

Sam Malone & Associates

SIGNED [signature] REGISTERED SURVEYOR



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BOUNDARY & PHYSICAL SURVEY OF

2.99 ACRES

SCALE 1" = 50' VANCE TOWNSHIP, UNION COUNTY, N.C.

THE PROPERTY OF CSD, INC.

MAP RECORDED IN BOOK N/A AT PAGE ..... DEED RECORDED IN BOOK 378 PAGE 688

TAX # 7-129-333 P

E

LDER 11-24-86

EIP = EXISTING IRON PIN
NIP = NEW IRON PIN
PP = POWER POLE

State of North Carolina
Department of Environment,
Health and Natural Resources
Mooresville Regional Office

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
Vivian Burke, Regional Manager

Central File

DEHNR

DIVISION OF ENVIRONMENTAL MANAGEMENT

July 19, 1993

Mr. Robert Schory
National Petroleum, Inc.
3501 Gribble Road
Matthews, North Carolina 28105

Dear Mr. Schory:

Subject: Air Permit No. 6640R4
National Petroleum, Inc.
Stallings, North Carolina
Union County

In accordance with your completed application received May 20, 1993, we are forwarding herewith Permit No. 6640R4 to National Petroleum, Inc., Stallings, Union County, North Carolina for the construction and operation of air emission sources or air cleaning devices and appurtenances.

If any parts, requirements, or limitations contained in this permit are unacceptable to you, you may request modification of your air permit pursuant to General Statute 150B-22 and Regulation 15A NCAC 2B .0508(b), through which the permit may be modified by the Director. This request must be submitted in writing to the Director and must identify the specific provisions or issues for which modification is being sought. Unless such a request is made within thirty (30) days following the receipt of this permit, this permit shall become final and binding.

In the alternative, you have the right to request a formal adjudicatory hearing within thirty (30) days following receipt of this permit, identifying the specific issues to be contested. This hearing request must be in the form of a written petition, conforming to General Statute 150B-23 of the North Carolina General Statutes, and filed with the Office of Administrative Hearings, Post Office Drawer 27447, Raleigh, North Carolina 27611-7447. Unless a request is made for either an informal modification procedure pursuant to G.S. 150B-22 or a formal adjudicatory hearing pursuant to G.S. 150B-23, this air permit shall be final and binding.

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919 North Main Street, Mooresville, North Carolina 28115 Telephone 704-663-1699 FAX 704-663-6040
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As a reminder, all new construction of air pollution sources, air cleaning devices, or modifications to the sources contained in this permit must obtain as required a permit from this Division prior to construction. Failure to do so is a violation of General Statute 143-215.108 and may subject the permittee to civil or criminal penalties contained in General Statute 143-215.114.

This permit shall be effective from July 19, 1993, until October 31, 1994, is nontransferable to future owners and operators, and shall be subject to the conditions and limitations as specified therein.

Sincerely,

Brenda J. Smith

Brenda J. Smith, P. G.
Regional Supervisor

Enclosures

cc: Alan Klimek

MSL:fk

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NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES

DIVISION OF ENVIRONMENTAL MANAGEMENT

A I R P E R M I T N O. 6640R4

Issue Date: July 19, 1993 Effective Date: July 19, 1993

Expiration Date: October 31, 1994 Replaces Permit: 6640R3

To construct and operate air emission source(s) or air cleaning device(s), and for the discharge of the associated air contaminants into the atmosphere. In accordance with the provisions of Article 21B of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules and Regulations,

National Petroleum, Inc.
3501 Gribble Road, Stallings
Union County, North Carolina

is hereby authorized to construct and operate air emission sources or air cleaning devices and appurtenances consisting of:

a. two natural gas-fired hot oil boilers (one 2.5 million Btu per hour and one 7 million Btu per hour maximum heat input, respectively, ID Nos. H-1 and H-3),

b. one natural gas-fired ethylene glycol concentrator/water evaporator (5 million Btu per hour maximum heat input, ID No. H-2),

c. one packed type ethylene glycol/water vacuum distillation system (column dimensions of two feet in diameter and 30 feet in length, ID No. C-1),

d. one packed type ethylene glycol/water vacuum distillation system (two columns each with dimensions of 2 feet in diameter and 20 feet in length, ID No. C-2),

e. two ethylene glycol storage tanks with relief vents (ID Nos. T-1 and T-2; 30,000 gallons capacity, each; NSPS Subpart Kb sources),

f. one methanol, isopropyl alcohol, N-methylpyrrolidone product storage tank with relief vent (ID No. T-3; 30,000 gallons capacity; NSPS Subpart Kb source),

g. three ethylene glycol storage tanks with relief vents (ID Nos. T-4, T-6, and T-8; 7,500 gallons capacity each),

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h. one ethylene glycol storage tank with relief vent (ID No. T-5, 5,000 gallons capacity),

i. three ethylene glycol storage tanks with relief vents (ID Nos. T-7, T-9, and T-10; 15,000 gallons capacity each; NSPS Subpart Kb sources),

j. one ethylene glycol storage tank with relief vent (ID No. T-11; 25,000 gallons capacity; NSPS Subpart Kb source),

k. two alcohol based product storage tanks with relief vents (ID Nos. T-12 and T-13; 25,000 gallons capacity each; NSPS Subpart Kb sources),

l. one vent moisture trap installed on one mixed-use product storage tank relief vent (ID No. T-14; 25,000 gallons capacity; NSPS Subpart Kb source),

m. three mixed-use storage tanks with relief vents (ID Nos. T-15, T-16, and T-17; with 25,000 gallons, 20,000 gallons, and 25,000 gallons capacity, respectively; NSPS Subpart Kb sources),

n. three ethylene glycol storage tanks with relief vents (ID Nos. T-18, T-19, and T-22; 10,000 gallons capacity each),

o. one mixed-use storage tank with relief vent (ID No. T-20; 4,000 gallons capacity),

p. one mixed-use storage tank with relief vent (ID No. T-21; 4,800 gallons capacity),

q. one ethylene glycol storage tank with relief vent (ID No. T-23; 2,000 gallons capacity), and

r. one automobile antifreeze storage tank with relief vent (ID No. L-1; 100 gallons capacity) with an associated antifreeze filling station,

in accordance with the completed application (APP016537) received May 20, 1993, including any plans, specifications, previous applications, and other supporting data, all of which are filed with the Department of Environment, Health and Natural Resources and are incorporated as part of this Permit.

This Permit is subject to the following specified conditions and limitations including any <u>TESTING, REPORTING, OR MONITORING REQUIREMENTS:</u>

JUL 22 1993
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Central File

State of North Carolina
Department of Environment, Health, and Natural Resources
Mooresville Regional Office

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Albert F. Hilton, Regional Manager

DIVISION OF ENVIRONMENTAL MANAGEMENT

May 5, 1992

Mr. Tom Ward
Union County Health Department
500 North Main Street
Monroe, North Carolina 28112-4799

Subject: Complaint Investigation
Summit Resources Management, Inc.
Union County, N. C.

Dear Mr. Ward:

Reference is made to your complaint which was received in this Office on April 24, 1992, with regard to odorous emissions from Summit Resources Management, Inc. Mr. Michael Landis of the Air Quality Staff of this Office investigated your complaint on April 28, 1992.

Enclosed is a copy of the complaint investigation report. Hopefully the actions taken by this Office and the Company will alleviate the problem.

Your concern for the air quality in your area is appreciated and shared by the staff of this Office. If you have any questions with reference to this matter or if the problem reoccurs, please do not hesitate to contact Mr. Landis or me at (704) 663-1699.

Sincerely,

B. Keith Overcash, P. E.
Environmental Regional Supervisor
Air Quality Section

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Enclosure

MSL/kr

P.O. Box 950, 919 North Main Street, Mooresville, N.C. 28115-0950 • Telephone 704-663-1699 • FAX 704-663-6040

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AQ-16 Revised 3/1/84

NORTH CAROLINA DIVISION OF ENVIRONMENTAL MANAGEMENT

Air Quality Action Request

Computer ____

Name	Location	Reg/Co./Prem. No.
Summit Resource Management, Inc.	Matthews/Union County	3-90-00134

Contact: Ed Kuhn Telephone:

Type Action: CI_x EE SR PC VE PI Other

Air Program Status 03, 93 Class A1a Chg

Action Requested By: Address/Phone Rec'd Date

Last Insp. Date Action Date 04/28/92 Next Insp. Date

Permit # Issued Expires Stip. # Met Y/N

Recommendations: Signature: Michael Landis Date: 5-5-92

Dist: Yellow (Central File) - Blue (Region) - White (Opt.) Specify_____

This investigation was in response to a complaint received from Mr. Tom Ward, Union County Health Department, on April 24, 1992. The complaint was in reference to strong antifreeze odors being emitted from the Company on April 20 through April 23, 1992. Mr. Ward stated that these odors were noted by persons who worked near Summit Resources.

The writer drove around the plant prior to contacting Mr. Kuhn and did not note any odors off plant property. The writer then contacted Mr. Kuhn on April 28, 1992 with reference to this complaint. Mr. Kuhn indicated that on April 20, 1992 the support legs for a parked tanker, which contained antifreeze collapsed. One of the support legs ripped a hole in the bottom of the tanker and approximately 1000 gallons of antifreeze were spilled. Mr. Kuhn also stated that it was raining very hard at the time so the company collected all of the rain water on their property and all of the water from a small pond just off their property. This water was pumped into some of their containment basins. He stated, that well over 20,000 gallons of liquid was eventually collected. Mr. Kuhn stated, that the water from the pond was tested for antifreeze and none was found.

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The containment basins are open to the atmosphere which would allow the antifreeze to evaporate from the liquid collected in the containment basins. This is probably the best explanation for the strong antifreeze odors noted by the persons who contacted Mr. Ward. In addition, antifreeze is biodegradable and the bacteria in the collected stormwater probably decomposed some of the antifreeze after several days. This would probably result in a reduction of the odors emitted from the containment basins.

Mr. Kuhn stated that the water evaporator which would normally be used to evaporate the stormwater runoff had broken down. This unit was under repair at the time of this investigation. He also stated that the distillation unit could only be used on weekends to evaporate stormwater thus limiting the amount of rain water that could be evaporated. According to Mr. Kuhn, even using the distillation unit and the water evaporator it would take several weeks to evaporate the amount of storm water collected in this instance. So it may be that some antifreeze odor will be noted at nearby factories for the next few weeks until all of the stormwater is evaporated. In addition, Mr. Kuhn stated that the distillation unit operated only under vacuum during the time period in question so there should not have been any odors from this unit.

During this investigation, this facility appeared to be in compliance with applicable air quality regulations.

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Central File

State of North Carolina
Department of Environment, Health, and Natural Resources
Mooresville Regional Office

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Albert F. Hilton, Regional Manager

DIVISION OF ENVIRONMENTAL MANAGEMENT

June 25, 1992

Mr. Joe Gentry
3500 Gribble Road
Matthews, North Carolina 28105

Subject: Complaint Investigation
Summit Resource Management, Inc.
Union County, North Carolina

Dear Mr. Gentry:

Reference is made to your complaint which was received in this Office on June 12, 1992, with regard to odorous emissions from Summit Resource Management, Inc., Matthews, Union County, North Carolina. Mr. Michael Landis of the Air Quality Staff of this Office investigated your complaint on June 15, 1992.

Enclosed is a copy of the complaint investigation report. Your concern for the air quality in your area is appreciated and shared by the staff of this Office. If you have any questions with reference to this matter or if the problem reoccurs, please do not hesitate to contact Mr. Landis or me at (704) 663-1699.

Sincerely,

for BKO

B. Keith Overcash, P. E.
Environmental Regional Supervisor
Air Quality Section

Enclosure

MSL:fk

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NORTH CAROLINA DIVISION OF ENVIRONMENTAL MANAGEMENT

Air Quality Action Request

Computer ____

Name	Location	Reg/Co./Prem. No.
Summit Resource Management, Inc.	Matthews, Union County	3-90-00134

Contact: Ed Kuhn Telephone:

Type Action: CI x EE__ SR__ PC__ VE__ PI__ Other __

Air Program Status 03 93 _ Class A1a Chg __

Action Requested By: Joe Gentry, 3500 Gribble Road, Matthews 28105 Address/Phone: 821-2105 Rec'd Date:

Last Insp. Date: Action Date: 6-16-92 Next Insp. Date:

Permit # 6640R3 Issued 2-24-92 Expires 10-31-94 Stip. # Met Y/N

Recommendations: Signature: Michael Landis Date: 6-24-92

Dist: Yellow (Central File) - Blue (Region) - White (Opt.) Specify_____

This investigation was in response to a complaint received from Mr. Gentry on 6-12-92. Mr. Gentry complained that strong odors were being emitted from the Company. He stated that the odors smelled like antifreeze.

The writer contacted Mr. Kuhn at the Company with reference to this complaint on 6-15-92. He stated that the Company had collected a great deal of rain water during the last few weeks. He stated that the water evaporator was in use at the time of the complaint. He indicated that he had observed that the plume from the evaporator was blowing directly across the street and into the Duke Power warehouse. He also indicated that he had received a call from personnel at the warehouse on 6-12-92. He felt that the odors noted by Mr. Gentry were coming from the water evaporator.

The writer is in agreement with Mr. Kuhn that the odors noted by Mr. Gentry probably came from the water evaporator. The writer looked in available literature and determined that the odor threshold for ethylene glycol (antifreeze) is 0.08 ppm and that ethylene glycol is classified as an irritant. As far as the writer can determine ethylene glycol is not toxic to humans.

The water evaporator is heated to approximately 240 degrees F to evaporate the water. Ethylene glycol boils at approximately 340 degrees F. From this, one could assume that probably a trace of ethylene glycol is emitted during the evaporation process. The emission rate of ethylene glycol from this process is unknown but with an odor threshold of 0.08 ppm, a concentration of 1 ppm in the air exhausted from the water evaporator could possibly cause strong odors. Mr. Gentry indicated that the air flow rate from the water evaporator exhaust is 1245 CFM. The writer has calculated that if the concentration of ethylene glycol is 1 ppm in the exhausted air this would result in an emission rate of approximately 9 lb/hr.

Mr. Kuhn estimated that there were 70,000 gallons of water in the holding areas at the plant. He indicated that they were hauling off the bulk of this liquid because the water evaporator could only evaporate 2,000 gallons of water per 24-hour day. He hoped that, between hauling off the collected liquid and using the water evaporator, most of the liquid would be gone within the next two weeks.

During this investigation, the writer noted only light odors being emitted from the water evaporator. In order to assure that the odors from the water evaporator are not excessive, the writer will drive by this plant when he is in Union County.

MSL:fk

The writer advised Mr. Kuhn that it would be necessary to incorporate the water evaporator in the Company's Air Permit due to the evaporator's potential to emit a volatile organic compound. Permit Applications will be forwarded to the Company along with a letter which requests that the applications be completed and forwarded to this Office as soon as possible.

During this investigation, the plant appeared to be in compliance with applicable air quality regulations.

MSL:fk

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Central File

NORTH CAROLINA DIVISION OF ENVIRONMENTAL MANAGEMENT

Air Quality Action Request

Computer ____

Name	**Location**	**Reg/Co./Prem. No.**
Summit Resource Management, Inc.	Matthews, Union County	3-90-00134

Contact Ed Kuhn **Telephone**

Type Action: CI_x_ EE__ SR__ PC__ VE__ PI__ Other __

Air Program Status _03_ _93_ __ **Class** _A1a_ **Chg** __

Action Requested By: Gerald Maxwell, 3500 Gribble Rd., **Address/Phone** Matthews 28105 821-2133 **Rec'd Date**

Last Insp. Date **Action Date** 8-7-92 **Next Insp. Date**

Permit # 6640R3 **Issued** 2-24-92 **Expires** 10-31-94 **Stip. #** **Met Y/N**

Recommendations: **Signature:** Michael Landis Michael Landis **Date:** 8-28-92

Dist: Yellow (Central File) - Blue (Region) - White (Opt.) **Specify**_____

This investigation was in response to three complaints received in this Office on 8-7-92. The complainants stated that strong odors were being emitted from the Company and one complainant stated that several persons who worked at the Duke Power Operations Center, across the street from the Company, had apparently become ill from the emissions from the Company.

Mr. Mike Koerschner and the writer investigated these complaints. We arrived at the plant about 4:30 PM on 8-7-92. A very sweet smell was noted at the Duke Power Office. This smell appeared to be emanating from Summit Resource Management, Inc. Mr. Koerschner and the writer then contacted Mr. Kuhn at the Company. He explained that the Company was using a compound which had a sweet citrus odor to mask the odors caused by the decomposing ethylene glycol in their catch basins. Since the complainants indicated that the odors noted were that of antifreeze, the odors generated by the masking agent were not considered to be the cause of the complaints.

Since the distillation column at the plant does not exhaust to the outdoor atmosphere, the water evaporator appears to be the only source of emissions at the Company. It was determined that the water evaporator had been turned off around one PM because the processing of the current batch of water/ethylene glycol had been completed around noon. According to Mr. Kuhn, water which contains approximately 5% ethylene glycol is taken from the distillation column and placed in the water evaporator. The water is evaporated until the water/ethylene glycol mix is approximately 50/50. This process takes about five days. The 50/50 mix is then placed back in the distillation column to reclaim the remaining ethylene glycol.

The writer advised Mr. Kuhn that several persons had reportedly gotten sick from emissions from this facility. Therefore, the writer requested that the Company perform emissions testing of the water evaporator exhaust to determine ethylene glycol emission rates. Due to the fact that persons had become ill due to emissions from the Company, the writer requested and Mr. Kuhn agreed that the water evaporator would not be used until testing was performed. This will keep emissions to a minimum until it can be determined if there are significant emissions from the water evaporator. Emissions data from the stack tests will document actual emission rates and the compliance status of the Company can then be determined. However, even if the Company is in compliance with any applicable emission standards, an air pollution control device may need to be installed if the odor problems persist.

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NORTH CAROLINA DIVISION OF ENVIRONMENTAL MANAGEMENT

Air Quality Action Request

Computer ____

Name	**Location**	**Reg/Co./Prem. No.**
Summit Resource Management, Inc.	Matthews, Union County	3/90/00134

Contact James Yarborough **Telephone**

Type Action: CI_x_ EE__ SR__ PC__ VE__ PI__ Other __

Air Program Status _03_ _93_ __ **Class** _A1a_ **Chg** __

Action Requested By: **Address/Phone** **Rec'd Date**

Last Insp. Date 8/21/92 **Action Date** 9/23/92 **Next Insp. Date**

Permit # 6640R3 **Issued** 2/24/92 **Expires** 10/31/94 **Stip. #** **Met Y/N**

Recommendations: **Signature:** Michael Koerschner M Koerschner **Date:** 10/13/92

Dist: Yellow (Central File) - Blue (Region) - White (Opt.) **Specify**_____

This investigation was in response to two complaints received at this Office on 9/23/92. The complainants complained of strong odors emanating from Summit Resource Management, Inc., in Matthews, Union County. One of the complainants specifically complained of a sewer smell. The other complainant referred to generally offensive odors. Both of the complaints were received at approximately 4:30 P.M. Both of the complainants work directly across the street from Summit Resource Management, Inc., at a Duke Power facility.

The writer arrived at Summit Resource Management at approximately 5:50 P.M. on the same date. Before entering the plant, the writer walked the fence line down wind from the plant. Chemical odors were noted but did not seem overbearing or offensive. The skies were overcast and the wind was blowing approximately 10 m.p.h. in the direction from Summit Resource Management, Inc. directly towards Duke Power Company's facility.

The writer contacted Mr. James Yarborough, Superintendent, in order to inspect the water evaporator, the only source of emissions at this facility. Mr. Yarborough informed the writer that the evaporator had been emptied that afternoon, at approximately 1:00 P.M. The writer confirmed that the water evaporator was empty and was not operating. It was noted that the fan, which draws the emissions from the evaporator through the stack, was still operating. The writer requested that the fan be turned off.

The writer informed Mr. Yarborough of the odor complaints. Mr. Yarborough speculated that the complaints were probably the result of a malfunction of the company's sewage system which had occurred that afternoon between 1:00 and 3:00 P.M. The electric breaker on the pump which pumps the sewage from the plant into the local sewage system had been tripped, allowing raw sewage to accumulate in front of Summit Resource Management, Inc. Mr. Yarborough showed the writer the site of the accumulation, which was approximately 20 feet from Gribble Road, and 40 feet from the fence line at the Duke Power Facility. At that area, there was a sewage-like smell. Mr. Yarborough indicated that it had been much worse.

It is the opinion of the writer that the complaints received on 9/23/92 were a result of the sewage system malfunction.

MFK:fk

OCT 14 1992
CENTRAL FILES

AQ-16 Revised 3/1/84

NORTH CAROLINA DIVISION OF ENVIRONMENTAL MANAGEMENT

Air Quality Action Request

Computer ____

Name	**Location**	**Reg/Co./Prem. No.**
Summit Resource Management	Matthews, Union County	03/90/00134

Contact Ed Kuhn, Plant Manager **Telephone**

Type Action: CI__ EE__ SR__ PC__ VE__ PI__ Other Excess Emissions Report

Air Program Status 03 93 __ **Class** A1a **Chg** __

Action Requested By: **Address/Phone** **Rec'd Date**

Last Insp. Date **Action Date** 10/22/92 **Next Insp. Date**

Permit # 6640R3 **Issued** 2/24/92 **Expires** 10/31/94 **Stip. #** **Met Y/N**

Recommendations: **Signature:** Michael Koerschner **Date:** 10/22/92

Dist: Yellow (Central File) - Blue (Region) - White (Opt.) **Specify**_____

On October 6, 1992 this office was informed of an accidental release of diethylene glycol from Summit Resource Management, Matthews, Union County, North Carolina. Ed Kuhn, Plant Manager, reported to Mr. Michael Landis of this Office that the release occurred on Sunday, October 5, 1992 in the late afternoon. The release was caused by a ruptured gasket in the distillation column.

A newspaper reported that there was a fire at the plant. Mr. Kuhn stated that there was not a fire but that the fire department had been notified as per standard emergency procedures. Mr. Kuhn estimated diethylene glycol emissions at approximately 485 gallons, most of which condensed immediately and was captured in the rain dikes at the facility.

Diethylene glycol is non-photochemically reactive as per 15A NCAC 2D .0518. Diethylene glycol is not Toxic.

By informing this Office of the release, Summit Resource Management, Inc. has complied with Air Permit No. 6640R3.

MFK:fk

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Memo

Date: March 25, 1995

To: File

From: Douglas Moore Douglas B Moore.
Environmental Chemist
NC Superfund Section

Topic: Water Quality and Groundwater Section File Information

Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union County, North Carolina
US EPA ID: NCD 986 232 213

On January 11, 1991, D. Rex Gleason, P.E. Water Quality Regional Supervisor sent a letter to Mr. Jerome DuBow of Chemstreams, Inc., requesting that Chemstreams submit a plan to address the containment, treatment and disposal of wastewater from the facility. A complaint investigation, conducted on January 4, 1991, revealed contaminated runoff water leaving the property (attachment A). Samples taken of rainwater from the sump area (aka diked area) indicated a concentration of 39,000 mg/l of ethylene glycol. Analysis of a runoff sample collected from the adjacent property indicated a concentration of 91,000 mg/l of ethylene glycol (attachments B & C). A Notice of Violation letter was sent to Chemstreams on February 6, 1991. (attachment B).

On February 15, 1991, a neighbors complaint led investigators to a spill of an "oil or chemical" substance from a tanker truck on the NPP parcel (then, Chemstreams, Inc.). Numerous unlabelled barrels were also observed on the NPP parcel at this time which were open and some were observed to have overflowed onto the ground (attachment D) A follow-up investigation on July 11, 1991 found the spills on the NPP parcel cleaned up. However, an area of discolored soil was discovered downgradient of the NPP parcel on a vacant lot owned by Mr. Richard Wagoner. Chemstreams contention, at this time, was that the chemical substance at this location was from the former asphalt plant (attachments E & F). Subsequent investigation identified ethylene glycol as well as petroleum hydrocarbons in the discolored soil (attachment F & G).

On October 24, 1991, another spill was reported at the NPP parcel (then, Distech, Inc.) by the company. A bottom outlet valve on a tank had been inadvertently left open. Approximately 1500 gallons of 90-95% ethylene glycol mixture escaped from the tanks onto the ground. This material was reportedly washed to a sump area surrounded by a

earthen containment wall at the southeast corner of the NPP parcel. The disposal method of the spilled material was not disclosed (attachment H).

In response to a monitoring well samples collected on August 27, 1991, a Notice of Violation letter was sent to Chemstreams, Inc. on November 4, 1991 for violations of State Groundwater standards (attachment I).

On February 14, 1992, Local Fire Department personnel responded to a fire involving ethylene glycol at the NPP parcel (then, Summit Resource Management, Inc.). No runoff was reported from the fire (attachment J). On March 11, 1992, staff of the Mooresville Regional Office-Water Quality Section responded to a neighbor complaint of ethylene glycol runoff into the South Fork Crooked Creek. It was observed at this time that employees were pumping what appeared to be ethylene glycol from an abandoned septic tank located on the site (attachment K). Surface water samples collected at this time, 0.3 miles downgradient of the site in the Creek, detected 3,400 ppm of ethylene glycol (attachment L & M). The Division of Environmental Management Aquatic Toxicology Unit determined that a less than 5 % of the runoff sample in solution resulted in a greater than 50 % mortality in test fish (*Ceriodaphnia dubia*) (attachment N).

On April 20, 1992, Local Fire Department personnel responded to a spill at the NPP parcel (then, Summit Resource Management, Inc.). A support on a tanker truck collapsed causing the tanker to fall, hitting a second tanker, which fell and hit a third tanker. A hole was punctured in one of the tankers. Approximately 1500 gallons of glycol material escaped from the tanker, ran across the site through the parking lot, around the back of Summit Resources, along a railroad ditch and into a holding basin below the facility. Heavy rains at this time prevented the material from being contained in earthen dikes (attachment O).

On October 5, 1992, Emergency Management, Highway Patrol and Local Fire Department personnel responded to a reactor fire at the NPP parcel (then, Summit Resource Management, Inc.). A pressure buildup in a system tank caused a relief valve to activate, releasing approximately 600 gallons of di-ethylene glycol into the air and on the ground. The material reportedly caught fire and was later extinguished. Rainy weather at the time of the spill may have contributed to site runoff (attachment P).

On February 26, 1993, Mooresville Regional Office - Hazardous Waste Section personnel investigated a report from Don Hankins of ERM Southeast, consultants for Blazek and Teal, that Summit Resources had abandoned an estimated 3000 fifty-five gallon drums of material in a warehouse on the B&T parcel (attachment Q). A Notice of Violation letter (Docket # 93-201A) was subsequently issued to Summit Resource Management, Inc. for unpermitted storage of waste (attachment R).

Ref. 15A

State of North Carolina
Department of Environment, Health, and Natural Resources
Mooresville Regional Office

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Albert F. Hilton, Regional Manager

DIVISION OF ENVIRONMENTAL MANAGEMENT

January 11, 1991

Mr. Jerome Dubow
Chemstreams, Inc.
Post Office Box 1565
Matthews, North Carolina 28106

Subject: Wastewater Discharge
Chemstreams, Inc.
Union County, NC

Dear Mr. Dubow:

Mr. Ron Phelps of this Office visited the subject facility on January 4, 1991 in response to a complaint. A survey of the premises was conducted which revealed contaminated runoff water leaving the property. This contaminated runoff must be contained, treated and properly disposed of. As previously discussed, it is recommended that you contact Mr. Mike Shalati, Union County Public Works regarding the pretreatment of this wastewater for disposal into the sanitary sewer system. Mr. Shalati can be reached at 704/283-3819. Continuing to discharge this contaminated wastewater is a violation of North Carolina General Statute 143-215.1 and would subject you to a civil penalty of up to $10,000 per day.

It is requested that a plan addressing the containment, treatment and disposal of your wastewater be submitted to this Office by February 4, 1991. If you need assistance with this matter, please do not hesitate to contact Mr. Phelps or me.

Sincerely,

D. Rex Gleason

D. Rex Gleason, P. E.
Water Quality Regional Supervisor

cc: Mr. Mike Shalati
Mr. Will Oliver

RGP:se

919 North Main Street, Mooresville, N.C. 28115 • Telephone 704-663-1699 • FAX 704-663-6040

Ref. 15B

State of North Carolina
Department of Environment, Health, and Natural Resources
Mooresville Regional Office

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Albert F. Hilton, Regional Manager
DIVISION OF ENVIRONMENTAL MANAGEMENT

February 6, 1991

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Jerome Dubow
Chemstreams, Inc.
Post Office Box 1565
Matthews, North Carolina 28106

Subject: Notice of Violation
Wastewater Discharge
Chemstreams, Inc.
Union County, N.C.

Dear Mr. Dubow:

This Office concurs with the modifications proposed for the subject facility outlined in your recent correspondence dated January 16, 1991. It is recommended that the work on these improvements begin as soon as possible.

The results from the sampling at Chemstreams conducted by Mr. Phelps on January 4, 1991 have been received by this Office. The results from the diked area indicated a concentration of 39,000 mg/l ethylene glycol. Analysis of the runoff onto the adjacent property indicated a concentration of 91,000 mg/l ethylene glycol.

To comply with North Carolina General Statute 143-215.84, it will be necessary to immediately cease all unpermitted discharges and undertake to restore all areas adversely affected by previous discharges. Failure to comply with these requirements may result in this Office recommending enforcement action in this matter.

It is requested that a written response be submitted to this Office by February 28, 1991 outlining what measures are proposed for restoring the affected areas and preventing further discharges.

919 North Main Street, Mooresville, NC 28115 • Telephone 704-663-1699 • FAX 704-663-6040

An Equal Opportunity/Affirmative Action Employer

If you have any questions regarding this matter, please do not hesitate to contact Mr. D. Rex Gleason, Water Quality Regional Supervisor, Mr. Ron Phelps or me at this Office.

Sincerely,

Brenda J. Smith

Brenda J. Smith
Regional Supervisor

cc: Mr. Will Oliver

RGP:se

COUNTY: [illegible]

RIVER BASIN: [illegible]

REPORT TO ARO FRO MRO RRO WaRO WiRO WSRO TS

Other

Shipped by: Bus, Courier, Other

COLLECTOR(S): [illegible]

BOD RANGE: SEED:

N.C. DEPT. OF NATURAL RESOURCES & COMMUNITY DEVELOPMENT

DIVISION OF ENVIRONMENTAL MANAGEMENT

WATER QUALITY FIELD-LAB FORM (DM1)

SAMPLE TYPE

☐ AMBIENT ☐ EMERGENCY ☐ SPLIT ☐ COMPLIANCE

STATION LOCATION: [illegible]

REMARKS:

LAB NUMBER 00008: [illegible]

DATE RECIEVED 910107 Time: [illegible]

Rec'd by [illegible] From Bus - Courier - Other

DATA ENTRY BY: CK

DATE REPORTED: [illegible]

	Station Number	Date Begin (yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H L	Composite T S B	Sample Type C G GNXX

1	BOD5 310	mg/l		Chloride 940	mg/l		NH3 as N 610	mg/l		Ni – Nickel 1067	ug/l
2	COD High 340	mg/l		Arsenic: Total 1002	ug/l		TKN as N 625	mg/l		Pb – Lead 1051	ug/l
3	COD Low 335	mg/l		Chl a: Tri 32217	ug/l		NO2+NO3 as N 630	mg/l		Sb – Antimony 1097	ug/l
4	Coliform: MF Fecal 31616	/100ml		Chl a: Corr 32209	ug/l		PO4 as P 70507	mg/l		Se – Selenium 1147	ug/l
5	Coliform MF Total 31504	/100ml		Pheophytin a 32213	ug/l		P Total as P 665	mg/l		Zn – Zinc 1092	ug/l
6	Coliform Tube Fecal 31615	/100ml		Color: True 80	Pt–Co		P Dissolved as P 666	mg/l			
7	Coliform Tube Total 31505	/100ml		Chromium: Hex. 1032	ug/l		Ag – Silver 1077	ug/l		Pesticides Specifically	
8	Residue Total 500	mg/l		Cyanide 720	mg/l		Al – Aluminum 1105	ug/l			
9	Volatile 505	mg/l		Fluoride 951	mg/l		Be – Beryllium 1012	ug/l		Scan Organochlorine	
10	Fixed 510	mg/l		Formaldehyde 71880	mg/l		Ca – Calcium 916	mg/l		Scan Organophosphorus	
11	Residue Suspended 530	mg/l		Grease and Oils 556	mg/l		Cd – Cadmium 1027	ug/l		[illegible]	
12	Volatile 535	mg/l		Hardness: Total 900	mg/l		Co – Cobalt 1037	ug/l		Organics Specifically	
13	Fixed 540	mg/l		MBAS 38260	mg/l		Chromium: Total 1034	ug/l		[illegible]	
14	pH 403	units		Phenols 32730	ug/l		Cu – Copper 1042	ug/l		Scan Base / Neutral Extractables	
15	Acidity to pH 4.5 436	mg/l		Sulfate 945	mg/l		Fe – Iron 1045	ug/l		Scan Acid Extractables	
16	Acidity to pH 8.3 435	mg/l		Sulfide 745	mg/l		Hg – Mercury 71900	ug/l			
17	Alkalinity to pH 8.3 415	mg/l		Specific Cond. 95	uMhos/cm²		Li – Lithium 1132	ug/l		Special Analysis Specifically	
18	Alkalinity to pH 4.5 410	mg/l		Biomass: Dry Wt. 573	g/M²		Mg – Magnesium 927	mg/l			
19	TOC 680	mg/l		Biomass: Peri Ash Free 572	g/M²		Mn – Manganese 1055	ug/l		Scan Acid Herbicides	
20	Turbidity 76	NTU		Chl a: Peri Fluo 82547	mg/M²		Na – Sodium 929	mg/l		Scan Purgeables	

SEE ATTACHED ORGANICS ANALYSIS REPORT

Analyze for ethylene glycol once get from Phillips 1/7/91 ?

A	Sampling Point: Pt 63 2	Water Temperature (°C) 10	D.O. 300	pH 400	Conductance µ 25°C 94	Alkalinity pH 8.3 82244	Alkalinity pH 4.5 431	Acidity pH 4.5 82243	Acidity pH 8.3 82242
B	Secchi (Meters) 78	Air Temperature (°C) 20	D.O. % Saturation 301	Salinity ‰ 480	Algae: Floating Mats Severity 1325	Precipitation (In/Day) 45	Cloud Cover % 32	Wind Direction (Deg.) 36	Wind Force Beaufort 37
C	1 Hr. Settleable Matter (ml/l/Hr) 50086	Dead Fish Severity 1340	Turbidity Severity 1350	Odor: Atmosphere Severity 1330	Stream Flow Severity 1351	Detergent Suds Severity 1305	Oil-Grease Severity 1300	Floating Debris Severity 1345	Sludge Severity 1315

DM1/Revised 7-85

Ref. 15C

SEMIVOLATILE ORGANIC REPORT

LAB NO. 1W44

REPORTED BY CW

ENTERED BY DS

CHECKED BY PVD

CHECKED BY

REVIEWED BY PVD

SUPERVISOR REK

DATE 1/17/91

SAMPLE TYPE: OTHER

ANALYSIS RESULTS

STORET NO.	COMPOUND	CONCENTRATION MG/L
	ANALYSIS BY GC/FID DIRECT AQUEOUS INJECTION INDICATES THE PRESENCE OF ETHYLENE GLYCOL.	
	EHTYLENE GLYCOL	39000

COUNTY: Chatham

RIVER BASIN: CAT

REPORT TO ARO, FRO, (MRO) RRO, WaRO, WiRO, WSRO, TS

Other

Shipped by: Bus, (Courier), Other

COLLECTOR(S): R. Fiscaps

BOD RANGE: SEED:

N.C. DEPT. OF NATURAL RESOURCES & COMMUNITY DEVELOPMENT

DIVISION OF ENVIRONMENTAL MANAGEMENT

WATER QUALITY FIELD-LAB FORM (DM1)

(1)

SAMPLE TYPE

☐ AMBIENT ☐ EMERGENCY ☐ SPLIT ☐ COMPLIANCE

STATION LOCATION: Rainwater Reclaim

REMARKS:

LAB NUMBER 00008: 1645

DATE RECEIVED 910107 Time 0970

Rec'd by JMW | From Bus - (Courier) - Other

DATA ENTRY BY: CK:

DATE REPORTED: 1/8/91

	Station Number	Date Begin (yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H L	Composite I S B	Sample Type C G GNXX

1	BOD5 310	mg/l		Chloride 940	mg/l		NH3 as N 610	mg/l		Ni – Nickel 1067	ug/l
2	COD High 340	mg/l		Arsenic: Total 1002	ug/l		TKN as N 625	mg/l		Pb – Lead 1051	ug/l
3	COD Low 335	mg/l		Chl a: Tri 32217	ug/l		NO2+NO3 as N 630	mg/l		Sb – Antimony 1097	ug/l
4	Coliform: MF Fecal 31616	/100ml		Chl a: Corr 32209	ug/l		PO4 as P 70507	mg/l		Se – Selenium 1147	ug/l
5	Coliform: MF Total 31504	/100ml		Pheophytin a 32213	ug/l		P: Total as P 665	mg/l		Zn – Zinc 1092	ug/l
6	Coliform: Tube Fecal 31615	/100ml		Color: True 80	Pt–Co		P: Dissolved as P 666	mg/l			
7	Coliform: Tube Total 31505	/100ml		Chromium: Hex 1032	ug/l		Ag – Silver 1077	ug/l		Pesticides Specifically	
8	Residue: Total 500	mg/l		Cyanide 720	mg/l		Al – Aluminum 1105	ug/l			
9	Volatile 505	mg/l		Fluoride 951	mg/l		Be – Beryllium 1012	ug/l		Scan Organochlorine	
10	Fixed 510	mg/l		Formaldehyde 71880	mg/l		Ca – Calcium 916	mg/l		Scan Organophosphorus	
11	Residue-Suspended 530	mg/l		Grease and Oils 556	mg/l		Cd – Cadmium 1027	ug/l			
12	Volatile 535	mg/l		Hardness: Total 900	mg/l		Co – Cobalt 1037	ug/l		Organics Specifically	
13	Fixed 540	mg/l		MBAS 38260	mg/l		Chromium: Total 1034	ug/l	X		
14	pH 403	units		Phenols 32730	ug/l		Cu – Copper 1042	ug/l		Scan Base / Neutral Extractables	
15	Acidity to pH 4.5 436	mg/l		Sulfate 945	mg/l		Fe – Iron 1045	ug/l		Scan Acid Extractables	
16	Acidity to pH 8.3 435	mg/l		Sulfide 745	mg/l		Hg – Mercury 71900	ug/l		SEE ATTACHED ORGANICS	
17	Alkalinity to pH 8.3 415	mg/l		Specific Cond 95	uMhos/cm		Li – Lithium 1132	ug/l		ANALYSIS REPORT	
18	Alkalinity to pH 4.5 410	mg/l		Biomass: Dry Wt. 573	g/M²		Mg – Magnesium 927	mg/l			
19	TOC 680	mg/l		Biomass: Peri Ash Free 572	g/M²		Mn – Manganese 1055	ug/l		Scan Acid Herbicides	
20	Turbidity 76	NTU		Chl a: Peri Fluro 82547	mg/M²		Na – Sodium 929	mg/l		Scan Purgeables	

Analyze for ethylene glycol only per Ron Phelps 1/7/91

A	Sampling Point PT % 63 2	Water Temperature (°C) 10	D.O. 300 .	pH 400 .	Conductance at 25°C 94	Alkalinity pH 8.3 82244	Alkalinity pH 4.5 431	Acidity pH 4.5 82243	Acidity pH 8.3 82242
B	Secchi (Meters) 78	Air Temperature (°C) 20	D.O. % Saturation 301	Salinity ‰ 480	Algae: Floating Mats Severity 1325	Precipitation (In/Day) 45	Cloud Cover: % 32	Wind Direction (Deg.) 36	Wind Force Beaufort 37
C	1 Hr. Settleable Matter (ml/l/Hr) 50086	Dead Fish Severity 1340	Turbidity Severity 1350	Odor: Atmosphere Severity 1330	Stream Flow Severity 1351	Detergent Suds Severity 1305	Oil-Grease Severity 1300	Floating Debris Severity 1345	Sludge Severity 1315

DM1/Revised 7-85

SEMIVOLATILE ORGANIC REPORT

LAB NO. 1W43

REPORTED BY CW

ENTERED BY DS

CHECKED BY PVD

CHECKED BY DA

REVIEWED BY PVD

SUPERVISOR REK

DATE 1/17/91

SAMPLE TYPE: OTHER

ANALYSIS RESULTS

STORET NO.	COMPOUND	CONCENTRATION MG/L
	ANALYSIS BY GC/FID DIRECT AQUEOUS INJECTION INDICATES THE PRESENCE OF ETHYLENE GLYCOL.	
	EHTYLENE GLYCOL	91000

Attachment II

Ref. 150

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH
AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT
WATER QUALITY SECTION
POST OFFICE BOX 950
MOORESVILLE, NORTH CAROLINA 28115

REPORT OF: Complaint Investigation

PLACE VISITED: Rolling Truck Leasing and Chemstreams, Inc.

DATE: February 15, 1991

~~ADDRESS: Gribble~~ Road, Indian Trail, Union County, NC

RIVER BASIN: Catawba

BY WHOM: Tony R. Parker and Kent Smith

TIME SPENT: 2 Hours

PERSONS CONTACTED: Complainant-Steve Owens (Rollins Truck Leasing); Jerome DuBow and Hardy Griffin (Chemstreams, Inc.)

REASON FOR VISIT: Mooresville Regional Office received complaint concerning chemicals or oil in a ditch below Chemstreams, Inc. located at Indian Trail in Union County, North Carolina

COPIES TO: Solid Waste Management Division (Hazardous Waste Section)
Groundwater Section (MRO)
Union County Health Department
Ron Phelps (MRO)
Kent Smith (MRO)

REPORT:

A site visit was made by Tony Parker (writer) and Kent Smith on Friday, February 15, 1991. The investigators arrived at Rollins Truck Leasing and met with Mr. Steve Owens (Service Manager, complainant). Mr. Owens stated there appeared to be oil entering a ditch located on their property. He also stated a chemical substance was bubbling up from the ground also on their property. Mr. Rollins then led the investigators to the rear of their property where a visual inspection revealed that an oily substance was evident in a ditch; also a chemical substance appeared to be bubbling up from the ground in several areas. The area is located downgradient approximately 0.2 mile from Chemstreams. There is a vacant lot between Chemstreams and Rollins Truck Leasing. The investigators then departed and proceeded to Chemstreams, Inc. and met with Mr. Jerome DuBow and

Mr. Hardy Griffin, General Manager. Mr. DuBow stated that Ron Phelps, Division of Environmental Management/Mooresville Regional Office had been working with them concerning the problem. The investigators were not aware that Ron Phelps had already investigated the Company prior to this visit. After speaking with Mr. DuBow, the investigators requested to inspect the grounds. Mr. Griffin then agreed to accompany the investigators on a tour of the facility and grounds. During the investigation, it was noted that Chemstreams had numerous unlabeled barrels stored on site. Many barrels were open with no lids and some were observed to have overflowed. Further investigation revealed an oily residue which had spilled onto the ground and appeared to be from a truck tanker. An additional oil or chemical spill was observed near the northern property boundary. The spills noted appeared to be confined to Chemstreams' property. According to other workers on site, the spills had just been discovered. The investigators then advised Mr. Griffin that the spills would need to be cleaned up immediately. Mr. Griffin said he would comply and ordered employees to begin cleaning up the spills. The investigators then departed.

Upon returning to the Mooresville Regional Office, it was learned that a Notice of Violation dated February 6, 1991 had already been mailed regarding the above noted deficiencies. Company officials have advised they are preparing a response to that notice along with the most recent spillages noted during this investigation.

By copy of this Report of Investigation, it is suggested that the Solid Waste Management Division (Hazardous Waste Section) further investigate this facility to determine if any hazardous waste violations have occurred.

Another area of concern not previously addressed is groundwater. The water table in this area appears to be very shallow and borders the Charlotte Belt and Carolina Slate Belt units. The investigators suspect that groundwater may have been impacted due to the past spills and discharges; therefore, by copy of this report, it is suggested that the Groundwater Section, Mooresville Regional office, investigate to determine if groundwaters at and adjacent to this area have been impacted by the discharges and spills from Chemstreams, Inc.

Ref. 15E

State of North Carolina
Department of Environment, Health, and Natural Resources
Mooresville Regional Office

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Albert F. Hilton, Regional Manager
DIVISION OF ENVIRONMENTAL MANAGEMENT

July 16, 1991

Mr. Will Oliver
Chemstreams, Inc.
Post Office Box 1565
Matthews, North Carolina 28106

Subject: Follow-Up Investigation
Chemstreams, Inc.
Union County, NC

Dear Mr. Oliver:

Attached please find a copy of the Report prepared by Mr. Tony R. Parker with this Office, regarding the investigation of Chemstreams, Inc.

It is requested that you take whatever action is indicated in the report.

The Report should be self-explanatory; however, should there be any questions or if you should need assistance from this Office, please do not hesitate to contact Mr. Parker or me.

Sincerely,

D. Rex Gleason

D. Rex Gleason, P. E.
Water Quality Regional Supervisor

Attachments: (1) Map
(2) Report of Investigation (2/15/91)

cc: Mr. Herb Leith

TRP:se

919 North Main Street, Mooresville, N.C. 28115 • Telephone 704-663-1699 • FAX 704-663-6040

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH
AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT
WATER QUALITY SECTION
POST OFFICE BOX 950
MOORESVILLE, NORTH CAROLINA 28115

REPORT OF: Follow-Up Investigation and Recommendations

PLACE VISITED: Chemstreams, Inc.

DATE: July 11, 1991

ADDRESS: Gribble Road, Indian Trail, Union County, NC

RIVER BASIN: Yadkin

BY WHOM: Tony R. Parker, Environmental Tech. IV

TIME SPENT: 4 Hours

PERSONS CONTACTED: Mr. Will Oliver, Chemstreams Representative; Mr. Herb Leith, Realtor; and Mr. Scott Readling, Hazardous Waste

REASON FOR VISIT: Follow-up investigation

COPIES TO: Mr. Will Oliver
Mr. Herb Leith
Mr. Scott Readling, Hazardous Waste Section
Ms. Chris DeRoller, Groundwater Section
Union County Health Department

REPORT:

A previous investigation (see attached report) was conducted by this writer/investigator (Tony Parker) on February 15, 1991 at Chemstreams, Inc. located at the above address. Prior to the visit by this writer, Mr. Ron Phelps (no longer employed with the State) had investigated the facility, and a Notice of Violation was issued to Chemstreams, Inc. dated February 6, 1991 for an unlawful discharge of ethylene glycol (not considered a hazardous waste).

A follow-up inspection was conducted by this writer on July 11, 1991. The investigator met with Chemstreams' representative, Mr. Will Oliver, and the adjacent property owner, Representative Herb Leith. Mr. Scott Readling with the North Carolina Hazardous Waste Section was also present at the writer's request to determine if any hazardous waste regulations would apply to the facility. Mr. Readling's report will be sent under separate cover. Listed below are the observations that were noted during this follow-up investigation:

Chemstreams' Facility Review - On Site

The areas affected by spillages noted previously by this writer had been cleaned up. Some of the areas previously affected now have concrete slabs and containment walls and/or earthen berms to prevent runoff. The southeast corner of the property has a sump installed which collects property runoff and returns it back to process storage tanks for processing. This area also has been dyked with earthen berms to prevent runoff. It would appear if spills or leaks were to occur, they would be contained in this area, however, ground water may be affected since this is an earthen containment area. It is suggested that this area be poured and bermed with concrete. All yard drainage should be directed to sumps and then reprocessed or properly disposed of in accordance with applicable regulations. Most of the storage tank concrete containment barriers appeared to have cracks in the walls, and some had minor leaks. The cracks in the walls should be sealed to prevent further leakage. Mr. Oliver stated the substance in these containment areas was methanol and glycol. All barrels on site now appear to be marked with an identification code. The previous inspection revealed that numerous barrels had no labels or markings. Some glycol spillage was noted at one of the truck loading areas. It is requested that immediate measures be taken to prevent any spillages. At the northern end of the property there is a drainage ditch and culvert. The ditch would convey any spilled or released material onto adjacent property; therefore, it is requested that all culverts in this area be sealed. Any runoff should be directed to containment areas.

Offsite Evaluation - Wagner Property

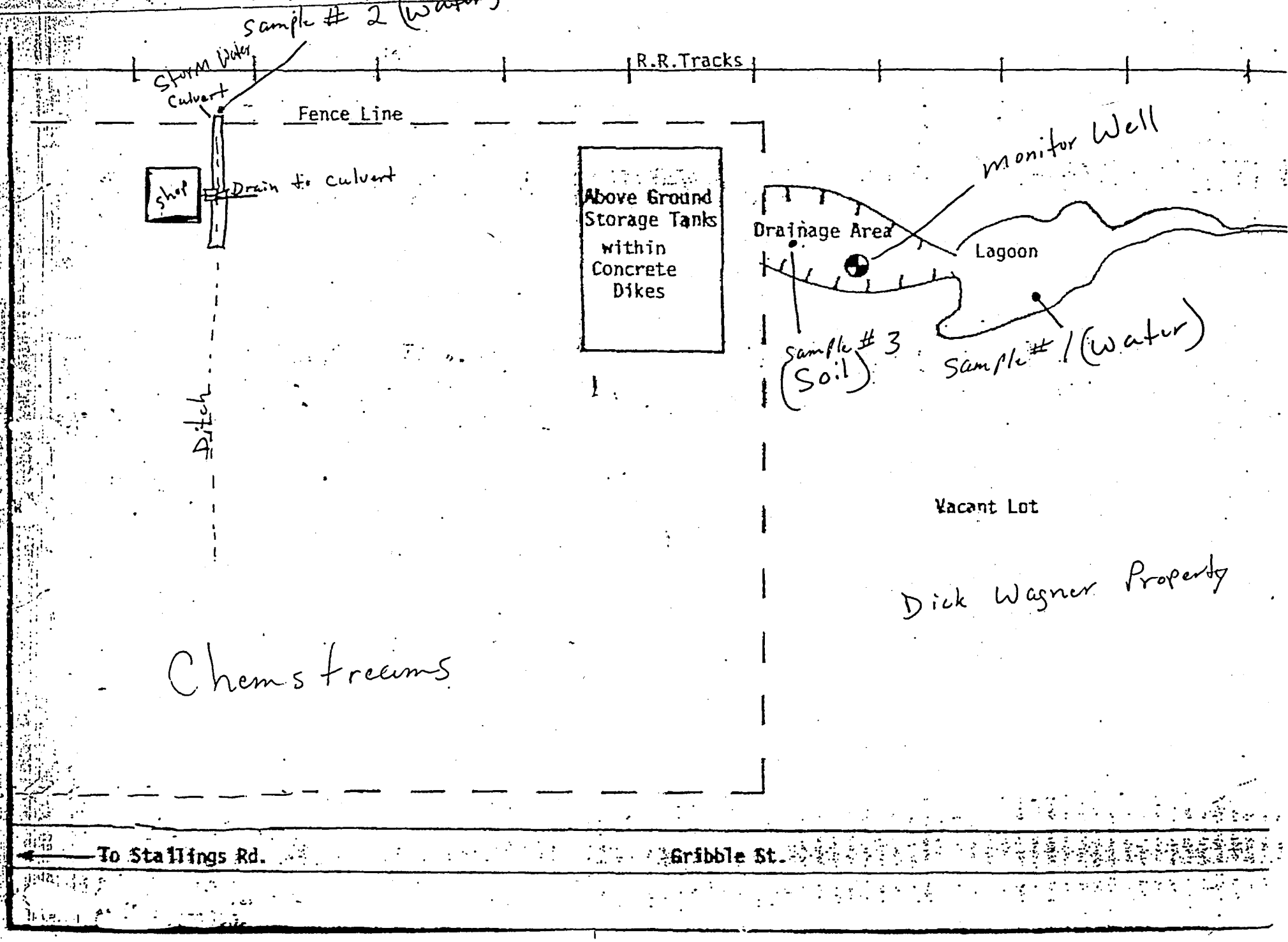
There did not appear to be any direct discharges or evidence of direct discharges observed. Just offsite of Chemstreams' property along the east side of the fence line there was an area where a substance was observed to be seeping out of the ground. The area was discolored and there was an unusual odor detected from the soil. This area is not affected by any surface runoff. Runoff from this site would spread out in a drainage area and subsequently enter a natural lagoon on property owned by a Mr. Dick Wagner. Mr. Will Oliver contends that the chemical substance surfacing on this site is from an old asphalt plant which was previously located at the Chemstreams site.

Sample Collection

The writer collected water column samples at a culvert from the northwest corner of Chemstreams' property just offsite, adjacent to the railroad. The culvert connects to a ditch which originates on Chemstreams' property. The samples will be analyzed for Organics, Metals, Arsenic, Mercury and Cyanide. Other water column samples were obtained from the lagoon on Mr. Wagner's property. The analysis will be for the same constituents as indicated above. A soil sample was also obtained from the area just outside the fence on Mr. Wagner's property where ground water or a liquid substance appeared to be seeping out of the ground. See attached map for explanation.

Conclusion

Conclusive results will not be available until the sample analyses are received; however, from a water quality standpoint the deficiencies (spillages) noted earlier appeared to have been resolved. No discharges appeared to have occurred. The major area of concern is the area offsite along the fence where the chemical substance appears to be seeping out of the ground. The Groundwater Section may wish to perform their own site investigation to determine the cause and source of the problem. When the sample analyses have been received, copies will be mailed to all interested parties. If further action is deemed necessary all parties will be advised.


Sample # 2 (Run off water)
Storm Water Culvert
R.R.Tracks
Fence Line
shed
Drain to culvert
Above Ground Storage Tanks within Concrete Dikes
Monitor Well
Drainage Area
Lagoon
Sample # 3 (Soil)
Sample # 1 (water)
Ditch
Vacant Lot
Dick Wagner Property
Chemstreams
To Stallings Rd.
Gribble St.

Ref. 15F

DIVISION OF ENVIRONMENTAL MANAGEMENT

September 27, 1991

MEMORANDUM TO: Barbara Christian

FROM: D. Rex Gleason DRG

SUBJECT: Chemstreams, Inc.
Union County, North Carolina

This is to advise that the sample analysis reports have been received from soil and water samples obtained near, but off-site of, the subject facility. Tony Parker collected the samples during a follow-up investigation on July 11, 1991. In Tony's report of investigation (attached) he noted an area off-site of the subject facility where soils were discolored. The discolored area was apparently caused by seepage from the ground, not from any surface discharge. Tony collected soil samples from this area. Two other areas were also sampled (see attached map). The soil sample analysis report indicates high levels of phenols, alkanes, isocyanoto methyl benzene, toluene, ethyl benzene, xylenes and other petroleum constituents along with some glycols. Chemstreams has indicated that an asphalt company was located at their location many years ago, and they contend that the contaminated soils in the area where seepage occurs, is a result of the asphalt plant's past operation. According to Tony, none of the petroleum based products are utilized on site at Chemstreams. The glycols and/or other contaminants indicated on the reports are most likely due to past spillages at Chemstreams which spillage may have reached groundwaters and are resurfacing in the area off-site.

Based on the information gathered during Tony's investigation and the laboratory reports, it appears that no water quality violations were noted (i.e., surface runoff, direct discharges, and/or any documented adverse impact to defined surface waters).

Tony advised that Chris DeRoller is investigating this site for possible groundwater contamination, therefore, I thought the attached correspondence and lab reports would be useful to Chris in her investigation.

Should you or Chris need additional information, please contact either Tony or me.

Attachments: Follow-up Investigation Report and Map (Attachment I)
Site Investigation Report by Hazardous Waste (Attachment II)
Lab Reports Nos. 1-3

Ref. 15G

N.C. DEPARTMENT OF ENVIRONMENT, HEALTH,

AND NATURAL RESOURCES

Division of Environmental Management

Chemistry Laboratory

4405 Reedy Creek Road

Raleigh, N.C. 27607

FAX: (919) 733-6241

FAX TO: Tony Parker

FAX NUMBER: 704/663-6040

FROM: DONNA DEM/Chemistry Lab. PHONE: (919) 733-3908

NO. OF PAGES INCLUDING THIS SHEET 13

COMMENTS: Volatiles should be completed by the end of the week. Check back then.

[redacted]

Here's the other 2 pages.

DIVISION OF ENVIRONMENTAL MANAGEMENT — WATER QUALITY FIELD-LAB FORM (DM1)

[redacted] COUNTY: Iverson

RIVER BASIN: Yao

REPORT TO: ARO FRO MRO RRO WaRO WIRO WSRO TS AT BM

Other

Shipped by: Bus Courier Staff, Other

COLLECTOR(S): T. Parker

Estimated BOD Range: 0-5/5-25/25-65/40-130 or 100 plus

Seed: Yes ☐ No ☐ Chlorinated: Yes ☐ No ☐

PRIORITY: ☐ AMBIENT ☐ QA ☐ COMPLIANCE ☑ CHAIN OF CUSTODY ☐ EMERGENCY

CHAIN OF CUSTODY

SAMPLE TYPE: ☐ STREAM ☐ EFFLUENT ☐ LAKE ☐ INFLUENT ☐ ESTUARY ✓ Lagoon or Wet Area

5

For Lab Use ONLY

Lab Number: W 2 26

Date Received: 7/12/91 Time: 9:00

Rec'd by: DS From: Bus Courier Hand Del

DATA ENTRY BY: CK:

DATE REPORTED:

STATION LOCATION: Property adjacent to Chemstreams

REMARKS: Lagoon located 70 yds. downgradient from Chemstreams

Station #	Date Begin (yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H L	Composite T S B	Sample Type C G GNXX
CS-3	91.07.11	1600						

1		BOD5 310	mg/l		Chloride 940	mg/l		NH3 as N 610	mg/l	X	Li-Lithium 1132 <75 ug/l
2		COD High 340	mg/l		Chl a: Trl 32217	ug/l		TKN as N 625	mg/l	X	Mg-Magnesium 927 4.9 mg/l
3		COD Low 335	mg/l		Chl a: Corr 32209	ug/l		NO2 plus NO3 as N 630	mg/l	X	Mn-Manganese 1055 2500 ug/l
4		Coliform: MF Fecal 31616	/100ml		Pheophytin a 32213	ug/l		P: Total as P 665	mg/l	X	Na-Sodium 929 48 mg/l
5		Coliform: MF Total 31504	/100ml		Color: True 80	Pt-Co		PO4 as P 70507	mg/l		~~Arsenic Total 1002 50~~ ug/l
6		Coliform: Tube Fecal 31615	/100ml		Color:(pH) 83	ADMI		P: Dissolved as P 666	mg/l	X	Se-Selenium 1147 omit ug/l
7		Coliform: Fecal Strep 31673	/100ml		Color: pH 7.6 82	ADMI				X	Hg-Mercury <.71 ug/l
8		Residue: Total 500	mg/l	X	Cyanide 720	mg/l	X	Cd-Cadmium 1027 <2.0	ug/l		Organochlorine Pesticides
9		Volatile 505	mg/l		Fluoride 951	mg/l		~~Cr-Chromium Total 1034 10~~	ug/l		Organophosphorus Pesticides
10		Fixed 510	mg/l		Formaldehyde 71880	mg/l	X	Cu-Copper 1042 23	ug/l	X	PCB's
11		Residue: Suspended 530	mg/l		Grease and Oils 556	mg/l		~~Ni-Nickel 1067 14~~	ug/l		Acid Herbicides
12		Volatile 535	mg/l		Hardness Total 900	mg/l	X	Pb-Lead 1051 <10	ug/l		
13		Fixed 540	mg/l		Specific Cond. 95	uMhos/cm²	X	Zn-Zinc 1092 170	ug/l	X	Base/ Neutral Extractable Organics *
14	X	pH 403	units		MBAS 38260	mg/l				X	Acid Extractable Organics *
15		Acidity to pH 4.5 436	mg/l		Phenols 32730	ug/l	X	Ag-Silver 1077 <5.0	ug/l		
16		Acidity to pH 8.3 435	mg/l		Sulfate 945	mg/l	X	Al-Aluminum 1105 1900	ug/l	X	Purgeable Organics (VOA bottle req'd)
17		Alkalinity to pH 8.3 415	mg/l		Sulfide 745	mg/l	X	~~Be-Beryllium 1012~~ omit	ug/l		
18		Alkalinity to pH 4.5 410	mg/l				X	Ca-Calcium 916 130	mg/l		V.S. P:7
19		TOC 680	mg/l				X	~~Co-Cobalt 1037~~ omit	ug/l		
20		Turbidity 76	NTU				X	Fe-Iron 1045 110000	ug/l		Phytoplankton

Sampling Point %	Conductance at 25 C	Water Temperature (C)	D.O. mg/l	pH	Alkalinity pH 8.3	Alkalinity pH 4.5	Acidity pH 4.5	Acidity pH 8.3	Air Temperature (C)
2	94	10	300	400 5.9	82244	431	82243	82242	20
	Salinity %	Precipitation (in/day)	Cloud Cover %	Wind Direction (Deg)	Stream Flow Severity	Turbidity Severity	Wind Velocity M/H	Mean Stream Depth ft.	Stream Width ft.
	480	45	32	35	1351	1350	35	54	4

* Suspect Glycols, Alcohols, Esters, Brake Fluid, Windshield cleaner & Cut. Prod.

DM1/Revised 10/86

AUG-13-1991 11:18 FROM DEM CHEMISTRY LABORATORY TO 8704635049 P.03/11

SEMIVOLATILE ORGANICS REPORT - DEM LAB

LAB NUMBER 1W2124 SUPERVISOR RZK 1W2124
DATE: 7/23/91

REPORTED BY sm
CHECKED BY PTW
REVIEWED BY PTW

ENTERED BY Ds 7/23/91
CHECKED BY _____

SAMPLE TYPE: WATER DILUTION FACTOR: 10

CAS NUMBER	TQL X 10		CONC. UG/L
108-95-2	~~10~~	~~PHENOL~~	~~560~~
111-44-4	10	BIS(2-CHLOROETHYL) ETHER	U
95-57-8	10	2-CHLOROPHENOL	U
541-73-1	10	1,3-DICHLOROBENZENE	U
106-46-7	10	1,4-DICHLOROBENZENE	U
100-51-6	~~10~~	~~BENZYL ALCOHOL~~	~~160 E~~
95-50-1	10	1,2-DICHLOROBENZENE	U
95-48-7	10	2-METHYLPHENOL	U
108-60-1	10	BIS(2-CHLOROISOPROPYL) ETHER	U
106-44-5	10	4-METHYLPHENOL	U
621-64-7	10	N-NITROSO-DI-N-PROPYLAMINE	U
67-72-1	10	HEXACHLOROETHANE	U
98-95-3	10	NITROBENZENE	U
78-59-1	10	ISOPHORONE	U
88-75-5	10	2-NITROPHENOL	U
105-67-9	10	2,4-DIMETHYLPHENOL	U
65-85-0	50	BENZOIC ACID	U
111-91-1	10	BIS(2-CHLOROETHOXY) METHANE	U
120-83-2	10	2,4-DICHLOROPHENOL	U
120-82-1	10	1,2,4-TRICHLOROBENZENE	U
91-20-3	10	NAPHTHALENE	U
106-47-8	20	4-CHLOROANILINE	U
87-68-3	10	HEXACHLOROBUTADIENE	U
59-50-7	20	4-CHLORO-3-METHYLPHENOL	U
91-57-6	10	2-METHYLNAPHTHALENE	U
77-47-4	10	HEXACHLOROCYCLOPENTADIENE	U
88-06-2	10	2,4,6-TRICHLOROPHENOL	U
95-95-4	10	2,4,5-TRICHLOROPHENOL	U
91-58-7	10	2-CHLORONAPHTHALENE	U
88-74-4	50	2-NITROANALINE	U
131-11-3	10	DIMETHYL PHTHALATE	U
208-96-8	10	ACENAPHTHYLENE	U
606-20-2	10	2,6-DINITROTOLUENE	U
99-09-2	50	3-NITROANALINE	U
83-32-9	10	ACENAPHTHENE	U
51-28-5	50	2,4-DINITROPHENOL	U
100-02-7	50	4-NITROPHENOL	U
132-64-9	10	DIBENZOFURAN	U
121-14-2	10	2,4-DINITROTOLUENE	U
84-66-2	10	DIETHYL PHTHALATE	U
7005-72-3	10	4-CHLOROPHENYL PHENYL ETHER	U
86-73-7	10	FLUORENE	U
100-01-6	50	4-NITROANALINE	U
534-52-1	50	4,6-DINITRO-2-METHYL PHENOL	U

SEMIVOLATILE ORGANICS REPORT - DEM LAB

86-30-6	10	N-NITROSODIPHENYLAMINE	U
101-55-3	10	4-BROMOPHENYL PHENYL ETHER	U
118-74-1	10	HEXACHLOROBENZENE	U
87-86-5	50	PENTACHLOROPHENOL	U
85-01-8	10	PHENANTHRENE	U
120-12-7	10	ANTHRACENE	U
84-74-2	10	DI-N-BUTYL PHTHALATE	U
206-44-0	10	FLUORANTHENE	U
129-00-0	10	PYRENE	U
85-68-7	10	BUTYLBENZYL PHTHALATE	U
91-94-1	20	3,3'-DICHLOROBENZIDINE	U
56-55-3	10	BENZO(A)ANTHRACENE	U
218-01-9	10	CHRYSENE	U
117-81-7	10	BIS(2-ETHYLHEXYL) PHTHALATE	U
117-84-0	10	DI-N-OCTYL PHTHALATE	U
205-99-2	10	BENZO(B)FLUORANTHENE	U
207-08-9	10	BENZO(K)FLUORANTHENE	U
50-32-8	10	BENZO(A)PYRENE	U
193-39-5	10	INDENO(1,2,3-CD)PYRENE	U
53-70-3	10	DIBENZO(A,H)ANTHRACENE	U
191-24-2	10	BENZO(G,H,I)PERYLENE	U

OTHER SEMIVOLATILE ORGANICS FOR SAMPLE NUMBER: 1W2124

~~BUTANOIC ACID (C4H8O2)~~		~~[illegible] T~~
~~BUTOXYETHANOL (C6H14O2)~~		~~[illegible] T~~
~~METHYL PYRROLIDINONE (C5H9ON)~~		~~[illegible] T~~
~~BUTOXYETHOXYETHANOL (C8H18O3)~~		~~8900 T~~
~~METHOXY METHYLETHOXY METHYLETHOXY PROPANOL (C10H22O4)~~		~~[illegible] T~~
~~METHOXY METHYLETHOXY METHYLETHOXY PROPANOL (C10H22O4)~~		~~2205~~
UNIDENTIFIED	_____	1600 E
UNIDENTIFIED	_____	330 E
UNIDENTIFIED	_____	180 E
UNIDENTIFIED	_____	1700 E
UNIDENTIFIED	_____	2800 E
UNIDENTIFIED	_____	170 E
UNIDENTIFIED	_____	190 E
UNIDENTIFIED	_____	260 E
UNIDENTIFIED	_____	760 E
UNIDENTIFIED	_____	490 E
UNIDENTIFIED	_____	150 E
UNIDENTIFIED	_____	240 E
UNIDENTIFIED	_____	180 E
UNIDENTIFIED	_____	220 E

TQL= TARGET QUANTITATION LIMIT
T= TENTATIVELY IDENTIFIED ESTIMATED CONC.
E= ESTIMATED CONCENTRATION
U= COMPOUND ANALYZED FOR NOT DETECTED
N= COMPOUND NOT ANALYZED FOR
D= DETECTED BELOW QUANTITATION LIMIT
H= HOLDING TIME EXCEEDED
TQL SUBJECT TO CHANGE DUE TO INSTRUMENT SENSITIVITY

LAB #: 1W2124

PESTICIDES ANALYTICAL REPORT

REPORTED BY: HC
CHECKED BY: HB
REVIEWED BY: HB
SUPERVISOR: RZK 7/31/91

SAMPLE TYPE: WATER

ENTERED BY: DB
CHECKED BY:
DATE: 7/31/91

ANALYSIS RESULTS

CAS NO.	CHLORINATED PESTICIDES BY ECD	TQL UG/L	CONCENTRATION DETECTED (UG/L)
309-00-2	ALDRIN	0.02	N
57-74-9	CHLORDANE, TECHNICAL	0.90	N
5103-71-9	CHLORDANE-ALPHA	0.02	N
5103-74-2	CHLORDANE-GAMMA	0.02	N
3734-48-3	CHLORDENE	0.02	N
2675-77-6	CHLORONEB	0.15	N
301-15-6	CHLOROBENZILATE	0.51	N
2921-88-2	CHLOROTHALONIL	0.03	N
1897-45-6	DCPA	0.09	N
53-19-0	DDD, op	0.05	N
72-54-8	DDD, pp	0.04	N
3424-82-6	DDE, op	0.02	N
72-55-9	DDE, PP	0.02	N
789-02-6	DDT, op	0.04	N
50-29-3	DDT, pp	0.02	N
60-57-1	DIELDRIN	0.02	N
959-98-9	ENDOSULFAN I	0.03	N
33213-65-9	ENDOSULFAN II	0.03	N
1031-07-8	ENDOSULFAN SULFATE	0.02	N
72-20-8	ENDRIN	0.03	N
7421-93-4	ENDRIN ALDEHYDE	0.06	N
53494-70-5	ENDRIN KETONE	0.06	N
2593-15-9	ETHAZOLE	0.03	N
319-84-6	BHC-ALPHA	0.02	N
319-85-7	BHC-BETA	0.03	N
58-89-9	BHC-GAMMA (LINDANE)	0.02	N
76-44-8	HEPTACHLOR	0.02	N
1024-57-3	HEPTACHLOR EPOXIDE	0.02	N
[illegible]-74-1	HEXACHLOROBENZENE	0.01	N
121-75-5	MALATHION	0.24	N
72-43-5	METHOXYCHLOR, pp	0.05	N
2385-85-5	MIREX	0.03	N
39765-80-5	TRANS-NONACHLOR	0.02	N

CAS NO.	CHLORINATED PESTICIDES BY ECD	TQL UG/L	CONCENTRATION DETECTED (UG/L)
26880-48-6	OXYCHLORDANE	0.03	N
52645-53-1	CIS-PERMETHRIN	NE	N
52645-53-1	TRANS-PERMETHRIN	NE	N
1918-16-7	PROPACHLOR	NE	N
117-18-0	TECNAZENE	0.02	N
1582-09-8	TRIFLURALIN	0.02	N
12674-11-2	AROCHLOR 1016	0.68	U
11104-28-2	AROCHLOR 1221	2.2	U
11141-16-5	AROCHLOR 1232	2.2	U
53469-21-9	AROCHLOR 1242	0.80	U
12672-29-6	AROCHLOR 1248	1.7	U
11097-69-1	AROCHLOR 1254	1.5	U
11096-82-5	AROCHLOR 1260	1.4	U
8001-35-2	TOXAPHENE	1.5	N
	CHLORINATED ACIDS BY ECD		
50594-66-6	ACIFLUORFEN	0.15	N
25057-89-0	BENTAZON	0.30	N
133-90-4	CHLORAMBEN	0.20	N
94-75-7	2,4-D	0.38	N
75-99-0	DALAPON	NE	N
94-82-6	2,4-DB	1.1	N
	DCPA(ACID METABOLITES)	0.09	N
1918-00-9	DICAMBA	0.23	N
51-36-5	3,5-DICHLOROBENZOIC ACID	0.25	N
120-36-5	DICHLORPROP	0.34	N
88-85-7	DINOSEB	0.12	N
7600-50-2	5-HYDROXYDICAMBA	0.20	N
100-02-7	4-NITROPHENOL	0.50	N
87-86-5	PENTACHLOROPHENOL	0.03	N
1918-02-1	PICLORAM	0.30	N
93-76-5	2,4,5-T	0.09	N
93-72-1	2,4,5-TP	0.06	N

PESTICIDE ANALYTICAL REPORT

LAB #: 1W2184

CAS NO.	ORGANOPHOSPHATE PESTICIDES BY FPD	TQL UG/L	CONCENTRATION DETECTED (UG/L)
786-19-6	CARBOPHENOTHION	4.0	N
2921-88-2	CHLORPYRIFOS	1.5	N
50-29-3	DDE	2.4	N
298-03-3	DEMETON	1.3	N
333-41-5	DIAZINON	0.80	N
60-51-5	DIMETHOATE	3.5	N
2104-64-5	EPN	4.0	N
563-12-2	ETHION	1.3	N
13194-48-4	ETHOPROP	1.0	N
55-38-9	FENTHION	1.5	N
115-90-2	FENSULFOTHION	10.0	N
150-50-5	FOLEX	2.0	N
6923-22-4	MONOCROTOPHOS	10.0	N
300-76-5	NALED	4.0	N
56-38-2	PARATHION, ETHYL	0.65	N
298-00-0	PARATHION, METHYL	0.75	N
298-02-0	PHORATE	0.35	N
299-84-3	RONNEL	0.75	N
3689-24-5	SULFOTEPP	0.25	N
	NITROGEN/PHOSPHOROUS PESTICIDES BY NPD		
15972-60-8	ALACHLOR	5.0	N
834-12-8	AMETRYN	5.0	N
1912-24-9	ATRAZINE	2.6	N
314-40-9	BROMACIL	20	N
23184-66-9	BUTACHLOR	24	N
2008-41-5	BUTYLATE	2.6	N
5234-68-5	CARBOXIN	18	N
101-21-3	CHLOROPRAM	11	N
1134-23-2	CYCLOATE	3.0	N
333-41-5	DIAZINON	0.10	N
62-73-7	DICHLORVOS	0.06	N
[illegible]-51-7	DIPHENAMID	12	N
298-04-4	DISULFOTON	0.20	N
2497-06-5	DISULFOTON SULFONE	10	N

CAS NO.	NITROGEN/PHOSPHOROUS PESTICIDES BY NPD	TQL UG/L	CONCENTRATION DETECTED (UG/L)
2497-07-6	DISULFOTON SULFOXIDE	0.16	N
759-94-4	EPTC(EPTAM)	2.4	N
13194-48-4	ETHOPROP	0.20	N
22224-92-6	FENAMIPHOS	0.50	N
51235-04-2	HEXAZINONE	18	N
150-50-5	MERPHOS	7.6	N
51218-45-2	METOLACHLOR	24	N
21087-64-9	METRIBUZIN	4.0	N
7786-34-7	MEVINPHOS	0.36	N
113-48-4	MGK 264	22	N
2212-67-1	MOLINATE	3.6	N
15299-99-7	NAPROPANIDE	7.6	N
27314-13-2	NORFLURAZON	10	N
1114-71-2	PEBULATE	2.6	N
1610-18-0	PROMETON	200	N
7287-19-6	PROMETRYN	5.0	N
23950-58-5	PRONAMIDE	20	N
139-40-2	PROPAZINE	3.6	N
122-34-9	SIMAZINE	30	N
1014-70-6	SIMETRYN	5.0	N
34014-18-1	TEBUTHIURON	6.0	N
5902-51-2	TERBACIL	20	N
13071-79-9	TERBUFOS	0.16	N
886-50-0	TERBUTRYN	5.0	N
1929-77-7	VERNOLATE	3.6	N

TQL-TARGET QUANTITATION LIMIT

NE- NO ESTABLISHED TQL

E- ESTIMATED VALUE

U- SAMPLE ANALYZED FOR THIS COMPOUND BUT NOT DETECTED

N- SAMPLE NOT ANALYZED FOR THIS COMPOUND

T- TENTATIVELY IDENTIFIED BUT UNABLE TO CONFIRM

13 UNIDENTIFIED PEAKS DETECTED BY GC/ECD - PEST EXTRACTION

SEMIVOLATILE ORGANICS REPORT - DEM LAB

LAB NUMBER 1W2123 SUPERVISOR REK 1W2123
DATE: 8/6/91

REPORTED BY CWJ
CHECKED BY EJM
REVIEWED BY EJM

ENTERED BY Da 8/7/91
CHECKED BY _____

SAMPLE TYPE SEDIMENT DILUTION FACTOR: 10

CAS NUMBER	TQL X10		CONC. UG/KG
108-95-2	660	PHENOL	18000
111-44-4	660	BIS(2-CHLOROETHYL) ETHER	U
95-57-8	660	2-CHLOROPHENOL	U
541-73-1	660	1,3-DICHLOROBENZENE	U
106-46-7	660	1,4-DICHLOROBENZENE	U
100-51-6	1300	BENZYL ALCOHOL	U
95-50-1	660	1,2-DICHLOROBENZENE	U
95-48-7	660	2-METHYLPHENOL	U
108-60-1	660	BIS(2-CHLOROISOPROPYL) ETHER	U
106-44-5	660	4-METHYLPHENOL	U
621-64-7	660	N-NITROSO-DI-N-PROPYLAMINE	U
67-72-1	660	HEXACHLOROETHANE	U
98-95-3	660	NITROBENZENE	U
78-59-1	660	ISOPHORONE	U
88-75-5	660	2-NITROPHENOL	U
105-67-9	660	2,4-DIMETHYLPHENOL	U
65-85-0	3300	BENZOIC ACID	U
111-91-1	660	BIS(2-CHLOROETHOXY) METHANE	U
120-83-2	660	2,4-DICHLOROPHENOL	U
120-82-1	660	1,2,4-TRICHLOROBENZENE	U
91-20-3	660	NAPHTHALENE	U
106-47-8	1300	4-CHLOROANILINE	U
87-68-3	660	HEXACHLOROBUTADIENE	U
59-50-7	1300	4-CHLORO-3-METHYLPHENOL	U
91-57-6	660	2-METHYLNAPHTHALENE	U
77-47-4	660	HEXACHLOROCYCLOPENTADIENE	U
88-06-2	660	2.4,6-TRICHLOROPHENOL	U
95-95-4	660	2,4,5-TRICHLOROPHENOL	U
91-58-7	660	2-CHLORONAPHTHALENE	U
88-74-4	3300	2-NITROANALINE	U
131-11-3	660	DIMETHYL PHTHALATE	U
208-96-8	660	ACENAPHTHYLENE	U
606-20-2	660	2,6-DINITROTOLUENE	U
99-09-2	3300	3-NITROANALINE	U
83-32-9	660	ACENAPHTHENE	U
51-28-5	3300	2,4-DINITROPHENOL	U
100-02-7	3300	4-NITROPHENOL	U
132-64-9	660	DIBENZOFURAN	U
121-14-2	660	2.4-DINITROTOLUENE	U
84-66-2	660	DIETHYL PHTHALATE	U
7005-72-3	660	4-CHLOROPHENYL PHENYL ETHER	U
86-73-7	660	FLUORENE	U
100-01-6	3300	4-NITROANALINE	U
534-52-1	3300	4,6-DINITRO-2-METHYL PHENOL	U

SEMIVOLATILE ORGANICS REPORT - DEM LAB

86-30-6	660	N-NITROSODIPHENYLAMINE	U
101-55-3	660	4-BROMOPHENYL PHENYL ETHER	U
118-74-1	660	HEXACHLOROBENZENE	U
87-86-5	3300	PENTACHLOROPHENOL	U
85-01-8	660	PHENANTHRENE	U
120-12-7	660	ANTHRACENE	U
84-74-2	660	DI-N-BUTYL PHTHALATE	U
206-44-0	660	FLUORANTHENE	U
129-00-0	660	PYRENE	U
85-68-7	660	BUTYLBENZYL PHTHALATE	U
91-94-1	1300	3,3'-DICHLOROBENZIDINE	U
56-55-3	660	BENZO(A)ANTHRACENE	U
218-01-9	660	CHRYSENE	U
117-81-7	660	BIS(2-ETHYLHEXYL) PHTHALATE	U
117-84-0	660	DI-N-OCTYL PHTHALATE	U
205-99-2	660	BENZO(B)FLUORANTHENE	U
207-08-9	660	BENZO(K)FLUORANTHENE	U
50-32-8	660	BENZO(A)PYRENE	U
193-39-5	660	INDENO(1,2,3-CD)PYRENE	U
53-70-3	660	DIBENZO(A,H)ANTHRACENE	U
191-24-2	660	BENZO(G,H,I)PERYLENE	U

OTHER SEMIVOLATILE ORGANICS FOR SAMPLE NUMBER: 1W2123

~~TRIETHYLENE GLYCOL (C6 H10 O4)~~		~~22000 T~~
~~ISOCYANATO-METHYL BENZENE (C8 H7 O N)~~		~~600 T~~
~~DIHYDRO-INDOLONE (C8 H7 O N)~~		~~2600 T~~
~~ALKANE~~		~~1000 T~~
~~ALKANE~~		~~3100 T~~
~~ALKANE~~		~~160000 T~~
~~ALKANE~~		~~21000 T~~
UNIDENTIFIED		26000 E
UNIDENTIFIED		33000 E
UNIDENTIFIED		30000 E
UNIDENTIFIED		18000 E
UNIDENTIFIED		19000 E
UNIDENTIFIED		17000 E
UNIDENTIFIED		160000 E
UNIDENTIFIED		7200 E
UNIDENTIFIED		6800 E
UNIDENTIFIED		32000 E
UNIDENTIFIED		43000 E
UNIDENTIFIED		24000 E
UNIDENTIFIED		13000 E

TQL= TARGET QUANTITATION LIMIT
T= TENTATIVELY IDENTIFIED ESTIMATED CONC.
E= ESTIMATED CONCENTRATION
U= COMPOUND ANALYZED FOR NOT DETECTED
N= COMPOUND NOT ANALYZED FOR
D= DETECTED BELOW QUANTITATION LIMIT
H= HOLDING TIME EXCEEDED
TQL SUBJECT TO CHANGE DUE TO INSTRUMENT SENSITIVITY

DIVISION OF ENVIRONMENTAL MANAGEMENT WATER QUALITY FIELD-LAB FORM (DM1)

(1)

For Lab Use ONLY
Lab Number: IW 2122
Date Received: 7/12/91 Time: 9:00
Rec'd by: DS From: Bus Courier Hand Del
DATA ENTRY BY: CK:
DATE REPORTED:

COUNTY Union
RIVER BASIN Yad
REPORT TO: ARO FRO MRO RRO WaRO WIRO WSRO TS AT BM
Other
Shipped by: Bus Courier, Staff, Other
COLLECTOR(S): T. Parker
Estimated BOD Range: 0-5/5-25/25-65/40-130 or 100 plus
Seed: Yes ☐ No ☐ Chlorinated: Yes ☐ No ☐

PRIORITY: ☐ AMBIENT ☐ QA ☐ COMPLIANCE ☑ CHAIN OF CUSTODY ☐ EMERGENCY

SAMPLE TYPE: ☐ STREAM ☐ EFFLUENT ☐ OTHER ☐ INFLUENT ☐ ESTUARY

CHAIN OF CUSTODY

Culvert & Process Runoff

STATION LOCATION: Chemstreams Inc.

REMARKS: @ Culvert discharge from Chemstreams outside fence

Station #	Date Begin (yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H L	Composite T S B	Sample Type C G GNXX
C.I. - 1	91 07 11	1530						

1		BOD5 310	mg/l		Chloride 940	mg/l		NH3 as N 610	mg/l	X	Li-Lithium 1132 <25 ug/l
2		COD High 340	mg/l		Chl a: Tri 32217	ug/l		TKN as N 625	mg/l	X	Mg-Magnesium 927 13 mg/l
3		COD Low 335	mg/l		Chl a: Corr 32209	ug/l		NO2 plus NO3 as N 630	mg/l	X	Mn-Manganese 1055 20000 ug/l
4		Coliform: MF Fecal 31616	/100ml		Pheophytin a 32213	ug/l		P: Total as P 665	mg/l	X	Na-Sodium 929 240 mg/l
5		Coliform: MF Total 31504	/100ml		Color: True 80	Pt-Co		PO4 as P 70507	mg/l	X	[redacted] ug/l
6		Coliform: Tube Fecal 31615	/100ml		Color:(pH) 83	ADMI		P: Dissolved as P 666	mg/l	X	Se-Selenium 1147 omit ug/l
7		Coliform: Fecal Strep 31673	/100ml		Color: pH 7.6 82	ADMI				X	Hg-Mercury 71900 <.20 ug/l
8		Residue: Total 500	mg/l	X	Cyanide 720	mg/l	X	Cd-Cadmium 1027 53 ug/l			Organochlorine Pesticides
9		Volatile 505	mg/l		Fluoride 951	mg/l	X	Cr-Chromium Total 1034 110 ug/l			Organophosphorus Pesticides
10		Fixed 510	mg/l		Formaldehyde 71880	mg/l	X	Cu-Copper 1042 44 ug/l		X	PCB's
11		Residue: Suspended 530	mg/l	X	Grease and Oils 556 omit	mg/l	X	Ni-Nickel 1067 51 ug/l			Acid Herbicides
12		Volatile 535	mg/l		Hardness Total 900	mg/l	X	Pb-Lead 1051 [illegible] ug/l			
13		Fixed 540	mg/l		Specific Cond. 95	uMhos/cm²	X	Zn-Zinc 1092 17000 ug/l		X	Base/ Neutral Extractable Organics
14		pH 403	units		MBAS 38260	mg/l				X	Acid Extractable Organics
15		Acidity to pH 4.5 436	mg/l		Phenols 32730	ug/l	X	Ag-Silver 1077 <5.0 ug/l		X	
16		Acidity to pH 8.3 435	mg/l		Sulfate 945	mg/l	X	Al-Aluminum 1105 35000 ug/l		X	Purgeable Organics (VOA bottle req'd)
17		Alkalinity to pH 8.3 415	mg/l		Sulfide 745	mg/l	X	Be-Beryllium 1012 Omit ug/l			
18		Alkalinity to pH 4.5 410	mg/l				X	Ca-Calcium 916 360 mg/l			V,S
19		TOC 680	mg/l				X	Co-Cobalt 1037 omit ug/l			
20		Turbidity 76	NTU				X	Fe-Iron 1045 190000 ug/l			Phytoplankton

Sampling Point %	Conductance at 25 C	Water Temperature (C)	D.O. mg/l	pH	Alkalinity pH 8.3	Alkalinity pH 4.5	Acidity pH 4.5	Acidity pH 8.3	Air Temperature (C)
2	94	10 31	300	400 6.3	82244	431	82243	82242	20
	Salinity %	Precipitation (in/day)	Cloud Cover %	Wind Direction (Deg)	Stream Flow Severity	Turbidity Severity	Wind Velocity M/H	Mean Stream Depth ft.	Stream Width ft.
	480	45 0	32 30	36 10	1351	1	35 3	64	4

Glycols, Alcohols, Esters, Brake Fluid, windshield cleaner fluid, petroleum products suspected

SEMIVOLATILE ORGANICS REPORT - DEM LAB

LAB NUMBER: 1W2122 SUPERVISOR RSK 1W2122
DATE: 7/23/91

REPORTED BY MD
CHECKED BY DTD
REVIEWED BY DTD

ENTERED BY DD 7/24/91
CHECKED BY _____

~~SAMPLE TYPE: WATER~~ DILUTION FACTOR: 10

CAS NUMBER	TQL X 10		CONC. UG/L
108-95-2	10	~~PHENOL~~	~~NONE~~
111-44-4	10	BIS(2-CHLOROETHYL) ETHER	U
95-57-8	10	2-CHLOROPHENOL	U
541-73-1	10	1,3-DICHLOROBENZENE	U
106-46-7	10	1,4-DICHLOROBENZENE	U
100-51-6	20	BENZYL ALCOHOL	U
95-50-1	10	1,2-DICHLOROBENZENE	U
95-48-7	10	2-METHYLPHENOL	U
108-60-1	10	BIS(2-CHLOROISOPROPYL) ETHER	U
106-44-5	10	4-METHYLPHENOL	U
621-64-7	10	N-NITROSO-DI-N-PROPYLAMINE	U
67-72-1	10	HEXACHLOROETHANE	U
98-95-3	10	NITROBENZENE	U
78-59-1	10	ISOPHORONE	U
88-75-5	10	2-NITROPHENOL	U
105-67-9	10	2,4-DIMETHYLPHENOL	U
65-85-0	50	BENZOIC ACID	U
111-91-1	10	BIS(2-CHLOROETHOXY) METHANE	U
120-83-2	10	2,4-DICHLOROPHENOL	U
120-82-1	10	1,2,4-TRICHLOROBENZENE	U
91-20-3	10	NAPHTHALENE	U
106-47-8	20	4-CHLOROANILINE	U
87-68-3	10	HEXACHLOROBUTADIENE	U
59-50-7	20	4-CHLORO-3-METHYLPHENOL	U
91-57-6	10	2-METHYLNAPHTHALENE	U
77-47-4	10	HEXACHLOROCYCLOPENTADIENE	U
88-06-2	10	2,4,6-TRICHLOROPHENOL	U
95-95-4	10	2,4,5-TRICHLOROPHENOL	U
91-58-7	10	2-CHLORONAPHTHALENE	U
88-74-4	50	2-NITROANALINE	U
131-11-3	10	DIMETHYL PHTHALATE	U
208-96-8	10	ACENAPHTHYLENE	U
606-20-2	10	2,6-DINITROTOLUENE	U
99-09-2	50	3-NITROANALINE	U
83-32-9	10	ACENAPHTHENE	U
51-28-5	50	2,4-DINITROPHENOL	U
100-02-7	50	4-NITROPHENOL	U
132-64-9	10	DIBENZOFURAN	U
121-14-2	10	2,4-DINITROTOLUENE	U
84-66-2	10	DIETHYL PHTHALATE	U
7005-72-3	10	4-CHLOROPHENYL PHENYL ETHER	U
86-73-7	10	FLUORENE	U
100-01-6	50	4-NITROANALINE	U
534-52-1	50	4,6-DINITRO-2-METHYL PHENOL	U

SEMIVOLATILE ORGANICS REPORT - DEM LAB

86-30-6	10	N-NITROSODIPHENYLAMINE	U
101-55-3	10	4-BROMOPHENYL PHENYL ETHER	U
118-74-1	10	HEXACHLOROBENZENE	U
87-86-5	50	PENTACHLOROPHENOL	U
85-01-8	10	PHENANTHRENE	U
120-12-7	10	ANTHRACENE	U
84-74-2	10	DI-N-BUTYL PHTHALATE	U
206-44-0	10	FLUORANTHENE	U
129-00-0	10	PYRENE	U
85-68-7	10	BUTYLBENZYL PHTHALATE	U
91-94-1	20	3,3'-DICHLOROBENZIDINE	U
56-55-3	10	BENZO(A)ANTHRACENE	U
218-01-9	10	CHRYSENE	U
117-81-7	10	BIS(2-ETHYLHEXYL) PHTHALATE	U
117-84-0	10	DI-N-OCTYL PHTHALATE	U
205-99-2	10	BENZO(B)FLUORANTHENE	U
207-08-9	10	BENZO(K)FLUORANTHENE	U
50-32-8	10	BENZO(A)PYRENE	U
193-39-5	10	INDENO(1,2,3-CD)PYRENE	U
53-70-3	10	DIBENZO(A,H)ANTHRACENE	U
191-24-2	10	BENZO(G,H,I)PERYLENE	U

OTHER SEMIVOLATILE ORG NICS FOR SAMPLE NUMBER:1W2122

BUTOXYETHANOL	(C6.H14.O2)	2200	T
HEXANOIC ACID	(C6.H12.O2)	3000	T
UNIDENTIFIED		15000	E
BENZOIC ACID AMMONIUM SALT (C7.H9.O2.N)		2800	T
TRIETHYLENEGLYCOL	(C6.H14.04)	60000	T
UNIDENTIFIED		1100	E
METHYLPROPYL ESTER BENZOIC ACID	(C11.H14.O2)	950	T
BUTOXYETHOXYETHOXYETHANOL	(C10.H22.04)	2100	T
METHYL METHYLPROPYL ESTER BENZOIC ACID	(C12.H16.02)	1000	T
UNIDENTIFIED		2600	E
UNIDENTIFIED		1900	E
UNIDENTIFIED		2900	E
UNIDENTIFIED		1700	E
UNIDENTIFIED		3400	E
UNIDENTIFIED		570	E
UNIDENTIFIED		2600	E
UNIDENTIFIED		1700	E
UNIDENTIFIED		780	E
UNIDENTIFIED		580	E
UNIDENTIFIED		1200	E

TQL= TARGET QUANTITATION LIMIT
T= TENTATIVELY IDENTIFIED ESTIMATED CONC.
E= ESTIMATED CONCENTRATION
U= COMPOUND ANALYZED FOR NOT DETECTED
N= COMPOUND NOT ANALYZED FOR
D= DETECTED BELOW QUANTITATION LIMIT
H= HOLDING TIME EXCEEDED
TQL SUBJECT TO CHANGE DUE TO INSTRUMENT SENSITIVITY

LAB #: 1W2122

PESTICIDES ANALYTICAL REPORT

REPORTED BY: HC

CHECKED BY: HB

REVIEWED BY: HB

SUPERVISOR: REK 7/31/91

ENTERED BY: Da

CHECKED BY:

DATE: 7/31/91

SAMPLE TYPE: WATER

ANALYSIS RESULTS

CAS NO.	CHLORINATED PESTICIDES BY ECD	TQL UG/L	CONCENTRATION DETECTED (UG/L)
309-00-2	ALDRIN	0.02	N
57-74-9	CHLORDANE,TECHNICAL	0.90	N
5103-71-9	CHLORDANE-ALPHA	0.02	N
5103-74-2	CHLORDANE-GAMMA	0.02	N
2794-48-3	CHLORDENE	0.02	N
2675-77-6	CHLORONEB	0.15	N
501-15-6	CHLOROBENZILATE	0.51	N
2921-88-2	CHLOROTHALONIL	0.03	N
1897-45-6	DCPA	0.09	N
53-19-0	DDD, op	0.05	N
72-54-8	DDD, pp	0.04	N
3424-82-6	DDE, op	0.02	N
72-55-9	DDE, PP	0.02	N
789-02-6	DDT, op	0.04	N
50-29-3	DDT, pp	0.02	N
60-57-1	DIELDRIN	0.02	N
959-98-9	ENDOSULFAN I	0.03	N
33213-65-9	ENDOSULFAN II	0.02	N
1031-07-8	ENDOSULFAN SULFATE	0.02	N
72-20-8	ENDRIN	0.03	N
7421-93-4	ENDRIN ALDEHYDE	0.06	N
53494-70-5	ENDRIN KETONE	0.06	N
2593-15-9	ETHAZOLE	0.03	N
319-84-6	BHC-ALPHA	0.02	N
319-85-7	BHC-BETA	0.03	N
58-89-9	BHC-GAMMA (LINDANE)	0.02	N
76-44-8	HEPTACHLOR	0.02	N
1024-57-3	HEPTACHLOR EPOXIDE	0.02	N
118-74-1	HEXACHLOROBENZENE	0.01	N
121-75-5	MALATHION	0.24	N
72-43-5	METHOXYCHLOR, pp	0.05	N
2385-85-5	MIREX	0.03	N
39765-80-5	TRANS-NONACHLOR	0.02	N

CAS NO.	CHLORINATED PESTICIDES BY ECD	TQL UG/L	CONCENTRATION DETECTED (UG/L)
26880-48-8	OXYCHLORDANE	0.03	N
52645-53-1	CIS-PERMETHRIN	NE	N
52645-53-1	TRANS-PERMETHRIN	NE	N
1918-16-7	PROPACHLOR	NE	N
117-18-0	TECNAZENE	0.02	N
1582-09-8	TRIFLURALIN	0.02	N
12674-11-2	AROCHLOR 1016	0.88	U
11104-28-2	AROCHLOR 1221	2.2	U
11141-16-5	AROCHLOR 1232	2.2	U
53469-21-9	AROCHLOR 1242	0.80	U
12672-29-6	AROCHLOR 1248	1.7	U
11097-69-1	AROCHLOR 1254	1.5	U
11096-82-5	AROCHLOR 1260	1.4	U
8001-35-2	TOXAPHENE	1.5	N
	CHLORINATED ACIDS BY ECD		
50594-66-6	ACIFLUORFEN	0.15	N
25057-89-0	BENTAZON	0.50	N
133-90-4	CHLORAMBEN	0.20	N
94-75-7	2,4-D	0.39	N
75-99-0	DALAPON	NE	N
94-82-6	2,4-DB	1.1	N
	DCPA(ACID METABOLITES)	0.09	N
1918-00-9	DICAMBA	0.23	N
51-36-5	3,5-DICHLOROBENZOIC ACID	0.23	N
120-36-5	DICHLORPROP	0.34	N
88-85-7	DINOSEB	0.12	N
7600-50-2	5-HYDROXYDICAMBA	0.20	N
100-02-7	4-NITROPHENOL	0.30	N
87-86-5	PENTACHLOROPHENOL	0.03	N
1918-02-1	PICLORAM	0.30	N
93-76-5	2,4,5-T	0.09	N
93-72-1	2,4,5-TP	0.06	N

PESTICIDE ANALYTICAL REPORT

LAB #: 1N2122

CAS NO.	ORGANOPHOSPHATE PESTICIDES BY FPD	TQL UG/L	CONCENTRATION DETECTED (UG/L)
786-19-6	CARBOPHENOTHION	4.0	N
2921-88-2	CHLORPYRIFOS	1.5	N
50-29-3	DDE	2.4	N
298-03-3	DEMETON	1.3	N
333-41-5	DIAZINON	0.80	N
[illegible]4-51-5	DIMETHOATE	3.5	N
2104-64-5	EPN	4.0	N
563-12-2	ETHION	1.3	N
13194-48-4	ETHOPROP	1.0	N
55-38-9	FENTHION	1.5	N
115-90-2	FENSULFOTHION	[illegible].0	N
150-50-5	FOLEX	2.0	N
[illegible]22-4	MONOCROTOPHOS	10.0	N
[illegible]7[illegible]-5	NALED	4.0	N
[illegible] 15-2	PARATHION, ETHYL	0.65	N
[illegible]-[illegible]-0	PARATHION, METHYL	0.75	N
[illegible] 16-0	PHORATE	0.35	N
2[illegible]-[illegible]-2	[illegible]	0.75	N
[illegible]-24-5	[illegible]	0.25	N
	NITROGEN/PHOSPHOROUS PESTICIDES BY NPD		
15972-60-8	ALACHLOR	5.0	N
834-12-8	AM[illegible]N	5.0	N
1912-24-9	ATRAZINE	2.6	N
314-40-9	BROMACIL	20	N
23184-66-9	BUTACHLOR	24	N
2008-41-5	BU[illegible]YLATE	2.6	N
5234-68-5	CARBOXIN	18	N
101-21-3	CHLOROPROP	11	N
1134-23-2	CYCLOATE	3.0	N
333-41-5	DIAZINON	0.10	N
62-73-7	DICHLORVOS	0.06	N
[illegible]7-51-7	DIPHENAMID	12	N
298-04-4	DISULFOTON	0.20	N
2497-06-5	DISULFOTON SULFONE	10	N

CAS NO.	NITROGEN/PHOSPHOROUS PESTICIDES BY NPD	TQL UG/L	CONCENTRATION DETECTED (UG/L)
2497-07-6	DISULFOTON SULFOXIDE	0.16	N
759-94-4	EPTC(EPTAM)	2.4	N
13194-48-4	ETHOPROP	0.20	N
22224-92-6	FENAMIPHOS	0.50	N
51235-04-2	HEXAZINONE	18	N
150-50-5	MERPHOS	7.6	N
51218-45-2	METOLACHLOR	24	N
21087-64-9	METRIBUZIN	4.0	N
7786-34-7	MEVINPHOS	0.34	N
113-48-4	MGK 264	22	N
2212-67-1	MOLINATE	3.6	N
15299-99-7	NAPROPAMIDE	7.6	N
27314-13-2	NORFLURAZON	10	N
1114-71-2	PEBULATE	2.6	N
1610-18-0	PROMETON	200	N
7287-19-6	PROMETRYN	5.0	N
23950-58-5	PRONAMIDE	20	N
139-40-2	PROPAZINE	3.6	N
122-34-9	SIMAZINE	30	N
1014-70-6	SIMETRYN	5.0	N
34014-18-1	TEBUTHIURON	6.0	N
5902-51-2	TERBACIL	20	N
13071-79-9	TERBUFOS	0.16	N
886-50-0	TERBUTRYN	5.0	N
1929-77-7	VERNOLATE	3.6	N

TQL-TARGET QUANTITATION LIMIT

NE- NO ESTABLISHED TQL

E- ESTIMATED VALUE

U- SAMPLE ANALYZED FOR THIS COMPOUND BUT NOT DETECTED

N- SAMPLE NOT ANALYZED FOR THIS COMPOUND

T- TENTATIVELY IDENTIFIED BUT UNABLE TO CONFIRM

19 UNIDENTIFIED PEAKS DETECTED BY GC/ECD - PEST EXTRACTION

Ref. 15H

DISTECH INC

4 November 1991

N. C. DEPT. OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

NOV 1 2 1991

DIVISION OF ENVIRONMENTAL MANAGEMENT
MOORESVILLE REGIONAL OFFICE

Mr. Tony Parker
Water Quality Section
N.C. Dept. of Environment, Health and Natural Resources
919 N. Main St.
Mooresville, NC 28115

Dear Mr. Parker:

This letter confirms Distech's verbal report and our telephone conversation of October 25, 1991 regarding a water/ethylene glycol mixture spill at our plant on Gribble Road in Stallings, NC.

At approximately 10:30 pm on October 24, 1991 our shift supervisor noticed liquid flowing from the filter press feed tank onto the filter press room floor and out onto the ground near the building. The cause of the spill was the bottom outlet valve on the tank had been inadvertently left open, thus permitting the liquid feed to escape, unnoticed, from the tank. Immediately, upon seeing the spill, the supervisor closed the valve, shut off the feed, and initiated flushing with water the ground upon which the mixture had come to rest.

The terrain is sloped so that surface water flows directly to a sump pump which automatically pumps any fluid into a nearby diked area. Also, there is a built up mound of soil along the property line so that any surface flow is kept on our property. Consequently, the spilled water/glycol mixture was contained on our property and quickly diluted, flushed and pumped to a diked containment area for future disposal. Also, we followed our prescribed practice of shoveling any dirt, gravel, soil, etc. that had been wetted by the mixture into drums.

Tank measurements indicate approximately 1500 gallons of the water/glycol mixture escaped onto the ground. At least that amount of water was used to flush the spilled liquid to the sump pump. The mixture was 90-95% ethylene glycol.

The contents of the diked area which contains primarily rainwater, is periodically pumped into tank trucks and hauled to a waste water disposal facility. We have used James Waste Oil in Charlotte, NC and Moreco Motor Oils Co., outside of Chicago, Illinois. The drums of gravel, sand, etc. are presently stored on site ready for disposal. We do not have many, maybe 6 to 8. Although these are nonhazardous per se, a method of disposal has yet to be decided upon, such as subsequent simple landfill disposal.

The operator who left the valve open, albeit a short time, has been admonished and put on notice that it shall not happen again. We are intensifying our efforts to make our operators understand that the environment is everyone's responsibility and our objective is "no spills", large or small. Also, please note that we are planning to further dike and grade the Northeast corner of our plant to facilitate surface water to flow more quickly into the sump pump.

I appreciate your courtesy and advice. If you have any questions, do not hesitate to call me at (704) 821-4311.

Regards,

Ray Collins

Ray Collins

RC/jw
cc: Will Oliver
Darrell Patton
William D. Gabbard

3481 GRIBBLE ROAD / MATTHEWS, NORTH CAROLINA 28106 / (704) 821-4038 / FAX (703) 821-4317

Chris

Ref. 151

State of North Carolina
Department of Environment, Health, and Natural Resources
Mooresville Regional Office

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Albert F. Hilton, Regional Manager

DIVISION OF ENVIRONMENTAL MANAGEMENT

November 4, 1991

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Chemstreams, Inc.
Post Office Box 1565
Matthews, North Carolina 28106
Attn: Mr. Will Oliver

RE: Notice of Violation
15A NCAC 2L Classifications and
Water Quality Standards Applicable
to the Groundwaters
Chemstreams, Inc.
Union County, N.C.

Dear Sirs:

Chapter 143, North Carolina General Statutes, authorizes and directs the Environmental Management Commission of the Department of Environment, Health, and Natural Resources to protect and preserve the water and air resources of the State. The Division of Environmental Management has the delegated authority to enforce adopted pollution control rules.

Based upon sample results from a monitor well immediately downgradient of your facilities located at 3501 Gribble Road, Stallings in Union County, the Division has reason to believe that you are responsible for activities resulting in noncompliance with North Carolina law. You had the well sampled on August 27, 1991. Diethylene glycol was detected in the sample.

Specific violations of 15A NCAC 2L .0103(d) - No person shall conduct or cause to be conducted any activity which causes the concentration of any substance to exceed that specified in 15A NCAC 2L .0202 - are as follows:

919 North Main Street, Mooresville, N.C. 28115 • Telephone 704-663-1699 • FAX 704-663-6040

An Equal Opportunity Affirmative Action Employer

Constituent	Concentration	2L Standard
Diethylene glycol	2.5 ppm	ND

ppm - parts per million
ND - not permitted in detectable concentrations

You are responsible for causing, contributing to and allowing the continuing violation of the underground water quality standards because you store, process, and repackage ethylene glycol, diethylene glycol, and triethylene glycol at your facility. According to 15A NCAC 2L .0106(c)(1), you are required to assess the cause, significance and extent of the violation, submit a plan for eliminating the source and for restoration of the groundwater, and implement this plan in accordance with a Special Order by Consent or a Special Order of the Environmental Management Commission.

To achieve compliance with the above-cited laws or regulations, you are required to submit within sixty (60) days from receipt of this letter a site assessment report as prescribed in the enclosed outline. This data will then be used to submit a remedial action plan which will be due within sixty (60) days after the site assessment report is submitted and approved by this Office.

The above violation of 15A NCAC 2L is subject to a civil penalty assessment under the authority of G.S. 143-215.6A of not more than $10,000.00 per day per violation. Failure to respond within the time specified and to voluntarily achieve compliance may result in a recommendation for enforcement, the issuance of a special order against you under the authority of G.S. 143-215.2, or a request to the Attorney General to institute an action for injunctive relief.

Your response and/or questions should be directed to Chris DeRoller of the Mooresville Regional Office at (704) 663-1699.

Sincerely,

Brenda J. Smith

Brenda J. Smith, P.G.
Regional Supervisor

cc: Perry Nelson, Groundwater Section Chief
Rex Gleason, Water Quality Supervisor - Mooresville Regional Office

Enclosure

CMD:fk

Ref. 15J

NORTH CAROLINA DIVISION OF EMERGENCY MANAGEMENT EMERGENCY REPORT FORM
Taken By: JST Date Reported: 21492 Time Reported: 1033
Reported By: WHITAKER Agency: UCC Phone: 289-1591
Date Occrd: 21492 Time Occrd: 1033 Day Occrd: 6
County: UNION DEM Area: E
Weather: Chemicals: GLYCOL FNF:
NON-FNF Events: SAR: Others:
Event Description: FIRE INVOLVING ETHELYNE GLYCOL

Event Location: SUMMIT RESOURCES, 3501 GRIBBLE ROAD, STALLINGS

State Agencies A/C: A SHP: EnvMngt: Water: RPS: Land: DOT:
Other State Agencies:
Local Agencies LEMC: A SO: PD: LFD: Y CHealth: Sewer: PWrk:
Other Local Agencies:
Affected Persons: Dwellings: Area Affected: IMMEDIATE AREA
State Assistance Requested: Special Resources:
Deaths: Injured: Hospitalized: Evacuated: Businesses:
Shelters: Put shelter locations and # of Shelterees on next page (Press Pg Dn)
Misc. or Call Back Info: (Press Pg Dn)

Attachment : STATIONS 19, 20, 23 RESPONDED. NO RUNOFF.

Bill Penny
(615) 742-9346 O
(615) 363-0833 H
(615) 330-0313

John Blazek
Figure

(20 minutes)

File

Ref. 15K

State of North Carolina
Department of Environment, Health, and Natural Resources
Mooresville Regional Office

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Albert F. Hilton, Regional Manager

DIVISION OF ENVIRONMENTAL MANAGEMENT

March 26, 1992

Mr. Quay Whitesides
Union County Department of Public Works
Post Office Box 987
Monroe, North Carolina 28110

Subject: Complaint Investigation
Summit Resources, Inc. (Formerly Chemstreams)
Union County, N. C.

Dear Mr. Whitesides:

Attached please find a copy of the Report of Investigation prepared by Mr. Tony R. Parker with this Office, regarding the complaint filed by you on March 11, 1992.

The Report should be self-explanatory; however, should there be any questions or if you should need assistance from this Office in the future, please do not hesitate to contact Mr. Parker or me.

Sincerely,

D. Rex Gleason

D. Rex Gleason, P. E.
Water Quality Regional Supervisor

Attachment

TRP:fk

P.O. Box 950, 919 North Main Street, Mooresville, N.C. 28115-0950 • Telephone 704-663-1699 • FAX 704-663-6040

An Equal Opportunity Affirmative Action Employer

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH
AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT
WATER QUALITY SECTION
POST OFFICE BOX 950
MOORESVILLE, NORTH CAROLINA 28115

REPORT OF: Complaint Investigation

PLACE VISITED: Summit Resources, Inc. (Formerly Chemstreams)
Union County

DATE: 920312

ADDRESS: 3501 Gribble Road, Matthews, N.C. 28105

RIVER BASIN: Yadkin

BY WHOM: Tony R. Parker TRP & Richard M. Bridgeman

TIME SPENT: 6 hours

PERSONS CONTACTED: Quay Whitesides (Complainant) and Bob Kuhn, Plant Manager for Summit Resources

REASON FOR VISIT: MRO received a complaint from Mr. Quay Whitesides indicating that ethelyne glycol was being detected in South Fork Crooked Creek.

COPIES TO: Mr. Tom Ward, Union County Environmental Health Dept.
Ms. Brenda Smith, DEM
Ms. Barbara Christian, DEM - Groundwater

REPORT:

Investigators, Tony Parker (writer) and Richard Bridgeman, responded to the complaint and visited Mr. Whitesides (complainant) and discussed the situation. Mr. Whitesides is employed by the Union County Public Works Department as a wastewater treatment plant operator. He indicated that while collecting stream samples on 3-11-92 that he detected ethelyne glycol in South Fork Crooked Creek at U.S. Highway 74. He also stated that area golfers had told him they had observed several dead muskrats and dead fish on the golf course impoundment. (South Fork Crooked Creek runs through the golf course impoundment and is located approximately 3.0 miles from the Summit facility). Mr. Whitesides further indicated the the glycol contamination was suspected as originating at the Summit Resources, Inc. facility (formerly Chemstreams). After discussing the problem with Mr. Whitesides the investigators proceeded to Summit Resources. After arriving at the site, the investigators walked the outer perimeter of the property (Wagoner property). No discharges were observed other than rain water.

The investigators then entered the Summit facility and met with a Mr. Bob Kuhn, (Plant Manager for Summit) and discussed the alleged complaint. Mr. Kuhn stated that no discharges had occurred at the site and that he was not aware of any major problems. A site inspection of the premises was permitted. During the investigation no discharges were observed; however, an abandoned septic tank was being pumped out by Summit employees. The plant manager stated that the septic tank is no longer used and had previously been used for domestic waste. He stated that they are currently discharging their domestic waste to the City of Monroe's Wastewater Treatment Plant. The Company apparently discovered that the abandoned septic tank was filling up with glycol product via infiltration of groundwater. Employees were observed to be pumping, what appeared to be pure ethelyne glycol from the abandoned septic tank into a containment basin. This action appeared to be taken to prevent further groundwater contamination due to product migration. The investigators then proceeded off-site to a unnamed tributary to South Fork Crooked Creek which is approximately 0.3 mile downgradient from the Company. Glycol odors were detected in the unnamed tributary and water samples were collected. The investigators determined that the unnamed tributary was not receiving any direct flow from any nearby sources and that the headwaters of the unnamed tributary was in fact 0.3 miles from Summit Resources. The investigators then departed. After returning to MRO the samples collected during the investigation were shipped to the DEM Lab in Raleigh for analyses. Results of the analyses have indicated extremely high levels of ethelyne glycol, glycol constituents and other contaminants (see attached lab report).

Conclusion:

No water quality violations were observed at the Summit facility and no discharges were observed from the Company. Water quality contamination does, however, exist off site. The contamination appears to originate from Groundwater sources; therefore, the Groundwater Section will be advised of the situation.

Attachment

TRF:fk

Ref. 15L

MOORESVILLE REGIONAL OFFICE
WATER QUALITY SECTION
MOORESVILLE, N. C.

March 26, 1992

MEMORANDUM TO: Barbara Christian

FROM: D. Rex Gleason

PREPARED BY: Tony R. Parker TRP

SUBJECT: Summit Resources Management, Inc. (formerly Chemstreams)
Union County, N. C.

This is to advise that the Water Quality Section has received additional complaints in reference to the subject facility. Members of the Water Quality Staff have investigated, and it has been determined that possible additional Groundwater problems exist at the site which are adversely impacting surface waters. During a recent investigation, Water Quality staff discovered that an abandoned septic tank contained what appeared to be nearly pure product (ethelyne glycol). A slight oil sheen was also visible on the surface of the glycol product. The Company has reported that all their domestic waste goes to the City of Monroe, and that the septic system is no longer being used for domestic waste or any other purpose. During the investigation no spillages or direct discharges were observed. Glycols and other contaminants were detected in a stream (unnamed tributary to South Fork Crooked Creek) which neither originates on or passes through the site. The stream originates approximately 0.3 miles downgradient from the Company. Water quality samples collected from this intermittent stream indicate ethelyne glycol contamination. Concentration values of 3,400,000 ug/1 were measured. Other similar glycol constituents were also detected (see attached report). Since no discharges to surface waters or spillages were occurring at the Company, the investigators suspect that contamination on site, possibly from the abandoned septic tank, is infiltrating the groundwater and resurfacing off-site. We have also received reports of dead fish and muskrats up to 3.0 miles below the site (in and around South Fork Crooked Creek). Union County Public Works employees have also detected ethelyne glycol in this creek at U. S. Highway 74.

In light of the fact that surface waters are adversely being impacted as a result of what appears to be groundwater contamination, it is suggested that this matter receive some priority, and that efforts be initiated so as to eliminate the impact to surface waters and the surrounding environment. It should also be noted that Raleigh's Aquatic Toxicology Unit has determined that the values noted for several of the constituents

are acutely toxic to aquatic life and pose an endangerment to the environment. Ethelyne glycol is also known to be very poisonous to animals. The Union County Environmental Health Department has been contacted concerning the situation and the abandoned septic tank. They are currently researching their files for any records on the facility, and information will be provided to this Office.

Attachment

cc: Brenda J. Smith

TRP:fk

[redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted]

IVISION OF ENVIRONMENTAL MANAGEMENT — WATER QUALITY FIELD LAB FORM (DM[redacted]

(2)

Lab Use ONLY
Lab Number: 2W1241
Date Received: 3-13-92 Time: 8:30
Rec'd by: DG | From: Bus Courier Hand Del
DATA ENTRY BY: PG CK: DS
DATE REPORTED: 3-23-92

OUNTY Union

IVER BASIN YAD

EPORT TO: ARO FRO MRO RRO WaRO WIRO WSRO TS T BM

ther

hipped by: Bus Courier Staff, Other

OLLECTOR(S): T. Parker / R. Bridgeman

PRIORITY: ☐ AMBIENT ☐ QA ☐ COMPLIANCE ☑ CHAIN OF CUSTODY ☑ EMERGENCY

SAMPLE TYPE: ☐ STREAM ☐ EFFLUENT ☐ LAKE ☐ INFLUENT ☐ ESTUARY

STATION LOCATION: U.T. to South Fork Crooked Creek near Summit Reservoir

stimated BOD Range: 0-5/5-25/25-65/40-130 or 100 plus

ed: Yes ☐ No ☐ Chlorinated: Yes ☐ No ☑

REMARKS: Suspect glycol contamination

Station	Date Begin (yy/mm/dd)	Time Begin	Date End	Time End	Depth DM DB DBM	Value Type A H I	Composite T S B	Sample Type C G GNXX
741 SR. UT.S.F. -2	92 03 12	1330						

1		BOD5 310	mg/l		Chloride 940	mg/l		NH3 as N 610	mg/l		Li-Lithium 1132 ug/l
2		COD High 340	mg/l		Chl a: Trl 32217	ug/l		TKN as N 625	mg/l		Mg-Magnesium 927 mg/l
3		COD Low 335	mg/l		Chl a: Corr 32209	ug/l		NO2 plus NO3 as N 630	mg/l		Mn-Manganese 1055 ug/l
4		Coliform: MF Fecal 31616	/100ml		Pheophytin a 32213	ug/l		P: Total as P 665	mg/l		Na-Sodium 929 mg/l
5		Coliform: MF Total 31504	/100ml		Color: True 80	Pt-Co		PO4 as P 70507	mg/l		Arsenic:Total 1002 ug/l
6		Coliform: Tube Fecal 31615	/100ml		Color:(pH) 83	ADMI		P: Dissolved as P 666	mg/l		Se-Selenium 1147 ug/l
7		Coliform: Fecal Strep 31673	/100ml		Color: pH 7.6 82	ADMI					Hg-Mercury 71900 ug/l
8		Residue: Total 500	mg/l		Cyanide 720	mg/l		Cd-Cadmium 1027	ug/l		Organochlorine Pesticides
9		Volatile 505	mg/l		Fluoride 951	mg/l		Cr-Chromium:Total 1034	ug/l		Organophosphorus Pesticides
10		Fixed 510	mg/l		Formaldehyde 71880	mg/l		Cu-Copper 1042	ug/l		
11		Residue: Suspended 530	mg/l		Grease and Oils 556	mg/l		Ni-Nickel 1067	ug/l		Acid Herbicides
12		Volatile 535	mg/l		Hardness Total 900	mg/l		Pb-Lead 1051	ug/l		
13		Fixed 540	mg/l		Specific Cond. 95	uMhos/cm 2		Zn-Zinc 1092	ug/l	X	Base/ Neutral Extractable Organics
14		pH 403	units		MBAS 38260	mg/l				X	Acid Extractable Organics
15		Acidity to pH 4.5 436	mg/l		Phenols 32730	ug/l		Ag-Silver 1077	ug/l	X	Ethylene Glycol
16		Acidity to pH 8.3 435	mg/l		Sulfate 945	mg/l		Al-Aluminum 1105	ug/l		Purgeable Organics (VOA bottle req'd)
17		Alkalinity to pH 8.3 415	mg/l		Sulfide 745	mg/l		Be-Beryllium 1012	ug/l		
18		Alkalinity to pH 4.5 410	mg/l					Ca-Calcium 916	mg/l		
19		TOC 680	mg/l					Co-Cobalt 1037	ug/l		SEE ATTACHED ORGANICS ANALYSIS REPORT
20		Turbidity 76	NTU					Fe-Iron 1045	ug/l		Phytoplankton

N. C. DEPT. OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

Sampling Point %	Conductance at 25 C	Water Temperature (C)	D.O. mg/l	pH	Alkalinity pH 8.3	Alkalinity pH 4.5	Acidity pH 4.5	Acidity pH 8.3	Air Temperature (C)
2	94	10	300	400	82244	431	82243	82242	20
	Salinity %	Precipition (in/day)	Cloud Cover %	Wind Direction (Deg)	Stream Flow Severity	Turbidity Severity	Wind Velocity M/H	Mean Stream Depth ft.	Stream Width ft.
	480	45	32	36	1351	1350	35	64	4

MAR 25 1992
DIVISION OF ENVIRONMENTAL MANAGEMENT
MOORESVILLE REGIONAL OFFICE

Ref. 15M

DM1/Revised 10/86

SEMIVOLATILE ORGANICS REPORT - DEM LAB

LAB NUMBER: 2W1241 SUPERVISOR REK LAB #: 2W1241
DATE : 3/23/92

REPORTED BY SM
CHECKED BY PD ENTERED BY PD
REVIEWED BY PD CHECKED BY DS

SAMPLE TYPE: WATER DILUTION FACTOR : 1

CAS NUMBER	TOL X 1	ANALYTE NAME	CONC. UG/L
108-95-2	10	PHENOL	U
111-44-4	10	BIS(2-CHLOROETHYL) ETHER	U
95-57-8	10	2-CHLOROPHENOL	U
541-73-1	10	1,3-DICHLOROBENZENE	U
106-46-7	10	1,4-DICHLOROBENZENE	U
100-51-6	20	BENZYL ALCOHOL	U
95-50-1	10	1,2-DICHLOROBENZENE	U
95-48-7	10	2-METHYL PHENOL	U
108-60-1	10	BIS(2-CHLOROISOPROPYL) ETHER	U
106-44-5	10	4-METHYL PHENOL	U
621-64-7	10	N-NITROSO-DI-N-PROPYLAMINE	U
67-72-1	10	HEXACHLOROETHANE	U
98-95-3	10	NITROBENZENE	U
78-59-1	10	ISOPHORONE	U
88-75-5	10	2-NITRO PHENOL	U
105-67-9	10	2,4-DIMETHYL PHENOL	U
65-85-0	50	BENZOIC ACID	U
111-91-1	10	BIS(2-CHLOROETHOXY) METHANE	U
120-83-2	10	2,4-DICHLORO PHENOL	U
120-82-1	10	1,2,4-TRICHLOROBENZENE	U
91-20-3	10	NAPHTHALENE	U
106-47-8	20	4-CHLOROANILINE	U
87-68-3	10	HEXACHLOROBUTADIENE	U
59-50-7	20	4-CHLORO-3-METHYL PHENOL	U
91-57-6	10	2-METHYL NAPHTHALENE	U
77-47-4	10	HEXACHLOROCYCLOPENTADIENE	U
88-06-2	10	2,4,6-TRICHLORO PHENOL	U
95-95-4	10	2,4,5-TRICHLORO PHENOL	U
91-58-7	10	2-CHLORO NAPHTHALENE	U
88-74-4	50	2-NITROANALINE	U
131-11-3	10	DIMETHYL PHTHALATE	U
208-96-8	10	ACENAPHTHYLENE	U
606-20-2	10	2,6-DINITROTOLUENE	U
99-09-2	50	3-NITROANALINE	U
83-32-9	10	ACENAPHTHENE	U
51-28-5	50	2,4-DINITRO PHENOL	U
100-02-7	50	4-NITRO PHENOL	U
132-64-9	10	DIBENZOFURAN	U
121-14-2	10	2,4-DINITROTOLUENE	U
84-66-2	10	DIETHYL PHTHALATE	U
7005-72-3	10	4-CHLOROPHENYL PHENYL ETHER	U
86-73-7	10	FLUORENE	U
100-01-6	50	4-NITROANALINE	U
534-52-1	50	4,6-DINITRO-2-METHYL PHENOL	U

SEMIVOLATILE ORGANICS REPORT - DEM LAB

86-30-6	10	N-NITROSODIPHENYLAMINE	U
101-55-3	10	4-BROMOPHENYL PHENYL ETHER	U
118-74-1	10	HEXACHLOROBENZENE	U
87-86-5	50	PENTACHLORO PHENOL	U
85-01-8	10	PHENANTHRENE	U
120-12-7	10	ANTHRACENE	U
84-74-2	10	DI-N-BUTYL PHTHALATE	U
206-44-0	10	FLUORANTHENE	U
129-00-0	10	PYRENE	U
85-68-7	10	BUTYLBENZYL PHTHALATE	U
91-94-1	20	3,3'-DICHLOROBENZIDINE	U
56-55-3	10	BENZO(A)ANTHRACENE	U
218-01-9	10	CHRYSENE	U
117-81-7	10	BIS(2-ETHYLHEXYL) PHTHALATE	U
117-84-0	10	DI-N-OCTYL PHTHALATE	U
205-99-2	10	BENZO(B)FLUORANTHENE	U
207-08-9	10	BENZO(K)FLUORANTHENE	U
50-32-8	10	BENZO(A)PYRENE	U
193-39-5	10	INDENO(1,2,3-CD)PYRENE	U
53-70-3	10	DIBENZO(A,H)ANTHRACENE	U
191-24-2	10	BENZO(G,H,I)PERYLENE	U

OTHER SEMIVOLATILE ORGANICS FOR SAMPLE NUMBER : 2W1241

ETHYLENE GLYCOL	EST. RANGE OF CONC. ---	3400000	T*
BUTOXYETHANOL (C6H14O2)		110	T
METHYL PYRROLIDINONE (C5H9ON)		79	T
BUTOXYETHOXYETHANOL (C8H18O3)		240	T
METHYL BENZOIC ACID (C8H8O2)		47	T
ETHYL BENZOIC ACID (C9H10O2)		36	T
BUTOXYETHOXY ETHOXYETHANOL (C10H22O4)		260	T
BUTOXYETHOXY ETHOXYETHANOL (C10H22O4)		250	T
UNIDENTIFIED	_____	66	E
UNIDENTIFIED	_____	23	E
UNIDENTIFIED	_____	23	E
UNIDENTIFIED	_____	31	E
UNIDENTIFIED	_____	49	E
UNIDENTIFIED	_____	94	E
UNIDENTIFIED	_____	130	E
UNIDENTIFIED	_____	22	E
UNIDENTIFIED	_____	60	E
UNIDENTIFIED	_____	160	E
UNIDENTIFIED	_____	160	E
UNIDENTIFIED	_____	32	E
UNIDENTIFIED		28	E

TQL= TARGET QUANTITATION LIMIT
T= TENTATIVELY IDENTIFIED ESTIMATED CONCENTRATION
E= ESTIMATED CONCENTRATION
U= COMPOUND ANALYZED FOR NOT DETECTED
N= COMPOUND NOT ANALYZED FOR
D= DETECTED BELOW QUANTITATION LIMIT
H= HOLDING TIME EXCEEDED
TQL SUBJECT TO CHANGE DUE TO INSTRUMENT SENSITIVITY
*DIRECT AQUEOUS INJECTION : GC/FID

Ref. 15H

DIVISION OF ENVIRONMENTAL MANAGEMENT

September 28, 1992

N. C. DEPT. OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT

SEP 30 1992

DIVISION OF ENVIRONMENTAL MANAGEMENT
MOORESVILLE REGIONAL OFFICE

MEMORANDUM

To: Rex Gleason

Through: Phil Bethea PB
Larry Ausley

From: Susan Carroll SC

Subject: Ambient sample of Summit Resources Management, Inc. Runoff (Union County).

Acute toxicity tests were performed on September 16, 1992, on grab samples collected in the vicinity of Summit Resources Management, Inc. on September 15 by Richard Bridgeman. The first sample was collected from a shallow pond receiving runoff from the property. The second sample was collected from a small pool downslope from the pond. Both were received as emergency samples in response to a suspected runoff of ethylene glycol from the facility property. The toxicity test results are presented below.

Sample	Test	Result
Summit Mgmt.-pond	48-hour Acute Definitive test (*Ceriodaphnia dubia*)	LC50-<5%**
Summit Mgmt.-pool	48-hour Acute Definitive test (*Ceriodaphnia dubia*)	LC50->90%

** There was no statistical calculation appropriate for evaluating this test result; therefore, the LC50 is reported as <5%.

Dissolved oxygen measured in a 90% concentration of the pond sample prior to test initiation was 2.1 mg/L. This mixture was aerated for 5 minutes and then allowed to sit for five minutes. D.O. was then measured at 28% saturation. The same procedure was performed with a 70% concentration of the pond sample. Initial D.O. was 25% saturation, and 31% saturation was measured following aeration. Due to the low dissolved oxygen in these concentrations and their inability to hold D.O. after aeration, these two concentrations were dropped from the test. The highest test concentration used in testing the pond sample was 40%.

Temperatures at receipt of the pond and pool samples, as measured at the Aquatic Toxicology Laboratory, were 5.1°C and 5.0°C, respectively. These temperatures exceed the acceptable maximum of 4°C. Since the test conditions did not adhere to standard procedures with regard to sample temperature, both tests are recorded as bad tests. The results are provided above for your records only.

If further information on these tests is required, please contact me at (919) 733-2136.

Basin: 03-07-12

cc: Richard Bridgeman
Central Files

NORTH CAROLINA DIVISION OF EMERGENCY MANAGEMENT EMERGENCY REPORT FORM
Taken By: JST Date Reported: 4-20-92 Time Reported: 17:26
Reported By: SMITH/HANEY Agency: UCC Phone: 289-1591
Date Occrd: 4-20-92 Time Occrd: 17:26 Day Occrd: 2
County: UNION DEM Area: E
Weather: Chemicals: EG, DEG, TEG ?? FNF:
NON-FNF Events: SAR: Others:
Event Description: SUPPORTS ON TANKER TRUCK GAVE WAY CAUSING TANKER TO FALL, HITTING SECOND TANKER, WHICH FELL AND HIT THIRD TANKER. HOLE PUNCTURED IN ONE TANKER...
Event Location: SUMMIT RESOURCE MANAGEMENT, INC.,3501 GRIBBLE ROAD, STALLINGS, NC.
State Agencies A/C: A SHP: EnvMngt: Y Water: RPS: Land: DOT:
Other State Agencies:
Local Agencies LEMC: Y SO: PD: LFD: Y CHealth: Sewer: PWrk:
Other Local Agencies: FIRE MARSHAL
Affected Persons: Dwellings: Area Affected: IMMEDIATE AREA
State Assistance Requested: ENVIRON. MGT. NOTIFICATION Special Resources:
Deaths: Injured: Hospitalized: Evacuated: Businesses:
Shelters: Put shelter locations and # of Shelterees on next page (Press Pg Dn)
Misc. or Call Back Info: (Press Pg Dn)

Attachment : LOST APPROXIMATELY 1500 GALLONS OF ONE OF THE FOLLOWING: ETHYLENE GLYCOL, DIETHYLENE GLYCOL, OR TRIETHYLENE GLYCOL. NO ONE KNOWS FOR SURE WHAT IS IN TANKERS. TANKERS OWNED BY MONTGOMERY TANK LINES, LEASED BY DISTECH OR NOVACHEM, NO ONE KNOWS FOR SURE. PRODUCT LOST RAN THROUGH PARKING LOT AROUND BACK OF SUMMIT RESOURCES ALONG RAILROAD DITCH AND INTO A HOLDING BASIN BELOW THE FACILITY.

ALLEN HARDY, DIVISION OF ENVIRONMENTAL MANAGEMENT, MOORESVILLE RESPONDED TO THE SCENE, SURVEYED AND MADE RECOMMENDATIONS. HAVE NOT RECEIVED FINAL REPORT FROM HIM.

STATIONS 20, STALLINGS VFD AND 23, HEMBY BRIDGE VFD RESPONDED. ATTEMPTED TO DIKE SPILL BUT HEAVY RAINS WASHED AWAY DIKES FASTER THAN THEY COULD BE BUILT.

NORTH CAROLINA DIVISION OF EMERGENCY MANAGEMENT EMERGENCY REPORT FORM
Taken By: EDP Date Reported: 100592 Time Reported: 0650
Reported By: FARMER Agency: UCC Phone: 7042891591
Date Occrd: 100592 Time Occrd: 0650 Day Occrd: 02
County: UNION DEM Area: E
Weather: Chemicals: DI-ETHYLENE GLYCOL FNF:
NON-FNF Events: SAR: Others: REACTOR FIRE
Event Description: SYSTEM RELIEF VALVE ACTIVATED

Event Location: SUMMIT RESOURCES - 3501 GRIBBLE RD, MATTHEWS

State Agencies A/C: A SHP: Y EnvMngt: Water: RPS: Land: DOT:
Other State Agencies:
Local Agencies LEMC: Y SO: PD: Y LFD: Y CHealth: Sewer: PWrk:
Other Local Agencies: FIRE MARSHAL
Affected Persons: Dwellings: Area Affected: IMMEDIATE
State Assistance Requested: Special Resources:
Deaths: Injured: Hospitalized: Evacuated: Businesses:
Shelters: Put shelter locations and # of Shelterees on next page (Press Pg Dn)
Misc. or Call Back Info: (Press Pg Dn)

Attachment : PRESSURE BUILD UP IN SYSTEM RELIEF VALVE ACTIVATED AND DISCARDED PRODUCT INTO AIR AND ON GROUND CAUSING FIRE AND CONTAMINATION WHEN PRESSURE RELIEVED VALVE CLOSED AND FIRE WAS EXTINGUISHED. 600 GALLONS LOST

CAUSE: 8" FLANGE GASKET DISENTEGRATED.

MCSO, STATE HIGHWAY PATROL, FIRE MARSHAL, VFD'S STATION 19 - BAKERS, STATION 20 - STALLINGS, STATION 23 - HEMBY BRIDGE, AND STATION 32 - PROVIDENCE, ASSISTED WITH THE FIRE.

RESPONSIBLE PARTY: ROBERT G. SHORY, SUMMIT RESOURCES, 3501 GRIBBLE RD., MATTHEWS, NC, (704) 821-4766.

CONTACT PERSON: ED KUHN, ADDRESS AND PHONE NO. SAME AS RESPONSIBLE PARTY.

DIETHYLENE GLYCOL

UNION COUNTY FIRE SERVICE
INVESTIGATIVE INCIDENT REPORT
Submitted By:

Incident #	Dispatcher:
002684	Farmer

Incident Address: 3501 Gribble Rd

Death: Injury:

Date of Incident:	Alarm Time:	Day of Week:	Weather Cond:	Type of Incident:
10-5-92	6:50	Monday	Rain	Reactor fire

Property Owner or Victim:	Race	Sex	Age	DOB
Robert G Shory Summit Resources				

Address:	Res. Phone	Bus. Phone
3501 Gribble Rd Matthews		821-4766

Occupant or Reporting Person:	Race	Sex	Age	DOB
Ed Kuhn	W	M		

Address:	Res. Phone	Bus. Phone
3501 Gribble Rd Matthews		821-4766

First Dept.	Second Dept.	Third Dept.	Fourth Dept.
20	23	19	3

1st-In-Unit	Arrival Time	Incident Commander	1st-In-Firefighter
Car 20		Ed Deason	

Type of Construction	No. of Stories	Det./Sup. System	Method of Entry
metal	3	Relief Valve	N/A

Description of Property: 3 story metal Reactor

Photographs By:	Person(s) Interviewed:
N/A	Ed Kuhn

Narrative: Pressure Build up in system relief value Activated And discharged product into Air and on ground causing fire + contamination. when Pressure relieved value closed and fire was extinguished

max 600 gallons lost.

	Building	Contents	Bld.Loss	Cont. Loss
Owner Insurance Carrier:	$	$ 600.00 Product	$	$
Occupant Insurance Carr:	$	$ 4000.00 Clean-up	$	$

Investigator: Cw Alcock

Arrival Time: 7:48 In Service Time: 8:15 Total Time: 1hr.

CFS9002 3/90 * Values are approximate

Ref. 15Q

State of North Carolina
Department of Environment, Health, and Natural Resources
Mooresville Regional Office

James B. Hunt, Jr., Governor Jonathan B. Howes, Secretary

DIVISION OF SOLID WASTE MANAGEMENT

March 4, 1993

MEMORANDUM TO: Ms. Brenda Smith
DEM Regional Supervisor

FROM: Jesse Wells
Waste Management Specialist

SUBJECT: Suspected Glycol Release
John Blazek Property
Gribble Road
Union County, N.C.

On February 25, 1993, Mr. Don Hankins, ERM Southeast, contacted this Office concerning the staging of approximately 3,000 55-gallon drums within a storage building on the property of Mr. John Blazek. Mr. Hankins also reported the suspected release of glycol on the Blazek property. Mr. Hankins was informed to report the release to the MRO Water Quality Section. Mr. Blazek's property is located adjacent to property leased by Summit Resources which is presently under investigation by DEM.

On February 26, 1993, Mr. Phillip Delp and I visited Mr. Blazek's property to investigate the drum storage area in order to identify owner(s) and/or person(s) responsible for the staging of the drummed material. Mr. Delp and I were met on-site by Mr. Don Hankins. Mr. Hankins was acting as a representative of the property owner at the request of Mr. Bill Penny, Attorney for Mr. Blazek.

While walking over the site, a spill of suspected glycol material was determined to be noted on the north side of the storage building. The spill was unrelated to the drum storage building. Due to recent precipitation, the suspected material had dispersed and spread on the property. No off-site migration of the material was noted. Mr. Hankins was informed that the area should be remediated immediately.

P.O. Box 950, 919 North Main Street, Mooresville, N.C. 28115-0950 • Telephone 704-663-1699 • FAX 704-663-6040

An Equal Opportunity Affirmative Action Employer

Upon returning to the MRO, I contacted Mr. Penny concerning our findings. Mr. Penny was informed that the spill needed immediate attention and that the release must be reported. Mr. Delp and I arrived at the MRO after regular office hours. Mr. Penny was thus instructed to report the spill at 1-800-662-7956.

On March 1, 1993, I reported my findings to Mr. Richard Bridgeman, DEM Water Quality Section. Mr. Bridgeman was informed due to his knowledge of the on-going investigation of the area.

On March 2, 1993, I returned to the site and met with Mr. Hankins and Mr. C. W. Adcock, Union County Fire Marshall. This meeting was held to address the drums in storage. The area of release was not discussed. It was noted that the released material had not been remediated and that the material had been absorbed into the soil.

Please be advised that this spill is unrelated to the confirmed releases which have occurred and that are presently being investigated on the Summit Resources site.

If you feel that a short meeting would be beneficial to discuss our findings, please advise

JWW/ds

cc: Mr. Keith Masters
Mr. Rex Gleason
Mr. Richard Bridgeman

Contact Telephone Numbers

1. Mr. John Blazek, Property Owner
   704/588-6317

2. Mr. Bill Penny, Blazek Attorney
   615/742-9346 (office)
   615/353-0833 (home)

3. Mr. Don Hankins, Consultant, ERM Southeast
   704/541-8345

   Mr. Tom Wilson, Don Hankins supervisor

Jesse

Ref. 15R

State of North Carolina
Department of Environment, Health, and Natural Resources
512 North Salisbury Street • Raleigh, North Carolina 27604
Division of Solid Waste Management
James B. Hunt, Jr., Governor Telephone 919-733-2178 Jonathan B. Howes, Secretary

April 8, 1993

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

NOTICE OF VIOLATION
Docket #93-201A

Mr. David R. Johns, President
Summit Resources Management, Inc.
6325 Constitution Drive
Fort Wayne, Indiana 46804

Dear Mr. Johns:

On December 18, 1980, the State of North Carolina, Hazardous Waste Section (State) was authorized to operate the State RCRA hazardous waste program under the Solid Waste Management Act, (Act) N.C.G.S. 130A, Article 9 and rules promulgated thereto at 15A NCAC 13A (Rules) in lieu of the federal RCRA program.

On February 26, 1993, Mr. Jesse Wells and Mr. Phillip Delp, Waste Management Specialists with this Office, investigated the reported storage of 3000 (55-gallon) drums in a warehouse located at 3481 Gribble Road, Indian Trail, North Carolina. Mr. Wells and Mr. Delp observed through the front window of the facility, wooden pallets stacked three high with four drums per pallet. The number of drums could not be determined due to a safety consideration. Messrs. Wells and Delp were later met on-site by Mr. Don Hankins of ERM-Southeast, Inc. Mr. Hankins reported that he was acting on behalf of Mr. William L. Penny, Attorney-At-Law, for the property owner identified as Blazek & Teal Enterprises.

Summit Resource Management leased property located at 3481 Gribble Road, Indian Trail, North Carolina, until February 1, 1993. From information provided to Mr. Wells and Delp, it is their belief that Summit Resource Management actively operated the warehouse up until the time the lease was terminated.

On March 2, 1993, Mr. Wells returned to the Blazek & Teal Enterprises' property and met with Mr. Don Hankins and Mr. C.V. Adcock, Union County Fire Marshall. Mr. Hankins and Mr. Adcock had completed a walk through of the facility. They reported that the

building contained an estimated 3000 (55-gallon) drums. The contents of a majority of the drums were not known. Labeling on a number of drums indicated that the contents were flammable or corrosive.

A. 40 CFR 261.1(a), codified at 15A NCAC 13A .0006, states that this part identifies those solid wastes which are subject to regulation as hazardous wastes under Parts 262 through 265 and Parts 270, 271, and 124 of this Chapter and which are subject to the notification requirements of Section 3010 of RCRA.

B. 40 CFR 261.2(b), codified at 15A NCAC 13A .0006, states that materials are solid waste if they are abandoned by being [1] disposed of; or [2] burned or incinerated; or [3] accumulated, stored, or treated (but not recycled) before or in lieu of being abandoned by being disposed of, burned, or incinerated.

C. 40 CFR 261.3(a), codified at 15A NCAC 13A .0006, states that a solid waste, as defined in Section 261.2 is a hazardous waste if:

1. It is not excluded from regulation as a hazardous waste under Section 261.4(b); and

2. It meets any of the following criteria:

   i. It exhibits the characteristics of hazardous waste identified in Subpart C.

   ii. It is listed in Subpart D and has not been excluded from the lists in Subpart D under Sections 260.20, and 260.22 of this chapter.

   iii. It is a mixture of solid waste and hazardous waste that is listed in Subpart D solely because it exhibits one or more of the characteristics of hazardous waste identified in Subpart C, unless the resultant mixture no longer exhibits any characteristic of hazardous waste identified in Subpart C.

   iv. It is a mixture of solid waste and one or more hazardous wastes listed in Subpart D and has not been excluded from this paragraph under Sections 260.20 and 260.22 of this chapter.

D. GS 130A-290(41), defines "Storage" as the containment of solid waste, either on a temporary basis or for a period of years, in a manner which does not constitute disposal.

E. 40 CFR 262.11, codified at 15A NCAC 13A .0007, states that a person who generates a solid waste, as defined in 40 CFR 261.2, must determine if that waste is a hazardous waste using the following method:

a. He should first determine if the waste is excluded from regulation under 40 CFR 261.4 and 261.5.

b. He must then determine if the waste is listed as a hazardous waste in Subpart D of 40 CFR Part 261.

c. If the waste is not listed as a hazardous waste in Subpart D of 40 CFR Part 261, he must determine whether the waste is identified in Subpart C of 40 CFR Part 261 by either:

i. Testing the waste according to the methods set forth in Subpart C of 40 CFR Part 261, or according to an equivalent method approved by the Administrator under 40 CFR 260.21; or

ii. Applying knowledge of the hazard characteristic of the waste in light of the materials or the processes used.

Summit Resources Management, Inc. is in violation of 40 CFR 262.11, codified at 15A NCAC 13A .0007, in that it stored or caused to be stored a solid waste, as defined in 40 CFR 261.2, and did not determine if that waste is a hazardous waste.

COMPLIANCE SCHEDULE

By May 10, 1993, Summit Resources Management, Inc. shall take the following action with regard to materials stored in or on its property located at 3481 Gribble Road, Indian Trail, North Carolina:

Comply with 40 CFR 262.11, codified at 15A NCAC 13A .0007, by first determining if the waste is excluded from regulation under 40 CFR 261.4 and 261.5. It must then determine if the waste is listed as a hazardous waste in Subpart D of 40 CFR Part 261.

If the waste is not listed as a hazardous waste in Subpart D of 40 CFR Part 261, it must determine whether the waste is identified in Subpart C of 40 CFR 261 by either: (1) testing the waste according to the methods set forth in Subpart C of 40 CFR 261 or according to an equivalent method approved by the administration under 40 CFR 260.21; or (2) by applying knowledge of the hazard characteristics of the waste in light of the materials or processes used.

If the requirements above are not met, pursuant to N.C.G.S. 130A-22(a) and 15A NCAC 13A .0701-.0707, an administrative penalty of up to $25,000 per day may be assessed for violation of the hazardous waste law or regulations.

If you should have any questions concerning this matter, you may contact Jesse W. Wells at (704) 663-1699.

Sincerely,

Jerome H. Rhodes

Jerome H. Rhodes, Chief
Hazardous Waste Section

JHR/laf/KM0074

cc: Keith Masters
Jesse Wells
William Penny
Central files
Doug Holyfield

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

ACTION MEMORANDUM

DATE: AUG 30 1993

SUBJECT: Removal Authorization for the Summit Resource Management Site located in Matthews, Mecklenburg County, North Carolina

FROM: Michael Taylor, On-Scene Coordinator
Emergency Response and Removal Branch

TO: Joseph R. Franzmathes, Director
Waste Management Division

Site ID#: 8U

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the proposed removal action described herein for the Summit Resource Management Site, Matthews, Mecklenburg County, North Carolina. The Summit Resource Management Site meets the criteria for conducting removal actions under section 300.415(b)(2) of the National Contingency Plan (NCP).

II. SITE CONDITIONS AND BACKGROUND

CERCLIS identification number: NCD986232213

Removal category: Time Critical Removal

The Summit Resource Management Site (Site) is an unpermitted temporary storage facility for waste. The Site is located in an industrial/residential setting on the southeast side of Matthews, North Carolina. It is approximately one acre in size with a metal industrial building currently housing 3,000 drums. Upon an initial site investigation by the Emergency Response and Removal Branch (ERRB), the warehouse was unsecured with drums triple stacked and overturned. There is documentation that many of the drums are corroded, leaking and releasing their contents from inside the building into the surrounding soils. Runoff from the contaminated areas discharges into drainage ditches then migrates

off site.

There are a variety of contaminants and large volumes of waste on-site to be addressed. Some contaminants identified on site consist of ethylene glycol waste, waste oils, still bottoms, phenols and chlorinated compounds. Many of the drums contain labels of "corrosive water," "flammable material," and "reactive material." This Site presents a direct contact threat, the threat of migration to surface waters from leaking drums, and a fire and explosion threat from the volume of wastes stored inside the warehouse.

This Site was referred to EPA and the State of North Carolina's Division of Solid Waste Management in March of 1993 by the landowner. The landowner has filed a third party lawsuit against a former tenant and operator under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Summit Resource Management assumed the lease on the property from a prior occupant called Chemstream in October of 1991. Industrial textile waste was believed to be reprocessed to recover antifreeze. Summit renegotiated the lease with the owners, Blazek & Teal, a few months later. Summit later vacated the property in February of 1993. Sludge, still bottoms, and other wastes were transported to Chemical Waste Management as nonhazardous waste during Summit's operation. Approximately 2,000 drums were transported to Southeastern Chemical & Solvent in Sumter, South Carolina, for disposal at a cement kiln. Summit Resources later sold its assets to National Petroleum Packers. National Petroleum Packers is currently an active facility located adjacent to the Site.

A. Site Description

1. Removal Site Evaluation

EPA's Removal Assessment Team (RAT) assigned this Site for evaluation to an On-Scene Coordinator (OSC) in May of 1993. The facility was reported as being an abandoned warehouse filled to capacity with approximately 3,000 drums containing various substances.

This Site is not fenced or secured. Incompatible wastes are stored next to each other. Many drums are placed on pallets and stacked three and four high. Air monitoring reveals organic vapors exist within the warehouse and surrounding drums. Some drums contain chemical substances with a pH of less than two (2) while others have a pH above 12.5.

The warehouse contains the majority of the waste on site. There are other drums scattered throughout the Site, and a 2,000 gallon storage tank is adjacent to the rear of the property line. This tank is placed on top of the ground and contains some residue, possibly from previous processes on site. There is a main control building along the south side of the property with a railroad track

bordering the east side of the Site. A Site drainage ditch which is lined with stone is located approximately 75 feet from the warehouse. This ditch eventually leads to an unnamed tributary and then into South Fork Crooked Creek. There are several business establishments around this Site. The closest facility is located along the northern boundary approximately 30 feet away from the warehouse.

There is visual contamination of the soils surrounding the Site warehouse. There are indications of past releases onto the property from previous operations believed to have been from recycling textile waste, oils, and still bottoms.

2. Physical Location

The Summit Resource Management Site is located at 3481 Gribble Road in Matthews, North Carolina, approximately thirty miles southeast of Charlotte, North Carolina. The nearest thoroughfares are Stallings Road, Old Monroe Highway, and Highways 74 and 51. Several businesses surround the Site, with a railroad track separating the businesses directly behind the facility. A drainage ditch borders the south side of the Site. The runoff flows southward across the chemical processing facility owned by National Petroleum Packers. A threat to the public also exists due to its proximity to local residential dwellings. Population in this area is estimated at greater than 5,000 within a mile radius. There are five churches, an elementary school, a day care center, a medical center, a town hall, three public park areas, and a varied mixture of private residences and commercial businesses within a mile radius of this Site.

3. Site Characteristics

The Site is an unpermitted temporary storage facility for wastes. The types and quantity of hazardous substances and containers on-site pose a materials handling challenge and a serious safety concern. There is an extremely small area available for placement and sampling of all containers. As previously described, a number of these containers are corroded, leaking, and incompatible, increasing the likelihood of a fire and/or explosion. Of the known wastes contained within the warehouse, some off-gases from a fire would include carbon monoxide, carbon dioxide, hydrogen gas, acrolein, and sulfur dioxide gas emmissions.

The extent of soil and groundwater contamination is unknown at this time. The extent of contamination will be determined after the initial wastes are removed from Site.

4. Release or threatened release into the environment of a hazardous substance or pollutant or contaminant

The following hazardous substances were found on-site as a result of sampling several areas and waste containers. Analytical I contains sample data collected in August of 1993. However, this data only presents a fraction of what is actually on-site. Data in Analytical I represents random samples taken by the OSC upon initial response to determine the presence of hazardous substances contained on-site.

Analytical I

Hazardous Substance	Concentration	Location
Acetone	610 ppm	SRW-07
Chlorobenzene	1,700 ppm	SRW-05
Methylene Chloride	110 ppm	SRW-07
4 Methyl 2 Pentanone	980 ppm	SRW-07
Tetrachloroethene	600 ppm	SRW-05
Toluene	140 ppm	SRW-05
Xylene	200 ppm	SRW-05
1,2 Dichlorobenzene	190,000 ppm	SRW-05
1,3 Dichlorobenzene	41,000 ppm	SRW-05
1,4 Dichlorobenzene	95,000 ppm	SRW-05
Phenol	1,800 ppm	SRW-01
Phenol	37,000 ppm	SRW-05
Arsenic	97 ppm	SRW-05
Cyanide	1.1 ppm	SRW-01
Lead	16 ppm	SRW-01
Mercury	1.2 ppm	SRW-01
Aluminum	8,800 ppm	SRS-08
Flashpoint (Fahrenheit)	95 F	SRW-07

SRW-Summit Resource Warehouse-followed by the drum number
SRS-Summit Resource Soil-followed by the sample number

5. NPL Status

The Summit Resource Management Site is not listed on the NPL. EPA's Site Assessment group and the State of North Carolina's Division of Solid Waste Management will perform a Preliminary Assessment in accordance with current Agency policy.

6. Maps, pictures and other graphic representations

Available upon request.

B. Other Actions to Date

1. Previous Actions

This Site was brought to the attention of ERRB through a referral from the landowner initiating a Citizen's suit under CERCLA. The previous actions included the removal of approximately 2,000 drums by Summit Resource Management to a disposal facility (cement kiln). There remains approximately 3,000 drums stored in a warehouse with a 2,000 gallon storage tank placed at the rear of the property. The landowner has been unsuccessful in negotiations with the former lessee in removing the remaining drums and no other further actions have been taken to date.

It is reported that Summit Resource Management leased the adjacent chemical facility at 3501 Gribble Road to conduct their activities after vacating the property owned by Blazek & Teal. Summit Resource Management later sold their assets to National Petroleum Packers, located in Monticello, Florida. During this time, the State of North Carolina issued a Notice of Violation (NOV) on 3481 Gribble Road to Blazek & Teal and Summit Resource Management. They both agreed to comply with the NOV . According to North Carolina Department of Environmental Health and Natural Resources (NCDEHNR), the NOV's are still pending.

The landowner initiated a CERCLA Citizen's suit in March of 1993. The former Lessee, Summit Resource Management, has filed a counter lawsuit against the landowner stating all their activities they believe that they are responsible for have been completed.

In May of 1993 ERRB assessed the Site for removal eligibility and priority ranking. After the removal assessment was completed it was considered a high priority site and deemed to be a time-critical removal.

2. Current Actions

The Site remains unfenced and unsecure. There are thousands of drums, improperly stored inside a warehouse with many leaking into the environment. Unauthorized access and vandalism is a strong concern. No additional actions have been taken to prevent the threat of direct contact with chemical substances, fire and explosion from organic vapors or migration of hazardous substances into the surrounding surface waters by the Potentially Responsible Parties (PRPs).

EPA has obtained random samples from the drums within the warehouse and the soil around the perimeter of the Site for further identification of hazardous constituents and characterization.

C. <u>State and Local Authorities' Role</u>

1. State and local actions to date

North Carolina's Division of Solid Waste Management has issued a Notice of Violation to the landowner, Blazek & Teal, as well as the previous lessee, Summit Resource Management. No further legal action or cleanup actions have been undertaken by the State of North Carolina.

2. Potential for continued State/local response

It is unlikely that the State or any other political subdivision will undertake any response activity on this Site in the future due to the lack of available funding.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

A. Threats to Public Health or Welfare

The Summit Resource Management Site presents a constant threat of fire and explosion, in addition to a direct contact threat and contamination of surface waters through runoff from the Site.

The warehouse which currently contains approximately 3,000 drums presents a definite fire and explosion threat from the various wastes. The fumes and volatilization of hazardous substances threatens the surrounding businesses and residential neighborhoods with airborne contaminants. The adjacent business establishment has experienced some minor fires according to the local fire department and the local emergency planning committee. This business is involved in the same production and recycling performed by the previous tenant, Summit Resource Management. The threat of a fire within the warehouse, an unattended and unsecure Site, is a major concern for the community.

There is also a direct contact threat to anyone exposed to the hazardous substances and waste contained on this Site. The Site is unsecure and uncontrolled. It is located within a industrial/residential section of town with a high volume of traffic in and around this area. This situation is subject to casual interests of individuals passing by, but also to vandalism, inspectors and local utility personnel unaware of the nature and scope of threats this Site presents. Thousands of drums of mixed variety (ethylene glycol, still bottoms, caustics, oily wastes) pose a direct threat of human exposure to both trespassers and local residents. There are several churches, schools, day care centers, a town hall, and medical facilities within close proximity to this Site.

The runoff from the leaking drums and containers is a threat to the surrounding public and the environment. It presents the threat of contaminating local surface and subsurface soils, nearby surface waters, and possibly groundwater.

In addition to surface water and sediment contamination, much of the soil on-site is visibly contaminated, causing concerns of direct contact exposure with the soil or contaminants migrating into groundwater. The exact extent of soil contamination has not been fully determined.

B. Threats to the Environment

Potential environmental threats include releases into the atmosphere due to the volatilization of hazardous substances, as well as the constant threat of airborne particulates from a fire and explosion. Toxic off-gases from a fire would pollute the surrounding vicinity threatening the immediate public. In addition, the Site poses the threat of contamination to the surrounding soil and nearby surface waters from the runoff of the leaking containers and past releases on site.

A list of threatened or endangered species for the State of North Carolina has been obtained. This information will be used during the proposed removal action to protect any natural resources present in the area. It is unlikely that listed threatened or endangered species would be directly impacted from the Site due to the commercial and residential nature of the area.

IV. ENDANGERMENT DETERMINATION

Response authority is warranted for this Site under Section 104 (a)(1)(A),(B) of CERCLA as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and Title 40 of the Code of Federal Regulations part 300.400 (a)(1),(2). A Removal action for this Site is further determined and meets the criteria set forth in part 300.415 (b)(2) of the NCP. There is a potential of exposure to nearby populations from hazardous substances contained at this Site. The drums and containers pose a threat of release into the soils and from runoff into nearby surface waters. In addition, there is the threat of a fire or explosion that would affect the surrounding population. Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, welfare and the environment.

The Agency for Toxic Substances and Disease Registry (ATSDR) has been consulted regarding the known hazardous substances and current conditions on-site. ERRB's preparations and actions taken are consistent with the views and recommendations by ATSDR. ATSDR will be consulted further, once the drums have been removed, to provide guidance on cleanup and removal of the contaminated soils.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed Action Description

(a) Secure, contain, and stabilize the Site from further releases into the enviroment.
(b) Separate, stage, and segregate all drums and containers from the warehouse and surrounding facility property.
(c) Perform Hazard Categorization (Hazcat) on each drum to determine if it is a characteristic waste.
(d) Develop the appropriate waste streams for the identified wastes on site.
(e) Identify and determine the best treatment and disposal option for the known waste identified. If determined more cost effective and safe, some waste will be treated on site.
(f) Transport and dispose of waste determined to be appropriate for off-site disposal according to the EPA Off-site Disposal Policy.

It has been determined that bulking drums, based on compatibility groups rather than disposing of individual drums, is more cost effective. This method is consistent with the current Superfund Removal guidance. For smaller compatible waste groups, disposing of individual drums may be more cost effective. The most appropriate disposal will be determined after all analytical results are compiled. Until this list is completed, total quantities for final disposal will not be known.

Disposal will be carried out using the best available and most cost-effective method in accordance with EPA policy. First, all hazardous wastes will be considered for on-site treatment. If this is not possible, hazardous waste will be considered for treatment or disposal at a permitted facility within the State of North Carolina. Finally, if the first two options are not feasible, wastes will be transported outside of the State for final disposal.

A comparison of disposal options for handling empty containers is underway. There are basically four options for empty drum handling that are to be considered, including shredding, crushing, rinsing/recycling or leaving on-site. Recycling materials for recovery will be considered, where possible.

Once the hazardous drums have been removed, sampling of the suspected contaminated soil will be conducted to determine the extent of contamination. Surface and subsurface samples will be taken at specific location points. Soil cleanup levels will be determined once sampling and analysis reveal the volume and extent of contamination. Disposal options will be determined at that time based upon volume and best available technology.

2. Contribution to Remedial Performance

This removal action will abate the immediate threats identified in the preceding sections of this Action Memorandum. The removal actions outlined will be consistent with any remedial action. At this time the Site is not listed on the NPL.

3. Description of Alternative Technologies

Several alternatives are being considered for the drums containing hazardous substances. The final technologies will be determined once the extent of Site contaminants and waste are known. Careful consideration will be given to the limited Site space and proximity to the local residents.

4. Applicable or Relevant and Appropriate Requirements (ARARs)

The Federal ARARs determined to be practicable for the Site include the Resource Conservation and Recovery Act (RCRA) and EPA's Off-site Disposal Policy as referenced in 53 FR 48218-48234 dated November 29, 1988.

5. Project Schedule

Response action at this Site will be initiated upon approval of this Action Memorandum. Foregoing any unexpected delays, all actions are expected to be completed within twelve months.

B. Estimated Costs

The following summary of estimated costs are based on the possibility all containers on site contain hazardous substances.

Extramural Costs

Regional Allowance Costs: Total Cleanup Contractor Costs (This cost category includes OSC estimates for: ERCS, Regional ERCS, subcontractors, Letter Contracts, orders for services, Notices to proceed, Alternative Technology Contracts, and IAGs with other Federal agencies. Also includes a 10% contingency.)	$1,525,500

Other Extramural Costs Not Funded From the Regional Allowance:

Total TAT, including multiplier costs	$ 120,000
Subtotal, Extramural	$1,645,500
Extramural Costs Contingency (10% of Subtotal, Extramural Costs)	$ 164,550

TOTAL, EXTRAMURAL COST AND CONTINGENCY	$1,810,050
Intramural Costs	
Direct (1800 hrs at $30/hr)	$ 54,000
Indirect (1000 hrs at $54/hr)	$ 54,000
TOTAL, INTRAMURAL	$ 108,000
TOTAL PROJECT CEILING	$1,918,050

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If action is delayed or not taken at this Site there will be a continued release to the environment and an increased risk of a fire or explosion. These conditions will continue to pose a direct contact threat to the public health and welfare. The Site conditions will not improve, but will only worsen as time passes. Drums will continue to deteriorate and release their contents. Contaminated soil will continue to contribute to the environmental degradation of the surface water and groundwater.

VII. OUTSTANDING POLICY ISSUES

An issue at hand pertains to the State of North Carolina and its off-site disposal situation. The State of North Carolina failed to cite its incinerator within the State, which was a requirement of the Southeastern Waste Compact. Because of this, some states have attempted to restrict shipment of RCRA and CERCLA wastes from North Carolina. EPA will be considerate of this issue during cleanup and disposal activities.

VIII. ENFORCEMENT

"Enforcement Sensitive", See Attachment I.

IX. RECOMMENDATION

Conditions at the Summit Resource Management Site, in Matthews, Mecklenburg County, North Carolina, meet the criteria for a CERCLA removal action in accordance with the NCP section 300.415 (b)(2). This Memorandum is submitted for your approval of the proposed removal actions. The total project ceiling, if approved, will be $1,918,050 of which an estimated $1,525,500 will be funded for the emergency cleanup contractor.

Approve: /s/ RICHARD D. GREEN DEPUTY FOR Date: AUG 3 1 1993

Disapprove:_____Date:_____

Joseph R. Franzmathes
Director
Waste Management Division

Attachment

Memo

Date: November 15, 1994

To: File

From: Douglas Moore
Environmental Chemist
NC Superfund Section

Topic: Blazek and Teal Property
Summit Resource Management site
Gribble Road, Stallings, Union Co., NC
US EPA ID: NCD 986 232 213

On this day, I received a phone call from Mrs. Mary Catherine Holcomb, attorney for Jon Blazek (704) 333-5800. Mrs. Holcomb called to determine the current status of our pending integrated preliminary assessment/site inspection (PA/SI) report as it relates to Mr. Blazeks property. Mrs. Holcomb stated that Mr. Blazeks bank wanted to pursue payment of his loan for the property. The bank gave Mr. Blazek a deadline to list the property for sale, but, she stated that they were unsuccessful in getting the property listed. In addition, the bank refused to foreclose on the property due to the residual contamination at the site. She contacted our office to determine if our report would be completed prior to the banks deadline. I explained to Mrs. Holcomb the type of samples, their locations and reason for sampling. I stated to her that, to date, we had received the organic volatile and semi-volatile sample results only and were currently waiting on the inorganic sample results. I told her also that when we received the complete results, a copy of the analytical data as it pertains to his property would be provided to Mr. Blazek. I told Mrs. Holcomb that following receipt of all the analytical results, a report would be generated for the EPA detailing the findings of our investigation and that the EPA will have the final decision on the future status of the site. I also told her that a copy of our report will be on file at our office for public review. As regards the sale of the property, I suggested to her that there were companies which are interested in purchasing industrial properties similar to Mr. Blazek's. The companies subsequently invest in clean up of the property to State standards and sell the property. I suggested that Mr. Blazek may want to inquire into such companies in his area.

Mrs. Holcomb stated that Summit Resource Management, Inc., an Indiana based company which operated the site, has filed Chapter 7 bankruptcy (i.e. total liquidation). As a result, Mr. Blazeks lawsuit against Summit Resource Management, Inc. has been terminated.

Ref. 18

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

RECEIVED
NC DIVISION OF SOLID WASTE MANAGEMENT

Mike Kelley, Deputy Director
Solid Waste Management Division
North Carolina Division of
Solid Waste Management
P.O. Box 27687
Raleigh, North Carolina 27611-7687

SUBJ: $2 Million Exemption Action Memorandum for Summit Resources

Dear Mr. Kelley:

The Summit Resource Management Site is located in Matthews, Mecklenburg County, North Carolina. A copy of the $2 million Action Memorandum is being provided to you. The Summit Resource Management Site required an exemption from the statutory limits to continue a removal response. Enclosed is a detailed Memorandum outlining site conditions and projected costs for addressing the identified waste. For further comments or questions regarding this document contact the On-Scene Coordinator at the following address:

Michael R. Taylor
U.S. Environmental Protection Agency
Waste Management Division
Emergency Response and Removal Branch
345 Courtland Street, NE
Atlanta, Georgia 30365
(404) 347-3931

Sincerely,

Myron D. Lair,
Chief, Emergency Response and
Removal Branch

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

ACTION MEMORANDUM

SUBJECT: Request for Removal Action Ceiling Increase with Exemption from the $2 Million Statutory Limit at the Summit Resource Management Site, Matthews, Mecklenburg County, North Carolina

FROM: John H. Hankinson Jr. Patrick M Tobin for
Regional Administrator
EPA Region IV

THRU: for Henry L. Longest II
Director
Office of Emergency and Remedial Response

THRU: for Deborah A. Dietrich John Riley
Acting Director
Emergency Response Division

TO: Elliott P. Laws
Assistant Administrator
Office of Solid Waste and Emergency Response

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of a ceiling increase and an emergency exemption from the $2 Million Statutory Limit, at the Summit Resource Management Site, located on 3481 Gribble Road in Matthews, Mecklenburg County, North Carolina. The Summit Resource Management Site ("Site") meets the criteria for exceeding the statutory limit under section 104(c)(1)(A) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA). Funds are requested to complete actions necessary to eliminate unstable waste materials from this non-NPL Site, which pose an immediate threat. The total project ceiling if approved, will be $2,665,800, of which an estimated $2,150,000 will be funded from the Regional removal allowance.

II. SITE CONDITIONS AND BACKGROUND

CERCLIS identification number: NCD986232213

Removal category: Time Critical Removal

Site conditions are consistent with the previous description in the August 1993 Action Memorandum (See attachments). Removal activities began on September 13, 1993, but since that time a greater volume of waste has been confirmed. The original Action Memorandum stated that approximately 3,000 drums were abandoned inside a warehouse. EPA's Emergency Response and Removal Branch (ERRB) began staging drums in preparation for disposal and discovered an estimated 5,000 drums stacked three and four high, in addition to over 800 small quantity containers inside the warehouse. Upon initial site investigations, the nature and condition of the hazardous containers prevented an accurate count.

Removal actions to date consist of staging and overpacking leaking drums. Sampling and hazard categorization has been completed for 3,070 drums. Limited space prohibits staging the total estimated 5,000 drums. There are currently 11 waste streams identified from the first 3,070 drums. Approximately 2,500 drums have completed transportation and disposal. More than 2,000 drums remain "unknown" or have not been categorized within a specific waste stream.

The increase in the total number of drums will increase the overall disposal cost projection in the August 1993 Action Memorandum. Transportation and disposal costs have increased due to local transportation, storage and disposal (TSD) facilities being out of compliance with the CERCLA Off-site Rule. In addition, the recent extreme sub-freezing temperatures require the use of additional specialized equipment for bulking and handling of the identified waste.

Based upon the potential life threatening situation that exists and the volume of drums discovered, additional funds are required to abate the immediate threats to the public and surrounding area. There is a continued threat of fire/explosion and toxic release as long as these drums remain on site.

A. Site Description

1. Removal Site Evaluation

Since removal actions began the Site has been fenced and secured, limiting the direct contact threat. The original estimate of 3,000 drums has risen to approximately 5,000 drums and more than 800 small quantity containers. Most of the drums have been found to be highly corroded and leaking. Many of the

drums have overturned or fallen from their stacked pallets and some with incompatible waste are stored next to each other. Several drums have been found to be bulging from extreme pressure. Some drums contain chemical substances with a pH of less than two while others have a pH above 12.5. Considering the quantity of solids and liquids remaining in the drums, as well as waste stored on-site, costs for completing the action are anticipated to exceed $2 million.

Some hazardous substances identified are flammable liquids, flammable solids, strong acids and bases, peroxides, cyanides, sulfides, oxidizers and chlorinated compounds. This Site presents a direct contact threat, the threat of migration to surface waters from leaking drums, a fire and explosion threat and toxic release through air emissions from the volume of wastes stored inside the warehouse.

A 5,000 gallon above ground storage tank is adjacent to the rear of the property line. This tank contains some residue, possibly from previous processes on-site. There is a main control building along the south side of the property with a railroad track bordering the east side. A drainage ditch, which is lined with stone, is located approximately 75 feet from the warehouse. This ditch eventually leads to an unnamed tributary and then into South Fork Crooked Creek. There are several business establishments around this Site. The closest facility is located along the northern boundary approximately 30 feet away from the warehouse.

There are contaminated soils surrounding the warehouse. There are indications of past releases from previous operations believed to have been from recycling textile waste, oils, and still bottoms. No controls were in place to prevent human exposure to surface water runoff. Upon the initial site investigation, leakage from the warehouse presented a fire and explosion threat and a environmental threat to South Fork Crooked Creek.

2. Physical Location

The physical location is consistent with the description provided in the August 1993 Action Memorandum.

3. Site Characteristics

The Site characteristics described in the August 1993 Action Memorandum have not changed significantly. However, the Site does not allow adequate space for the placement, sampling and handling of the total number of drums.

The extent of soil and groundwater contamination remains unknown at this time. The limited Site space for the temporary

placement of drums does not allow for proper identification of soil contamination. Contaminated soils will be addressed, as part of this action, after the waste containers are removed.

4. Release or threatened release into the environment of a hazardous substance or pollutant or contaminant

More than sixty percent of the drums have been addressed. The hazardous wastes currently identified consist of the following Resource Conservation and Recovery Act (RCRA) waste codes: D001, D002, D003, D027 and D039. Eighty percent of the drums handled to date contain two or more layers of waste. The summary below outlines the initial 3,070 drums restaged from the warehouse. Approximately 2,000 drums remain to be addressed.

Summary of Drum Inventory

Waste Stream	Drum Count	Volume(gallon)
Flammable Liquid	1,263	47,264
Aqueous Liquid	541	19,287
Stabilized Solids	780	600 yards
Chlorinated Liquid	196	7,593
Alkaline Liquid	125	4,770
Acid Liquid	24	550
Peroxides	15	523
Oxidizers	14	589
Cyanides	41	1,510
Empty drums	71	0
	3,070	82,086 + 600yds

Additionally, there are approximately 800 small quantity containers scattered throughout the warehouse that range in volume from five gallons to pint jars. The estimated volume calculates to an additional 1,000 gallons. A large portion of these containers are unmarked or mislabeled. An estimated 1,250 wooden pallets will require handling once the drums are bulked and consolidated.

Many containers had been leaking for an undetermined period prior to EPA response. Incompatible waste in the drums stored next to each other continues to present a fire and/or explosion threat. Temperature ranges in this area range from the high 90s to recent record low temperatures of 5 degrees. These varied and sometimes drastic changes will rupture containers and cause the release of hazardous waste. Emissions from an incident of this magnitude would directly affect the immediate population. Toxic releases and off-gases from a fire would include, at a minimum, carbon monoxide, carbon dioxide, sulfur dioxide and acrolein.

Soil sampling from the initial site investigation revealed that two distinct areas were contaminated with heavy metal and chlorinated compounds. At least 60 yards of contaminated soil

from this area of known contamination will be removed to abate the direct contact threat.

Surface water runoff, if left unaddressed, would migrate off-site to adjoining businesses and to an unnamed tributary of South Fork Crooked Creek. The hazardous substances are threats through direct contact and possibly through ingestion. The majority of nearby residences are connected to a city water system. However, there are two residential wells downgradient from the Site. The closest well is four tenths of a mile away. The State of North Carolina will continue to monitor these wells.

5. NPL Status

The Summit Resource Management Site is not listed on the NPL. EPA's Site Assessment group and the State of North Carolina's Division of Solid Waste Management may perform an assessment in accordance with current Agency policy.

6. Maps, pictures and other graphic representations

Pictures or graphs are available upon request.

B. Other Actions to Date

1. Previous Actions

North Carolina's Division of Emergency Management (DEM) and the local fire department have documented reports of several emergency incidents at this Site since 1991. Numerous fires and multi-gallon spills were reported as caused by the previous operator, Summit Resources. The locals have had to respond frequently due to negligent operating procedures by the transporters and facility officials.

EPA conducted a site investigation in May of 1993. Random samples were taken from the interior and exterior areas of the warehouse beginning in August of 1993. The representative sampling effort included drums from the warehouse and soil from observed contaminated areas.

ERRB began removal actions on September 13, 1993. Activities on-site have consisted of securing, separating, segregating, staging and sampling 3,070 drums from the interior areas of the warehouse. A mobile laboratory was placed on-site for processing the waste samples. Hazard categorization commenced in September of 1993. Since December, hazard categorization has been completed and bulking is underway. Compatibility tests were performed prior to bulking the drummed waste. Waste streams have been established and identified hazardous waste has been disposed of at permitted waste facilities.

The original estimate of drums believed to be stored inside the warehouse was 3,000. The warehouse was found to contain thousands of drums stacked three and four high with no aisle space for entry during the initial site investigation. Once staging and sampling began, this estimate escalated. The Site does not allow adequate space for placement of all containers. The exact number of drums remain unknown at this time, but it is expected to total 5,000.

2. Current Actions

The Site currently remains secure by way of a fence and security guard after hours to prevent unauthorized access. Bulking operations continue for the identified waste streams. EPA has identified eleven waste groups from the first 3,070 staged drums (see attachment).

The majority of the drums, from the initial 3,070 staged containers, have been found to exceed regulatory limits under RCRA. Based upon estimated bulking, transporting and disposal costs for this volume and the drums that remain to be addressed, removal costs will exceed the statutory $2 million limit.

More than 47,000 gallons of flammable and 19,000 gallons of aqueous liquids have been transported and disposed. In addition, 400 cubic yards of solidified sludge have been shipped to a permitted TSD facility. Chlorinated, alkaline and strong acid wastes are bulked into multi-gallon poly containers. Cyanide and peroxide drums are being segregated and staged. Disposal for these waste streams will be performed at a later date.

Staging and sampling of the remaining 2,000 drums will commence in February of 1994. Hazard categorization and identification of waste streams is expected to take approximately six weeks.

The State of North Carolina's Department of Environment, Health and Natural Resources (NCDEHNR) is conducting a preliminary assessment on this Site as well as the two adjoining lots owned by National Petroleum Packers and a private individual. ERRB's cleanup actions are limited to the 3481 Gribble Road Site.

A 5,000 gallon above ground storage tank will be addressed during the staging of the remaining "unknown" drums. Sampling and classification of this storage tank will be completed and addressed with the proper waste stream.

The extent of soil contamination is not known at this time. The immediate focus for this response is removing the threat posed by the thousands of waste drums.

The excavation and removal of contaminated soil will be addressed as part of this action, but after all drums and containers have been handled. At least 60 yards of contaminated soil will require removal and possibly much more.

C. State and Local Authorities' Role

1. State and local actions to date

There have been no significant changes to State and local activities to date. The Notice of Violation (NOV) issued by North Carolina's Division of Solid Waste Management to the landowner, Blazek & Teal, as well as the previous lessee, Summit Resource Management, is still pending.

North Carolina's Department of Environment, Health and Natural Resources is conducting a preliminary assessment and scoring process for the hazard ranking system.

2. Potential for continued State/local response

It is unlikely that the State or any other political subdivision will undertake response activity on this Site, due to the lack of available funding. It is anticipated that no post-removal site activities will be required once the immediate threats posed by the drums and the soil are addressed.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

A. Threats to Public Health or Welfare

The Summit Resource Management Site continues to pose threats to the public health or welfare as previously addressed in the August 1993 Action Memorandum.

There is additional concern due to the volume of containers and the variety of waste on-site. The original estimate of 3,000 drums is below the current estimate of 5,000 drums. This volume of waste presents an even greater threat and concern of releases into the environment.

The Site presents a constant threat of fire and explosion. The flammable waste stream consists of approximately fifty percent of the total waste. In addition, several drums of cyanides, peroxides, chlorinated compounds, strong acids and bases are stored in the warehouse. Airborne contaminants from a fire would threaten the local population with toxic fumes.

The runoff from a fire response would contribute to the contamination of the soil and surface waters. Given the proximity to the local population and residential homes, this

presents a threat potentially affecting several thousand people within a mile radius.

The recent extremely cold weather is rapidly deteriorating the containers. The majority of containers found are not Department of Transportation (DOT) shippable in their current condition.

The Site is currently fenced and has a security guard after hours. Even though these steps have been taken there remains a direct contact threat of human exposure. A portion of the Site is unobservable and the Site is subject to constant inquiries from local workers from adjacent businesses.

The soil on-site is visibly contaminated. Analytical data confirms the presence of hazardous substances, which poses a direct contact and runoff threat. The extent of contamination has not been fully determined since the drums are currently staged on the interior and exterior areas of the warehouse, but at least 60 yards will require removal.

B. Threats to the Environment

The environmental threats continue to exist as described in the August 1993 Action Memorandum. Atmospheric releases from volatilization of hazardous substances and airborne particulates from a fire/explosion continue to threaten the surrounding environment.

Site runoff to the soils and surface waters will remain a threat if these containers are unaddressed. Soil and surface water contamination may lead to groundwater contamination.

Surface water runoff, which leads to South Fork Crooked Creek, threatens aquatic life. Water obtained for local livestock may be affected if runoff is allowed to leave the Site.

The State of North Carolina has supplied a list of threatened or endangered species for Mecklenburg and Union County. There are currently no threatened or endangered species identified near the Site.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. EXEMPTION FROM STATUTORY LIMITS

Section 104(c) of CERCLA as amended by SARA, limits Federal emergency response actions to $2,000,000 unless the requirements of one of two exemptions set in the statute are met. Section 104(c)(1)(A) allows an emergency exemption if:

(i) there is an immediate risk to public health or welfare or the environment; and

(ii) continued response actions are immediately required to prevent, limit, or mitigate an emergency;

(iii) such assistance will not otherwise be provided on a timely basis

The Summit Resource Management Site meets the requirements for an emergency exemption of Section 104(c)(1)(A). The action that is proposed for this $2 million ceiling exemption is consistent with CERCLA and the SARA amendments in that:

1. There is an immediate risk to public health or welfare or the environment.

There exists a direct contact threat from contaminants and waste on-site. The materials stored pose a constant threat of fire/explosion. A ground or air release would potentially affect a large portion of the local population due to its proximity to the surrounding townships.

The Site conditions constitute an immediate risk to the public and the environment based on the known hazardous substances present. Some waste groups that have been identified on-site include highly flammable substances, strong acids and bases, cyanides, peroxides and chlorinated compounds (See Attachment).

Runoff from a fire response would jeopardize and threaten the nearby waterway, South Fork Crooked Creek. Such a release would contaminate local environmental resources.

The Agency for Toxic Substances and Disease Registry (ATSDR) has been consulted regarding the known hazardous substances and current conditions on-site. ERRB's preparations and actions taken are consistent with the views of ATSDR. ATSDR will be consulted further, once the drums have been removed, to provide guidance on the contaminated soil. Currently, with the placement of 5,000 drums on one and a half acres, proper identification of soil contamination is not possible.

2. Continued response actions are immediately required to prevent, limit, or mitigate an emergency.

The Site continues to pose an immediate threat of a fire or explosion. Site conditions will not improve, but will only worsen as time passes. Drums will continue to deteriorate and release their contents, further contaminating the soil. There is also an immediate need to prevent the threat of surface water and groundwater contamination. Response actions are necessary to prevent all routes of exposure (inhalation, absorption, and ingestion).

Appropriate disposal of the approximately 3,000 drums that remain on-site will prevent leakage and further deterioration. Removal of the drums would mitigate the threat of a fire or explosion and further contamination into the air, soil, groundwater and local creek.

Prolonging removal actions will increase cleanup costs. Contamination of surrounding and underlying soils will continue to increase with a delay in proceeding with cleanup efforts. The potential for groundwater contamination also increases as cleanup is delayed.

Soil contamination poses a potential direct contact threat to any trespassers on-site and provides a pathway for groundwater and surface water contamination. Drums staged throughout the Site must be properly disposed of prior to beginning the determination of soil contamination. There is clear evidence and documentation that leaking drums from past operations have contributed to the contamination of surface soil. Once the hazardous drums are removed from Site, removal of contaminated soil can be conducted.

3. Assistance will not otherwise be provided on a timely basis.

Assistance from either the State or county government is not believed to be forthcoming. Due to the lack of appropriate funds and resources, Site maintenance or removal cannot be conducted properly or in a timely manner. The PRPs are unwilling or technically and financially unable to conduct the cleanup. There is no other entity or agency capable of addressing the immediate threats this Site poses for a timely removal.

The Summit Resource Management Site has not been proposed for the National Priorities List (NPL). Additional Site work is not anticipated at this time.

VI. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed action description

The proposed actions for this $2 million exemption and ceiling increase Action Memorandum are consistent with the August 1993 Action Memorandum. The scope of work outlines specific tasks to abate the immediate threats this Site poses to the public and environment.

Currently, 3,070 drums have been sampled and classified through hazard categorization. Eleven waste streams exist within the initial staged drums. With an estimated 2,000 drums remaining to be addressed, additional waste streams may be discovered. Based upon the new estimate of 5,000 drums, it is anticipated that bulking activities will require 10 to 12 weeks longer than the original estimate.

The remaining 2,000 drums will undergo the same procedure outlined for the initial 3,070 drums. The immediate actions proposed will consist of bulking the identified waste solids and liquids from the remaining drums. Bulking the waste streams containing large volumes has proven more cost effective. Small volume waste streams will remain in drums and be evaluated for the appropriate disposal method after all containers have been identified.

Compatible sludge and solids will be treated and stabilized on-site prior to transportation and disposal to a permitted facility in accordance with the EPA Off-site Rule.

The empty drums will be decontaminated to render them nonhazardous. The drums will be crushed and placed inside 20 yard rolloff boxes prior to disposal at a secure landfill. Recycling and shredding drums was considered but these options were not found to be feasible or cost effective.

Site disposal options will continue to include the best available and most cost-effective method in accordance with EPA policy. All waste will be considered for on-site treatment.

Once the drums and containers are addressed, the warehouse building will require decontamination. The floor and walls will undergo a decontamination procedure. The waste liquid will be collected inside the warehouse for disposal.

Removal of contaminated soil will be required. There is visual contamination and confirmed analytical data that identifies hazardous substances within the surface soil at two separate areas. The areas were identified during the site

investigation conducted in August of 1993. The extent of soil contamination will be determined. Once the extent of contamination is known, contaminated soil will be excavated and removed.

2. Contribution to Remedial Performance

This removal action will abate the immediate threats identified in the preceding sections of this Action Memorandum. The removal actions outlined will control the source of contamination and are consistent with any remedial action. At this time the Site is not listed on the NPL.

3. Description of Alternative Technologies

Alternate technologies continue to be considered during this removal action. Several alternatives have been considered and ruled out, due to their impracticality to this Site. Many of the technologies are currently underway as described in the August 1993 Action Memorandum.

4. Applicable or Relevant and Appropriate Requirements (ARARs)

The Federal ARARs determined to be practicable for the Site include the Resource Conservation and Recovery Act (RCRA), parts 260 to 268. In addition, all transport and disposal of waste will be in accordance with EPA's Off-site Rule.

Currently there are no applicable State ARARs.

5. Project Schedule

Staging of the remaining drums inside the warehouse is scheduled to begin early February of 1994. Sampling and hazard categorization of the estimated 2,000 drums will continue for five to six weeks. Bulking operations for the existing drums and hazard categorization for the remaining drums will be conducted simultaneous.

Completion of all drum disposal is anticipated in mid-Spring of 1994, assuming the remaining unidentified drums are consistent with the current waste streams.

Excavation and removal of contaminated soil will begin once all drums and containers are removed from Site. It is anticipated this action should be completed in late Spring of 1994. EPA's Site Assessment Branch will be consulted during soil removal.

B. Estimated Costs

Site costs reflected in this Action Memorandum show the current and proposed ceilings to complete this removal action. The following costs are based on the total removal of approximately 5,000 drums, decontamination of the warehouse and removal of contaminated soil.

Extramural Costs	Current Ceiling	Proposed Ceiling
Regional Allowance Costs:		
ERCS Contractor Costs:	$1,525,500	$2,150,000
Other Extramural Costs Not Funded From the Regional Allowance:		
Total TAT, including multiplier costs	$ 120,000	$ 160,000
Subtotal, Extramural	$1,645,500	$2,310,000
Extramural Costs Contingency (10% of Subtotal)	$ 164,550	$ 231,000
TOTAL, EXTRAMURAL COST AND CONTINGENCY	$1,810,050	$2,541,000
Intramural Costs		
Direct (1,800 hrs at $30/hr)	$ 54,000	
Direct (2,000 hrs at $30/hr)		$ 60,000
Indirect (1,000 hrs at $54/hr)	$ 54,000	
Indirect (1,200 hrs at $54/hr)		$ 64,800
TOTAL, INTRAMURAL	$ 108,000	$ 124,800
TOTAL PROJECT CEILING	$1,918,050	$2,665,800

VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

This section remains consistent with the August 1993 Action Memorandum.

VIII. OUTSTANDING POLICY ISSUES

There are no additional issues known for this removal activity since the August 1993 Action Memorandum.

IX. ENFORCEMENT

"Enforcement Sensitive", See Attachment I.

X. RECOMMENDATION

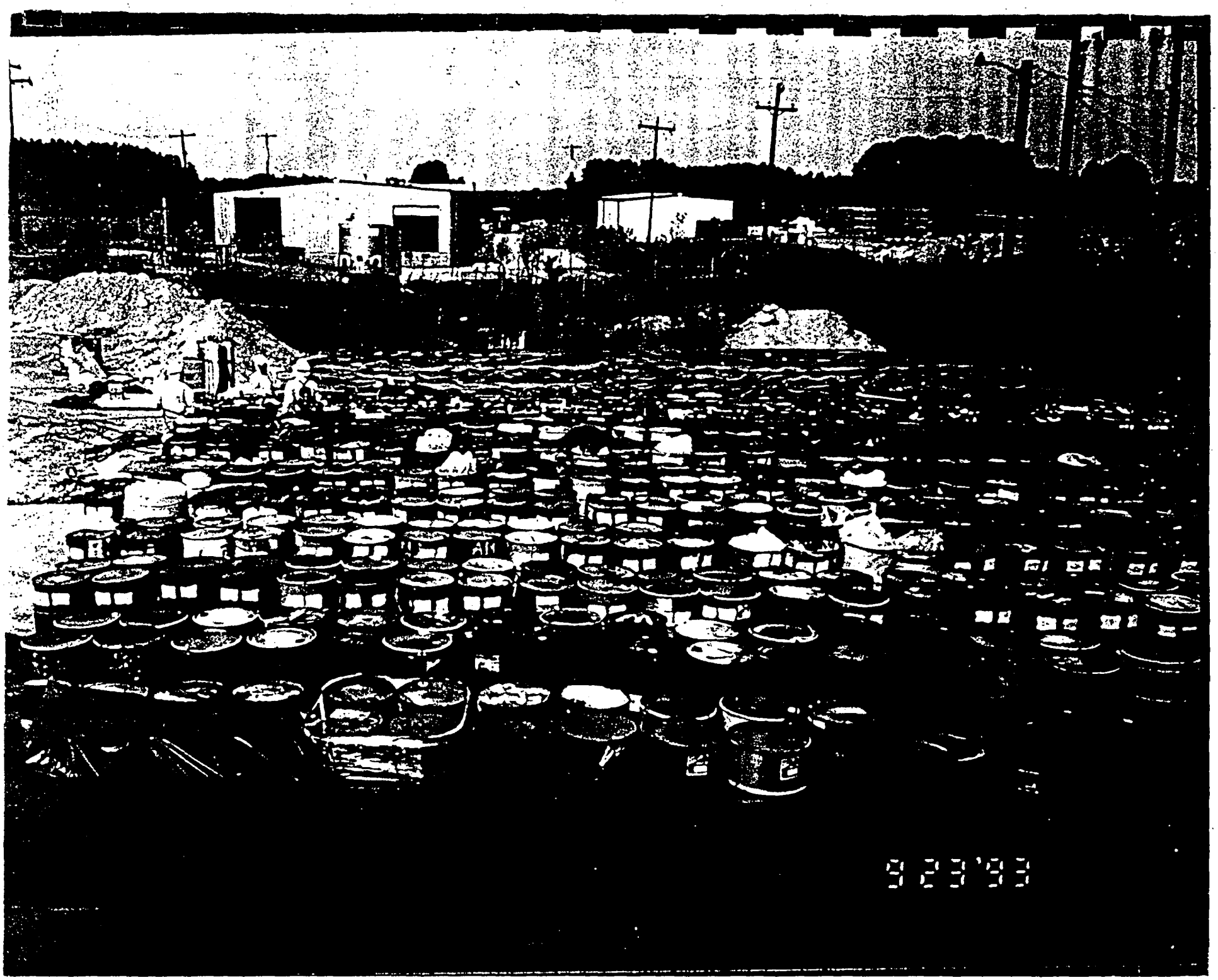
Conditions at the Summit Resource Management Site, in Matthews, Mecklenburg County, North Carolina, meet the criteria for a CERCLA section 104(c) emergency exemption, and I recommend your approval of an exemption from the $2 million limitation and a ceiling increase of $747,750. The total project ceiling, if approved, will be $2,665,800 of which an estimated $2,150,000 will be for extramural cleanup contractor costs funded from the Regional removal allowance.

Approved: Walter W. Kovalick for Date: 3/22/94

Disapproved: _____ Date: _____

Elliott P. Laws,
Assistant Administrator
Office of Solid Waste and Emergency Response

Attachments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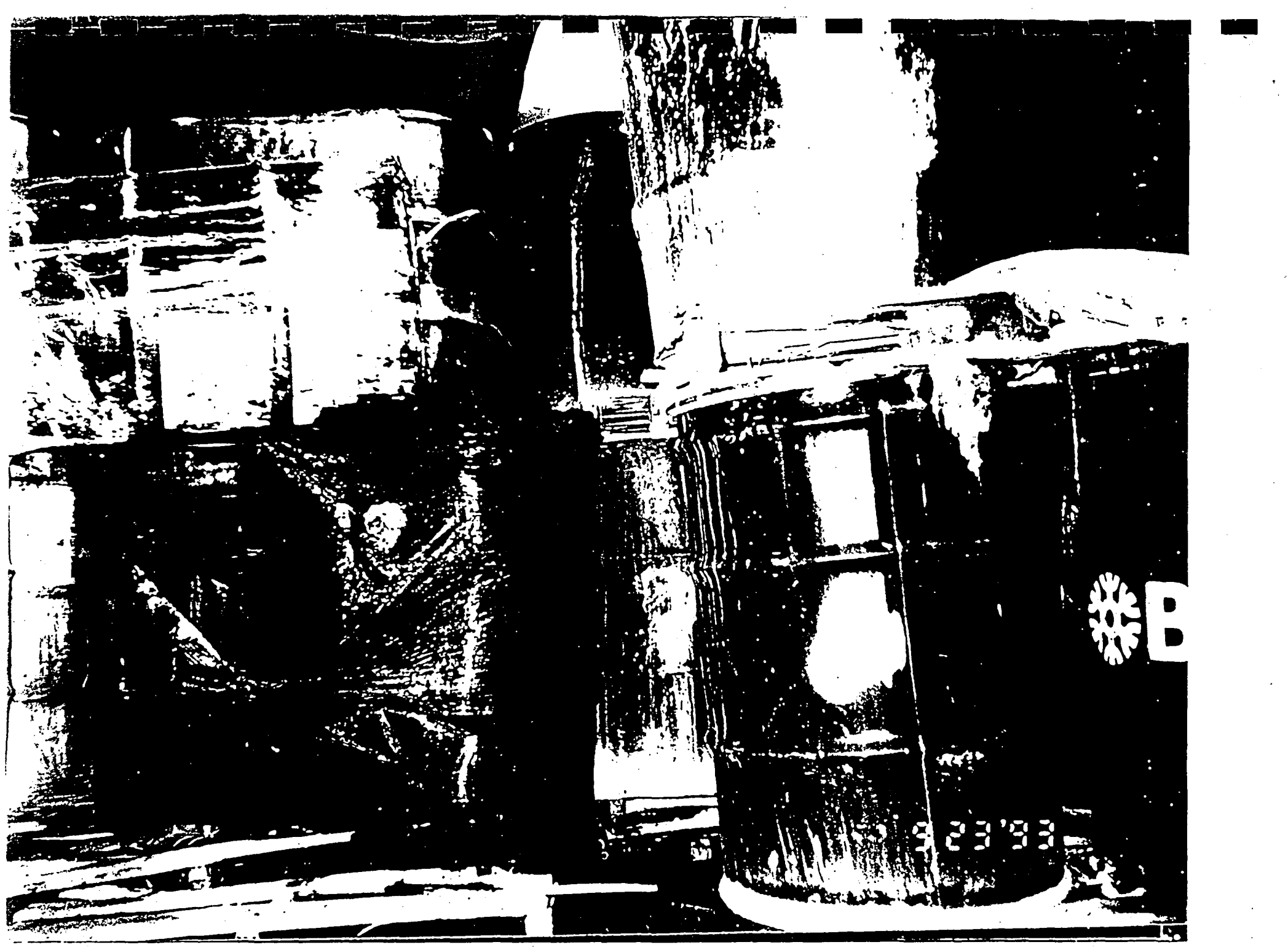
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G - Summit Resource Mike, FYI

Ref. 19

(7)

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(919) 420-1700 FAX (919) 420-1800

Keith,
For your information
Summit Resource Mgmt.
Union County, N.C.
Court Judgement.
Thanks,
Jesse

Jesse Wells
DEM - EPA
Eng. response requested
Call if you have questions.
DBH 8/30/93

August 23, 1993

VIA FACSIMILE (919-663-6040)

Mr. Jesse Wells
Mooresville Regional Office
N.C. Department of Environment, Health
and Natural Resources
P.O. Box 950
Mooresville, NC 28115

SEP

Re: Summit Resource Management Site
3481 Gribble Road, Matthews, Mecklenburg County, North Carolina

Dear Jesse:

We represent Blazek & Teal Enterprises in connection with the warehouse that they leased to Summit Resources Management at 3481 Gribble Road, Matthews, Mecklenburg County, North Carolina (the "Site"). Pursuant to our telephone conversation earlier today, I am attaching a copy of the Court Order entered by Judge Potter, United States District Court Judge, regarding this Site. As you can see, Judge Potter ordered Summit Resources to remove the drums from the Site in accordance with EPA policy. Please do not hesitate to call me if you have any questions about the Order or its effect.

It is my understanding that Summit Resources provided some documents to you describing the analytical results of samples taken from the drums on the Site. In accordance with the North Carolina Public Records Act, North Carolina General Statute § 132-6, we would like to obtain a copy of analytical results of samples from drums on the Site. If possible, I would appreciate it if you could provide me with a copy of this information through the mail. If it is not possible to obtain a copy of this information by mail, I anticipate that Mr. Blazek will visit the Mooresville office to review the file and to obtain a copy of the analytical results. I hoped that it might be possible to save Mr. Blazek a trip to Mooresville.

With best regards.

Very truly yours,

Richard C. Gaskins, Jr.

RCGjr/jmm
Enclosure
cc: Mr. Jon Blazek
Ms. Carolyn Teal
Mr. William L. Penny
Mr. John E. Quinn
Mr. John R. Caldwell
576:201540.00001
089\77931

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF NORTH CAROLINA
CHARLOTTE DIVISION

FILED
CHARLOTTE, N.C.
AUG 23 1993
U.S. DISTRICT COURT
W. DIST. OF N.C.

BLAZEK & TEAL ENTERPRISES, Plaintiff, v. SUMMIT RESOURCES MANAGEMENT, INC. Defendant.	)	NO. 3:93CV172-P

ORDER

This matter came to be heard on the 23rd day of August 1993 before the Honorable Robert D. Potter, District Judge, on the motion for preliminary injunction pursuant to Rule 65(a) of the Federal Rules of Civil Procedure and § 7002(a)(1)(B) of the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. § 6972(a)(1)(B), by plaintiff, Blazek & Teal Enterprises ("B&T") against defendant, Summit Resources Management, Inc. Based on the motion, memorandum of law, and supporting affidavits filed by B&T, the response filed by Summit, the arguments of counsel for the parties at the hearing of this matter, the testimony of witnesses at the hearing, and the entire record in this cause, the Court finds that an imminent and substantial endangerment to health or the environment may exist with regard to the property located at 3481 Gribble Road, Matthews, North Carolina owned by B&T (hereinafter the "Site") for which Summit bears responsibility pursuant to RCRA § 7002(a)(1)(B), 42 U.S.C. § 6972(a)(1)(B), as a past operator of a storage facility who was responsible for the storage, transportation, or

disposal of solid and hazardous waste. This Court specifically finds that Summit has thwarted the purpose of the statute underlying B&T's motion and that the statute in question specifically provides for injunctive relief. Further, this Court finds that the likelihood of irreparable injury to B&T is greater than the likelihood of injury to Summit (given that this Court finds that the drums were abandoned by Summit on Site) and that grave and serious questions are presented in the form of the potential fire damage to the surrounding community and the possibility of environmental contamination if the drums on Site are not immediately removed. The need for Summit to remove the drums and restore the Site through the entry of a preliminary injunction outweighs the hardship on any party against whom this Order is entered. Finally, this Court finds that the public interest is very much involved in this case and its interest is aligned with that of B&T. In view of the foregoing, this Court concludes that B&T is entitled to a preliminary injunction pending final hearing and determination of the merits or until further order from this Court.

NOW, THEREFORE, IT IS ORDERED:

1. That the motion for preliminary injunction filed by B&T is GRANTED. Summit, its officers, agents, servants, employees, and all other persons acting in concert or participation with it or them, shall comply with the following:

(A) Summit shall perform the removal activities required by this Order itself or retain a contractor to perform the removal activities under the direction and in a manner satisfactory to EPA;

(B) Summit shall, within 7 days of the date of this Order, provide for the removal, segregation, sampling, and proper containment of the drums located on Site in a manner satisfactory to EPA;

(C) In a manner satisfactory to EPA, Summit shall designate a Project Coordinator who shall be responsible for administration of all of Summit's actions required under this Order;

(D) In a manner satisfactory to EPA, Summit shall direct all submissions and notifications required by this Order to the attention of the EPA's On-Scene-Coordinator, Michael Taylor of the EPA Region IV Emergency Response and Removal Branch ("OSC"), at 345 Courtland Street N.E., Atlanta Georgia 30365. Summit shall direct a copy of all such submissions and notifications to the attention of B&T's counsel;

(E) Summit shall submit a plan within 30 days of the date of this Order that will provide for the following removal activities and Summit shall perform the removal activities set forth in the plan in the time established by EPA:

(1) arrange for the ultimate disposal and/or treatment of solid and/or hazardous waste materials stored in on-site drums, tanks, and other containers in a manner satisfactory to EPA;

(2) complete all preliminary site investigation activities required to define the nature and extent of soil contamination at the Site in a manner satisfactory to EPA;

(3) control the source of existing releases or threatened releases of solid and/or hazardous wastes into the environment from the Site in a manner satisfactory to EPA; and

(4) arrange for the ultimate disposal and/or treatment of contaminated soil and other items impacted by the release of solid and/or hazardous wastes into the environment from the Site in a manner satisfactory to EPA;

(F) In a manner satisfactory to EPA, Summit shall submit for EPA review and comment a plan that ensures the protection of the public health and safety during performance of on-site work under this Order;

(G) All sampling and analyses performed pursuant to this Order shall be performed in a manner satisfactory to EPA;

(H) In a manner satisfactory to EPA, Summit shall submit written progress reports to EPA concerning activities undertaken pursuant to this Order;

(I) In a manner satisfactory to EPA, Summit shall submit for EPA review and approval a final report summarizing the activities taken to comply with this Order;

(J) Summit shall submit to EPA, upon receipt, the results of all sampling or tests and all other data generated by Summit or its contractor, or on Summit's behalf during implementation of this Order;

(K) In a manner satisfactory to EPA, Summit shall preserve all documents and information relating to work performed under this Order or relating to the hazardous or solid wastes found on or released from the Site following completion of the removal activities required by this Order;

(L) All hazardous and/or solid wastes, pollutants or contaminants removed off-site pursuant to this Order for treatment, storage, or disposal shall be treated, stored, or disposed of in a manner satisfactory to EPA;

(M) Summit shall perform all activities required pursuant to this Order in accordance with all applicable local, state, and federal laws and regulations except as designated by EPA;

(N) If any incident or change in Site conditions, during the actions conducted pursuant to this Order causes or threatens to cause an additional release of hazardous or solid wastes from the Site or an endangerment to the health or the environment, Summit shall immediately take all appropriate action in accordance with all applicable provisions of this Order, including, but not limited to, the provisions of paragraph (F), above, in order to prevent, abate or minimize such release or endangerment caused or threatened by the release. Summit shall also immediately notify EPA in a manner satisfactory to EPA; and

(O) All work performed by Summit or anyone acting on Summit's behalf pursuant to this Order shall be consistent with the National Contingency Plan.

2. B&T shall, at least 30 days prior to the conveyance of any interest in real property at the Site, give written notice that the property is subject to this Order to the transferee and written notice to EPA (with a copy to Summit's counsel) of the proposed conveyance, including the name and address of the transferee. B&T agrees to require that any successor comply with the immediately preceding sentence and paragraph 3, below dealing with access to the property and information;

3. B&T shall provide and/or obtain access to the Site necessary to implement this Order. B&T and Summit shall provide access to all records and documentation related to the conditions at the Site and the activities conducted pursuant to this Order. Such access shall be provided in a manner satisfactory to EPA.

4. B&T shall give security in the form of a bond in the amount of $100,000 or with a corporate surety authorized to do business in the State of North Carolina. The said bond shall provide for the payment of such costs and damages as may be incurred or suffered by Summit if it is found to have been wrongfully enjoined.

Entered this the 23rd day of August, 1993.

Robert D. Potter
United States District Judge

Certified to be a true and correct copy of the original.
U. S. District Court
Thomas J. McGraw, Clerk
Western Dist. of N. C.
By _____
Deputy Clerk
Date 8-23-93

Memo

Date: October 13, 1994

To: File

From: Douglas Moore
Environmental Chemist
NC Superfund Section

Topic: PA/SI Sampling Trip

Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union County, NC
US EPA ID: NCD 986 232 213.

On Monday, October 10, 1994, two (2) sampling teams from the NC Superfund Section departed Raleigh to collect environmental samples for the Preliminary Assessment/Site Inspection sampling trip. Team #1 consisted of Jeannette Stanley and Doug Moore. Team #2 consisted of Doug Rumford and Harry Zinn. Arrived at the site at 1200. Met with Herb Leith and Dick Wagoner. I explained the purpose of the trip to Mr. Leith and Wagoner.

At 1215, Team #2 arrived at the Smith farm residence and began purging the Smith Farm well. At 1230 Team #2 collected drinking water sample "SR-PW-01" from the well for volatile, semi-volatile and inorganic analyses. Water temp for the well sample was 16.1 to 16.2° F, pH ranged from 6.97 to 7.18, specific conductivity ranged from 49 to 55 umhos. Well diameter: 6 inches in diameter, Well depth: 95 feet deep, Casing depth: 53 feet, Average yield: 6 gpm. A jet pump is located at the wellhead which pumps water to a storage tank. The well was completed 7/22/76. Well pump and tank are enclosed in a wellhouse. Metals sample was field acidified to pH 1.0 with 50 % HNO_3. The volatile groundwater sample was acidified with 8 drops of 1:1 HCl.

At 1230, Patty St. John, consultant for National Petroleum Packers, Inc., arrived at the Wagoner property. Accompanying her were two (2) consultants from Cooper Environmental: Bob Jones, project manager for the site, and Joseph Nestor. Cooper Environmental was subcontracted by Patty St. John for NPP to accompany each Team and receive split samples at each location.

At 1235, Jeff Johnson of ULOCO, the utility line locater, arrived at the site and proceeded to mark the utility lines for the site.

At 1245, Team #2 arrived at Mint Hill Cabinet Shop and inspected well. Tap located at wellhead would not purge. At 1250, Team #2 began purging well through the water lines at the bathroom sink at rear of building (approx. 110 feet from the wellhouse). At 1305, Team #2 collected water sample "SR-PW-02" from Mint Hill Cabinet Shop well for volatile, semi-volatile and inorganics analyses. Water temp for the well sample ranged from 16.9° F to 17.0° F, pH was 6.86, specific conductivity was 149 umhos. Well owner thinks the well is 90 feet deep and approximately 16 years old. Inorganics sample was acidified to pH 1.0 using 50 % HNO_3. The volatile groundwater sample was acidified with 8 drops of 1:1 HCl.

At 1330, Team #2 arrived back at site and carried Bob Jones of Cooper Environmental at collect additional sample at Mint Hill Cabinet Shop. An additional sample was collected for Mr. Jones without repurging the well.

At 1345, Team #2 carried Mr. Jones to Smith Farm residence to collect additional well. Mr. Jones asked that the well be re-purged.

At 1345, Team #1 collected a soil boring sample at the head of a side ditch located on the Blazek and Teal property at 3481 Gribble Road. The sample was taken from the 6-12 inch profile. HNu #37591 using Probe #970164 was calibrated in the field using isobutylene span gas. Span setting was 58.6 meter units. No readings above background were obtained from the bore hole using the HNu. A split sample was provided to Joe Nestor of Cooper Environmental. The soil in this sample was a orange clayey soil. The soil sample was labelled "SR-SL-01". The soil sample was collected for volatile, semi-volatile and inorganics analyses.

At 1410, Team #2 arrived at Orren Honeycutt residence, 3125 Gribble Road. Mr. Honeycutt granted permission to sample the pond located near his house.

At 1425, Team #2 collected a surface water sample "SR-SW-01" from the pond. The samples were collected for volatile, semi-volatile and inorganic analyses. A split sample was provided to Bob Jones of Cooper Environmental. The inorganics samples were acidified to pH 1.0 using 50 % HNO_3. The surface water volatile sample was acidifed with 8 drops of 1:1 HCl.

At 1440, Team #2 collected a sediment sample from the same location on the pond. The sample was collected for volatile, semi-volatile and inroganics analyses. The sample was labelled "SR-SD-01". A split sample was provided to Bob Jones of Cooper Environmental.

At 1440, Team #1 collected a soil boring sample in a drainage at the southeast corner of the B&T property. The sample was taken from the 6-12 inch profile. HNu #970164 using 10.2 eV probe was calibrated in the field using isobutylene span gas. Span setting was 53.0 meter units. No readings above background were obtained from the bore hole using the HNu. A split sample was provided to Joe Nestor of Cooper Environmental.

The soil in this sample was a orange clayey soil. The soil sample was labelled "SR-SL-03". The soil was sampled for volatile, semi-volatile and inorganics analyses. A split sample was provided to Joe Nestor of Cooper Environmental.

At 1500, Team #1 collected a soil boring sample from a drainage ditch that enters the B&T property near the northeast corner. The soil sample was taken from the 6-12 inch profile. No HNu reading was taken at this location, as the sample point was inaccessible to the sampler. The soil boring sample was labelled "SR-SL-02". The soil was sampled for volatile, semi-volatile and inorganics analyses. A split sample was provided to Joe Nestor of Cooper Environmental.

The site appears to have been graded. A brief inspection of the grounds found no visibly stained soils near the warehouse. Stacked pallets of yellow anti-freeze jugs were visible through an open warehouse door. Likewise, the gate connecting the B&T parcel to the NPP parcel was open, allowing access to each.

Teams #1 & #2 departed the site for Lunch at 1515.
Team #2 arrived back at the site around 1620.

Between 1620 and 1700, Team #1 located a pair of bolt cutters at the Stallings VFD. Stallings VFD lended the cutters to Team #1 to break the locks off the onsite and offsite monitoring wells. At 1700, Team #1 arrived back at the site and met with Herb Leith and Dick Wagoner. Mr. Wagoner was concerned about our purpose for sampling his property. I explained to Mr. Wagoner our purpose in collecting environmental samples from his property. Mr. Wagoner granted permission to sample the wetland on his property.

Team #2 prepared to collect a wetland surface water and sediment sample from the Wagoner property. In order to confirm the precise location of the sample point in relation to the wetland area, a TopCon Theodolite Model TL-60 SE surveyor. The slope distance from the surveyor to the wetland sample point was determined using a TopCon DM-A5 electronic distance measure. The slope distance was determined by using 2 building corners as reference points and backsighting the instrument at the 2 known points.
Corner #1: Horizontal - 0°-00' Vertical - 271°-58' Slope Distance - 94.585 feet
Corner #2: Horizontal - 56°-15' Vertical - 270°-42' Slope Distance - 233.245 feet
Sediment Sample Point "SR-SD-02": Horizontal - 113°-57' Vertical - 268°-12' Slope Distance - 247.930 feet

The surface water wetland sample "SR-SW-02" was collected at 17:25. The sediment wetland sample "SR-SD-02" was collected at 17:35. Both the surface water and sediments were sampled for volatile, semi-volatile and inorganics analyses. The inorganics surface water sample was field acidified to pH 1.0 using 50 % HNO_3. The volatile surface water sample was field acidied using 8 drops of 1:1 HCl. Split samples were provided to Bob Jones of Cooper Environmental.

At 17:40, Team #1 proceeded to the monitoring well near the center of the National Petroleum Packers parcel. Groundwater was measured at 9 feet from the top of the outer casing and 8.8 feet from the top of the inner 2 I.D. PVC casing. A yellow tan floculate was observed on the well measuring probe. HNu readings of the headspace were < 1 meter unit but greater than 0 meter units.

At 17:55, Team #1 began bailing the monitoring well in the center of the National Petroleum Packers parcel. The well bailed dry after approximately 5.5 bailers. The water from the well had a dull cloudy, yellow-tan appearance with floculates present.

At 18:25, Team #1 sampled a soil boring from a drainage ditch along the northeast boundary of the NPP parcel. The sample was taken from the 6-12 inch profile. HNu #970164 using 10.2 eV probe had been previously calibrated in the field using isobutylene span gas. Span setting was 53.0 meter units. Readings of 1-2 meter units above background were obtained from the bore hole using the HNu. No HNu readings were found in the breathing zone above the bore hole. The soil had a rank rotten smell. The sample was labelled "SR-SL-04". The soil was sampled for volatile, semi-volatile and inorganics analyses. A split sample was provided to Joe Nestor of Cooper Environmental. The soil in this sample was a clay/sandy sediment.

At 18:50, Team #1 returned to collect groundwater samples from the monitoring well near the center of the National Petroleum Packers parcel. A volatile sample was collected at 18:50 and a semi-volatile sample was collected at 18:55. The groundwater sample was labelled "SR-MW-02". As the groundwater sample was yellowish and cloudy in appearance, no metals sample was collected due to the high turbidity. A split sample was provided to Joe Nestor of Cooper Environmental. The volatile sample was field acidified with 8 drops of 1:1 HCl.

At 18:25, Team #2 uncapped the monitoring well on the Wagoner property downgradient of the NPP parcel. The headspace of the well was sampled using HNu #970164 with its 10.2 eV probe. The HNu was field calibrated to 56 meter units at 5.50 span setting using isobutylene span gas. No readings above background were detected at the top of the well casing. The 2 inch I.D. PVC casing was 21.6 feet with a water level of 8.2 feet from the top of the casing.. Approx. 30 bailers were drawn from the well prior to sampling.

Team #2 sampled the Wagoner property monitoring well "SR-MW-01" at 19:10. The groundwater sample was collected for volatile, semi-volatile and inorganics analyses. The inorganics sample was field acidifed to pH 1.0 using 50 % HNO_3. A split sample was provided to Bob Jones of Cooper Environmental.

At 18:50, Team #2 collected a soil boring sample from visibly stained soils approximately 10 feet from the southeastern fence of the NPP property and 30 feet from the northeast corner of the NPP fence. The sample was collected from the 6-12 inch profile. An HNu reading of 15 meter units above background was determined in the bore

hole. No HNu readings above background were found in the breathing zone above the bore hole. The soil was sample for volatile, semi-volatile and inorganics analyses. The sample was labeled "SR-SL-05". A split sample was provided to Bob Jones of Cooper Environmental.

Summit Resources

10-10-94

Overcast slight Rain

Temp Aro 60's

At Smith Farm Residence

SR-PW-01 Nobody home

Acidify VOC vials w/ 4 Drops Each HCl

1215 Begin Purging Smith Residence well

Temp 16.0°F

pH 6.97

Spec. Cond 55

well Head Is Tagged, Jet pump

Used, Piped to Storage Tank

6" Diameter, Depth 95'

Completed 7/22/76 Casing Depth

53'; yield 6 gpm, No filtration

well pump & Tank enclosed in well house

1220 Temp. 16.1°F; pH 7.18; Spec Cond 50

1225 Temp 16.2°F; pH 7.08; Spec Cond 149

1230 Temp 16.2°F; pH 7.13; Spec. Cond 50

Collect Drinking water Sample.

No pictures Taken - Camera inoperable

Acidify metals sample w/ HNO_3 To pH 1

Finish sample SR-PW-01

1245 Arrive at Mint Hill Cabinet

shop - Inspect well. Submersible

pump Type used, Faucet at Top of

well Head, well & Tank Enclosed in

wooden well House. Will Not Purge at well

1250 Begin Purging well Through water

lines at Bathroom sink at Rear of

Building ≈ 110 Ft from well House

Temp. 18°F; pH 6.68; Spec Cond 146

1252 Purge water Began Running Rust

Colored Possible Turbidity.

1255 water is Running Clear Again

1300 Temp. 16.9°F; pH 6.86; Spec Cond 149

1305 Temp. 17.0°F pH 6.86; Spec Cond 149

Collect Sample SR-PW-02 From

Sink at Bathroom. Collect sample in

metals Container to Transfer to BNA

Container.

1310 Talk To Cabinet Shop owner He

Thinks well is ≈ 90 Ft Deep & Approx

16 yrs old Drilled Dave Mullis well

Drilling installed the well. 704-545-5694

1315 Acidify metals sample to pH 1

1330 Talk to Bob Jones of Cooper Environmental

To Sample at Mint Hill Cabinet Shop

Bob Jones Samples at same location w/o Repurging well.

1345 Return to Smith Farm well - Bob asks us to purge the well.

1410 Arrive Honeycutt Residence 3125 Gribble Rd Property owner of Pond where we will collect sample SR-SW-01 & SR-SD-01 704-821-8757 gave permission to sample pond. 14:25 Surface Water SR-SW-01 - Split sample w/ Bob Jones

1440 Collect sediment sample from same location at pond. Split sample w/ Bob Jones

1445 Acidify metals sample w/ HNO_3 to pH 2

1510 leave site for lunch

1620 Return to site

Wetland Sample SR SW 02 SR SD 02

HI prism 4.95'

Corner 1
H 0°-08' V 271°-58' S 94.585

Corner 2
H 56°-15' V 270°-42' S 233.245

SD-02
H 113°.57' V 268°12' S 247.430'

Sample @ 17:25 SW0
17:35 SED

Sediment Sample is more clay than background sample.

Sample at Wagner Monitoring Well
Uncapped Well at 18:25
No Reading above background
on HNU ~~9000~~ 970164
with 10.2 eV probe on it.
HNU Calibrated to 54 ppm at
5.50 span setting

Water level meter from Top of
PVC Casing Well depth 21.6'
Water depth 8.2'
13.4' of water in 2" ID PVC

30 bailers to purge well
Well sampled at 19:10

Soil SR-SL-05
Stained Soils approximately
10' from fence and
30 ft from property corner
Sample taken from
6" to 12" depth
Sample taken at 18:50
No HNU Reading above
background in Breathing

HNU Reading in Hole
15 ppm

COOPER ENVIRONMENTAL
ENGINEERS • GEOLOGISTS • SCIENTISTS

Joseph P. Nestor, P.G.
Geology Division Manager

2300 SARDIS ROAD N. • SUITE Q • CHARLOTTE, NC 28227
PHONE (704) 845-2000 • FAX (704) 841-8901

SUMMIT RESOURCES MGMT SITE
STALLINGS, UNION CO., NC
NCD 986 232 213

PA/SI SAMPLING TRIP
MONDAY, OCTOBER 10, 1994.

Arrived site 1200 -

Dick Wagner + Herb Leith
met with them and explained
what we would be doing
1230 - Patty St.
1235 - ULOCO began marking
lines
1240 - Cooper Environmental
Bob Jones
ULOCO Marker -
Jeff Johnson - 1800 822-2336
ID# 7390

met Joe Nestor, Cooper Env.
1305

1310 – proceeded to
sample location SR-SL-01
Head of Side Ditch next to
3481 Gribble Rd.

VOA 1057013 } Lot #'s
BNA 32100032 } soil bottles

~~OVA~~ HNU #3759 / Prop# 970164
Span setting ~~8.5~~ 58.6
Calibrated w/ gas.
Photo #1 + 2? / No reading on HNU
Sample SR-SL-01 taken
at 1345 – split provided
to Joe Nestor Cooper Env.
in his jars (2) / soil Clayey

Proceeded to sample location SR-SL-03
Recalibrated span setting 53.0
Photo #3 / No reading on HNU
Took sample 1440 – SR-SL-03
Provided split to Joe Nestor
Soil Clayey

SR-SL-02 - No reading taken/inaccessible
Sample location - Photo #4
Clay soil - SR-SL-02 - 1500
Location was selected on NW side of fence from B+T property. Doug Moore commented that he saw boxes (stacked pallets) of antifreeze inside B+T Warehouse. Patty St. John said NPP was not leasing property but would like to. Gate between NPP + B+T property was open. Split provided to Nestor
Left for lunch 1515
Got Bolt cutter from Stallings FD
Returned to site 1700
Track backed up to B+T warehouse
Prepared for water samples
Metals Lot #0235013
BNA Lot #4143042
Prepared trip VOA blank
Preacidified VOA vials

Proceeded to SR-MW-02
HNU headspace reading < 1 mu
but > 0

Groundwater - 9' from top of outer casing. From inner casing, 8.8' from top.
Yellow/tan floc noted on probe

Began bailing 1755 -
Photo #5 - 1st bailer
Bailed well dry ~ 5 1/2 bailers

Proceeded to SR-SL-04
HNU ~ 1 mu
soil had rotten smell
clay/sandy sediment appearance
took sample 1825
split provided to Joe Nestor

Returned to SR-MW-02 -
sampled VOA ~~[illegible]~~ 1850
BNA 1855

SR-MW-02-
Highly turbid- muddy.
Decided not to sample for metals.

All samples were locked in the van overnight in coolers with blue ice. DBM
10/10/94

All samples were labelled, chain of custody and sample analytical request sheets completed, delivered and relinquished to Rm #50 for organics analysis.
DBM
10/11/94

All samples were labelled, chain of custody & sample analytical request sheets completed, delivered and relinquished to Room #400 for inorganics analysis. DBM

SOLID WASTE MANAGEMENT DIVISION

Receipt for Samples

National Petroleum Packers, 3501 Gribble Rd.
Name of Firm — Firm Address — Stallings, Union Co, NC

Salim Boulos - owner
Firm Owner, Operator, or Agent Title

Robert Jones - Cooper Environmental - Charlotte.
Patricia St. John - consultant

SAMPLE NUMBER	COLLECTED DATE	COLLECTED TIME	SAMPLE TYPE WATER	SAMPLE TYPE SOIL	SAMPLE TYPE OTHER	DUPLICATE SAMPLE OFRD	DUPLICATE SAMPLE ACPT	DUPLICATE SAMPLE RJCTD	SAMPLE LOCATION ONSITE	SAMPLE LOCATION OFFSITE
SR-SL-01	10-10-94	1345		X			X		X	
SR-SL-02	10-10-94	1500		X			X		X	
SR-SL-03	10-10-94	1440		X			X		X	
SR-PW-01	10-10-94	1230	X				X			X
SR-PW-02	10-10-94	1305	X				X			X
SR-SW-01	10-10-94	1425	X				X			X
SR-SD-01	10-10-94	1440			X		X			X
SR-SL-04	10-10-94	1825		X			X		X	
SR-SW-02	10-10-94	1725	X				X			X
SR-SD-02	10-10-94	1725			X		X			X
SR-MW-01	10-10-94	1905	X				X			X
SR-MW-02	10-10-94	1850	X				X		X	
SR-SL-05	10-10-94	1900		X			X			X

Receipt for the sample(s) described above is hereby acknowledged:

Douglas B. Moore
Signature of Inspector

Environmental Chemist
Title

Receipt/rejection of duplicate or split samples is hereby acknowledged:

Robert D. Jones
Signature of Firm Owner, Operator, or Agent

Engineering Division Mgr.
Title

Patti St. John / Consultant

Comments:

:\COCR.FRM)

Ref. 21

(3)

Draft

TERRACHEM
ENVIRONMENTAL SERVICES, INC.

N. C. DEPT. OF NATURAL
RESOURCES AND
COMMUNITY DEVELOPMENT

MAY 18 1993

DIVISION OF ENVIRONMENTAL MANAGEMENT
MOORESVILLE REGIONAL OFFICE

PRELIMINARY SITE ASSESSMENT

FOR

SUMMIT RESOURCES MANAGEMENT, INC.
3501 GRIBBLE RD.
MATTHEWS, NC 28105

MARCH 10, 1993

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Field Activities:

On 2-23-93 TerraChem Environmental Services, Inc. mobilized a trailer mounted drill rig to the site located on Gribble Rd. in Union County. A series of borings, sampling of soils, sampling of groundwater and surface water was performed. A series of Monitor Wells were installed as well to assess the impact of petroleum and other similar chemicals on the area where they had been released.

It is clear that the dike area located in the western corner of the property is a source of some of the problem. Products are spilled and leak from hose connections into these concrete dike areas. These areas collect rain water which leaks out of the dikes into the surrounding soils. In the rear of the property near the railroad tracks it is apparent that drums containing some unknown contents have been buried and are now surfacing.

Sampling:

All soil samples were taken using a stainless steel hand auger. The soils were placed in 4 oz. glass jars with a teflon lined cap and placed on ice until received at the laboratory. These samples were all tested by EPA Methods 5030, 3550 and 9071 for Total Petroleum Hydrocarbons (TPH). In the event that the samples were found to contain petroleum hydrocarbons, they were analyzed by GCMS and all peaks searched on the NBS library and identified.

Water samples from wells were taken by first bailing three (3) to five (5) well volumes from the well, allowing the well to recover and then taking a sample using a teflon bailer. The sample was transferred from the bailer to two (2) 40 ml zero headspace vials and one (1) 1-liter glass amber jar. These samples were also placed on ice and tested for petroleum hydrocarbons. Surface water samples were collected by lowering the sames series of sample containers into a pond or stream and filling it. All sampling tools were decontaminated using an alconox scrub followed by two (2) organics-free water rinses.

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Samples Results:

Sample SR-1, 5' is a soil sample taken from a boring up-gradient on the site. This sample, along with samples SR-3,1' and SR-3, 3', were free of contamination. Samples taken during the installation of Monitor Well #2 were also free of contamination. All other samples which were tested had contamination in them. The characteristics of the identified compounds correspond with the heavy organics processed on site and their breakdown products. Triethylene Glycol and other long chained alcohols were identified by the Mass Spectra.

Conclusions:

It has been found that there is widespread contamination in and around the Summit property for which there is a known source of release. It is also our belief that these compounds are used and spent by other companies upstream of the sample collection area.

Jeffrey O'Ham
President

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AquaChem
ENVIRONMENTAL LABORATORIES, INC.
11176 Downs Road
Pineville, NC 28134
704/588-5076
FAX 704/588-2454

NC Certification Number: 305
SC Certification Number: 99032

Date of Report: 03/04/93
Date Received : ~~02/23/93~~

Approved By:
Tyler H. Garber
Laboratory Director

Client: TerraChem Environmental Services
P. O. Box 401302
Charlotte, North Carolina 28241-0302

Contact: Mr. Jeff O'Ham

Customer Number: 1084

LABORATORY REPORT

LAB ID: 615F01
SAMPLE ID: SR-1' 5' SUMMIT RESOURCE

Parameter	Result	Det.Limit	Unit	Method	Date Anal.	Anal.
TPH by 3550	BDL	5	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/24/93	LWC
TPH by 9071	BDL	10	PPM	EPA 9071	02/26/93	SJB

LAB ID: 615F02
SAMPLE ID: SR-2, 1' SUMMIT RESOURCE

TPH by 3550	53	5	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/24/93	LWC
TPH by 9071	298	10	PPM	EPA 9071	02/26/93	SJB

LAB ID: 615F03
SAMPLE ID: SR-2, 3' SUMMIT RESOURCE

TPH by 3550	329	5	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/24/93	LWC
TPH by 9071	159	10	PPM	EPA 9071	02/26/93	SJB

LAB ID: 615F04
SAMPLE ID: SR-2, 5' SUMMIT RESOURCE

TPH by 3550	409	5	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/24/93	LWC
TPH by 9071	78	10	PPM	EPA 9071	02/26/93	SJB

LAB ID: 615F05
SAMPLE ID: SR-3, 1' SUMMIT RESOURCE

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TerraChem Environmental Services
03/04/93
Page 2

LAB ID: 615F05
SAMPLE ID: SR-3, 1' SUMMIT RESOURCE

Parameter	Result	Det.Limit	Unit	Method	Date Anal.	Anal.
TPH by 3550	BDL	5	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/24/93	LWC
TPH by 9071	BDL	10	PPM	EPA 9071	02/26/93	SJB

LAB ID: 615F06
SAMPLE ID: SR-3, 3' SUMMIT RESOURCE

TPH by 3550	BDL	5	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/24/93	LWC
TPH by 9071	BDL	10	PPM	EPA 9071	02/26/93	SJB

LAB ID: 615F07
SAMPLE ID: SR-3, 5' SUMMIT RESOURCE

TPH by 3550	33	5	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/24/93	LWC
TPH by 9071	BDL	10	PPM	EPA 9071	02/26/93	SJB

LAB ID: 615F08
SAMPLE ID: POND SUMMIT RESOURCE

TPH by 3550	15	1	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/25/93	LWC
Oil & Grease	58	3	PPM	SM 503	03/01/93	SJB

LAB ID: 615F09
SAMPLE ID: STREAM SUMMIT RESOURCE

TPH by 3550	4	1	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/25/93	LWC
Oil & Grease	4	3	PPM	SM 503	03/01/93	SJB

LAB ID: 615F10
SAMPLE ID: MW-1 SUMMIT RESOURCE

TPH by 3550	98	1	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/25/93	LWC
Oil & Grease	179	3	PPM	SM 503	03/01/93	SJB

LAB ID: 615F11
SAMPLE ID: ENVIROSPECT SUMMIT RESOURCE

TPH by 3550	BDL	1	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/25/93	LWC
Oil & Grease	9	3	PPM	SM 503	03/01/93	SJB

LAB ID: 615F12
SAMPLE ID: MW-2 SUMMIT RESOURCE

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TerraChem Environmental Services
03/04/93
Page 3

LAB ID: 615F12
SAMPLE ID: MW-2 SUMMIT RESOURCE

Parameter	Result	Det.Limit	Unit	Method	Date Anal.	Anal.
TPH by 3550	BDL	1	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/25/93	LWC
Oil & Grease	4	3	PPM	SM 503	03/01/93	SJB

LAB ID: 615F13
SAMPLE ID: MW-2, 5' SUMMIT RESOURCE

TPH by 3550	BDL	5	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/25/93	LWC
TPH by 9071	BDL	10	PPM	EPA 9071	02/26/93	SJB

LAB ID: 615F14
SAMPLE ID: MW-2, 10' SUMMIT RESOURCE

TPH by 3550	BDL	5	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/25/93	LWC
TPH by 9071	BDL	10	PPM	EPA 9071	02/26/93	SJB

LAB ID: 615F15
SAMPLE ID: BACK AREA SUMMIT RESOURCE

TPH by 3550	459	1	PPM	EPA 3550	02/24/93	LWC
TPH by 5030	BDL	5	PPM	EPA 5030	02/25/93	LWC
Oil & Grease	1219	10	PPM	SM 503	03/01/93	SJB

8

AquaChem
ENVIRONMENTAL LABORATORIES, INC.
11176 Downs Road
Pineville, NC 28134
704/588-5076
FAX 704/588-2454

NC Certification Number: 305
SC Certification Number: 99032

Date of Report: March 4, 1993
Date Received: February 23, 1993

Approved By: _____

Client: TerraChem Environmental
P. O. Box 401302
Charlotte, North Carolina 28241

Contact: Mr. Jeff O'Ham

Customer Number 1063

LABORATORY REPORT

LAB ID: 615F02
SAMPLE ID: SR-2, 1' SUMMIT RESOURCE

Parameter	Method	Date Anal.	Analyst
Library Search		03/03/93	LWC

A semi-volatile scan was performed on the following sample and the compounds listed were found.

1-methyl-2-Pyrrolidinone
2-(2-butoxyethoxy)-Ethanol
Triethylene glycol
4-methyl-Pentanamide
1-{1-methyl-2-(2-propenyloxy)}-2-Propanol
1-{2-(2-methoxy-1-methylethoxy)}-2-Propanol
2,5,8,11-Tetraoxatetradecan-13-ol
1,1'-{(1-methyl-1,2-ethanedi)}-2-Propanol
2-{2-(2-butoxyethoxy) ethoxy}-Ethanol
2,5,8,11,14-Pentaoxahexadecan-16-ol

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Mr. Jeff O'Ham
March 4, 1993
Page 2

LAB ID: 615F03
SAMPLE ID: SR-2, 3' SUMMIT RESOURCE

Parameter	Method	Date Anal.	Analyst
Library Search		03/03/93	LWC

A semi-volatile scan was performed on the following sample and the compounds listed were found.

1-(2-methoxy-1-methylene)-2-Propanol
1-methyl-2-Pyrrolidinone
1-(2-butoxyethoxy)-Ethanol
2,5,8,11,14,17-Hexaoxaoctadecane
2,5,8,11-Tetraoxatetradecan-13-ol
2,5,8,11,14-Pentaoxahexadecan-16-ol

LAB ID: 615F04
SAMPLE ID: SR-2, 5' SUMMIT RESOURCE

Parameter	Method	Date Anal.	Analyst
Library Search		03/03/93	LWC

A semi-volatile scan was performed on the following sample and the compounds listed were found.

1-(2-methoxy-1-methylene)-2-Propanol
1-methyl-2-Pyrrolidinone
Triethylene Glycol
2,5,8,11-Tetraoxatetradecan-13-ol
1-{2-(2-methoxy-1-methylethoxy)-2-Propanol
2,5,8,11,14-Pentaoxahexadecan-16-ol

LAB ID: 615F07
SAMPLE ID: SR-3, 5' SUMMIT RESOURCE

Parameter	Method	Date Anal.	Analyst
Library Search		03/03/93	LWC

A semi-volatile scan was performed on the following sample and the compounds listed were found.

Phenol
1-methyl-2-Pyrrolidinone
4-Hexen-1-ol
2-(2-butoxyethoxy)-Ethanol
Triethylene Glycol
2-{2-(2-butoxyethoxy)ethoxy}Ethanol
1-methoxy-2-methyl-2-Propanol
2,5,8,11-Tetraoxatetradecan-13-ol

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Mr. Jeff O'Ham
March 4, 1993
Page 3

LAB ID: 615F08
SAMPLE ID: POND SUMMIT RESOURCE

Parameter	Method	Date Anal.	Analyst
Library Search		03/03/93	LWC

A semi-volatile scan was performed on the following sample and the compounds listed were found.

1-butoxy-2-Propanol
1-(2-methoxy-1-methylene)-2-Propanol
1-methyl-2-Pyrrolidinone
1,1'-(1-methyl-1,2-ethanedi)-2-Propanol
2-(2-methoxy propxy)-1-Propanol
1-{2-(2-methoxy-1-methyl)}-2-Propanol
2-hydroxy-2-methyl Propanoic acid

LAB ID: 615F10
SAMPLE ID: MW-1 SUMMIT RESOURCE

Parameter	Method	Date Anal.	Analyst
Library Search		03/03/93	LWC

A semi-volatile scan was performed on the following sample and the compounds listed were found.

1-butoxy-2-Propanol
Hexanoic acid
1-(2-methoxy-1-methylene)-2-Propanol
2,5,8,11,14-Pentaoxahexadecan-16-ol
2,4,8,11,14,17-Hexaoxaoctadecane
3,6,9,12,15-Pentaoxanonodecan-1-ol
2,5,8,11,14-Pentaoxahexadcan-16-ol
2,5,8,11-Tetraoxatetradecan-13-ol

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PINEVILLE, NC 28134
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FAX 704/588-2454

CHAIN OF CUSTODY

nt: Terra Chem Env. Serv.
ess: 2020 Cleveland Ave
Clt. State: N.C. Zip: 28209
ntact Person: Jeff O'Ham
mpled By: Jeff O'Ham

Phone Number: ( )
Fax Number: ( )
Purchase Order Number:
Date:
Requested Completion Date:
Rush Charges Authorized ☐ Yes ☐ No

inquishing this sample(s) to Laboratory Personnel, I warrant that I am authorized to enter into this agreement for the Client named above and that I authorize the below analysis subject to the terms and conditions on the reverse hereof. agreement is governed by the terms and conditions on the reverse side hereof. Analysis charges shall be as included in the Laboratories fee schedule in effect at the time of the analysis.

linquished By: [signature] Date: 2-23-93 Time: 1600
ived By: [signature] Date: 2-23-93 Time: 1600
linquished By: Date: Time:
ived By: Date: Time:

mmit Resources

Sample ID	PLASTIC	GLASS	Date & Time Sampled	COMPOSITE	GRAB	MATRIX	Lab ID	BOD	COD	TSS	pH	Ammonia	Oil & Grease	Cyanide	Phenol	Arsenic	Selenium	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Mercury	Silver	Barium	TCLP (Complete)	TPH (3550)	TPH (5030)	Volatile	Other Analysis	Preservative
R-1; 5'		✓	2-23-93 1300			S	615F1																					X	X		4071	ICE
2-2; 1'		✓				S	615F2																					X	X		LS	
2-2; 3'		✓				S	615F3																					X	X		LS	
R-2; 5'		✓				S	615F4																					X	X		LS	
3-3; 1'		✓				S	615F5																					X	X			
3-3; 3'		✓				S	615F6																					X	X			
3-3; 5'		✓				S	615F7																					X	X		LS	
and		✓				W	615F8					X																X	X		LS	
tream		✓				W	615F9					X																X	X			
W-1		✓				W	615F10																					X	X		LS	

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PAGE 06

(11)

sampler
e Installed: Time Installed:

Please sign and return the white and yellow copies to the Laboratory.

AquaChem

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11176 DOWNS ROAD
PINEVILLE, NC 28134
704/588-5076
FAX 704/588-2454

CHAIN OF CUSTODY

nt: Terra Chem Envi Serv
ress: 2020 Cleveland Ave
y: Clt State: N.C. Zip:
ntact Person: Jeff O'Ham
mpled By: Jeff O'Ham

Phone Number: ( )
Fax Number: ( )
Purchase Order Number:
Date:
Requested Completion Date:
Rush Charges Authorized ☐ Yes ☐ No

inquishing this sample(s) to Laboratory Personnel, I warrant that I am authorized to enter into this agreement for the Client named above and that I authorize the below analysis subject to the terms and conditions on the reverse hereof. agreement is governed by the terms and conditions on the reverse side hereof. Analysis charges shall be as included in the Laboratories fee schedule in effect at the time of the analysis.

inquished By: [signature]	Date: 2-23-93	Time: 1600
eived By: Donna Vettano	Date: 2-23-93	Time: 1600
linquished By:	Date:	Time:
eived By:	Date:	Time:

Summit

Sample ID	PLASTIC	GLASS	Date & Time Sampled	COMPOSITE	GRAB	MATRIX	Lab ID	BOD	COD	TSS	pH	Ammonia	Oil & Grease	Cyanide	Phenol	Arsenic	Selenium	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Mercury	Silver	Barium	TCLP (Complete)	TPH (3550)	TPH (8000)	Volatile	Other Analysis	Preservative
nuirospec		✓	1300 2-23-93			W	615F11						X															X	X		~~9071~~ OV	ICE
W-2		✓	"			W	615F12						X															X	X		9	
W-2, 5'		✓	"			S	615F13																					X	X		9071	
W-2, 10'		✓	"			S	615F14																					X	X		9071	
ck area		✓	"			W	615F15						X															X	X		OV	

osampler
e Installed: Time Installed:
Time Picked Up:

Please sign and return the white and yellow copies to the Laboratory.

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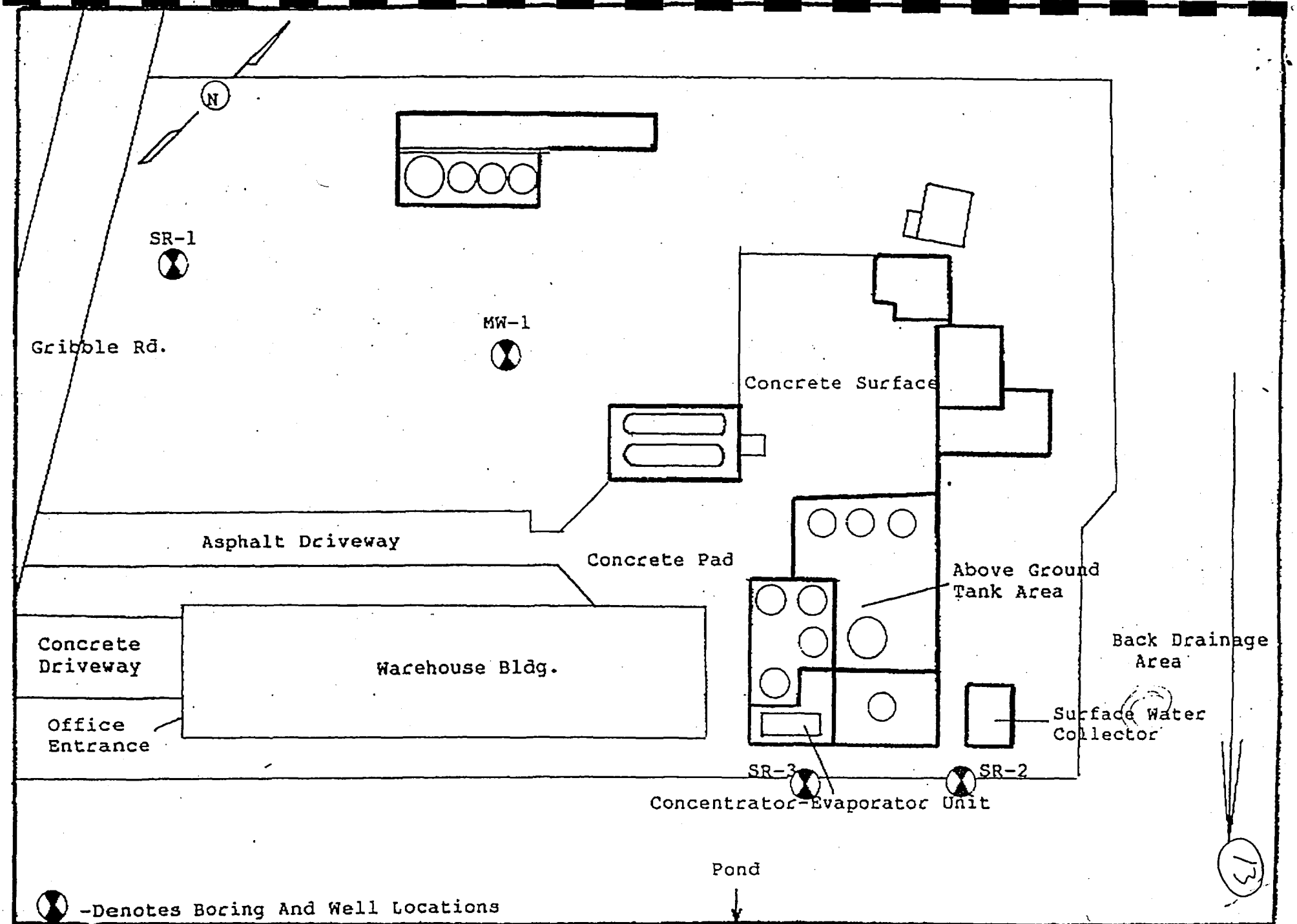
PAGE 87

03/09/1993 23:05 704-377-4719



Summit Resource Management, Inc.
3501 Gribble Rd.
Matthews, N.C. 28105

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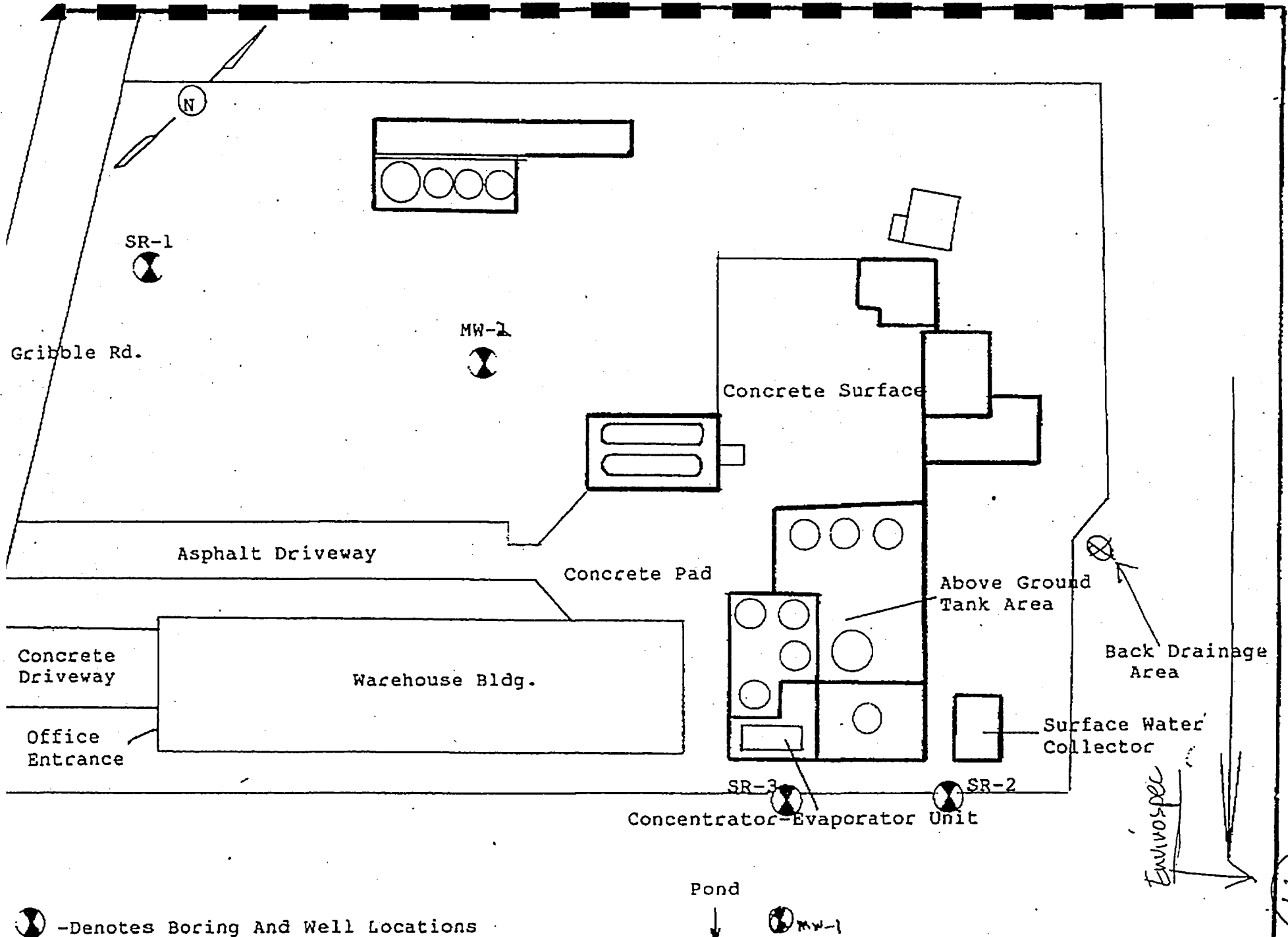
ENVIRONMENTAL SERVICES, INC.

JOB NO. 93117
SCALE: Not To Scale



-Denotes Boring And Well Locations

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3501 Gribble Rd.
Matthews, N.C. 28105

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ENVIRONMENTAL SERVICES, INC.

JOB NO. 93117
SCALE: Not To Scale

Ref. 22

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

Ms. Pat DeRosa
North Carolina Department of Environment,
Health and Natural Resources
P.O.Box 27687
Raleigh, North Carolina 27611-7687

Subject: Superfund Chemical Data Matrix (SCDM)

Dear Ms. DeRosa:

Attached is the revised Superfund Chemical Data Matrix (SCDM) These tables, which replace the March 1993 version of SCDM, are to be used when evaluating sites with the Hazard Ranking System (HRS) . Changes from the previous version have been marked with an asterisk in the tables. Also enclosed is a separate list of the values which have been changed.

There is one change of specific importance. In the June 1994 SCDM, a benchmark has been included for lead in drinking water. Since the former MCL of 50 ug/l was rescinded in November 1992, the action level of 15 ug/l, which is the standard used by the drinking water program to monitor water quality at the tap, was included.

Please contact me at 404/347-5069, ext. 6160 or Trish Gowland at 703/603-9017 if you have any questions.

Sincerely

Deborah A. Vaughn-Wright

Deborah A. Vaughn-Wright
Region 4 NPL Coordinator

Enclosure

Printed on Recycled Paper

SUPERFUND CHEMICAL DATA MATRIX

APPENDIX B TABLES

June 1994

Appendix B-1

Tables for Non-Radioactive Hazardous Substances

HAZARD RANKINL STEM
Hazardous Substance Benchmarks
(333 Substances)

SCDM Version: JUN94

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Acenaphthene	000083-32-9	...	...	...	...	2.1E+00	...
Acenaphthylene	000208-96-8	...	...	...	...	...	...
Acetaldehyde	000075-07-0	...	9.0E-03	4.5E-04	...	...	...
Acetone	000067-64-1	...	...	...	...	3.5E+00	...
Acetonitrile	000075-05-8	...	4.9E-02*	...	...	2.1E-01	...
Acetophenone	000098-86-2	...	...	...	...	3.5E+00	...
Acetyl-2-thiourea, 1-	000591-08-2	...	...	...	...	...	...
Acrolein	000107-02-8	...	2.0E-05	...	...	7.0E-01	...
Acrylamide	000079-06-1	...	...	7.7E-07	...	7.0E-03	7.8E-06
Acrylic acid	000079-10-7	...	3.0E-04	...	...	2.8E+00	...
Acrylonitrile	000107-13-1	...	2.0E-03	1.5E-05	...	...	6.5E-05
Adipic acid	000124-04-9	...	...	...	...	...	...
Aldicarb	000116-06-3	...	...	...	... *	3.5E-02*	...
Aldrin	000309-00-2	...	...	2.0E-07	...	1.1E-03	2.1E-06
Allyl alcohol	000107-18-6	...	...	...	...	1.8E-01	...
Aluminum	007429-90-5	...	...	...	...	...	...
Aluminum phosphide	020859-73-8	...	...	...	...	1.4E-02	...
Ammonia	007664-41-7	...	1.0E-01	...	...	1.2E+03	...
Ammonium picrate	000131-74-8	...	...	...	...	...	...
Ammonium sulfamate	007773-06-0	...	...	...	...	7.0E+00	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Aniline	000062-53-3	...	1.0E-03	...	...	...	6.3E-03
Anthracene	000120-12-7	...	...	...	...	1.1E+01	...
Antimony	007440-36-0	...	...	...	6.0E-03	1.4E-02	...
Arsenic	007440-38-2	...	...	2.3E-07	5.0E-02	1.1E-02	2.0E-05
Asbestos	001332-21-4	...	...	4.3E-06 fibers/mL	...	...	...
Atrazine	001912-24-9	...	...	...	3.0E-03	1.2E+00*	1.6E-04
Azinphos- ethyl	002642-71-9	...	...	...	...	...	...
Azinphos- methyl	000086-50-0	...	...	...	...	...	...
Aziridine	000151-56-4	...	...	...	...	...	...
Barium	007440-39-3	...	4.9E-04*	...	2.0E+00	2.5E+00	...
Barium cyanide	000542-62-1	...	...	...	...	3.5E+00	...
Benz(a)anthracene	000056-55-3	...	...	...	... *	...	...
Benzene	000071-43-2	...	...	1.2E-04	5.0E-03	...	1.2E-03
Benzene carbonyl chloride	000098-88-4	...	...	...	...	...	...
Benzidine	000092-87-5	...	...	1.5E-08	...	1.1E-01	1.5E-07
Benzo(a)pyrene	000050-32-8	...	...	... *	2.0E-04	...	4.8E-06
Benzo(g,h,i)perylene	000191-24-2	...	...	...	...	...	...
Benzo(j,k)fluorene	000206-44-0	...	...	...	...	1.4E+00	...
Benzo(k)fluoranthene	000207-08-9	...	...	...	... *	...	...
Benzofluoranthene, 3,4-	000205-99-2	...	...	...	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

SCDM Version: JUN94

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Benzoic acid	000065-85-0	...	...	...	...	1.4E+02	...
Benzonitrile	000100-47-0	...	...	...	...	...	...
Benzothiazole, 1,2,-	000095-16-9	...	...	...	...	...	...
Benzyl chloride	000100-44-7	...	...	...	...	...	2.1E-04
Beryllium	007440-41-7	1.0E-02	...	4.2E-07	4.0E-03*	1.8E-01	8.1E-06
Biphenyl, 1,1-	000092-52-4	...	...	...	...	1.8E+00	...
Bis (2-ethylhexyl) phthalate	000117-81-7	...	...	...	...	7.0E-01	2.5E-03
Bis(2-chloroethoxy)methane	000111-91-1	...	...	...	...	...	...
Bis(2-chloroethyl)ether	000111-44-4	...	...	3.0E-06	...	...	3.2E-05
Bis(chloromethyl)ether	000542-88-1	...	...	1.6E-08	...	...	1.6E-07
Boron	007440-42-8	...	2.0E-02	...	...	3.2E+00	...
Bromodichloromethane	000075-27-4	...	...	...	...	7.0E-01	5.6E-04*
Bromomethane	000074-83-9	...	5.0E-03	...	...	4.9E-02	...
Bromoxynil	001689-84-5	...	...	...	...	7.0E-01	...
Butadiene, 1,3-	000106-99-0	...	...	3.6E-06	...	...	...
Butanol	000071-36-3	...	...	...	...	3.5E+00	...
Butylbenzyl phthalate	000085-68-7	...	...	...	... *	7.0E+00	...
Butyric acid, 4-(2,4-dichlorophenoxy)	000094-82-6	...	...	...	...	2.8E-01	...
Cadmium	007440-43-9	...	...	5.6E-07	5.0E-03	1.8E-02	...
Captan	000133-06-2	...	...	...	...	4.6E+00	1.0E-02

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Carbaryl	000063-25-2	...	...	...	...	3.5E+00	...
Carbofuran	001563-66-2	...	...	...	4.0E-02	1.8E-01	...
Carbon disulfide	000075-15-0	...	1.0E-02	...	...	3.5E+00	...
Carbon Tetrachloride	000056-23-5	...	...	6.7E-05	5.0E-03	2.5E-02	2.7E-04
Carbophenothion	000786-19-6	...	...	...	...	...	...
Cesium	007440-46-2	... *	... *	... *	... *	... *	... *
Chloral	000075-87-6	...	...	...	...	7.0E-02	...
Chlordane	000057-74-9	...	...	2.7E-06	2.0E-03	2.1E-03	2.7E-05
Chlorine cyanide	000506-77-4	...	...	...	...	1.8E+00	...
Chloro-3-methylphenol, 4-	000059-50-7	...	...	...	...	7.0E+01	...
Chloroaniline, p-	000106-47-8	...	...	...	...	1.4E-01	...
Chlorobenzene	000108-90-7	...	2.0E-02*	...	...	7.0E-01	...
Chloroform	000067-66-3	...	...	4.3E-05	...	3.5E-01	5.7E-03
Chloromethane	000074-87-3	...	...	5.6E-04	...	...	2.7E-03
Chloromethyl methyl ether	000107-30-2	...	...	...	...	...	...
Chloromethyloxirane, 2-	000106-89-8	...	1.0E-03	8.3E-04	...	7.0E-02*	3.5E-03
Chloronaphthalene, 2-	000091-58-7	...	...	...	...	2.8E+00	...
Chlorophenol, 2-	000095-57-8	...	...	...	...	1.8E-01	...
Chlorpyrifos	002921-88-2	...	...	...	...	1.1E-01	...
Chromium	007440-47-3	...	...	...	1.0E-01	1.8E-01	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

SCDM Version: JUN94

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Chromium(III)	016065-83-1	...	...	...	...	3.5E+01	...
Chromium(VI)	018540-29-9	...	...	* 8.3E-08*	...	1.8E-01*	...
Chrysene	000218-01-9	...	...	...	... *	...	...
Cobalt	007440-48-4	...	...	...	...	...	...
Copper	007440-50-8	...	...	...	1.3E+00*	...	...
Copper cyanide	000544-92-3	...	...	...	...	1.8E-01	...
Coumaphos	000056-72-4	...	...	...	...	...	...
Creosote	008001-58-9	...	...	...	...	...	...
Cresol, m-	000108-39-4	...	...	...	...	1.8E+00	...
Cresol, p-	000106-44-5	...	...	...	...	1.8E-01*	...
Cumene	000098-82-8	...	9.0E-03	...	...	1.4E+00	...
Cyanazine	021725-46-2	...	...	...	...	7.0E-02	4.2E-05*
Cyanide	000057-12-5	...	...	...	2.0E-01	7.0E-01	...
Cyanogen	000460-19-5	...	...	...	...	1.4E+00	...
Cyanogen bromide	000506-68-3	...	...	...	...	3.2E+00	...
Cyclohexane	000110-82-7	...	...	...	...	...	...
Cyclohexanone	000108-94-1	...	...	...	...	1.8E+02	...
Cyclotrimethylenetrinitriamine	000121-82-4	...	...	...	...	1.1E-01	3.2E-04
DDD	000072-54-8	...	...	...	...	...	1.5E-04
DDE	000072-55-9	...	...	...	...	...	1.0E-04

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
DDT	000050-29-3	...	...	1.0E-05	...	1.8E-02	1.0E-04
DEF	000078-48-8	...	...	...	...	1.1E-02*	...
Di-n-butyl phthalate	000084-74-2	...	...	...	...	3.5E+00	...
Di-n-octyl phthalate	000117-84-0	...	...	...	...	7.0E-01	...
Diazinon	000333-41-5	...	...	...	...	3.2E-02	...
Dibenz(a,h)anthracene	000053-70-3	...	...	...	... *	...	...
Dibenzofuran	000132-64-9	...	...	...	...	...	...
Dibromo-3-chloropropane, 1,2-	000096-12-8	...	2.0E-04	5.1E+00*	...	...	2.5E-05
Dibromochloromethane	000124-48-1	...	...	...	...	7.0E-01	4.2E-04
Dibromoethane, 1,2-	000106-93-4	...	2.0E-04*	4.5E-06	5.0E-05	...	4.1E-07
Dicamba	001918-00-9	...	...	...	...	1.1E+00	...
Dichlorobenzene, 1,2-	000095-50-1	...	2.0E-01*	...	6.0E-01	3.2E+00	...
Dichlorobenzene, 1,3-	000541-73-1	...	...	...	6.0E-01*	...	...
Dichlorobenzene, 1,4-	000106-46-7	...	8.1E-01*	...	7.5E-02	...	1.5E-03
Dichlorobenzidine, 3,3-	000091-94-1	...	...	...	...	...	7.8E-05
Dichlorodifluoromethane	000075-71-8	...	2.0E-01*	...	...	7.0E+00	...
Dichloroethane, 1,1-	000075-34-3	...	4.9E-01*	...	...	3.5E+00*	...
Dichloroethane, 1,2-	000107-06-2	...	...	3.8E-05	5.0E-03	...	3.8E-04
Dichloroethene, 1,1-	000075-35-4	...	...	2.0E-05	7.0E-03	3.2E-01	5.8E-05
Dichloroethylene, cis-1,2-	000156-59-2	...	...	...	7.0E-02	3.5E-01	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Dinoseb	000088-85-7	...	...	...	7.0E-03	3.5E-02	...
Dioxane, 1,4-	000123-91-1	...	...	...	...	...	3.2E-03
Dioxathion	000078-34-2	...	...	...	...	...	...
Diphenylhydrazine, 1,2-	000122-66-7	...	...	4.5E-06	...	...	4.4E-05
Diquat	000085-00-7	...	...	...	2.0E-02	7.7E-02	...
Disulfoton	000298-04-4	...	...	...	...	1.4E-03	...
Diuron	000330-54-1	...	...	...	...	7.0E-02	...
Endosulfan (I or II)	000115-29-7	...	...	...	...	2.1E-01*	...
Endosulfan sulfate	001031-07-8	...	...	...	...	...	...
Endothall	000145-73-3	...	...	...	1.0E-01	7.0E-01	...
Endrin	000072-20-8	...	...	...	2.0E-03	1.1E-02	...
Endrin aldehyde	007421-93-4	...	... *	...	...	... *	...
Ethion	000563-12-2	...	...	...	...	1.8E-02	...
Ethyl acetate	000141-78-6	...	...	...	...	3.2E+01	...
Ethyl benzene	000100-41-4	...	1.0E+00	...	7.0E-01	3.5E+00	...
Ethyl chloride	000075-00-3	...	1.0E+01	...	...	...	...
Ethyl ether	000060-29-7	...	...	...	...	7.0E+00	...
Ethyldipropylthiocarbamate, s-	000759-94-4	...	...	...	...	8.8E-01	...
Ethylene glycol	000107-21-1	...	...	...	...	7.0E+01	...
Ethylene glycol monoethyl ether	000110-80-5	...	2.0E-01	...	...	...	...

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Hazardous Substance Benchmarks
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Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Kepone	000143-50-0	...	...	...	...	...	...
Lead	007439-92-1	1.5E+00	...	...	1.5E-02*	...	...
Lindane	000058-89-9	...	...	...	2.0E-04	1.1E-02	2.7E-05
Magnesium	007439-95-4	...	...	...	...	...	...
Malathion	000121-75-5	...	...	...	...	7.0E-01	...
Maleic anhydride	000108-31-6	...	...	...	...	3.5E+00	...
Maleic hydrazide	000123-33-1	...	...	...	...	1.8E+01	...
Manganese	007439-96-5	...	4.0E-04	...	... *	1.8E-01*	...
Mercury	007439-97-6	...	3.0E-04	...	2.0E-03	1.1E-02	...
Methacrylonitrile	000126-98-7	...	7.0E-04*	...	...	3.5E-03	...
Methanol	000067-56-1	...	...	...	...	1.8E+01	...
Methomyl	016752-77-5	...	...	...	...	8.8E-01	...
Methoxychlor	000072-43-5	...	...	...	4.0E-02	1.8E-01	...
Methyl chlorocarbonate	000079-22-1	...	...	...	...	...	...
Methyl ethyl ketone	000078-93-3	...	1.0E+00	...	...	2.1E+01*	...
Methyl isobutyl ketone	000108-10-1	...	8.1E-02*	...	...	1.8E+00	...
Methyl methacrylate	000080-62-6	...	...	...	...	2.8E+00	...
Methyl Napthalene, 2-	000091-57-6	...	...	...	...	...	...
Methylene bis (2-chloroaniline), 4,4-	000101-14-4	...	...	2.7E-05	...	2.5E-02	2.7E-04
Methylene chloride	000075-09-2	...	3.0E+00	2.1E-03	5.0E-03*	2.1E+00	4.7E-03

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Hazardous Substance Benchmarks
(333 Substances)

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Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Parathion, ethyl-	000056-38-2	...	...	...	...	2.1E-01	...
Parathion, methyl-	000298-00-0	...	...	...	...	8.8E-03	...
PCBs	001336-36-3	...	...	...	5.0E-04	...	4.5E-06
Pentachlorinated dibenzo-p-dioxin, 1,2,3	040321-76-4	...	...	5.0E-11	...	...	4.7E-10
Pentachlorinated dibenzofuran, 1,2,3,7,8	109719-77-9	...	...	2.3E-10	...	...	2.3E-09
Pentachlorinated dibenzofuran, 2,3,4,7,8	057117-41-6	...	...	2.3E-10	...	...	2.3E-09
Pentachlorobenzene	000608-93-5	...	...	...	...	2.8E-02	...
Pentachloroethane	000076-01-7	...	...	...	...	...	...
Pentachloronitrobenzene	000082-68-8	...	...	...	...	1.1E-01	1.3E-04
Pentachlorophenol	000087-86-5	...	...	...	1.0E-03	1.1E+00	2.9E-04
Phenanthrene	000085-01-8	...	...	...	...	...	...
Phenol	000108-95-2	...	...	...	...	2.1E+01	...
Phenyl sulfide	000139-66-2	...	...	...	...	...	...
Phenylmercuric acetate	000062-38-4	...	...	...	...	2.8E-03	...
Phorate	000298-02-2	...	...	...	...	7.0E-03	...
Phosgene	000075-44-5	...	...	...	...	...	...
Phosphamidon	013171-21-6	...	...	...	...	...	...
Phosphine	007803-51-2	...	3.0E-05	...	...	1.1E-02	...
Phosphoric acid	007664-38-2	...	...	...	...	...	...
Phosphorodithioc acid,phenyl-o-ethyl-o-(	002104-64-5	...	...	...	...	3.5E-04	...

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Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Phosphorous (elemental)	007723-14-0	...	...	...	...	...	...
Phthalic anhydride	000085-44-9	...	1.2E-01*	...	...	7.0E+01	...
Plutonium	007440-07-5	...	...	...	...	...	...
Polychlorinated triphenyl	012642-23-8	...	...	...	...	...	...
Potassium silver cyanide	000506-61-6	...	...	...	...	7.0E+00	...
Pronamide	023950-58-5	...	...	...	...	2.6E+00	...
Pyrene	000129-00-0	...	...	...	...	1.1E+00	...
Pyridine	000110-86-1	...	...	...	...	3.5E-02	...
Quinoline	000091-22-5	...	...	...	...	...	2.9E-06
Radium	007440-14-4	... *	... *	... *	... *	... *	... *
Radon	010043-92-2	... *	... *	... *	... *	... *	... *
Resorcinol	000108-46-3	...	...	...	...	...	...
Ronnel	000299-84-3	...	...	...	...	1.8E+00	...
Selenium	007782-49-2	...	...	...	5.0E-02	1.8E-01	...
Selenourea	000630-10-4	...	...	...	...	1.8E-01	...
Silver	007440-22-4	...	...	...	...	1.8E-01	...
Silver Cyanide	000506-64-9	...	...	...	...	3.5E+00	...
Sodium	007440-23-5	...	...	...	...	...	...
Strontium	007440-24-6	... *	... *	... *	... *	2.1E+01*	... *
Strychnine	000057-24-9	...	...	...	...	1.1E-02	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

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Substance Name	CAS Number	AIR PATHWAY NAAQS/NESHAPS (µg/m3)	AIR PATHWAY Reference Dose Screen Conc (mg/m3)	AIR PATHWAY Cancer Risk Screen Conc (mg/m3)	GROUND WATER PATHWAY MCL/MCLG (mg/L)	GROUND WATER PATHWAY Reference Dose Screen Conc (mg/L)	GROUND WATER PATHWAY Cancer Risk Screen Conc (mg/L)
Styrene	000100-42-5	...	1.0E+00	...	1.0E-01	7.0E+00	...
Sulfuric acid	007664-93-9	...	...	...	...	...	...
TB, 2,4,5-	000093-80-1	...	...	...	...	...	...
TCDD	001746-01-6	...	...	2.0E-11	3.0E-08*	...	2.3E-10
Tetrachlorobenzene, 1,2,4,5-	000095-94-3	...	...	...	...	1.1E-02	...
Tetrachlorodibenzofuran, 2,3,7,8-	125322-32-9	...	...	2.3E-10	...	...	2.3E-09
Tetrachloroethane, 1,1,1,2-	000630-20-6	...	...	1.3E-04	...	1.1E+00	1.3E-03
Tetrachloroethane, 1,1,2,2-	000079-34-5	...	...	1.8E-05	...	...	1.8E-04
Tetrachloroethene	000127-18-4	...	...	1.8E-03	5.0E-03	3.5E-01	6.7E-04
Tetrachlorophenol, 2,3,4,6-	000058-90-2	...	...	...	...	1.1E+00	...
Tetraethyl lead	000078-00-2	...	...	...	...	3.5E-06	...
Tetraethyldithiopyrophosphate	003689-24-5	...	...	...	...	1.8E-02	...
Tetrahydrofuran	000109-99-9	...	...	...	...	...	...
Thallium	007440-28-0	...	...	...	5.0E-04*	...	...
Thiourea	000062-56-6	...	...	...	...	...	...
Thiram	000137-26-8	...	...	...	...	1.8E-01	...
Thorium	007440-29-1	...	...	...	...	...	...
Toluene	000108-88-3	...	4.0E-01	...	1.0E+00	7.0E+00	...
Toluene diisocyanate	000584-84-9	...	...	...	...	...	...
Toxaphene	008001-35-2	...	...	3.2E-06	3.0E-03	...	3.2E-05

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		AIR PATHWAY			GROUND WATER PATHWAY		
Substance Name	CAS Number	NAAQS/NESHAPS (µg/m3)	Reference Dose Screen Conc (mg/m3)	Cancer Risk Screen Conc (mg/m3)	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)
Uranium	007440-61-1	...	...	...	...	...	...
Vanadium	007440-62-2	...	...	...	...	2.5E-01	...
Vanadium pentoxide	001314-62-1	...	...	...	...	3.2E-01	...
Vinyl acetate	000108-05-4	...	2.0E-01	...	...	3.5E+01	...
Vinyl chloride	000075-01-4	...	...	1.2E-05	2.0E-03	...	1.8E-05
Warfarin	000081-81-2	...	...	...	...	1.1E-02	...
Xylene, m-	000108-38-3	...	...	...	1.0E+01*	7.0E+01	...
Xylene, o-	000095-47-6	...	...	...	1.0E+01*	7.0E+01	...
Xylene, p-	000106-42-3	...	...	...	1.0E+01*	...	...
Zinc	007440-66-6	...	...	...	...	1.1E+01	...
Zinc cyanide	000557-21-1	...	...	...	...	1.8E+00	...
Zinc phosphide	001314-84-7	...	...	...	...	1.1E-02	...
Zinc sulfate	007733-02-0	...	...	...	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Acenaphthene	000083-32-9	...	2.1E+00	...	...	7.8E+01	...	...	...
Acenaphthylene	000208-96-8	...	...	...	...	...	...	...	...
Acetaldehyde	000075-07-0	...	...	...	...	...	...	...	...
Acetone	000067-64-1	...	3.5E+00	...	...	1.3E+02	...	...	...
Acetonitrile	000075-05-8	...	2.1E-01	...	...	7.8E+00	...	...	...
Acetophenone	000098-86-2	...	3.5E+00	...	...	1.3E+02	...	...	...
Acetyl-2-thiourea, 1-	000591-08-2	...	...	...	...	...	...	...	...
Acrolein	000107-02-8	...	7.0E-01	...	...	2.6E+01	...	...	...
Acrylamide	000079-06-1	...	7.0E-03	7.8E-06	...	2.6E-01	2.9E-04	...	...
Acrylic acid	000079-10-7	...	2.8E+00	...	...	1.0E+02	...	...	...
Acrylonitrile	000107-13-1	...	...	6.5E-05	...	...	2.4E-03	...	...
Adipic acid	000124-04-9	...	...	...	...	...	...	...	...
Aldicarb	000116-06-3	... *	3.5E-02*	...	...	1.3E+00*	...	...	...
Aldrin	000309-00-2	...	1.1E-03	2.1E-06	3.0E-01	3.9E-02	7.6E-05	3.0E+00	1.3E+00
Allyl alcohol	000107-18-6	...	1.8E-01	...	...	6.5E+00	...	...	...
Aluminum	007429-90-5	...	...	...	...	...	...	...	...
Aluminum phosphide	020859-73-8	...	1.4E-02	...	...	5.2E-01	...	...	...
Ammonia	007664-41-7	...	1.2E+03	...	...	4.4E+04	...	...	...
Ammonium picrate	000131-74-8	...	...	...	...	...	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Ammonium sulfamate	007773-06-0	...	7.0E+00	...	...	2.6E+02	...	...	...
Aniline	000062-53-3	...	...	6.3E-03	...	...	2.3E-01	...	...
Anthracene	000120-12-7	...	1.1E+01	...	...	3.9E+02	...	...	...
Antimony	007440-36-0	6.0E-03	1.4E-02	...	...	5.2E-01	...	...	...
Arsenic	007440-38-2	5.0E-02	1.1E-02	2.0E-05	...	3.9E-01	7.4E-04	1.9E+02	3.6E+01
Asbestos	001332-21-4	...	...	...	...	...	...	...	...
Atrazine	001912-24-9	3.0E-03	1.2E+00*	1.6E-04	...	4.6E+01*	5.9E-03	...	...
Azinphos- ethyl	002642-71-9	...	...	...	...	...	...	...	...
Azinphos- methyl	000086-50-0	...	...	...	...	...	...	...	...
Aziridine	000151-56-4	...	...	...	...	...	...	...	...
Barium	007440-39-3	2.0E+00	2.5E+00	...	...	9.1E+01	...	...	...
Barium cyanide	000542-62-1	...	3.5E+00	...	...	1.3E+02	...	...	...
Benz(a)anthracene	000056-55-3	... *	...	...	...	...	...	...	...
Benzene	000071-43-2	5.0E-03	...	1.2E-03	...	...	4.5E-02	...	...
Benzene carbonyl chloride	000098-88-4	...	...	...	...	...	...	...	...
Benzidine	000092-87-5	...	1.1E-01	1.5E-07	...	3.9E+00	5.7E-06	...	...
Benzo(a)pyrene	000050-32-8	2.0E-04	...	4.8E-06	...	...	1.8E-04	...	...
Benzo(g,h,i)perylene	000191-24-2	...	...	...	...	...	...	...	...
Benzo(j,k)fluorene	000206-44-0	...	1.4E+00	...	...	5.2E+01	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Benzo(k)fluoranthene	000207-08-9	... *	...	...	...	...	...	...	...
Benzofluoranthene, 3,4-	000205-99-2	...	...	...	...	...	...	...	...
Benzoic acid	000065-85-0	...	1.4E+02	...	...	5.2E+03	...	...	...
Benzonitrile	000100-47-0	...	...	...	...	...	...	...	...
Benzothiazole, 1,2,-	000095-16-9	...	...	...	...	...	...	...	...
Benzyl chloride	000100-44-7	...	...	2.1E-04	...	...	7.6E-03	...	...
Beryllium	007440-41-7	4.0E-03*	1.8E-01	8.1E-06	...	6.5E+00	3.0E-04	...	...
Biphenyl, 1,1-	000092-52-4	...	1.8E+00	...	...	6.5E+01	...	...	...
Bis (2-ethylhexyl) phthalate	000117-81-7	...	7.0E-01	2.5E-03	...	2.6E+01	9.3E-02	...	...
Bis(2-chloroethoxy)methane	000111-91-1	...	...	...	...	...	...	...	...
Bis(2-chloroethyl)ether	000111-44-4	...	...	3.2E-05	...	...	1.2E-03	...	...
Bis(chloromethyl)ether	000542-88-1	...	...	1.6E-07	...	...	5.9E-06	...	...
Boron	007440-42-8	...	3.2E+00	...	...	1.2E+02	...	...	...
Bromodichloromethane	000075-27-4	...	7.0E-01	5.6E-04*	...	2.6E+01	2.1E-02*	...	...
Bromomethane	000074-83-9	...	4.9E-02	...	...	1.8E+00	...	...	...
Bromoxynil	001689-84-5	...	7.0E-01	...	...	2.6E+01	...	...	...
Butadiene, 1,3-	000106-99-0	...	...	...	...	...	...	...	...
Butanol	000071-36-3	...	3.5E+00	...	...	1.3E+02	...	...	...
Butylbenzyl phthalate	000085-68-7	... *	7.0E+00	...	...	2.6E+02	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Butyric acid, 4-(2,4-dichlorophenoxy)	000094-82-6	...	2.8E-01	...	...	1.0E+01	...	...	...
Cadmium	007440-43-9	5.0E-03	1.8E-02	...	...	1.3E+00	...	1.1E+00	9.3E+00
Captan	000133-06-2	...	4.6E+00	1.0E-02	...	1.7E+02	3.7E-01	...	...
Carbaryl	000063-25-2	...	3.5E+00	...	...	1.3E+02	...	...	...
Carbofuran	001563-66-2	4.0E-02	1.8E-01	...	...	6.5E+00	...	...	...
Carbon disulfide	000075-15-0	...	3.5E+00	...	...	1.3E+02	...	...	...
Carbon Tetrachloride	000056-23-5	5.0E-03	2.5E-02	2.7E-04	...	9.1E-01	1.0E-02	...	...
Carbophenothion	000786-19-6	...	...	...	...	...	...	...	...
Cesium	007440-46-2	... *	... *	... *	... *	... *	... *	... *	... *
Chloral	000075-87-6	...	7.0E-02	...	...	2.6E+00	...	...	...
Chlordane	000057-74-9	2.0E-03	2.1E-03	2.7E-05	3.0E-01	7.8E-02	1.0E-03	4.3E-03	4.0E-03
Chlorine cyanide	000506-77-4	...	1.8E+00	...	...	6.5E+01	...	4.0E-03	4.0E-03
Chloro-3-methylphenol, 4-	000059-50-7	...	7.0E+01	...	...	2.6E+03	...	...	...
Chloroaniline, p-	000106-47-8	...	1.4E-01	...	...	5.2E+00	...	...	...
Chlorobenzene	000108-90-7	...	7.0E-01	...	...	2.6E+01	...	...	...
Chloroform	000067-66-3	...	3.5E-01	5.7E-03	...	1.3E+01	2.1E-01	...	...
Chloromethane	000074-87-3	...	...	2.7E-03	...	...	1.0E-01	...	...
Chloromethyl methyl ether	000107-30-2	...	...	...	...	...	...	...	...
Chloromethyloxirane, 2-	000106-89-8	...	7.0E-02*	3.5E-03	...	2.6E+00*	1.3E-01	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Chloronaphthalene, 2-	000091-58-7	...	2.8E+00	...	...	1.0E+02	...	...	...
Chlorophenol, 2-	000095-57-8	...	1.8E-01	...	...	6.5E+00	...	...	...
Chlorpyrifos	002921-88-2	...	1.1E-01	...	...	3.9E+00	...	4.1E-02	5.6E-03
Chromium	007440-47-3	1.0E-01	1.8E-01	...	...	6.5E+00	...	...	...
Chromium(III)	016065-83-1	...	3.5E+01	...	...	1.3E+03	...	2.1E+02	2.1E+02
Chromium(VI)	018540-29-9	...	1.8E-01*	...	...	6.5E+00*	...	1.1E+01*	5.0E+01*
Chrysene	000218-01-9	... *	...	...	...	...	...	...	...
Cobalt	007440-48-4	...	...	...	...	...	...	...	...
Copper	007440-50-8	1.3E+00*	...	...	...	...	...	1.2E+01	2.9E+00
Copper cyanide	000544-92-3	...	1.8E-01	...	...	6.5E+00	...	...	...
Coumaphos	000056-72-4	...	...	...	...	...	...	...	...
Creosote	008001-58-9	...	...	...	...	...	...	...	...
Cresol, m-	000108-39-4	...	1.8E+00	...	...	6.5E+01	...	...	...
Cresol, p-	000106-44-5	...	1.8E-01*	...	...	6.5E+00*	...	...	...
Cumene	000098-82-8	...	1.4E+00	...	...	5.2E+01	...	...	...
Cyanazine	021725-46-2	...	7.0E-02	4.2E-05*	...	2.6E+00	1.5E-03*	...	...
Cyanide	000057-12-5	2.0E-01	7.0E-01	...	...	2.6E+01	...	5.2E+00	1.0E+00
Cyanogen	000460-19-5	...	1.4E+00	...	...	5.2E+01	...	...	...
Cyanogen bromide	000506-68-3	...	3.2E+00	...	...	1.2E+02	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Ethion	000563-12-2	...	1.8E-02	...	...	6.5E-01	...	...	...
Ethyl acetate	000141-78-6	...	3.2E+01	...	...	1.2E+03	...	...	...
Ethyl benzene	000100-41-4	7.0E-01	3.5E+00	...	...	1.3E+02	...	...	...
Ethyl chloride	000075-00-3	...	...	...	...	...	...	...	...
Ethyl ether	000060-29-7	...	7.0E+00	...	...	2.6E+02	...	...	...
Ethyldipropylthiocarbamate, s-	000759-94-4	...	8.8E-01	...	...	3.3E+01	...	...	...
Ethylene glycol	000107-21-1	...	7.0E+01	...	...	2.6E+03	...	...	...
Ethylene glycol monoethyl ether	000110-80-5	...	...	...	...	...	...	...	...
Fenethion	000055-38-9	...	...	...	...	...	...	...	...
Ferrous sulfate	007720-78-7	...	...	...	...	...	...	...	...
Fluorene	000086-73-7	...	1.4E+00	...	...	5.2E+01	...	...	...
Fluorine	007782-41-4	...	2.1E+00	...	...	7.8E+01	...	...	...
Formaldehyde	000050-00-0	...	7.0E+00	...	...	2.6E+02	...	...	...
Formic acid	000064-18-6	...	7.0E+01	...	...	2.6E+03	...	...	...
Furan	000110-00-9	...	3.5E-02	...	...	1.3E+00	...	...	...
Furfural	000098-01-1	...	1.1E-01	...	...	3.9E+00	...	...	...
Glycidylaldehyde	000765-34-4	...	1.4E-02	...	...	5.2E-01	...	...	...
Heptachlor	000076-44-8	4.0E-04*	1.8E-02	7.8E-06	3.0E-01	6.5E-01	2.9E-04	3.8E-03	3.6E-03
Heptachlor epoxide	001024-57-3	2.0E-04	4.6E-04	3.8E-06	3.0E-01	1.7E-02	1.4E-04	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Hexane	000110-54-3	...	2.1E+00	...	...	7.8E+01	...	...	...
Hydrazine	000302-01-2	...	...	1.2E-05	...	...	4.3E-04	...	...
Hydrochloric acid	007647-01-0	...	...	...	...	...	...	...	...
Hydrogen cyanide	000074-90-8	...	7.0E-01	...	...	2.6E+01	...	...	...
Hydrogen sulfide	007783-06-4	...	1.1E-01*	...	...	3.9E+00*	...	2.0E+00*	2.0E+00*
Indeno(1,2,3-CD)pyrene	000193-39-5	... *	...	...	...	...	...	...	...
Ioxynil	001689-83-4	...	...	...	...	...	...	...	...
Iron	015438-31-0	...	...	...	...	...	...	1.0E+03	1.0E+03
Isobutanol	000078-83-1	...	1.1E+01	...	...	3.9E+02	...	...	...
Isophorone	000078-59-1	...	7.0E+00	3.7E-02	...	2.6E+02	1.4E+00	...	...
Kepone	000143-50-0	...	...	...	3.0E-01	...	...	...	...
Lead	007439-92-1	1.5E-02*	...	...	...	...	...	3.2E+00	5.6E+00
Lindane	000058-89-9	2.0E-04	1.1E-02	2.7E-05	...	3.9E-01	1.0E-03	8.0E-02	8.0E-02
Magnesium	007439-95-4	...	...	...	...	...	...	...	...
Malathion	000121-75-5	...	7.0E-01	...	...	2.6E+01	...	1.0E-01	1.0E-01
Maleic anhydride	000108-31-6	...	3.5E+00	...	...	1.3E+02	...	...	...
Maleic hydrazide	000123-33-1	...	1.8E+01	...	...	6.5E+02	...	...	...
Manganese	007439-96-5	... *	1.8E-01*	...	...	6.5E+00*	...	...	...
Mercury	007439-97-6	2.0E-03	1.1E-02	...	1.0E+00	3.9E-01	...	1.2E-02	2.5E-02

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Methacrylonitrile	000126-98-7	...	3.5E-03	...	...	1.3E-01	...	...	...
Methanol	000067-56-1	...	1.8E+01	...	...	6.5E+02	...	...	...
Methomyl	016752-77-5	...	8.8E-01	...	...	3.3E+01	...	...	...
Methoxychlor	000072-43-5	4.0E-02	1.8E-01	...	...	6.5E+00	...	3.0E-02	3.0E-02
Methyl chlorocarbonate	000079-22-1	...	...	...	...	...	...	...	...
Methyl ethyl ketone	000078-93-3	...	2.1E+01*	...	...	7.8E+02*	...	...	...
Methyl isobutyl ketone	000108-10-1	...	1.8E+00	...	...	6.5E+01	...	...	...
Methyl methacrylate	000080-62-6	...	2.8E+00	...	...	1.0E+02	...	...	...
Methyl Napthalene, 2-	000091-57-6	...	...	...	...	...	...	...	...
Methylene bis (2-chloroaniline), 4,4-	000101-14-4	...	2.5E-02	2.7E-04	...	9.1E-01	1.0E-02	...	...
Methylene chloride	000075-09-2	5.0E-03*	2.1E+00	4.7E-03	...	7.8E+01	1.7E-01	...	...
Methylenediphenyl diisocyanate, 4,4-	000101-68-8	...	...	...	...	...	...	...	...
Metribuzin	021087-64-9	...	8.8E-01	...	...	3.3E+01	...	...	...
Mirex	002385-85-5	...	7.0E-03	1.9E-05	1.0E-01	2.6E-01	7.2E-04	1.0E-03	1.0E-03
Naphthalene	000091-20-3	...	... *	...	...	... *	...	...	...
Nickel	007440-02-0	1.0E-01	7.0E-01	...	...	2.6E+01	...	1.6E+02	8.3E+00
Nitric acid	007697-37-2	...	...	...	...	...	...	...	...
Nitric oxide	010102-43-9	...	3.5E+00	...	...	1.3E+02	...	...	...
Nitroaniline, p-	000100-01-6	...	...	...	...	...	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Pentachloroethane	000076-01-7	...	...	...	...	...	...	...	...
Pentachloronitrobenzene	000082-68-8	...	1.1E-01	1.3E-04	...	3.9E+00	5.0E-03	...	...
Pentachlorophenol	000087-86-5	1.0E-03	1.1E+00	2.9E-04	...	3.9E+01	1.1E-02	1.3E+01	1.3E+01
Phenanthrene	000085-01-8	...	...	...	...	...	...	...	...
Phenol	000108-95-2	...	2.1E+01	...	...	7.8E+02	...	...	...
Phenyl sulfide	000139-66-2	...	...	...	...	...	...	...	...
Phenylmercuric acetate	000062-38-4	...	2.8E-03	...	...	1.0E-01	...	...	...
Phorate	000298-02-2	...	7.0E-03	...	...	2.6E-01	...	...	...
Phosgene	000075-44-5	...	...	...	...	...	...	...	...
Phosphamidon	013171-21-6	...	...	...	...	...	...	...	...
Phosphine	007803-51-2	...	1.1E-02	...	...	3.9E-01	...	...	...
Phosphoric acid	007664-38-2	...	...	...	...	...	...	...	...
Phosphorodithioc acid,phenyl-o-ethyl-o-(	002104-64-5	...	3.5E-04	...	...	1.3E-02	...	...	...
Phosphorous (elemental)	007723-14-0	...	...	...	...	...	...	1.0E-01	1.0E-01
Phthalic anhydride	000085-44-9	...	7.0E+01	...	...	2.6E+03	...	...	...
Plutonium	007440-07-5	...	...	...	...	...	...	...	...
Polychlorinated triphenyl	012642-23-8	...	...	...	...	...	...	...	...
Potassium silver cyanide	000506-61-6	...	7.0E+00	...	...	2.6E+02	...	...	...
Pronamide	023950-58-5	...	2.6E+00	...	...	9.8E+01	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Pyrene	000129-00-0	...	1.1E+00	...	...	3.9E+01	...	...	...
Pyridine	000110-86-1	...	3.5E-02	...	...	1.3E+00	...	...	...
Quinoline	000091-22-5	...	...	2.9E-06	...	...	1.1E-04	...	...
Radium	007440-14-4	... *	... *	... *	... *	... *	... *	... *	... *
Radon	010043-92-2	... *	... *	... *	... *	... *	... *	... *	... *
Resorcinol	000108-46-3	...	...	...	...	...	...	...	...
Ronnel	000299-84-3	...	1.8E+00	...	...	6.5E+01	...	...	...
Selenium	007782-49-2	5.0E-02	1.8E-01	...	...	6.5E+00	...	3.6E+01	5.4E+01
Selenourea	000630-10-4	...	1.8E-01	...	...	6.5E+00	...	...	...
Silver	007440-22-4	...	1.8E-01	...	...	6.5E+00	...	1.2E-01	1.2E-01
Silver Cyanide	000506-64-9	...	3.5E+00	...	...	1.3E+02	...	...	...
Sodium	007440-23-5	...	...	...	...	...	...	...	...
Strontium	007440-24-6	... *	2.1E+01*	... *	... *	7.8E+02*	... *	... *	... *
Strychnine	000057-24-9	...	1.1E-02	...	...	3.9E-01	...	...	...
Styrene	000100-42-5	1.0E-01	7.0E+00	...	...	2.6E+02	...	...	...
Sulfuric acid	007664-93-9	...	...	...	...	...	...	...	...
TB, 2,4,5-	000093-80-1	...	...	...	...	...	...	...	...
TCDD	001746-01-6	3.0E-08*	...	2.3E-10	...	...	8.7E-09	...	...
Tetrachlorobenzene, 1,2,4,5-	000095-94-3	...	1.1E-02	...	...	3.9E-01	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Tetrachlorodibenzofuran, 2,3,7,8-	125322-32-9	...	...	2.3E-09	...	...	8.7E-08	...	...
Tetrachloroethane, 1,1,1,2-	000630-20-6	...	1.1E+00	1.3E-03	...	3.9E+01	5.0E-02	...	...
Tetrachloroethane, 1,1,2,2-	000079-34-5	...	...	1.8E-04	...	...	6.5E-03	...	...
Tetrachloroethene	000127-18-4	5.0E-03	3.5E-01	6.7E-04	...	1.3E+01	2.5E-02	...	...
Tetrachlorophenol, 2,3,4,6-	000058-90-2	...	1.1E+00	...	...	3.9E+01	...	...	...
Tetraethyl lead	000078-00-2	...	3.5E-06	...	...	1.3E-04	...	...	...
Tetraethyldithiopyrophosphate	003689-24-5	...	1.8E-02	...	...	6.5E-01	...	...	...
Tetrahydrofuran	000109-99-9	...	...	...	...	...	...	...	...
Thallium	007440-28-0	5.0E-04*	...	...	...	...	...	...	...
Thiourea	000062-56-6	...	...	...	...	...	...	...	...
Thiram	000137-26-8	...	1.8E-01	...	...	6.5E+00	...	...	...
Thorium	007440-29-1	...	...	...	...	...	...	...	...
Toluene	000108-88-3	1.0E+00	7.0E+00	...	...	2.6E+02	...	...	...
Toluene diisocyanate	000584-84-9	...	...	...	...	...	...	...	...
Toxaphene	008001-35-2	3.0E-03	...	3.2E-05	5.0E+00	...	1.2E-03	1.3E-02	2.0E-04
TP, 2,4,5-	000093-72-1	5.0E-02	2.8E-01	...	...	1.0E+01	...	...	...
Tribromomethane	000075-25-2	...	7.0E-01	4.4E-03	...	2.6E+01	1.6E-01	...	...
Trichloro-1,2,2-Trifluoroethane, 1,1,2-	000076-13-1	...	1.1E+03	...	...	3.9E+04	...	...	...
Trichlorobenzene, 1,2,4-	000120-82-1	7.0E-02	3.5E-01	...	...	1.3E+01	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	Saltwater (µg/L)
Trichloroethane, 1,1,1-	000071-55-6	2.0E-01	... *	...	...	... *	...	...	...
Trichloroethane, 1,1,2-	000079-00-5	3.0E-03*	1.4E-01	6.1E-04	...	5.2E+00	2.3E-02	...	...
Trichloroethylene	000079-01-6	5.0E-03	...	3.2E-03	...	...	1.2E-01	...	...
Trichlorofluoromethane	000075-69-4	...	1.1E+01	...	...	3.9E+02	...	...	...
Trichlorophenol, 2,3,5-	000933-78-8	...	...	...	...	...	...	...	...
Trichlorophenol, 2,3,6-	000933-75-5	...	...	...	...	...	...	...	...
Trichlorophenol, 2,4,5-	000095-95-4	...	3.5E+00	...	...	1.3E+02	...	...	...
Trichlorophenol, 2,4,6-	000088-06-2	...	...	3.2E-03	...	...	1.2E-01	...	...
Trichlorophenol, 3,4,5-	000609-19-8	...	...	...	...	...	...	...	...
Trichlorophenoxyacetic acid, 2,4,5-	000093-76-5	...	3.5E-01	...	...	1.3E+01	...	...	...
Trichloropropane, 1,2,3-	000096-18-4	...	2.1E-01	...	...	7.8E+00	...	...	...
Triethanolamine	000102-71-6	...	...	...	...	...	...	...	...
Trifluralin	001582-09-8	...	2.6E-01	4.5E-03	...	9.8E+00	1.7E-01	...	...
Trinitrobenzene, 1,3,5-	000099-35-4	...	1.8E-03	...	...	6.5E-02	...	...	...
Trinitrotoluene	000118-96-7	...	1.8E-02	1.2E-03	...	6.5E-01	4.3E-02	...	...
Tris (2,3-dibromopropyl) phosphate	000126-72-7	...	...	...	...	...	...	...	...
Uranium	007440-61-1	...	...	...	...	...	...	...	...
Vanadium	007440-62-2	...	2.5E-01	...	...	9.1E+00	...	...	...
Vanadium pentoxide	001314-62-1	...	3.2E-01	...	...	1.2E+01	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

		SURFACE WATER PATHWAY							
		DRINKING WATER			FOOD CHAIN			ENVIRONMENTAL	
Substance Name	CAS Number	MCL/MCLG (mg/L)	Reference Dose Screen Conc (mg/L)	Cancer Risk Screen Conc (mg/L)	FDAAL (ppm)	Reference Dose Screen Conc (mg/kg)	Cancer Risk Screen Conc (mg/kg)	AWQC/AALAC Freshwater (µg/L)	AWQC/AALAC Saltwater (µg/L)
Vinyl acetate	000108-05-4	...	3.5E+01	...	...	1.3E+03	...	...	...
Vinyl chloride	000075-01-4	2.0E-03	...	1.8E-05	...	...	6.8E-04	...	...
Warfarin	000081-81-2	...	1.1E-02	...	...	3.9E-01	...	...	...
Xylene, m-	000108-38-3	1.0E+01*	7.0E+01	...	...	2.6E+03	...	...	...
Xylene, o-	000095-47-6	1.0E+01*	7.0E+01	...	...	2.6E+03	...	...	...
Xylene, p-	000106-42-3	1.0E+01*	...	...	...	...	...	...	...
Zinc	007440-66-6	...	1.1E+01	...	...	3.9E+02	...	1.1E+02	8.6E+01
Zinc cyanide	000557-21-1	...	1.8E+00	...	...	6.5E+01	...	...	...
Zinc phosphide	001314-84-7	...	1.1E-02	...	...	3.9E-01	...	...	...
Zinc sulfate	007733-02-0	...	...	...	...	...	...	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Acenaphthene	000083-32-9	3.5E+04	...
Acenaphthylene	000208-96-8	...	...
Acetaldehyde	000075-07-0	...	...
Acetone	000067-64-1	5.8E+04	...
Acetonitrile	000075-05-8	3.5E+03	...
Acetophenone	000098-86-2	5.8E+04	...
Acetyl-2-thiourea, 1-	000591-08-2	...	...
Acrolein	000107-02-8	1.2E+04	...
Acrylamide	000079-06-1	1.2E+02	1.3E-01
Acrylic acid	000079-10-7	4.7E+04	...
Acrylonitrile	000107-13-1	...	1.1E+00
Adipic acid	000124-04-9	...	...
Aldicarb	000116-06-3	5.8E+02*	...
Aldrin	000309-00-2	1.7E+01	3.4E-02
Allyl alcohol	000107-18-6	2.9E+03	...
Aluminum	007429-90-5	...	...
Aluminum phosphide	020859-73-8	2.3E+02	...
Ammonia	007664-41-7	2.0E+07	...
Ammonium picrate	000131-74-8	...	...
Ammonium sulfamate	007773-06-0	1.2E+05	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Aniline	000062-53-3	...	1.0E+02
Anthracene	000120-12-7	1.7E+05	...
Antimony	007440-36-0	2.3E+02	...
Arsenic	007440-38-2	1.7E+02	3.3E-01
Asbestos	001332-21-4	...	...
Atrazine	001912-24-9	2.0E+04*	2.6E+00
Azinphos- ethyl	002642-71-9	...	...
Azinphos- methyl	000086-50-0	...	...
Aziridine	000151-56-4	...	...
Barium	007440-39-3	4.1E+04	...
Barium cyanide	000542-62-1	5.8E+04	...
Benz(a)anthracene	000056-55-3	...	...
Benzene	000071-43-2	...	2.0E+01
Benzene carbonyl chloride	000098-88-4	...	...
Benzidine	000092-87-5	1.7E+03	2.5E-03
Benzo(a)pyrene	000050-32-8	...	8.0E-02
Benzo(g,h,i)perylene	000191-24-2	...	...
Benzo(j,k)fluorene	000206-44-0	2.3E+04	...
Benzo(k)fluoranthene	000207-08-9	...	...
Benzofluoranthene, 3,4-	000205-99-2	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Benzoic acid	000065-85-0	2.3E+06	...
Benzonitrile	000100-47-0	...	...
Benzothiazole, 1,2,-	000095-16-9	...	...
Benzyl chloride	000100-44-7	...	3.4E+00
Beryllium	007440-41-7	2.9E+03	1.4E-01
Biphenyl, 1,1-	000092-52-4	2.9E+04	...
Bis (2-ethylhexyl) phthalate	000117-81-7	1.2E+04	4.2E+01
Bis(2-chloroethoxy)methane	000111-91-1	...	...
Bis(2-chloroethyl)ether	000111-44-4	...	5.3E-01
Bis(chloromethyl)ether	000542-88-1	...	2.7E-03
Boron	007440-42-8	5.2E+04	...
Bromodichloromethane	000075-27-4	1.2E+04	9.4E+00*
Bromomethane	000074-83-9	8.2E+02	...
Bromoxynil	001689-84-5	1.2E+04	...
Butadiene, 1,3-	000106-99-0	...	...
Butanol	000071-36-3	5.8E+04	...
Butylbenzyl phthalate	000085-68-7	1.2E+05	...
Butyric acid, 4-(2,4-dichlorophenoxy)	000094-82-6	4.7E+03	...
Cadmium	007440-43-9	2.9E+02	...
Captan	000133-06-2	7.6E+04	1.7E+02

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Carbaryl	000063-25-2	5.8E+04	...
Carbofuran	001563-66-2	2.9E+03	...
Carbon disulfide	000075-15-0	5.8E+04	...
Carbon Tetrachloride	000056-23-5	4.1E+02	4.5E+00
Carbophenothion	000786-19-6	...	...
Cesium	007440-46-2	... *	... *
Chloral	000075-87-6	1.2E+03	...
Chlordane	000057-74-9	3.5E+01	4.5E-01
Chlorine cyanide	000506-77-4	2.9E+04	...
Chloro-3-methylphenol, 4-	000059-50-7	1.2E+06	...
Chloroaniline, p-	000106-47-8	2.3E+03	...
Chlorobenzene	000108-90-7	1.2E+04	...
Chloroform	000067-66-3	5.8E+03	9.6E+01
Chloromethane	000074-87-3	...	4.5E+01
Chloromethyl methyl ether	000107-30-2	...	...
Chloromethyloxirane, 2-	000106-89-8	1.2E+03*	5.9E+01
Chloronaphthalene, 2-	000091-58-7	4.7E+04	...
Chlorophenol, 2-	000095-57-8	2.9E+03	...
Chlorpyrifos	002921-88-2	1.7E+03	...
Chromium	007440-47-3	2.9E+03	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Chromium(III)	016065-83-1	5.8E+05	...
Chromium(VI)	018540-29-9	2.9E+03*	...
Chrysene	000218-01-9	...	...
Cobalt	007440-48-4	...	...
Copper	007440-50-8	...	...
Copper cyanide	000544-92-3	2.9E+03	...
Coumaphos	000056-72-4	...	...
Creosote	008001-58-9	...	...
Cresol, m-	000108-39-4	2.9E+04	...
Cresol, p-	000106-44-5	2.9E+03*	...
Cumene	000098-82-8	2.3E+04	...
Cyanazine	021725-46-2	1.2E+03	6.9E-01*
Cyanide	000057-12-5	1.2E+04	...
Cyanogen	000460-19-5	2.3E+04	...
Cyanogen bromide	000506-68-3	5.2E+04	...
Cyclohexane	000110-82-7	...	...
Cyclohexanone	000108-94-1	2.9E+06	...
Cyclotrimethylenetrinitriamine	000121-82-4	1.7E+03	5.3E+00
DDD	000072-54-8	...	2.4E+00
DDE	000072-55-9	...	1.7E+00

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
DDT	000050-29-3	2.9E+02	1.7E+00
DEF	000078-48-8	1.7E+02*	...
Di-n-butyl phthalate	000084-74-2	5.8E+04	...
Di-n-octyl phthalate	000117-84-0	1.2E+04	...
Diazinon	000333-41-5	5.2E+02	...
Dibenz(a,h)anthracene	000053-70-3	...	...
Dibenzofuran	000132-64-9	...	...
Dibromo-3-chloropropane, 1,2-	000096-12-8	...	4.2E-01
Dibromochloromethane	000124-48-1	1.2E+04	6.9E+00
Dibromoethane, 1,2-	000106-93-4	...	6.9E-03
Dicamba	001918-00-9	1.7E+04	...
Dichlorobenzene, 1,2-	000095-50-1	5.2E+04	...
Dichlorobenzene, 1,3-	000541-73-1	...	...
Dichlorobenzene, 1,4-	000106-46-7	...	2.4E+01
Dichlorobenzidine, 3,3-	000091-94-1	...	1.3E+00
Dichlorodifluoromethane	000075-71-8	1.2E+05	...
Dichloroethane, 1,1-	000075-34-3	5.8E+04*	...
Dichloroethane, 1,2-	000107-06-2	...	6.4E+00
Dichloroethene, 1,1-	000075-35-4	5.2E+03	9.7E-01
Dichloroethylene, cis-1,2-	000156-59-2	5.8E+03	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Dichloroethylene, trans-1,2-	000156-60-5	1.2E+04	...
Dichlorophenol, 2,4-	000120-83-2	1.7E+03	...
Dichlorophenoxyacetic acid, 2,4-	000094-75-7	5.8E+03	...
Dichloropropane, 1,2-	000078-87-5	...	8.6E+00
Dichloropropene, 1,3-	000542-75-6	1.7E+02	3.2E+00
Dichlorvos	000062-73-7	2.9E+02*	2.0E+00
Dicofol	000115-32-2	...	...
Dieldrin	000060-57-1	2.9E+01	3.6E-02
Diethyl phthalate	000084-66-2	4.7E+05	...
Diethylene glycol	000111-46-6	...	...
Diisopropylmethyl-phosphonate	001445-75-6	4.7E+04	...
Dimethoate	000060-51-5	1.2E+02	...
Dimethoxybenzidine, 3,3-	000119-90-4	...	4.2E+01
Dimethyl phenol, 2,4-	000105-67-9	1.2E+04	...
Dimethyl phthalate	000131-11-3	5.8E+06	...
Dimethyl sulfate	000077-78-1	...	...
Dinitrobenzene, 1,3-	000099-65-0	5.8E+01	...
Dinitrophenol, 2,4-	000051-28-5	1.2E+03	...
Dinitrotoluene, 2,4-	000121-14-2	1.2E+03	...
Dinitrotoluene, 2,6-	000606-20-2	5.8E+02*	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Dinoseb	000088-85-7	5.8E+02	...
Dioxane, 1,4-	000123-91-1	...	5.3E+01
Dioxathion	000078-34-2	...	...
Diphenylhydrazine, 1,2-	000122-66-7	...	7.3E-01
Diquat	000085-00-7	1.3E+03	...
Disulfoton	000298-04-4	2.3E+01	...
Diuron	000330-54-1	1.2E+03	...
Endosulfan (I or II)	000115-29-7	3.5E+03*	...
Endosulfan sulfate	001031-07-8	...	...
Endothall	000145-73-3	1.2E+04	...
Endrin	000072-20-8	1.7E+02	...
Endrin aldehyde	007421-93-4	... *	...
Ethion	000563-12-2	2.9E+02	...
Ethyl acetate	000141-78-6	5.2E+05	...
Ethyl benzene	000100-41-4	5.8E+04	...
Ethyl chloride	000075-00-3	...	...
Ethyl ether	000060-29-7	1.2E+05	...
Ethyldipropylthiocarbamate, s-	000759-94-4	1.5E+04	...
Ethylene glycol	000107-21-1	1.2E+06	...
Ethylene glycol monoethyl ether	000110-80-5	...	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Kepone	000143-50-0	...	...
Lead	007439-92-1	...	...
Lindane	000058-89-9	1.7E+02	4.5E-01
Magnesium	007439-95-4	...	...
Malathion	000121-75-5	1.2E+04	...
Maleic anhydride	000108-31-6	5.8E+04	...
Maleic hydrazide	000123-33-1	2.9E+05	...
Manganese	007439-96-5	2.9E+03*	...
Mercury	007439-97-6	1.7E+02	...
Methacrylonitrile	000126-98-7	5.8E+01	...
Methanol	000067-56-1	2.9E+05	...
Methomyl	016752-77-5	1.5E+04	...
Methoxychlor	000072-43-5	2.9E+03	...
Methyl chlorocarbonate	000079-22-1	...	...
Methyl ethyl ketone	000078-93-3	3.5E+05*	...
Methyl isobutyl ketone	000108-10-1	2.9E+04	...
Methyl methacrylate	000080-62-6	4.7E+04	...
Methyl Napthalene, 2-	000091-57-6	...	...
Methylene bis (2-chloroaniline), 4,4-	000101-14-4	4.1E+02	4.5E+00
Methylene chloride	000075-09-2	3.5E+04	7.8E+01

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Methylenediphenyl diisocyanate, 4,4-	000101-68-8	...	...
Metribuzin	021087-64-9	1.5E+04	...
Mirex	002385-85-5	1.2E+02	3.2E-01
Naphthalene	000091-20-3	... *	...
Nickel	007440-02-0	1.2E+04	...
Nitric acid	007697-37-2	...	...
Nitric oxide	010102-43-9	5.8E+04	...
Nitroaniline, p-	000100-01-6	...	...
Nitrobenzene	000098-95-3	2.9E+02	...
Nitrogen dioxide	010102-44-0	5.8E+05	...
Nitroglycerine	000055-63-0	...	...
Nitrophenol, 4-	000100-02-7	...	...
Nitroso-di-n-butylamine, N-	000924-16-3	...	1.1E-01
Nitroso-di-n-methylurethane, N-	000615-53-2	...	...
Nitrosodiethanolamine, N-	001116-54-7	...	2.1E-01
Nitrosodiethylamine, N-	000055-18-5	...	3.9E-03
Nitrosodimethylamine, N-	000062-75-9	...	1.1E-02
Nitrosodiphenylamine, N-	000086-30-6	...	1.2E+02
Nitrosopyrrolidine, N-	000930-55-2	...	2.8E-01
Nitrotoluene, 4-	000099-99-0	5.8E+03	...

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Parathion, ethyl-	000056-38-2	3.5E+03	...
Parathion, methyl-	000298-00-0	1.5E+02	...
PCBs	001336-36-3	...	7.6E-02
Pentachlorinated dibenzo-p-dioxin, 1,2,3	040321-76-4	...	7.8E-06
Pentachlorinated dibenzofuran, 1,2,3,7,8	109719-77-9	...	3.9E-05
Pentachlorinated dibenzofuran, 2,3,4,7,8	057117-41-6	...	3.9E-05
Pentachlorobenzene	000608-93-5	4.7E+02	...
Pentachloroethane	000076-01-7	...	...
Pentachloronitrobenzene	000082-68-8	1.7E+03	2.2E+00
Pentachlorophenol	000087-86-5	1.7E+04	4.9E+00
Phenanthrene	000085-01-8	...	...
Phenol	000108-95-2	3.5E+05	...
Phenyl sulfide	000139-66-2	...	...
Phenylmercuric acetate	000062-38-4	4.7E+01	...
Phorate	000298-02-2	1.2E+02	...
Phosgene	000075-44-5	...	...
Phosphamidon	013171-21-6	...	...
Phosphine	007803-51-2	1.7E+02	...
Phosphoric acid	007664-38-2	...	...
Phosphorodithioc acid,phenyl-o-ethyl-o-(	002104-64-5	5.8E+00	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Phosphorous (elemental)	007723-14-0	...	...
Phthalic anhydride	000085-44-9	1.2E+06	...
Plutonium	007440-07-5	...	...
Polychlorinated triphenyl	012642-23-8	...	...
Potassium silver cyanide	000506-61-6	1.2E+05	...
Pronamide	023950-58-5	4.4E+04	...
Pyrene	000129-00-0	1.7E+04	...
Pyridine	000110-86-1	5.8E+02	...
Quinoline	000091-22-5	...	4.9E-02
Radium	007440-14-4	... *	... *
Radon	010043-92-2	... *	... *
Resorcinol	000108-46-3	...	...
Ronnel	000299-84-3	2.9E+04	...
Selenium	007782-49-2	2.9E+03	...
Selenourea	000630-10-4	2.9E+03	...
Silver	007440-22-4	2.9E+03	...
Silver Cyanide	000506-64-9	5.8E+04	...
Sodium	007440-23-5	...	...
Strontium	007440-24-6	3.5E+05*	... *
Strychnine	000057-24-9	1.7E+02	...

HAZARD RANKING SYSTEM
Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Styrene	000100-42-5	1.2E+05	...
Sulfuric acid	007664-93-9	...	...
TB, 2,4,5-	000093-80-1	...	...
TCDD	001746-01-6	...	3.9E-06
Tetrachlorobenzene, 1,2,4,5-	000095-94-3	1.7E+02	...
Tetrachlorodibenzofuran, 2,3,7,8-	125322-32-9	...	3.9E-05
Tetrachloroethane, 1,1,1,2-	000630-20-6	1.7E+04	2.2E+01
Tetrachloroethane, 1,1,2,2-	000079-34-5	...	2.9E+00
Tetrachloroethene	000127-18-4	5.8E+03	1.1E+01
Tetrachlorophenol, 2,3,4,6-	000058-90-2	1.7E+04	...
Tetraethyl lead	000078-00-2	5.8E-02	...
Tetraethyldithiopyrophosphate	003689-24-5	2.9E+02	...
Tetrahydrofuran	000109-99-9	...	...
Thallium	007440-28-0	...	...
Thiourea	000062-56-6	...	...
Thiram	000137-26-8	2.9E+03	...
Thorium	007440-29-1	...	...
Toluene	000108-88-3	1.2E+05	...
Toluene diisocyanate	000584-84-9	...	...
Toxaphene	008001-35-2	...	5.3E-01

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Hazardous Substance Benchmarks
(333 Substances)

Substance Name	CAS Number	SOIL PATHWAY Reference Dose Screen Conc (mg/kg)	SOIL PATHWAY Cancer Risk Screen Conc (mg/kg)
Uranium	007440-61-1	...	...
Vanadium	007440-62-2	4.1E+03	...
Vanadium pentoxide	001314-62-1	5.2E+03	...
Vinyl acetate	000108-05-4	5.8E+05	...
Vinyl chloride	000075-01-4	...	3.1E-01
Warfarin	000081-81-2	1.7E+02	...
Xylene, m-	000108-38-3	1.2E+06	...
Xylene, o-	000095-47-6	1.2E+06	...
Xylene, p-	000106-42-3	...	...
Zinc	007440-66-6	1.7E+05	...
Zinc cyanide	000557-21-1	2.9E+04	...
Zinc phosphide	001314-84-7	1.7E+02	...
Zinc sulfate	007733-02-0	...	...

STATE OF NORTH CAROLINA

JAMES G. MARTIN, GOVERNOR

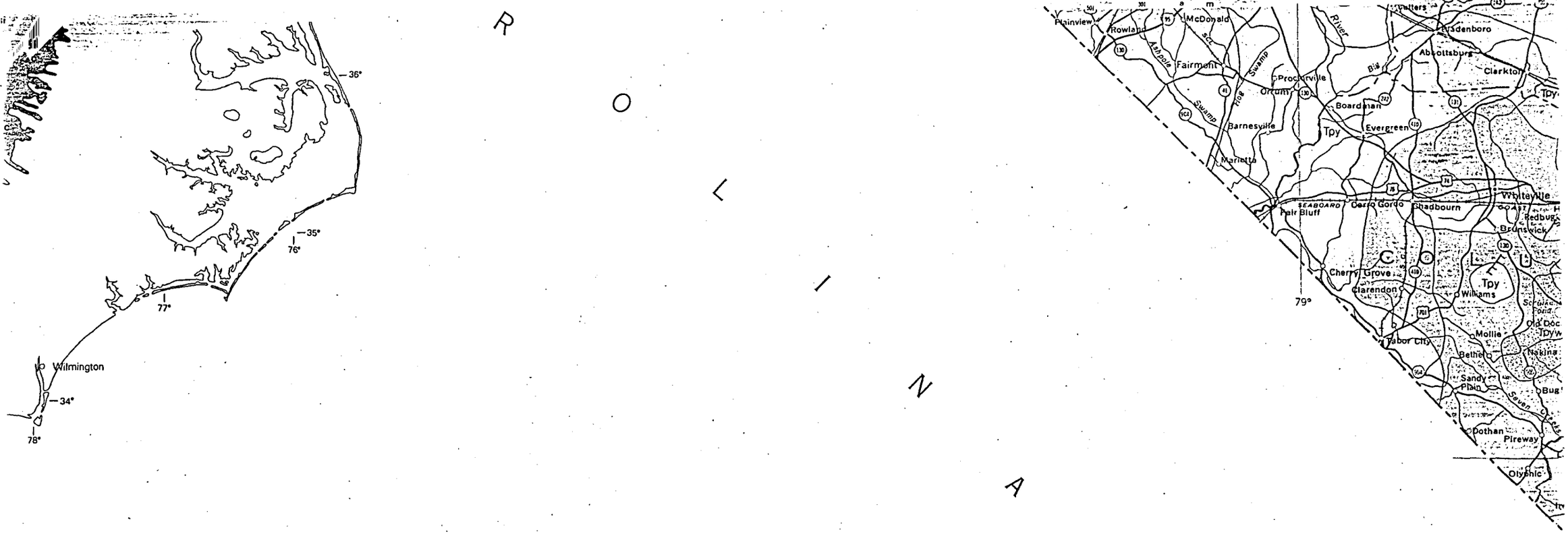
CHARLOTTE AND MILTON BELTS

METAMORPHIC ROCKS

- CZbf — FINE-GRAINED BIOTITE GNEISS — Massive to strongly foliated; minor layers of amphibolite and muscovite schist
- CZfg — FELSIC MICA GNEISS — Interlayered with biotite and hornblende gneiss and schist
- CZbg — BIOTITE GNEISS AND SCHIST — Inequigranular and megacrystic; abundant potassic feldspar and garnet; interlayered and gradational with calc-silicate rock, sillimanite-mica schist, mica schist, and amphibolite. Contains small masses of granitic rock
- CZv — METAVOLCANIC ROCK — Interbedded felsic to mafic tuffs and flowrock
- CZmv — MAFIC METAVOLCANIC ROCK — Metamorphosed basaltic to andesitic tuffs and flows, grayish green to black. Locally includes hypabyssal intrusives and minor felsic metavolcanic rock
- CZfv — FELSIC METAVOLCANIC ROCK — Metamorphosed dacitic to rhyolitic flows and tuffs, light gray to greenish gray; minor mafic and intermediate metavolcanic rock
- CZq — QUARTZITE — Massive to well foliated; contains andalusite, kyanite, or sillimanite, chloritoid, and pyrite
- CZph — PHYLLITE AND SCHIST — Minor biotite, pyrite, and sillimanite; includes minor quartzite

INTRUSIVE ROCKS

- Jd — DIABASE — Dikes, gray to black
- PIPg — GRANITIC ROCK (Pennsylvanian to Permian, 265-325 my; 11,9) — Megacrystic to equigranular. Churchland Plutonic Suite (Western group) - Churchland, Landis, and Mooresville intrusives
- DSg — GRANITE OF SALISBURY PLUTONIC SUITE (Devonian to Silurian, 385-415 my; 5) — Pink, massive to weakly foliated. Gold Hill, Kannapolis, Salisbury, Southmont, and Yadkin intrusives
- DSs — SYENITE OF CONCORD PLUTONIC SUITE (Silurian, 404 my; 9) — Includes the Concord ring dike
- DOgb — GABBRO OF CONCORD PLUTONIC SUITE (Devonian to Ordovician, 399-479 my; 24) — Barber, Concord, Farmington, Mecklenburg, and Weddington intrusives
- DOg — GRANITIC ROCK — Locally pinkish gray, massive to weakly foliated; contains hornblende
- Pgb — SHELTON GRANITE GNEISS (Silurian, 429 my; 21) — Poorly foliated, lineated granitic to quartz monzonitic gneiss
- PzZq — METAMORPHOSED QUARTZ DIORITE — Foliated to massive
- PzZg — METAMORPHOSED GABBRO AND DIORITE — Foliated to massive
- PzZm — METAMORPHOSED MAFIC ROCK — Metagabbro, metadiorite, and mafic plutonic-volcanic complexes
- PzZu — META-ULTRAMAFIC ROCK — Metamorphosed dunite and peridotite; serpentinite, soapstone, and other altered ultramafic rock. Only larger bodies shown
- CZg — METAMORPHOSED GRANITIC ROCK — Megacrystic, well foliated; locally contains hornblende



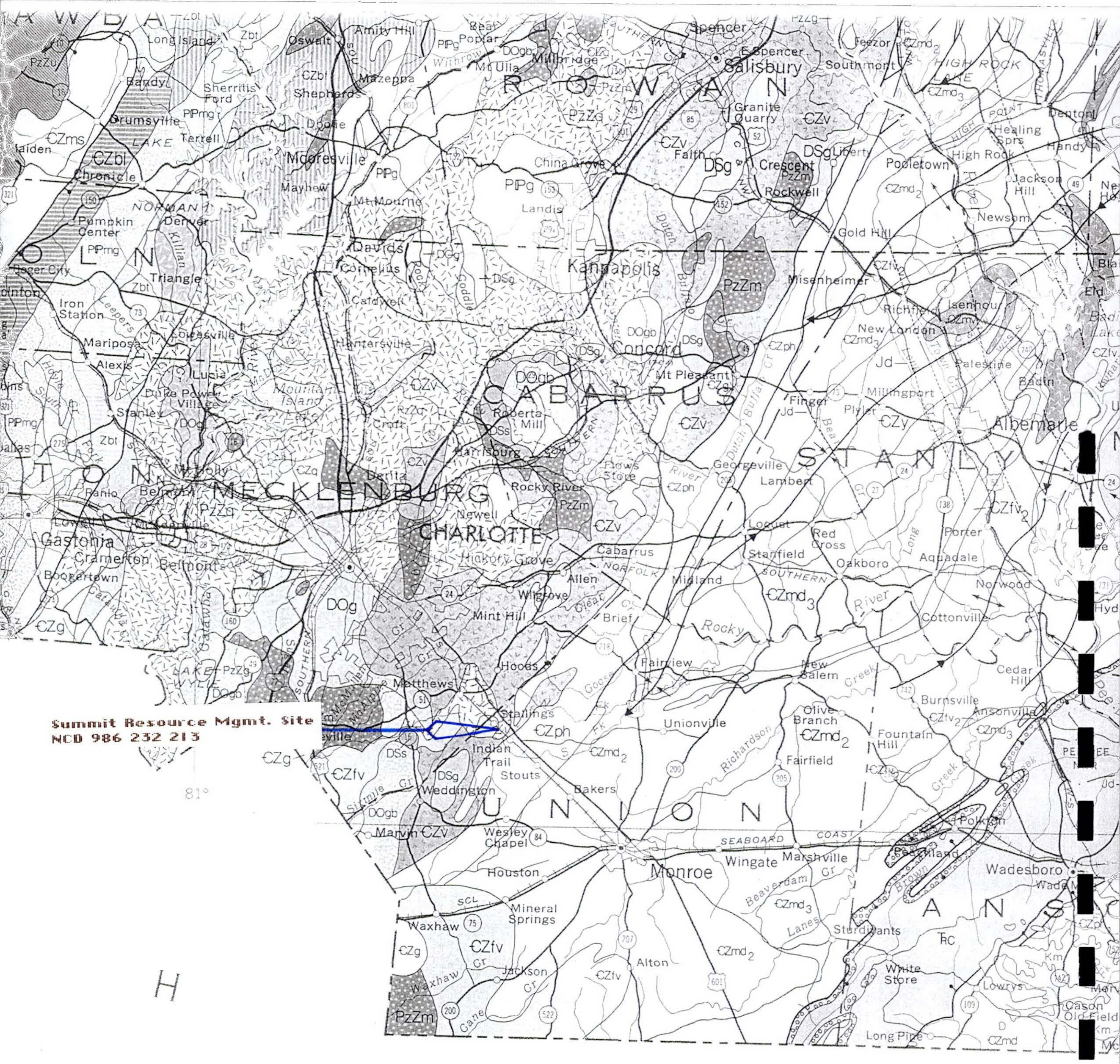
GEOLOGIC MAP OF NORTH CAROLINA

1985

Scale 1:500,000
1 inch equals approximately 8 miles

10 0 10 20 30 40 Miles

10 0 10 20 30 40 50 Kilometres



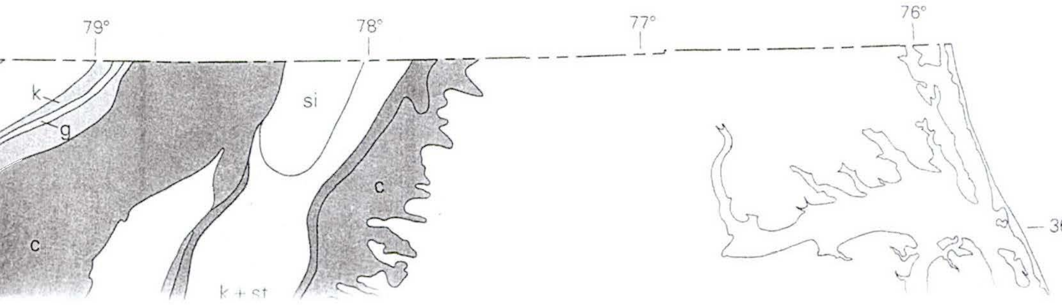
a Local development of andalusite in Charlotte belt

r Retrogressively metamorphosed rocks

C

A

R



HSW HOT SPRINGS WINDOW

GMW GRANDFATHER MOUNTAIN WINDOW

SRA SMITH RIVER ALLOCHTHON

BLUE RIDGE BELT

CHAUGA BELT

KINGS MOUNTAIN BELT

SAURATOWN MOUNTAINS ANTICLINORIUM

CHARLOTTE BELT

MILTON BELT

CSB CAROLINA SLATE BELT

DURHAM } SUB-BASINS
SANFORD }

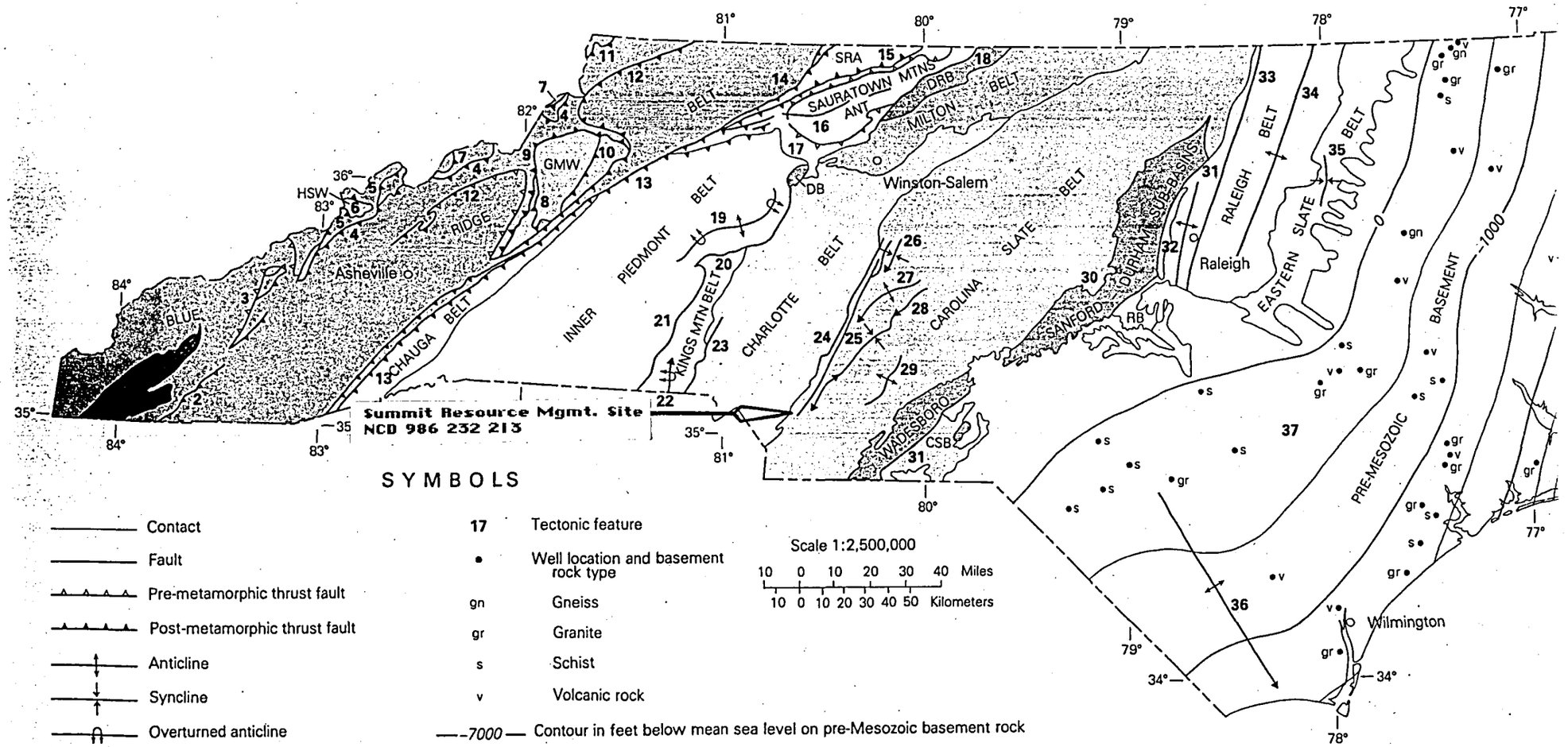
WADESBORO BASIN

DAN RIVER BASIN (DRB)

DAVIE BASIN (DB)

RB RALEIGH BELT

EASTERN SLATE BELT



MAP SHOWING MAJOR LITHO-TECTONIC FEATURES

REFERENCES FOR TECTONIC FEATURES

1. Mary King Mountain fault
Forrest, J.T., 1969, Stratigraphy and structure of the Murphy belt in the Murphy, North Carolina 7½' Quadrangle: Geological Society America Abstracts [redacted] prog[redacted] Part 4 [redacted]-24. [redacted]

2. Hayesville fault
Hatcher R.D. Jr., 1978, Tectonics of the western Pied-

10. Unnamed fault and
11. Unnamed fault
Rankin, D.W., Espenshade, G.H., and Neuman, R.B., 1972, Geologic map of the west half of the Winston-[redacted] Qua[redacted]le, N[redacted]arolin[redacted]ginia, [redacted] Tennessee: U.S. Geological Survey Miscellaneous Geol cal Investi ations Ma I-709-A.

18. Dan River fault
Stone, R.W., 1912, Coal on Dan River, North Carolina: U.S. Geological Survey Bulletin 471-B, p. 137-169.

19. Newton antiform
[redacted] Gold[redacted] Richa[redacted]ton, [redacted]d H[redacted].W., [redacted] in press, Geologic map of Charlotte 1° x 2° Quadran-le North Carolina and South Carolina: U.S. Geolo-

28. New London sy
29. Troy anticline
Conley, J.F. [redacted]rangle, N[redacted] Mineral F[redacted]
30. Colon cross-str
31. Jonesboro fau

Ref. 24

THE HYDROGEOLOGIC FRAMEWORK AND A RECONNAISSANCE OF GROUND-WATER QUALITY IN THE PIEDMONT PROVINCE OF NORTH CAROLINA, WITH A DESIGN FOR FUTURE STUDY

By Douglas A. Harned

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 88-4130

Raleigh, North Carolina

1989

(Ragland and others, 1983; Farrar, 1985; Russell and others, 1985; Wehr and Grover, 1985). Various periods of plate tectonic activity, along with the associated formation of rift margins, are believed to be responsible for these events. The Piedmont can be divided into northeast trending parallel geologic belts. Traversing from the southeast, the major geologic belts are the Carolina slate belt, the Raleigh belt, the Charlotte belt, the Kings Mountain belt, and the Inner Piedmont belt (Daniel, 1987).

The rock-type classification scheme based on lithologic and geohydrologic properties developed by Daniel (1987) for the Piedmont and Blue Ridge provinces of North Carolina has been used in this study. The near-surface earth materials of the Piedmont consist of a three-stage system which, from top to bottom, contains (1) a regolith zone, (2) a transition zone, and (3) underlying fractured crystalline bedrock (fig. 2).

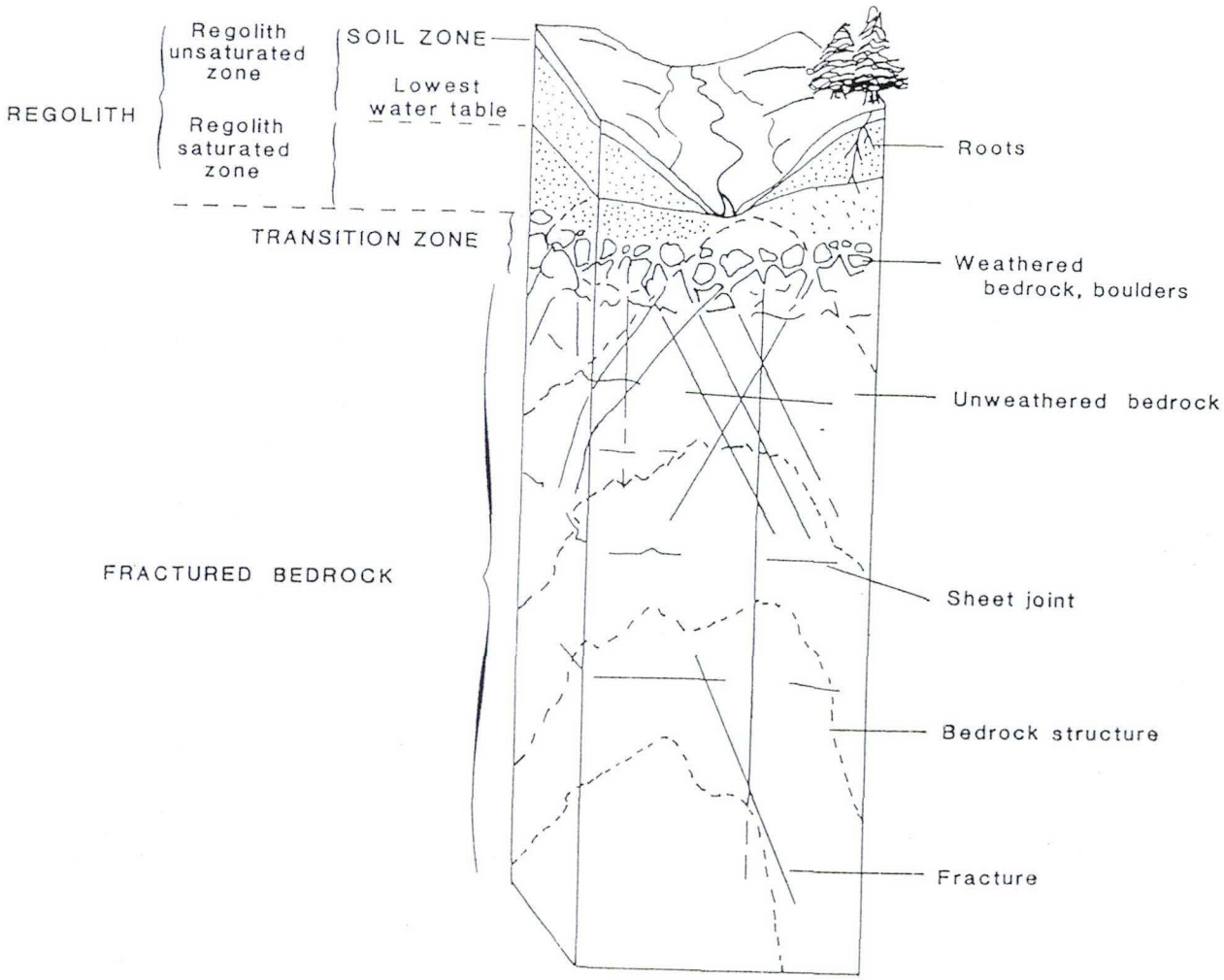


Figure 2.--Conceptual structure of the Piedmont ground-water system (modified from Heath, 1984).

Collectively, the uppermost layer is the regolith, which is composed of saprolite, alluvium, and soil (Daniel and Sharpless, 1983). The regolith zone consists of an unconsolidated or semiconsolidated mixture of clay and fragmental material ranging in grain size from silt to boulders.

Saprolite is the clay-rich, residual material derived from in-place weathering of bedrock. Saprolite deposits represent leached deposits and, being granular material with principal openings between grabens, differ significantly in texture and chemical composition from the parent rock which is unweathered, crystalline rock having principal openings along fractures. Since saprolite is the product of in-place weathering of the parent bedrock, some of the textural features of that bedrock are retained within the saprolite. Evidence of relic quartz veins, dikes, and shear zones are commonly seen in outcrops. Alluvial deposits are unconsolidated sediments deposited by streams and rivers. Soil is referred to as the natural medium for the growth of plants. Saprolite is the dominant deposit in this unconsolidated zone, with soil deposits generally restricted to the uppermost layer, and alluvium deposits restricted to locations of current and former stream channels and river beds.

The transition zone is where unconsolidated material grades into bedrock and consists of saprolite and partially weathered bedrock. Here, particle size ranges from silts and clays to large boulders of unweathered bedrock. The thickness of this zone depends a great deal on the texture and composition of the parent rock. The best defined transitional zones are usually associated with highly foliated metamorphic parent rock, while those of massive igneous rocks are often poorly defined or nonexistent (C.C. Daniel, III, U.S. Geological Survey, oral commun., 1985). In the Piedmont, 90 percent of the records for cased bedrock wells show combined thicknesses of 97 feet or less for the regolith and transition zones (Daniel, 1987).

The uppermost part of the Piedmont crystalline bedrock contains numerous closely spaced fractures which can be related to the local and regional tectonic history of the area. As a general rule, very few fractures occur in the Piedmont bedrock at depths greater than 400 feet (LeGrand, 1967).

HYDROGEOLOGIC FRAMEWORK AND CONCEPTUAL MODEL OF THE FLOW SYSTEM

Heath's (1984) concept of the ground-water system for the Piedmont and Blue Ridge provinces has been adopted as the conceptual model for this study with slight modifications to emphasize the transition zone between the regolith zone and the bedrock.

The fundamental structure of the ground-water system is shown in figure 2. The components of the system are:

1. The unsaturated zone in the regolith, which generally contains the organic layers of the surface soil;
2. The saturated zone in the regolith;
3. The transition zone between the regolith and bedrock; and
4. The fractured crystalline bedrock system.

Regolith Unsaturated Zone

The unsaturated zone extends from the land surface down to the water table, which is the top of the saturated zone. The pore spaces of the regolith in the unsaturated zone contain both air and water. The unsaturated zone usually ranges from 5 to 50 feet in thickness. Daniel (1987) found a mean depth to the water table of 31.3 feet in an examination of 2,326 Piedmont wells. Water moves down from the land surface through the soil zone by intergranular flow through the larger pore spaces and passages left by burrows or decayed roots. Roots from surface vegetation can grow to 30 feet below land surface but more commonly spread laterally near the surface. At the base of the soil zone, which is generally 3 to 8 feet thick, the average grain size abruptly decreases with a corresponding decrease in pore size as the water enters the saprolite (C.C. Daniel, III, U.S. Geological Survey, written commun., 1985). At this point water movement may also be diverted somewhat by relic structures of foliation or folds in the saprolite, which are remnants from the parent rock.

The total porosity of soil is commonly around 55 percent, and its specific yield is about 40 percent (Heath, 1983). Saprolite has a total porosity of 35 to 50 percent near land surface (fig. 3), which decreases at depth, and a specific yield of 20 percent (Daniel and Sharpless, 1983).

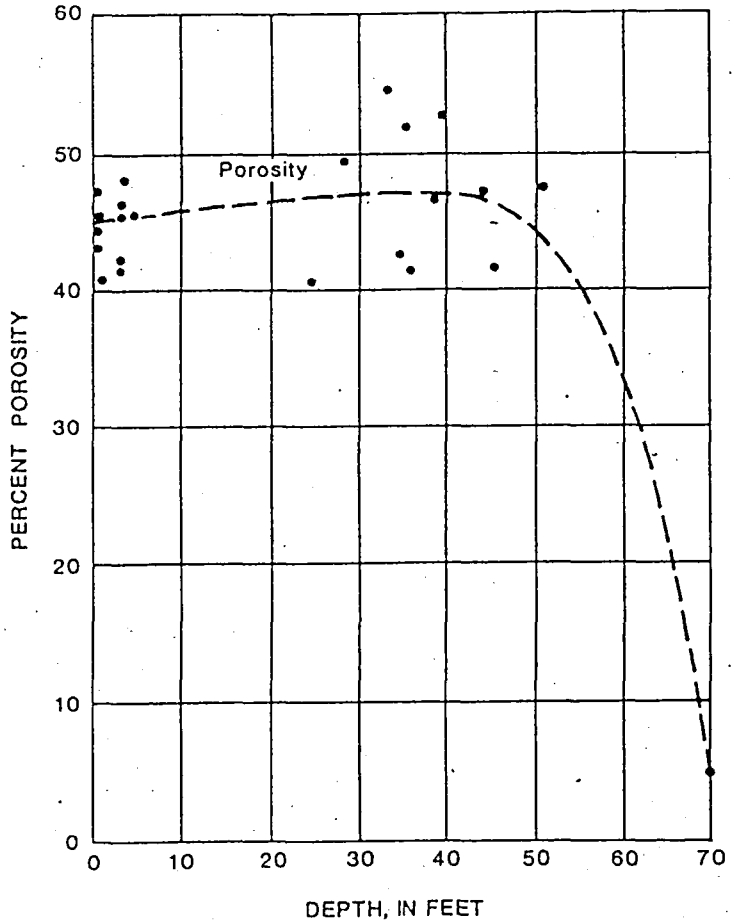


Figure 3.--Relation of porosity of saprolite with depth (after Stewart, 1962).

Topsoil in Piedmont soils to a depth of 7 to 10 inches was reported to have a mean hydraulic conductivity of 5.7 inches per hour (11.4 feet per day), and the subsoil, 7 to 20 inches below land surface, has a mean hydraulic conductivity 1.8 inches per hour (3.6 feet per day) (Lutz, 1969). These values are in line with the hydraulic conductivity values for saprolite reported by Heath (1980) that range from 0.5 to 10 inches per hour (1 to 20 feet per day). However, the hydraulic conductivity of saprolite is not the same in all directions. This anistropy may take the form of preferential permeability along the direction of relic structures within the saprolite.

Regolith Saturated Zone

The regolith saturated zone is that interval below the water table and above the transition zone. Daniel has calculated the median saturated

thickness of the regolith and transition zone from records of 1,749 water-supply wells in the Piedmont of North Carolina to be 13 feet (Daniel, 1987). The median saturated thickness was shown to be a function of topography: beneath draws and valleys, it was 28 feet thick; below slopes and flats, it was 15 feet; and beneath hills and ridges, it was 9 feet.

The saturated regolith provides the bulk of the water storage within the Piedmont ground-water system (Heath, 1980). This concept is illustrated in figure 4. In the Piedmont ground-water system, the regolith has a specific yield of around 20 percent (Daniel and Sharpless, 1983), whereas the porosity of the bedrock ranges from 0.01 to 2 percent (Heath, 1984). The depth-porosity relation described by Stewart (1962) is shown in figure 3. The amount of ground water in storage as a function of the saturated thickness of the regolith has been calculated by Daniel (C.C. Daniel, III, U.S. Geological Survey, written commun., 1985) and is presented as figure 5.

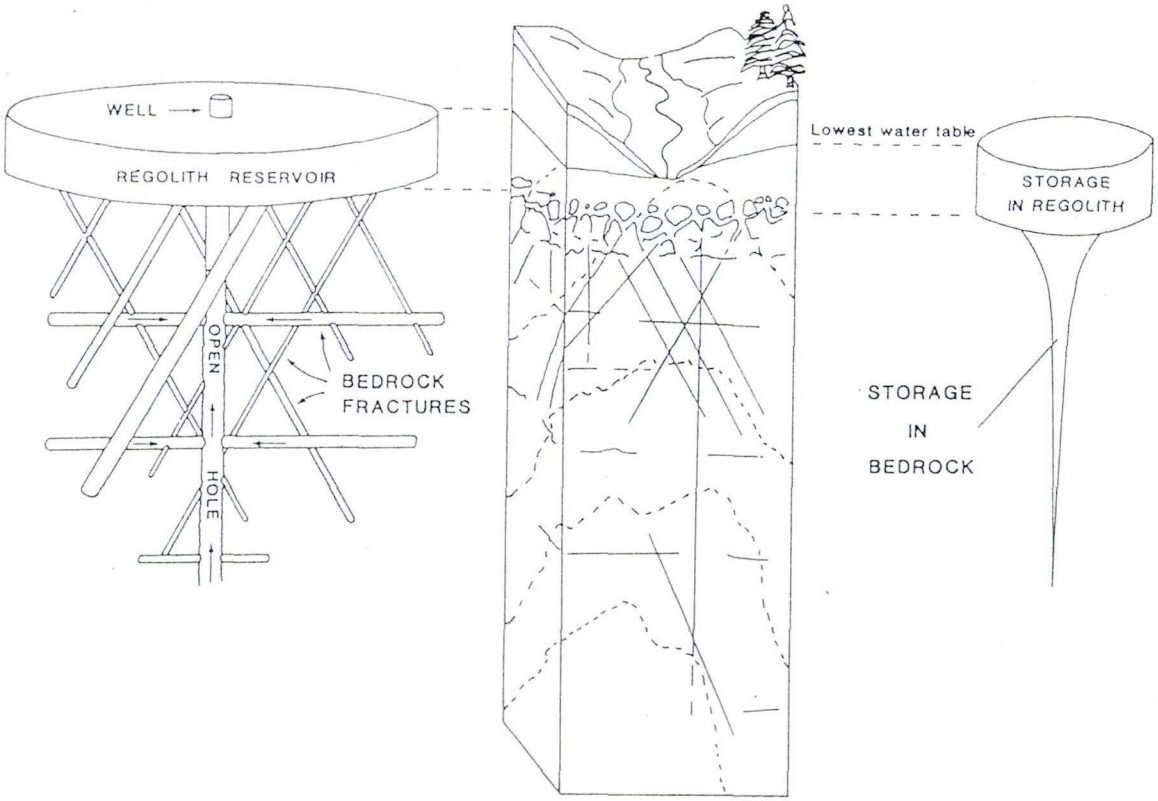


Figure 4.--Water storage within, and the reservoir-pipeline conceptual model of the Piedmont ground-water system (modified from Heath, 1984).

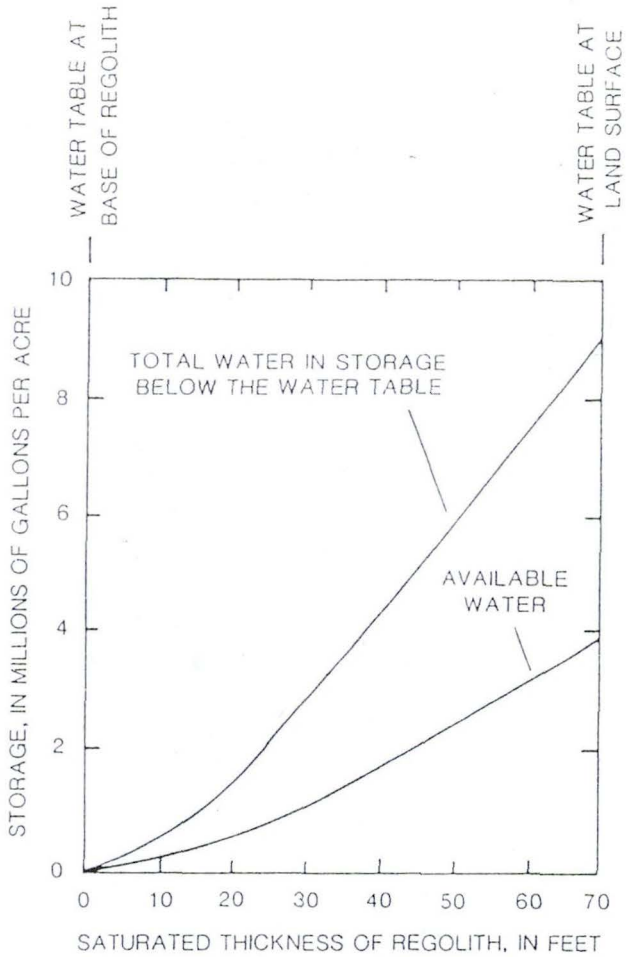


Figure 5.--Relation of ground-water storage and saturated thickness (after C.C. Daniel, III, U.S. Geological Survey, written commun., 1986).

As illustrated in figure 4, the regolith serves as a reservoir supplying water to interconnected fractures within the bedrock. In general, wells in the Piedmont are cased through the regolith, with open hole through enough of the bedrock to intercept enough fractures to furnish acceptable yields. The bedrock fractures serve as pipelines between the well and the regolith reservoir.

The depth to water table is largely a function of topography. Based on data from 2,326 water-supply wells, the median water level in wells located in draws and valleys is 20 feet, in slopes and flats 25 feet, and in hills and ridges 32 feet (Daniel, 1987). Depth to water table at any one place varies with ground-water recharge and continual discharge. An example of

the response of water level due to variation in rainfall is shown in figure 6. In this example, ground-water recharge (in excess of discharge) resulting from heavy rains in late winter, when evapotranspiration is low, is reflected by a peak in the water-table hydrograph appearing a few days after heavy rainfall in late March. The time after a storm that the peak appears in the water level is directly related to the vertical hydraulic conductivity of the material in the unsaturated zone and the depth to water table. The hydrograph also shows that little recharge took place during the growing season (April through September) even though the area received significant rainfall during these months. The declining water level indicates continuing ground-water discharge that is not equaled or exceeded by recharge until fall, when evapotranspiration is low. Similar seasonal

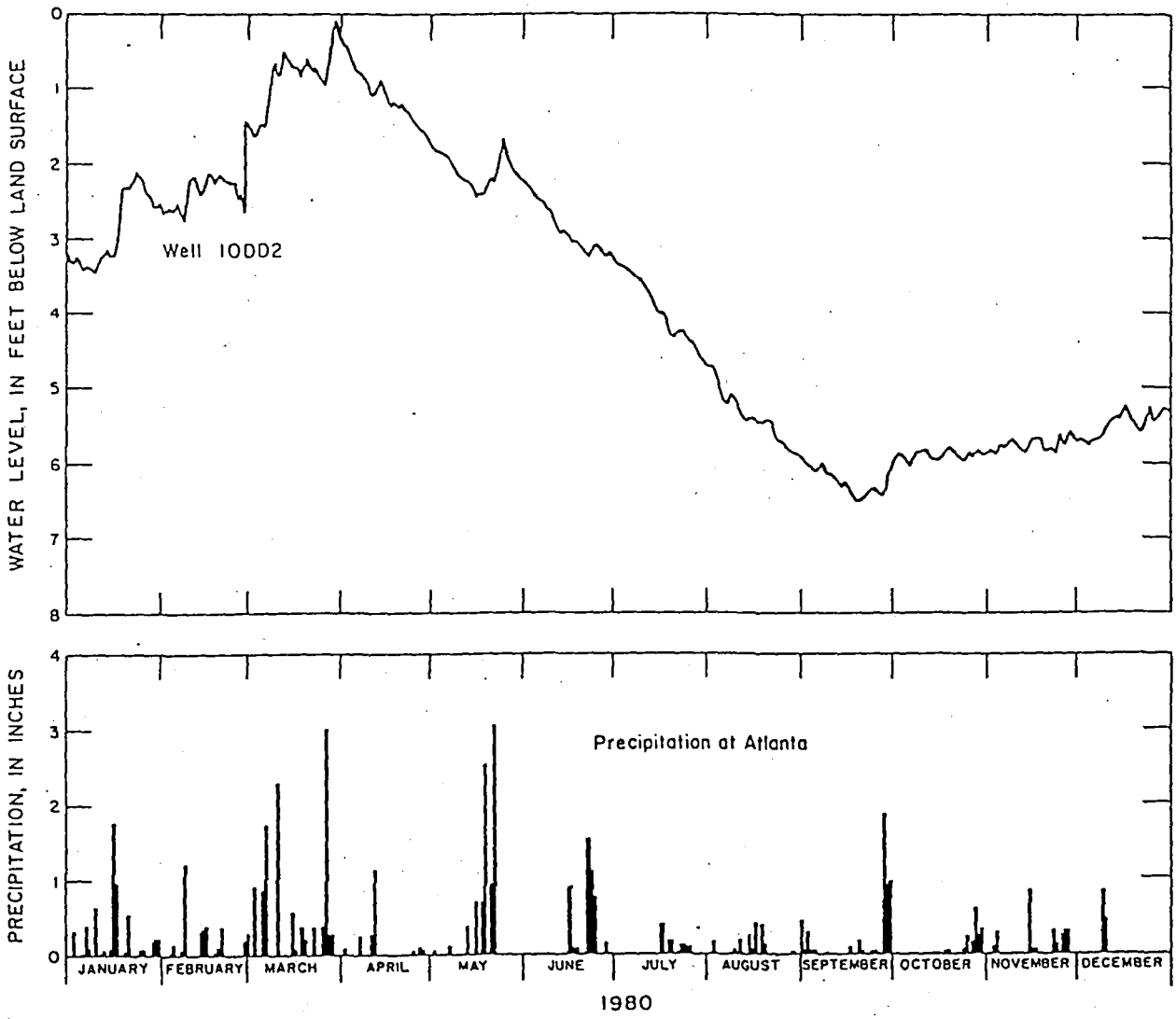


Figure 6.--Response of water-level change to rainfall (from Cressler and others, 1983).

fluctuations of the water table are also shown in the hydrograph for a well located in Iredell County, North Carolina (fig. 7).

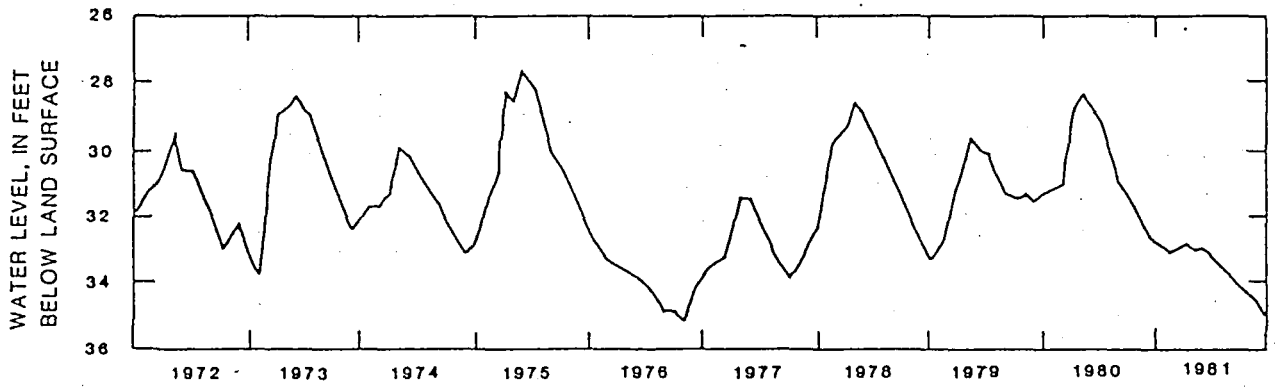


Figure 7.--Seasonal fluctuations in water-table depth in a well in Iredell County, North Carolina (from LeGrand, 1984).

Transition Zone

At the base of the regolith there is generally a transition zone of weathered rock, boulders, and saprolite. Careful augering of three wells showed this transition zone to be approximately 15 feet thick at the Guilford County, North Carolina, test site shown in figure 8 (C.C. Daniel, III, U.S. Geological Survey, written commun., 1985). This zone has been found in Georgia, Maryland, and North Carolina and reported by Stewart (1962), Nutter and Otton (1969), and Daniel (C.C. Daniel, III, U.S. Geological Survey, written commun., 1985), respectively. They describe this zone as being more permeable than the upper regolith and slightly more permeable than the soil zone. This observation is substantiated by reports from well drillers of so-called "first water" (C.C. Daniel, III, U.S. Geological Survey, written commun., 1985) in drillers' logs (Nutter and Otton, 1969).

The high permeability of the transition zone is probably due to incomplete weathering in the upper regolith. Chemical alteration of the bedrock has progressed to a stage of minute fracturing of the crystalline rock, yet it has not progressed so far that the rock minerals have been altered to clays, which would clog the tiny fractures (C.C. Daniel, III,

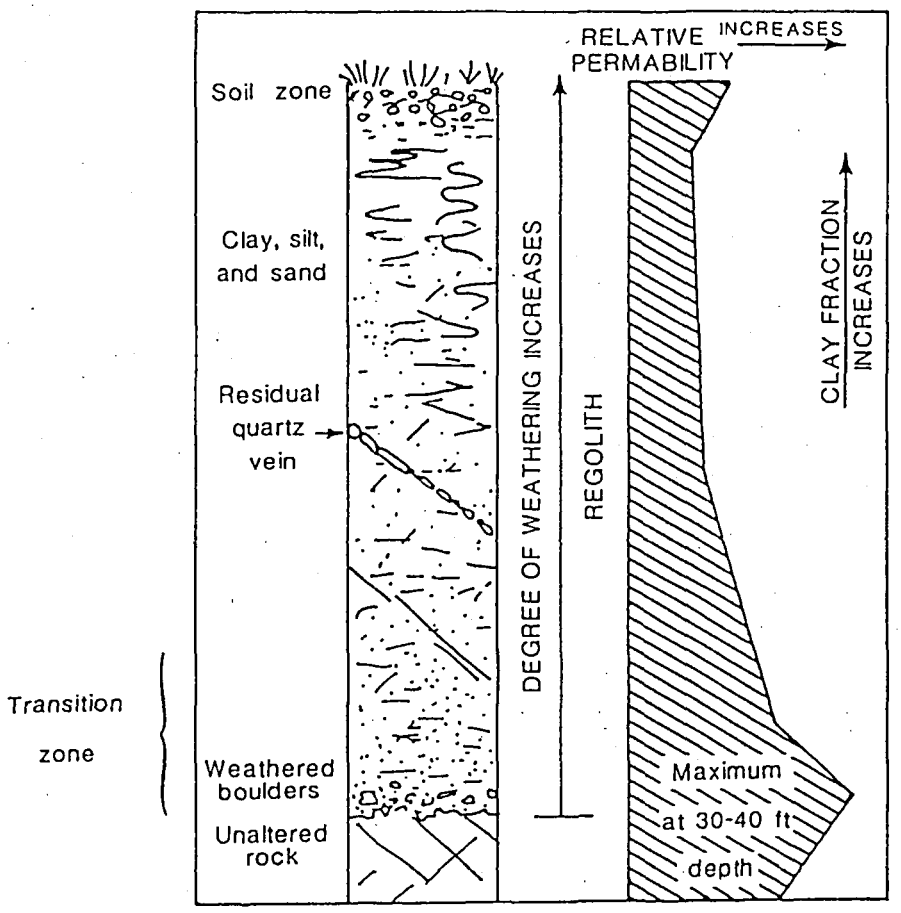


Figure 9.--An idealized weathering profile through the regolith showing relative permeability (after Nutter and Otton, 1969).

The presence of a high-permeability zone on top of the bedrock may create a zone of concentrated flow within the ground-water system. Daniel (C.C. Daniel, III, U.S. Geological Survey, written commun., 1985) cites the case where well drillers find water in the transition zone, yet end up with a dry hole after setting casing through the regolith and transition zone into the unweathered bedrock. In this case, the ground water occurs primarily in the transition zone, where there is poor connection between the regolith reservoir, the bedrock fracture pipeline system, and the well. Daniel comments that the transition zone may serve as an interval where relatively rapid movement of contaminated ground water can take place.

Fractured Bedrock

Ground-water flow within the crystalline bedrock occurs within fracture systems. LeGrand (1967) discussed what he considered to be the six common types of fracture patterns (fig. 10) that influence yields to wells. These fractures are reported to be more common near the surface and beneath valleys, draws, and surface depressions (Heath, 1980), and are considered to be zones of weakness that allowed the initial development of valleys and draws at these locations. Fracture openings are wider near the bedrock surface and decrease in size and number with depth due to increasing lithostatic pressure.

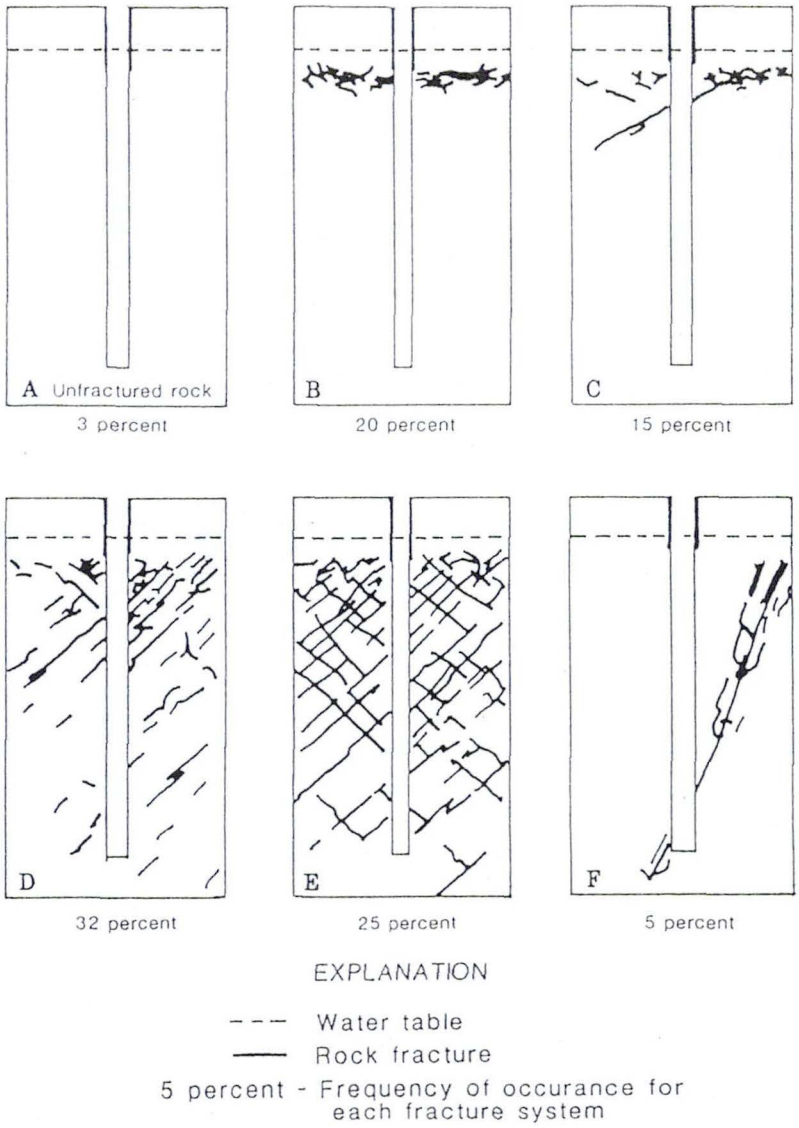


Figure 10.--Six common types of fracture systems in the Piedmont (from LeGrand, 1967).

Heath indicates that few fractures below 300 to 400 feet from land surface contain substantial amounts of water, and that those which do bear water at depth are probably associated with faults. However, Cressler and others (1983) found that for the Atlanta, Georgia, area, nearly horizontal stress-relief fractures at depths of 400 feet or more were often associated with high-yielding wells. When surface material is removed by erosion, nearly horizontal stress-relief fractures develop and widen in response to the reduction in compressional stress. Daniel also reports high-yielding wells at depths over 500 feet in the North Carolina Piedmont (Daniel, 1987). Fractures are planar features oriented along zones of lithologic and structural weakness. Water can move along the fractures with relative ease to discharge points such as wells or to natural discharge areas in stream valleys. Non-horizontal fractures may account for dramatically asymmetrical patterns of water-level decline that may be seen around a pumped well or the more rapid movement of water and contaminants in one direction than in another, creating aniostrophy in the bedrock aquifer. The hydrologic conductivity of the fractured bedrock is generally 0.001 to 3 feet per day (Heath, 1984). The primary porosity of the bedrock ranges from about 0.01 to 2 percent (Heath, 1984).

In general, the mineral assemblages determine the degree to which water will dissolve aquifer material. For example, quartz is resistant to chemical weathering and will dissolve much more slowly than less resistant ferromagnesium minerals such as biotite and hornblende and numerous iron minerals such as pyrite and magnetite. Generally, the mafic igneous rocks such as diorite-gabbro contain more ferromagnesium minerals and are more susceptible to chemical solution than the minerals of felsic rocks such as granite. Weathering of the ferromagnesium minerals produce solution openings and channels in the mafic rock units.

Ground water from a typical granite, composed largely of sodium and potassium feldspars, should have relatively high concentrations of sodium bicarbonate. Calcium and magnesium bicarbonate concentrations can be high in ground water moving through mafic rocks, such as gabbro, which is composed largely of calcium feldspars and ferromagnesium minerals. Ground water from certain metavolcanic and mica-schist units contain high concentrations of iron (Hem, 1970). However, these simple relationships are complicated if there is mixing of waters from adjacent rock types of different compositions or if the host rock is intermediate in composition.

Because the natural chemical quality of ground water is affected by the minerals in the regolith and bedrock, which form the hydrogeologic framework for the Piedmont ground-water system, the natural water quality should be considered when attempting to determine water-quality differences resulting from different land uses. The significance of the effects of geology and soils on the ground-water quality are described in the data-analysis section of the report.

Flow Hypotheses

Several aspects of the ground-water flow system in the Piedmont are particularly significant geochemically. In describing ground-water recharge and discharge and the functions of a ground-water system, Heath (1983, p. 14) states:

> Hydraulically, this system serves two functions: it stores water to the extent of its porosity, and it transmits water from recharge areas to discharge areas. Thus, a ground-water system serves as both a reservoir and a conduit.
>
> Water enters ground-water systems in recharge areas and moves through them, as dictated by hydraulic gradients and hydraulic conductivities, to discharge areas.
>
> In the humid part of the country, recharge occurs in all interstream areas--that is, in all areas except along streams and their adjoining flood plains. The streams and flood plains are, under most conditions, discharge areas.

These general conditions are assumed to apply in the Piedmont of North Carolina.

The generalized flow system in the Piedmont as represented in figure 11 occurs within a closely-spaced network of streams typical of the mature topography of the Piedmont. Ground-water flow is toward these streams, and the shape of the water table mimics the topography of the land surface,

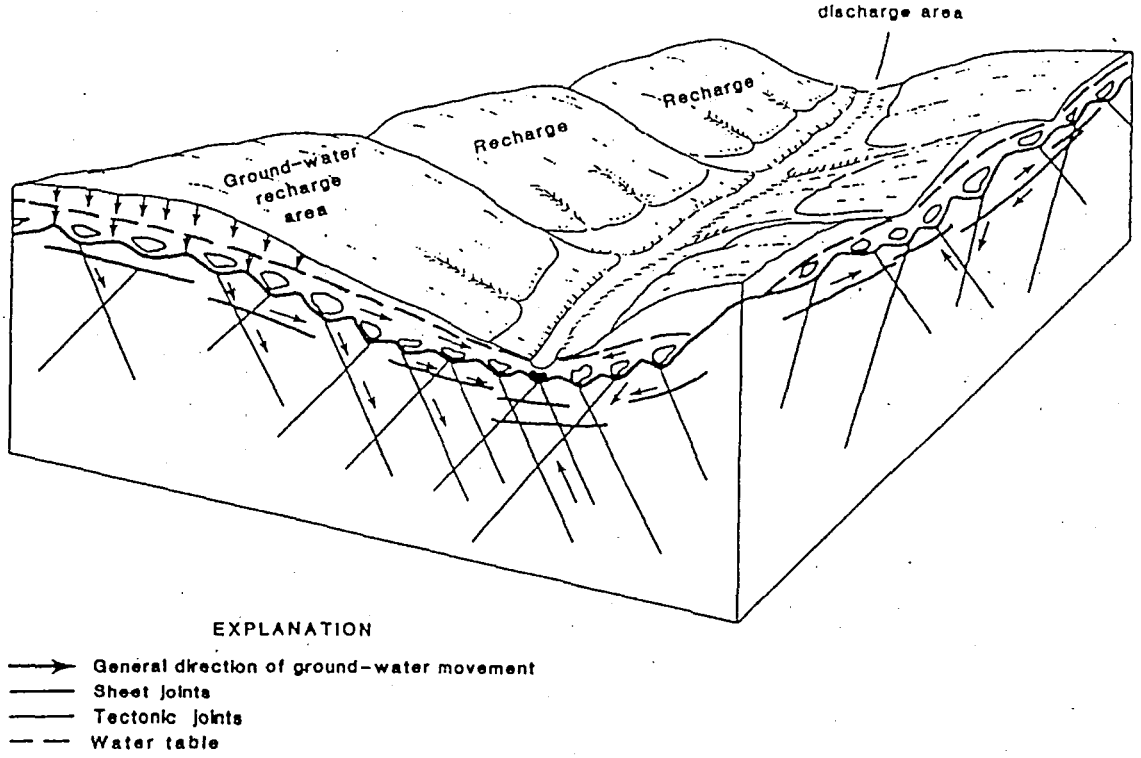


Figure 11.--Generalized ground-water flow system in the Piedmont (from Heath, 1980).

although with subdued relief. Thus, surface topography can be used to predict the natural direction of ground-water flow. The distance between the point where a drop of water or waste enters the system and the point where it discharges into the stream down slope is commonly less than a half mile (LeGrand, 1958). Most of the natural flow in the system is probably confined to the upper 30 feet of bedrock, where fractures are concentrated, and the overlying transition zone, which apparently has the highest hydraulic conductivity of any part of the hydrogeologic system (C.C. Daniel, III, U.S. Geological Survey, written commun., 1985). However, flow probably also occurs in the deeper fractured system in a manner harder to predict by local surface topography. In the deeper system, regional topography or structural features may result in flow over long distances and long ground-water residence times in the fractured rock.

The ground-water flow system in the Piedmont is directly connected to the surface-water system. The annual contribution of ground water to total streamflow for 11 streams flowing through the Piedmont is estimated to average 44 percent (Harned and Daniel, 1987). Consequently, it is a concern that ground-water contamination will eventually discharge to streams that are water-supply sources.

Because of the interconnection of the ground- and surface-water systems in the Piedmont, a drainage basin large enough to contain a perennial stream can serve as a basic unit for the description of ground-water quality (LeGrand, 1984). Each drainage basin is a flow-system cell similar to, and yet separate from, surrounding basins. Although not all of the ground-water flow for a particular area is confined within a single drainage basin, it should be possible to generalize, with a reasonable degree of confidence, about ground-water quality of larger regions from data collected in small drainage basins. This is a basic assumption used in this study.

Hypotheses about the Piedmont ground-water flow system relevant to this and future studies of the system include:

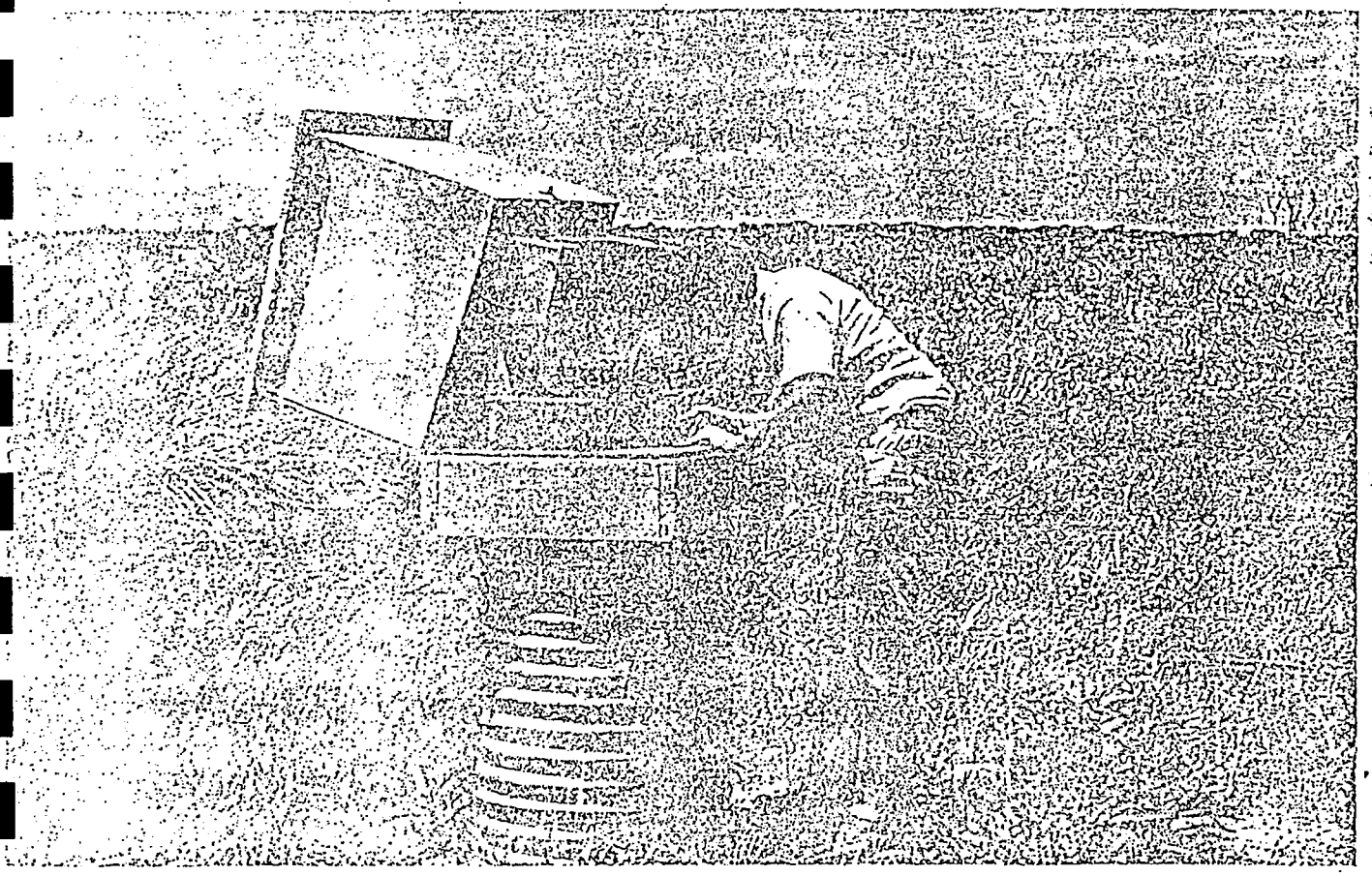
1. The transition zone between bedrock and regolith serves as a primary transmitter of contaminated ground water. The regolith serves as the principal reservoir of ground-water contamination.
2. Attenuation of ground-water contamination in the regolith is related to the degree of weathering and composition of regolith material and the hydraulic conductivity, gradient, and porosity of the material.
3. The velocity of contaminant movement can be highest within the fractured bedrock system, particularly under stressed conditions.
4. The deeper zones in basement rock generally contain the best quality water in the system due to contaminant attenuation in the regolith.
5. Geomorphological analysis can be used to identify fracture zones that help predict general subsurface-flow patterns of ground-water contamination. These methods can be verified with surface geophysical techniques.

Transition-Zone Studies

There have been some initial tests of the hypothesis that the transition zone is a principal conduit of ground-water movement and ground-water contamination. Daniel was the first investigator to focus on the transition zone and has done some initial test drilling, well construction, and well logging to define its characteristics. In particular, temperature logs run in several wells located in Cary and in Guilford County, North

Ref. 25

Basic Elements of Ground-Water Hydrology with Reference to Conditions in North Carolina



U.S. GEOLOGICAL SURVEY
WATER RESOURCES INVESTIGATIONS
OPEN-FILE REPORT 80-44

Prepared in cooperation with the
North Carolina Department of Natural
Resources and Community Development

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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

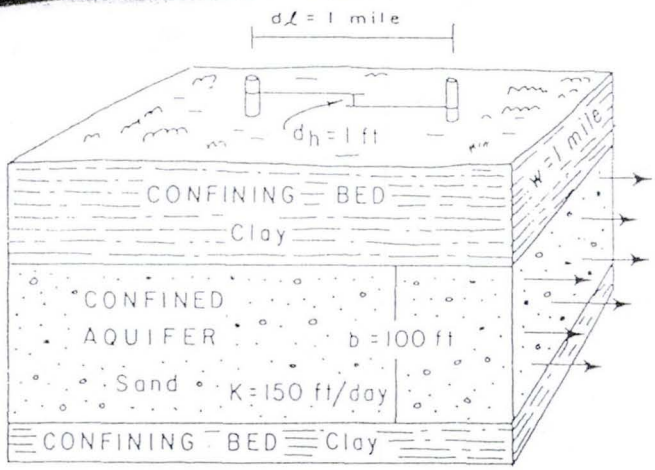
Basic Elements of Ground-Water Hydrology With Reference to Conditions in North Carolina

By Ralph C. Heath

U.S. Geological Survey
Water-Resources Investigations
Open-File Report 80-44

Prepared in cooperation with the North Carolina Department of Natural Resources and Community Development

Raleigh, North Carolina
1980



The capacity of an aquifer to transmit water is referred to as its transmissivity. The *transmissivity* (T) of an aquifer is equal to the hydraulic conductivity of the material comprising the aquifer multiplied by the thickness of the aquifer. Thus

$$T = Kb \qquad (1)$$

where T is transmissivity,
K is hydraulic conductivity, and
b is aquifer thickness.

As was the case with hydraulic conductivity, transmissivity is also defined in terms of a unit hydraulic gradient.

If we combine equation 1 with Darcy's law (see HYDRAULIC CONDUCTIVITY), the result is an equation that can be used to calculate the quantity of water moving through a width, w, of an aquifer. Thus,

$$Q = KA\frac{dh}{dl} = K(bw)\frac{dh}{dl} = (Kb)w\frac{dh}{dl}$$

$$Q = Tw\frac{dh}{dl} \qquad (2)$$

Equation 2 is also used to calculate transmissivity, where the quantity of water (Q) discharging from a known width of aquifer can be determined as, for example, with streamflow measurements. Rearranging terms, we obtain

$$T = \frac{Q\,dl}{w\,dh} \qquad (3)$$

The units of transmissivity, as can be demonstrated with the preceding equation, are

$$T = \frac{(ft^3\ day^{-1})\ (ft)}{(ft)\ (ft)} = \frac{ft^2}{day}$$

Because transmissivity depends both on K and b, its value is different in different aquifers and from place to place in the same aquifer.

Average Values of Hydraulic Conductivity, Thickness, and Transmissivity for Selected Aquifers in North Carolina

Aquifer	Hydraulic Conductivity (ft./day)	Thickness (ft.)	Transmissivity (ft^2./day)
Post-Yorktown deposits	50	20	1000
Yorktown Formation	50	40	2000
Castle Hayne Limestone	300	100	30000
Cretaceous deposits	20	200	4000
Saprolite	5	50	250
Granite and gneiss	5	200	1000

Transmissivity replaces the term "coefficient of transmissibility" because, by convention, an aquifer is transmissive and the water in it is transmissible.

PROBLEM - Determine the quantity of water (Q) moving through the segment of the confined aquifer shown in the preceding drawing in both $ft.^3$/day and gal./day.

(1) **Calculation of transmissivity**

$$T = Kb = \frac{150\ ft}{day} \times \frac{100\ ft}{1} = \frac{15{,}000\ ft^2}{day}$$

(2) **Solution in $ft.^3$/day**

$$Q = Tw\frac{dh}{dl} = \frac{15{,}000\ ft^2}{day} \times \frac{5280\ ft}{1} \times \frac{1\ ft}{5280\ ft} = \frac{15{,}000\ ft^3}{day}$$

(3) **Conversion of ft^3./day to gal./day**

$$\frac{15{,}000\ ft^3}{day} \times \frac{7.5\ gal}{ft^3} = 112{,}500\ gal/day$$

MEMO

Date: February 09, 1995

To: File

From: Douglas Moore
Environmental Chemist
NC Superfund Section

Topic: Union Co. Public Works Information

Summit Resources Management Site
US EPA ID: NCD 986 232 213

On Thursday, February 3, 1994, I spoke with Mr. Mike Shalati, Director of the Union Co. Public Works Dept. (1-704-283-3819) regarding past disposal practices at the subject site. Mr. Shalati stated that Summit Resources (Summit) had a discharge permit for domestic waste only. He stated that a representative from the Public Works dept. was visiting the site in 1992 and noticed a sewage truck discharging its tank contents directly to the manhole located in front of the plant. The driver of the truck stated that the contents of the tank included materials from the septic tank located on the plant property. The Public Works dept. took samples of the manhole in front of the plant and found trace levels of ethylene glycol in the sewer lines.

He also stated that Union Co. employees detected odors of ethylene glycol in the South Fork Crooked Creek during a 1992 sampling event. He believes that Union Co. took samples of the creek and found trace levels of ethylene glycol releases to the creek. He stated that the suspected release was reported to DEM in Mooresville. Mr. Shalati stated that he would send us a copy of the observation reports, analytical data and sampling maps for each sampling event from the Union Co. Public Works Dept. files.

On Thursday, February 9, 1995, I spoke with Mr. Gill Suggs, assistant public works director of the Union County Public Works department (704) 286-3819. Mr. Suggs stated that the Union County Public Works system serves approximately 11,000 connections, or a total estimated population of roughly 30,800 people. The Union County Public works system draws water from a surface intake located on the Catawba River near Highway 5 in Lancaster County, South Carolina (outside the 15 mile surface water target distance limit). The UCPWS also purchases water from Anson County and from the City of Monroe. The City of Monroe system draws water from a surface water intake located just north of the town of Wingate on Lake Twitty (outside the 15 mile surface water target distance limit). The Anson County system draws water from a surface water intake located on the Yadkin/Pee Dee River Basin between Anson and Richmond Counties (outside the 15 mile surface water target distance limit). He stated that the UCPWS operates a water line along Gribble Road in the vicinity of the site. He had no accurate estimates of the total number of taps on Gribble Road, but, stated that he believes that a majority of Gribble Road is connected.

\sr\publicwks

MEMO

Date: 01/25/93

To: File

From: Douglas Moore
Environmental Chemist
NC Superfund Section

Topic: Intakes for the Charlotte-Mecklenburg Water System
Dynatech Industries Site - NCD 981 014 517

On Monday, January 25,1993, I spoke with Mr.Terry Gross, Water Treatment Plant Consultant with the Public Water Supply Section of the Mooresville Regional Office (1-704-663-1699).

Mr.Gross stated that there are three intakes for the Charlotte Mecklenburg Water system; one at Mountain Island Lake, two at Lake Norman. He stated that there are no intakes along Irwin or Sugar Creek, or South of Charlotte. The town of Pineville gets its water directly from the Charlotte Mecklenburg system.

DM\D2GROSS

Memo

Date: February 10, 1995

To: File

From: Douglas Moore
Environmental Chemist
NC Superfund Section

Topic: Community well groundwater use within a 4 mile radius

Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union County, North Carolina
US EPA ID: NCD 986 232 213

On this day, I spoke with Mrs. Dare of Mid-South Water Company (800) 222-5607. According to the attached public water supply section printout, Mid-South maintains private water supply systems for four (4) subdivisions within a 4 mile radius: (a) Greenbriar of Matthews (b) Heathers subdivision (c) Reigate/Oxford Glen (d) Oakcroft subdivision. Mrs. Dare provided the following information on the locations of the community wells serving each of these systems.

	System Name	Water Source	Location
(a)	Greenbriar of Matthews	2 wells	Briar Ridge Ct., Matthews
(b)	Heathers S/D	2 wells	Off Phillips Road, Matthews
(c)	Reigate/Oxford Glen	2 wells	Off Thompson Rd, Matthews
(d)	Oakcroft S/D	1 well	Nr. Heathers S/D - Phillips Rd. and Mt. Harmony Rd., Matthews.

I also spoke with Martin Lashua, Regional Manager of Carolina Water Service, Inc.(CWS) @ (704) 525-7990. According to the attached public water supply section printout, CWS maintains private water supply systems for five (5) subdivisions and a mobile home park within a 4 mile radius of the site: (a) Eastwood Forest MHP (b) Idlewood subdivision (c) Providence Ridge subdivision (d) Saddlebrook subdivision (e) Southwoods/Williams Station subdivision (f) Suburban Woods subdivision. Mr. Lashua provided the following information on the locations of wells serving each of the systems:

	System Name	Water Source	Location
(a)	Eastwood Forest MHP	3 wells	off Monroe Road, west of Stallings.
(b)	Idlewood S/D	2 wells	At intersection of Thompson Rd. and Idlewild Hook Rd.
(c)	Providence Ridge S/D	2 wells	Off Tilley Morris Rd, southwest of Stallings
(d)	Saddlebrook S/D	2 wells	Near the intersection of Phillips Rd and Winding Trail
(e)	Southwoods/Williams St.	3 wells	Off Rice Rd. nr. intersection with Idlewild Rd.
(f)	Suburban Woods S/D	2 wells	Off Idlewild Rd., on Hallmark Dr. (outside the 4 mile radius).

I also spoke with Mr. Overcash, owner of the Oakhaven mobile home park (704) 847-1215. Mr. Overcash stated that Oakhaven MHP is served by two wells located at Moore Road and Old Highway 51 intersection.

I spoke with the owner of Countryside mobile home park (704) 537-5147. Countryside MHP is served by 2 wells located off Orr Road and Grier Rd intersection. This are is in North Charlotte, well outside a 4 mile radius of the site.

PMMGRID STATE N.C. PUBLIC WATER SUPPLY SYSTEM 01/21/94
ACTIVE SYSTEMS
GRID LATITUDE: 350100 / 350845, LONGITUDE: 0803600 / 0804510

	PWS ID	SYSTEM NAME	TYPE	POPULATION	RES.PERSON WORK PHONE	SOURCE NAME	SOURCE TYPE	SOURCE AVAIL.	LATITUDE	LONGITUDE	
	160127	~~COUNTRYSIDE MHP~~	~~C~~	~~120~~	~~7045375147~~	~~WELL 6~~	~~G~~	~~P~~	~~350731~~	~~804145~~	outside 4 mile radius
		~~COUNTRYSIDE MHP~~	~~C~~	~~120~~	~~7045375147~~	~~WELL 6~~	~~G~~	~~P~~	~~350731~~	~~804145~~	
1	160130	GREENBRIAR OF MATTHEWS	C	424	8002225607	WELL #1 (CTF)	G	P	350545	804412	
		GREENBRIAR OF MATTHEWS	~~C~~	~~424~~	8002225607	WELL #2	G	P	350548	804415	
2	160137	EASTWOOD FOREST MHP	C	512	7045257990	WELL #1	G	P	350506	804218	
		EASTWOOD FOREST MHP	~~C~~	~~512~~	7045257990	WELL #3	G	P	350521	804203	
		EASTWOOD FOREST MHP	~~C~~	~~512~~	7045257990	WELL #2	G	P	350512	804212	
3	160170	OAKHAVEN MHP	C	29	7048471215	WELL #2	G	E	350715	804133	
		OAKHAVEN MHP	~~C~~	~~29~~	7048471215	WELL #1	G	P	350715	804133	
	160184	~~SUBURBAN WOODS S/D~~	~~C~~	~~372~~	~~7045257990~~	~~WELL #2~~	~~G~~	~~P~~	~~350821~~	~~804127~~	outside 4 mile radius
		~~SUBURBAN WOODS S/D~~	~~C~~	~~372~~	~~7045257990~~	~~WELL #1~~	~~G~~	~~P~~	~~350821~~	~~804124~~	
4	160204	IDLEWOOD S/D	C	364	7045257990	WELL #2	G	P	350821	804036	
		IDLEWOOD S/D	~~C~~	~~364~~	7045257990	WELL #1	G	P	350818	804036	
5	160220	PROVIDENCE RIDGE	C	628	7045257990	WELL #2	G	P	350227	804454	
		PROVIDENCE RIDGE	~~C~~	~~628~~	7045257990	WELL #1	G	P	350230	804448	
6	160231	SADDLEBROOK S/D	C	171	7045257990	WELL #2	G	P	350800	804054	
		SADDLEBROOK S/D	~~C~~	~~171~~	7045257990	WELL #1	G	P	350800	804054	
7	160234	BRIGHTON ON MATTHEWS	C	120	7044782785	WELL	G	P	350600	804100	
8	160238	HEATHERS S/D	C	750	8002225607	WELL #3	G	P	350630	804018	
		HEATHERS S/D	~~C~~	~~750~~	8002225607	WELL #2	G	P	350630	804018	
		HEATHERS S/D	~~C~~	~~750~~	8002225607	WELL #1	G	P	350630	804018	
9	160239	REIGATE/OXFORD GLEN	C	160	8002225607	WELL #1	G	P	350840	803859	
		REIGATE/OXFORD GLEN	~~C~~	~~160~~	8002225607	WELL #2	G	P	350840	803859	
10	160254	OAKCROFT S/D	C	50	8002225607	WELL #1	G	P	350612	803924	
11	160260	SOUTHWOODS/WILLIAMS STATION	C	63	7045257990	WELL #1	G	P	350800	804200	
		SOUTHWOODS/WILLIAMS STATION	~~C~~	~~63~~	7045257990	WELL #1 WILLIAMS STATION	G	P	350800	804200	
		SOUTHWOODS/WILLIAMS STATION	~~C~~	~~63~~	7045257990	WELL #3	G	P	350750	804200	
	160448	~~WINSONS DRIVE IN~~	~~N~~	~~45~~	~~7048479506~~	~~WELL~~	~~G~~	~~P~~	~~350615~~	~~804100~~	
	160450	~~W.T. HILL SAND CO~~	~~N~~	~~25~~	~~7042836015~~	~~WELL~~	~~G~~	~~P~~	~~350630~~	~~804115~~	
	160452	~~FISH NET FISH CAMP~~	~~N~~	~~150~~	~~7048474010~~	~~WELL~~	~~G~~	~~P~~	~~350700~~	~~804145~~	
	160454	~~QUICK CHEK FOODS~~	~~N~~	~~25~~	~~7048477210~~	~~WELL~~	~~G~~	~~P~~	~~350710~~	~~804145~~	
	160455	~~THE FISH FARM~~	~~N~~	~~100~~	~~7048478578~~	~~WELL~~	~~G~~	~~P~~	~~350800~~	~~804300~~	
	160475	~~PLEASANT PLAINS BAPTIST CHURCH~~	~~N~~	~~210~~	~~7048479237~~	~~WELL~~	~~G~~	~~P~~	~~350457~~	~~804231~~	
	160476	~~OLD TIMERS~~	~~N~~	~~50~~	~~7048219498~~	~~WELL~~	~~G~~	~~P~~	~~350530~~	~~804200~~	
	160482	~~ARTHUR GOODMAN MEMORIAL PARK~~	~~N~~	~~100~~	~~7048218605~~	~~WELL~~	~~G~~	~~P~~	~~350615~~	~~804400~~	
	160518	~~74 DRIVE-IN~~	~~N~~	~~50~~	~~7048479090~~	~~WELL~~	~~G~~	~~P~~	~~350645~~	~~804100~~	
	160526	~~SAM NEWELL BAPTIST CH~~	~~N~~	~~50~~	~~7048475500~~	~~WELL~~	~~G~~	~~P~~	~~350830~~	~~804300~~	
	160579	~~WINDROW SWIM CLUB~~	~~N~~	~~50~~	~~7048474215~~	~~WELL~~	~~G~~	~~P~~	~~350755~~	~~804078~~	
	160678	~~SIMFIELD METHODIST CH~~	~~N~~	~~25~~		~~WELL~~	~~G~~	~~P~~	~~350545~~	~~804345~~	
	160687	~~MORNING STAR BAPTIST CHURCH~~	~~N~~	~~110~~	~~7045978761~~	~~WELL~~	~~G~~	~~P~~	~~350829~~	~~804170~~	
	160742	~~MT HARMONY BAPTIST CHURCH~~	~~N~~	~~250~~	~~7048479068~~	~~WELL #2~~	~~G~~	~~P~~	~~350700~~	~~804070~~	
	160823	~~WORSIN AROUND LOUNGE~~	~~N~~	~~50~~	~~7048470072~~	~~WELL~~	~~G~~	~~P~~	~~350845~~	~~804330~~	
	160825	~~MORNINGSTAR LUTHERAN CHURCH~~	~~N~~	~~160~~	~~7048474502~~	~~WELL~~	~~G~~	~~P~~	~~350810~~	~~804140~~	
	160827	~~LIVING FAITH WORSHIP CENTER~~	~~N~~	~~50~~	~~7045374341~~	~~WELL~~	~~G~~	~~P~~	~~350610~~	~~804110~~	
	190471	~~FAITH BAPT CH~~	~~N~~	~~100~~		~~WELL~~	~~G~~	~~P~~	~~350430~~	~~803710~~	
	190473	~~MAPLE GROVE BAPTIST CHURCH~~	~~N~~	~~50~~		~~WELL~~	~~G~~	~~P~~	~~350435~~	~~804000~~	
	190476	~~ANTIOCH METH CH~~	~~N~~	~~50~~		~~WELL~~	~~G~~	~~P~~	~~350300~~	~~804315~~	
	190483	~~CENTRAL BAPTIST CHURCH~~	~~N~~	~~250~~	~~7042834775~~	~~WELL~~	~~G~~	~~P~~	~~350415~~	~~804140~~	

Memo

Date: March 29, 1995

To: File

From: Douglas Moore
Environmental Chemist
NC Superfund Section

Topic: Groundwater use within a 4 mile radius

Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union County, North Carolina
US EPA ID: NCD 986 232 213

Using the topographic site map (Fig. 1), a housecount was performed for houses that do not have access to a municipal water line within the 0.5 - 4.0 radii of the site. From a January 1994 windshield survey, it was determined that there was 1 residence within the 0 - 0.25 mile radius and 7 residences within the 0.25 - 0.5 mile radius of the site. The residential population estimated to use private potable wells for their drinking water source was determined by multiplying the number of house by the 2.82, the 1990 US Census County average of persons per household for Union County.

Distance Ring	Residences	Total Estimated Pop.
0 - 0.25 mile	1	3
0.25 - 0.5 mile	7	21
0.5 - 1.0 mile	66	186
1.0 - 2.0 miles	234	660
2.0 - 3.0 miles	345	973
3.0 - 4.0 miles	563	1588

The total groundwater use within a 4 mile radius of the site was determined by adding the total estimated population that use private potable wells for their drinking water source to the total estimated population served by individual community wells within each distance ring (See Fig. 1).

Distance Ring	Community Well Name	Community Well Population
0 - 0.25 mile	N/A	N/A
0.25 - 0.5 mile	N/A	N/A
0.5 - 1.0 mile	N/A	N/A
1.0 - 2.0 miles	Eastwood Forest MHP Oakcroft S/D	512 50
2.0 - 3.0 miles	Brighton on Matthews S/D Oakhaven MHP Saddlebrook S/D Heathers S/D	120 29 171 750
3.0 - 4.0 miles	Greenbriar of Matthews S/D Idlewood S/D Reigate/Oxford Glen S/D Southwoods/Williams Sta.	424 364 160 63

Combining the total population estimates from the two above tables:

Distance Ring	Private Population	Community Well Population	Total Groundwater Population
0 - 0.25 mile	3	0	3
0.25 - 0.5 mile	20	0	21
0.5 - 1.0 mile	186	0	186
1.0 - 2.0 miles	660	562	1222
2.0 - 3.0 miles	973	1070	2043
3.0 - 4.0 miles	1588	1011	2599

Ref. 30

MEMO

TO: Superfund Section Staff

FROM: Jeanette Stanley
Environmental Chemist
NC Superfund Section

DATE: January 10, 1994

SUBJECT: Update on Status of Well Head Protection Programs in N.C.

I spoke with Carl Bailey, Groundwater Planning Branch Section Chief at (919) 733-3221. I asked him about Well Head Protection Areas (WHPAs) in North Carolina. Mr. Bailey said that Wally Venrick, Public Water Supply Section Chief, would be the most knowledgeable person on this subject.

I called Mr. Venrick at (919) 715-3232. He said that North Carolina has extended an invitation to communities to establish WHPAs, but none have been established. The cost to the community of establishing a WHPA exceeds the savings realized from waivers for certain analytical requirements. He does not anticipate that any WHPAs will be established prior to 1996.

Mr. Venrick said that there are minimum allowable distances between wells and certain structures (e.g. 100 feet between septic tanks and wells), but distances are arbitrary and vary depending on the structure.

State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Epidemiology

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary

RECEIVED
FEB 23 1995
SUPERFUND SECTION

DEHNR

February 20, 1995

MEMORANDUM

TO: Pat DeRosa, CERCLA Branch Head
NC Superfund Section

FROM: Kenneth Rudo, Ph.D., Toxicologist KMK
Environmental Epidemiology Section

SUBJECT: Health Risk Evaluation
Summit Resource Management Site
Union County

Attached are the Environmental Epidemiology Section's drinking water health risk evaluations for the well water samples from the above site. Recommendations for continued water use are also given.

If you have any further questions, please call me at 733-3410.

KR:td

Attachments

North Carolina Department of Environment, Health, & Natural Resources
Division of Epidemiology
Environmental Epidemiology Section

Drinking Water Health Risk Evaluation
General

Union COUNTY

DATE 2/17/95 LABORATORY NUMBER 943914, 943918, 943919, 943930, 943931, 943915, 943916, 943928, 943929, 618031, 618032, 943931, 943932

(✓) Based on these analytical results, this water should be considered safe for normal usage.

( ) Chemical analysis did not show any contamination. Water should be resampled if odor or taste persists.

( ) The water should not be used for drinking or cooking purposes, avoid prolonged bathing/showering.

( ) Based on these analytical results, this water is highly contaminated and should not be used for drinking, cooking or bathing/showering.

( ) The laboratory results are not conclusive, please resample:

PLEASE INDICATE ON LAB SHEET THAT IT IS A RESAMPLE AND PROVIDE PREVIOUS SAMPLE NUMBER(S).

(✓) COMMENTS:

Either no contaminants were found in the above wells or low levels of contaminants. Continued consumption should not any health risk.

For further information, contact Dr. Ken Rudo or Dr. Luanne Williams, Environmental Epidemiology Section, (919) 733-3410.

DEHNR 3891 (5/92)
Environmental Epidemiology Section (Review 5/95)

PURPOSE: To convey meaningful health-based recommendations about continued use of drinking water which may contain chemical contaminants.

PREPARATION:

1) Public health toxicologist prepares original.

2) Three (3) copies are made and sent to Environmental Health Section for distribution (1 copy for Environmental Health Section, 1 copy for local health department, and 1 copy for well owner(s).

DISPOSITION:

Environmental Epidemiology Section: This form will be kept within the Section for five (5) years and transferred to Records Services for five (5) years, then destroyed.

Recipient Agencies: This form will be used as guidance for the specific well sample(s) indicated, retained until need ends, then destroyed.

North Carolina Department of Environment, Health, & Natural Resources
Division of Epidemiology
Environmental Epidemiology Section

Drinking Water Health Risk Evaluation
General

Union COUNTY

DATE 2/12/95 LABORATORY NUMBER 94390

( ) Based on these analytical results, this water should be considered safe for normal usage.

( ) Chemical analysis did not show any contamination. Water should be resampled if odor or taste persists.

(✓) The water should not be used for drinking or cooking purposes, avoid prolonged bathing/showering.

( ) Based on these analytical results, this water is highly contaminated and should not be used for drinking, cooking or bathing/showering.

( ) The laboratory results are not conclusive, please resample:

PLEASE INDICATE ON LAB SHEET THAT IT IS A RESAMPLE AND PROVIDE PREVIOUS SAMPLE NUMBER(S).

(✓) COMMENTS:
High levels of several compounds exceed recommended limits and may pose an increased health risk over time upon continued consumption.

For further information, contact Dr. Ken Rudo or Dr. Luanne Williams, Environmental Epidemiology Section, (919) 733-3410.

DEHNR 3891 (5/92)
Environmental Epidemiology Section (Review 5/95)

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Recipient Agencies: This form will be used as guidance for the specific well sample(s) indicated, retained until need ends, then destroyed.

Memo

Date: March 8, 1995

To: File

From: Douglas Moore Douglas B Moore
Environmental Chemist
NC Superfund Section

Topic: Health Risk Evaluation Follow-Up

Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union County, North Carolina
US EPA ID: NCD 986 232 213

On this day, I spoke with Dr. Ken Rudo Ph.D., toxicologist, North Carolina Environmental Epidemiology Section (919) 733-3410. I had previously received a copy of the sections Health Risk evaluation recommendations for drinking water well samples collected at the subject site. I contacted Dr. Rudo to check on concerns over lead levels in the Mint Hill Cabinet shop well sample above the EPA's drinking water action level of 15 ug/l. Dr. Rudo explained that his recommendation that the drinking water should be considered safe for normal usage is based upon the fact that the action level is designed for protection of children, and as this was a business, there was little chance that children would regularly drink water from the well.

Ref. 33

North Carolina Administrative Code

Title 15A
Department of Environment, Health, and Natural Resources
Division of Environmental Management

Subchapter 2L

Sections .0100, .0200, and .0300

Classifications and Water Quality Standards Applicable To The Groundwaters of North Carolina

Current Through November 8, 1993
Environmental Management Commission
Raleigh, North Carolina

to the previous review.

(g) Class GA Standards. Where not otherwise indicated, the standard refers to the total concentration in milligrams per liter of any constituent in a dissolved, colloidal or particulate form which is mobile in groundwater. This does not apply to sediment or other particulate matter which is preserved in a groundwater sample as a result of well construction or sampling procedures.

(1) acetone: 0.7
(2) acrylamide (propenamide): 0.00001
(3) arsenic: 0.05
(4) barium: 2.0
(5) benzene: 0.001
(6) bromoform (tribromomethane): 0.00019
(7) cadmium: 0.005
(8) carbofuran: 0.036
(9) carbon tetrachloride: 0.0003
(10) chlordane: 2.7×10^{-5}
(11) chloride: 250.0
(12) chlorobenzene: 0.05
(13) chloroform (trichloromethane): 0.00019
(14) 2-chlorophenol: 0.0001
(15) chromium: 0.05
(16) cis-1,2-dichloroethene: 0.07
(17) coliform organisms (total): 1 per 100 milliliters
(18) color: 15 color units
(19) copper: 1.0
(20) cyanide: 0.154
(21) 2, 4-D (2,4-dichlorophenoxy acetic acid): 0.07
(22) 1,2-dibromo-3-chloropropane: 2.5×10^{-5})
(23) dichlorodifluoromethane (Freon-12; Halon): 1.4
(24) 1,1 dichloroethane: 0.7
(25) 1,2-dichloroethane (ethylene dichloride): 0.00038
(26) 1,1-dichloroethylene (vinylidene chloride): 0.007
(27) 1,2-dichloropropane: 0.00056
(28) di-n-butyl (or dibutyl) phthalate (DBP): 0.7
(29) diethylphthalate (DEP): 5.0
(30) di(2-ethylhexyl) phthalate (DEHP): 0.003
(31) p-dioxane (1,4-diethylene dioxide): 0.007
(32) dioxin: 2.2×10^{-10}
(33) dissolved solids (total): 500
(34) endrin: 0.002
(35) epichlorohydrin (1-chloro-2,3-epoxypropane): 0.00354
(36) ethylbenzene: 0.029
(37) ethylene dibromide (EDB; 1,2-dibromoethane): 4.0×10^{-7}
(38) ethylene glycol: 7.0
(39) fluoride: 2.0
(40) foaming agents: 0.5
(41) gross alpha (adjusted)particle activity (excluding radium-226 and uranium): 15 pCi/l

(42) heptachlor: 8.0×10^{-6}
(43) heptachlor epoxide: 4.0×10^{-6}
(44) heptane: 2.1
(45) hexachlorobenzene (perchlorobenzene): 0.00002
(46) n-hexane: 0.42
(47) iron: 0.3
(48) lead: 0.015
(49) lindane: 2.0×10^{-4}
(50) manganese: 0.05
(51) mercury: 0.0011
(52) metadichlorobenzene (1,3-dichlorobenzene): 0.62
(53) methoxychlor: 0.035
(54) methylene chloride (dichloromethane): 0.005
(55) methyl ethyl ketone (MEK; 2-butanone): 0.17
(56) methyl tert-butyl ether (MTBE): 0.2
(57) nickel: 0.1
(58) nitrate: (as N) 10.0
(59) nitrite: (as N) 1.0
(60) orthodichlorobenzene (1,2-dichlorobenzene): 0.62
(61) oxamyl: 0.175
(62) paradichlorobenzene (1,4-dichlorobenzene): 0.075
(63) pentachlorophenol: 0.0003
(64) pH: 6.5 - 8.5
(65) radium-226 and radium-228 (combined): 5 pCi/l
(66) selenium: 0.05
(67) silver: 0.018
(68) styrene (ethenylbenzene): 0.1
(69) sulfate: 250.0
(70) tetrachloroethylene (perchloroethylene; PCE): 0.0007
(71) toluene (methylbenzene): 1.0
(72) toxaphene: 3.1×10^{-5}
(73) 2, 4, 5,-TP (Silvex): 0.05
(74) trans-1,2-dichloroethene: 0.07
(75) 1,1,1-trichloroethane (methyl chloroform): 0.2
(76) trichloroethylene (TCE): 0.0028
(77) trichlorofluoromethane: 2.1
(78) vinyl chloride (chloroethylene): 1.5×10^{-5}
(79) xylenes (o-, m-, and p-): 0.53
(80) zinc: 2.1

(h) Class GSA Standards. The standards for this class shall be the same as those for Class GA except as follows:

(1) chloride: allowable increase not to exceed 100 percent of the natural quality concentration.
(2) total dissolved solids: 1000 mg/l.

(i) Class GC Waters.

(1) The concentrations of substances which, at the time of classification exceed the standards applicable to Class GA or GSA groundwaters shall not be caused to increase, nor shall the concentrations of other substances be caused to exceed the

Memo

Date: April 12, 1995

To: File

From: Douglas Moore
Environmental Chemist
NC Superfund Section

Douglas B Moore

Topic: Follow-Up Investigation

Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union County, NC
US EPA ID: NCD 986 232 213

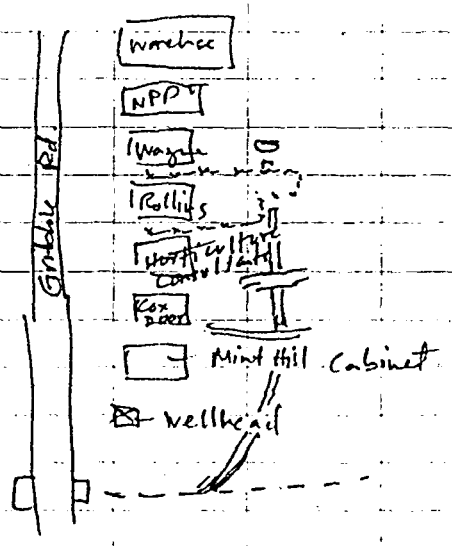
During the February 2, 1994 follow-up investigation, additional information was gathered about the drainage pattern from the Wagoner property and an additional wellhead was observed nearer to the site.

In January 1994, Harry Zinn and Doug Moore traced the drainage from the site to a pipe that passed under the Rollins Truck Service parking lot. In February 2, 1994, we continued to trace the runoff route from the point where we left off. The pipe passes under a fenced parking lot at Rollins Truck Service and emerges in a drainage ditch near the southeast corner of the Rollins property. From here it travels southeast behind a horticulture consultants shop, under dirt road between the horticulture consultant shop and Cox Door company. It travels in an open ditch behind Cox Door, under a second dirt road between Cox Door and Mint Hill Cabinet shop and into an open ditch behind Mint Hill Cabinet shop. The course of the ditch turns sharply to the southwest behind Mint Hill Cabinet shop and travels west-southwest to a pipe under Gribble Road. On the southwest side of Gribble Road, runoff enters and open drainage ditch and travels west towards South Fork Crooked Creek (see attachment).

While tracing the course of the drainage ditch, a wellhead was noticed on the edge of the parking lot next to the front of Mint Hill Cabinet. This wellhead was not previously known. The well owner is John Carriker, owner of Mint Hill Cabinet Shop at 3901 Gribble Road. The well is located approximately 0.25 miles south-southeast of the site, on the edge of Gribble Road. According to Mr. Carriker the well was drilled by Mullis Well Drillers of Mint Hill in 1980. Mr. Carriker stated that the water tastes bad and that they do not drink the water from the well. He stated that he did not notice any odors in the water. The well is currently used to provide process water only for the Cabinet business.

Observed wellhead near site.
Drilled 1980
Mullis Well Drillers, Mint Hill.
Water Tastes Bad, Do Not Drink.
No Odor.
Reg. tag # 345.

Mint Hill Cabinet Shop
3907 Grilldale Rd.
John Carrikor, owner



Ref. 35

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

UNION COUNTY, NORTH CAROLINA AND INCORPORATED AREAS

PANEL 15 OF 200
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
INDIAN TRAIL, TOWN OF	370235	0015	C
STALLINGS, TOWN OF	370472	0015	C
UNINCORPORATED AREAS	370234	0015	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
37179C0015 C

EFFECTIVE DATE:
JULY 5, 1994

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

UNION COUNTY, NORTH CAROLINA AND INCORPORATED AREAS

PANEL 80 OF 200

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
INDIAN TRAIL, TOWN OF	370235	0080	C
MONROE, CITY OF	370236	0080	C
STALLINGS, TOWN OF	370472	0080	C
UNINCORPORATED AREAS	370234	0080	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
37179C0080 C

EFFECTIVE DATE:
JULY 5, 1994

Federal Emergency Management Agency

J

ERENCE MARKS

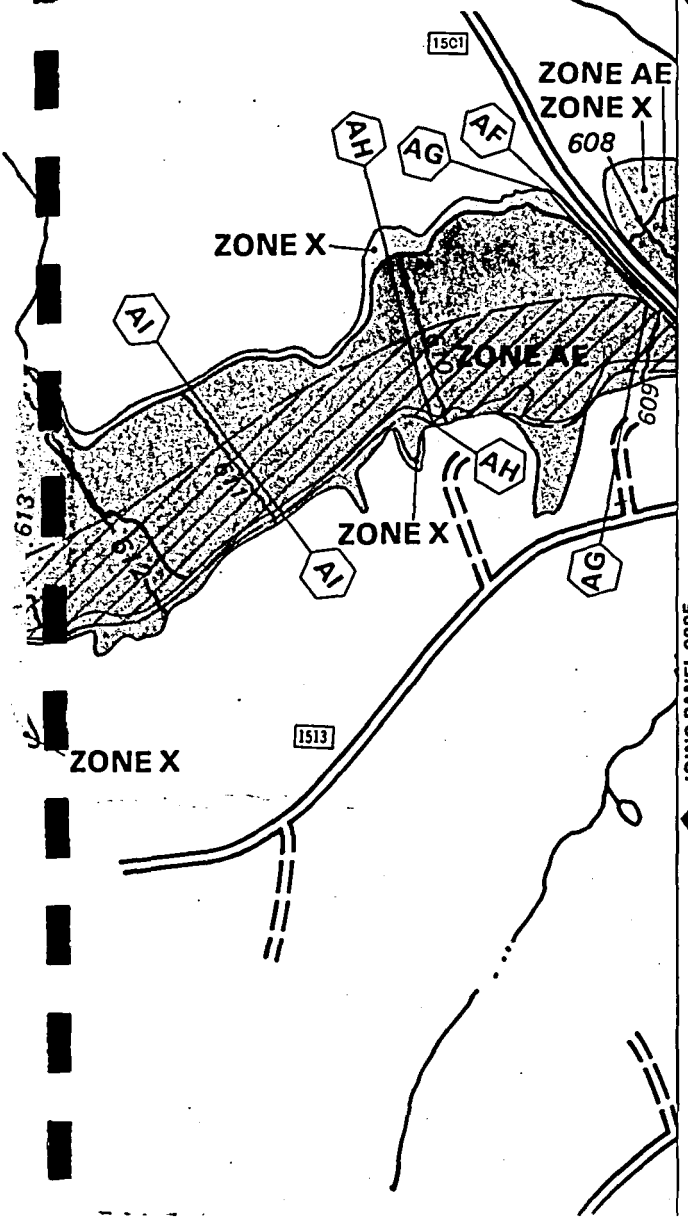
DESCRIPTION OF LOCATION

he [illegible]p of the tire guard on the southwest corner of the d 1346 bridge over West Fork Twelve Mile Creek, 0.30 of the intersection of Secondary Roads 1346 and 1338. uth[illegible]st of the centerline of the road.

the top of the piling on the northwest corner of the d 1346 bridge over Price Mill Creek, 0.55 mile southeast ion[illegible] Secondary Roads 1357 and 1346, and 15 feet north e of the road.

the top of the piling on the northwest corner of the d [illegible]5 bridge over South Fork Crooked Creek, 0.40 mile e intersection of Secondary Roads 1515 and U.S. Highway t northwest of the centerline of the road.

the top of the piling on the southwest corner of the d 1[illegible]8 bridge over South Fork Crooked Creek, 0.30 mile e intersection of Secondary Roads 1009 and 1008, and 17 of [illegible] centerline of the road.



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

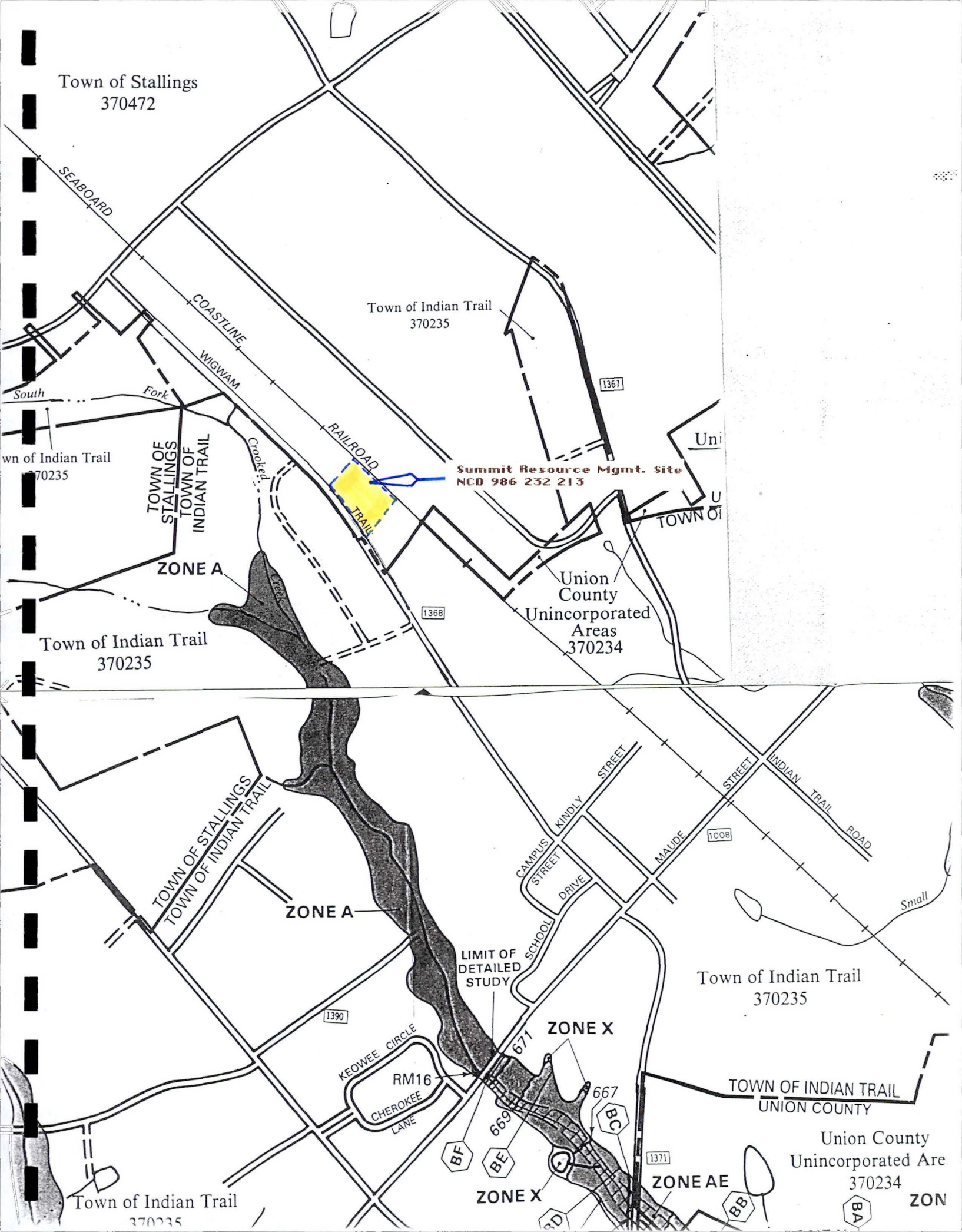
*Referenced to the National Geodetic Vertical Datum of 1929

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.


Town of Stallings
370472
SEABOARD
COASTLINE
WIGWAM
RAILROAD
Town of Indian Trail
370235
1367
South
Fork
Crooked
Creek
TOWN OF STALLINGS
TOWN OF INDIAN TRAIL
Summit Resource Mgmt. Site
NCD 986 232 213
TRAIL
ZONE A
1368
Union County Unincorporated Areas
370234
Town of Indian Trail
370235
TOWN OF STALLINGS
TOWN OF INDIAN TRAIL
ZONE A
KINDLY STREET
CAMPUS STREET
DRIVE
SCHOOL
MAUDE STREET
INDIAN TRAIL ROAD
1008
Small
LIMIT OF DETAILED STUDY
Town of Indian Trail
370235
1390
KEOWEE CIRCLE
RM16
CHEROKEE LANE
671
ZONE X
667
669
BC
BF
BE
ZONE X
TOWN OF INDIAN TRAIL
UNION COUNTY
1371
ZONE AE
BB
BA
Union County
Unincorporated Are
370234
Town of Indian Trail
370235

MEMO

Date: 02/03/94

To: File

From: Douglas Moore
Environmental Chemist
NC Superfund Section

Topic: Wagner property wetland

Summit Resources Management, Inc.
NCD 986 232 213

On Wednesday, February 2, 1994, Harry Zinn and Douglas Moore of the NC Superfund Section travelled to Stallings, NC in order to confirm the presence of a suspected wetland on the Richard Wagner property downgradient and in the surface water overland drainage pathway for the subject site. Arrangements were made to meet John Allison, Regional Soil Specialist, Division of Soil and Water Conservation, NCDEHNR- Asheville Regional Office at the site. Mr. Allison works as a soil scientist with the wetlands mapping program. Accompanying Mr. Allison as an aide was Mr. Samar Bou-Ghazale, an Environmental Engineer with the NC DEM- Mooresville Office. We met Mr. Allison and Mr. Bou-Ghazale at the site at 1145. At approximately 1300 hrs, we arrived at the Wagner property and Harry Zinn began set up of the survey equipment. Mr. Allison, Mr. Bou-Ghazale and Mr. Moore toured the property. From approximately 1300 -1430 hrs, Mr. Allison took numerous soil borings in an effort to delineate the area of hydric soil conditions and soil hydrology. Ten (10) stakes were set out at various stations which represented the approximate boundaries of the wetland. The stakes were labelled as A-J and recorded in my logbook. From 1430-1530 hrs, Harry Zinn surveyed the individual stations and recorded each measurement in his logbook. The measurements were surveyed using a TopCon Theodolite Model TL60-SE surveyor. The reflecting target prism was mounted on top of a solodex camera tripod, as a survey stick. The length of the survey stick from the center of the prism to the ground level was measured at each point using a Lufkin 100' tape measure and recorded in my logbook. The slope distance was determined using a TopCon DM-A5 electronic distance measure (EDM). The reference point for the surveyor was determined by back sighting to the two corners of the National Petroleum Products warehouse. Then, the distance as determined using the EDM, the horizontal angle and the vertical angle was recorded at each station. The field measurements were later plotted onto an AutoCad scaled drawing and the perimeter and area was calculated for the wetland. The wetland covers an area of 65144.93 square feet (1.49 acres) and has a perimeter of 1196.08 feet.

\sr\wgnrwtld

Temp - Mid 30's
Cloudy

SUMMIT RESOURCES
3481 GRIBBLE RD.
STALLINGS, UNION CO., NC
NCD 986 232 213

WEDNESDAY, FEBRUARY 2, 1994
PA SITE TRIP.

PURPOSE: TO CONDUCT FIELD SURVEY OF POTENTIAL JURISDICTIONAL WETLAND ON THE ADJACENT WAGNER PROPERTY. TO CONDUCT FILE REVIEW IN MONROE.

DEPARTED RALEIGH 7:30 AM
SITE TRIP MEMBERS: DOUG MOORE
HARRY ZINN

11:05 AM
Arrived @ Warehouse site. Met w/ Bill Joyner, EPA OSC. Discussed our purpose for visit and Dynatech site. Mr. Joyner stated that removal @ Dynatech will begin ~ February 28, 1994. He stated that they have sampled soils along drainage path. Found

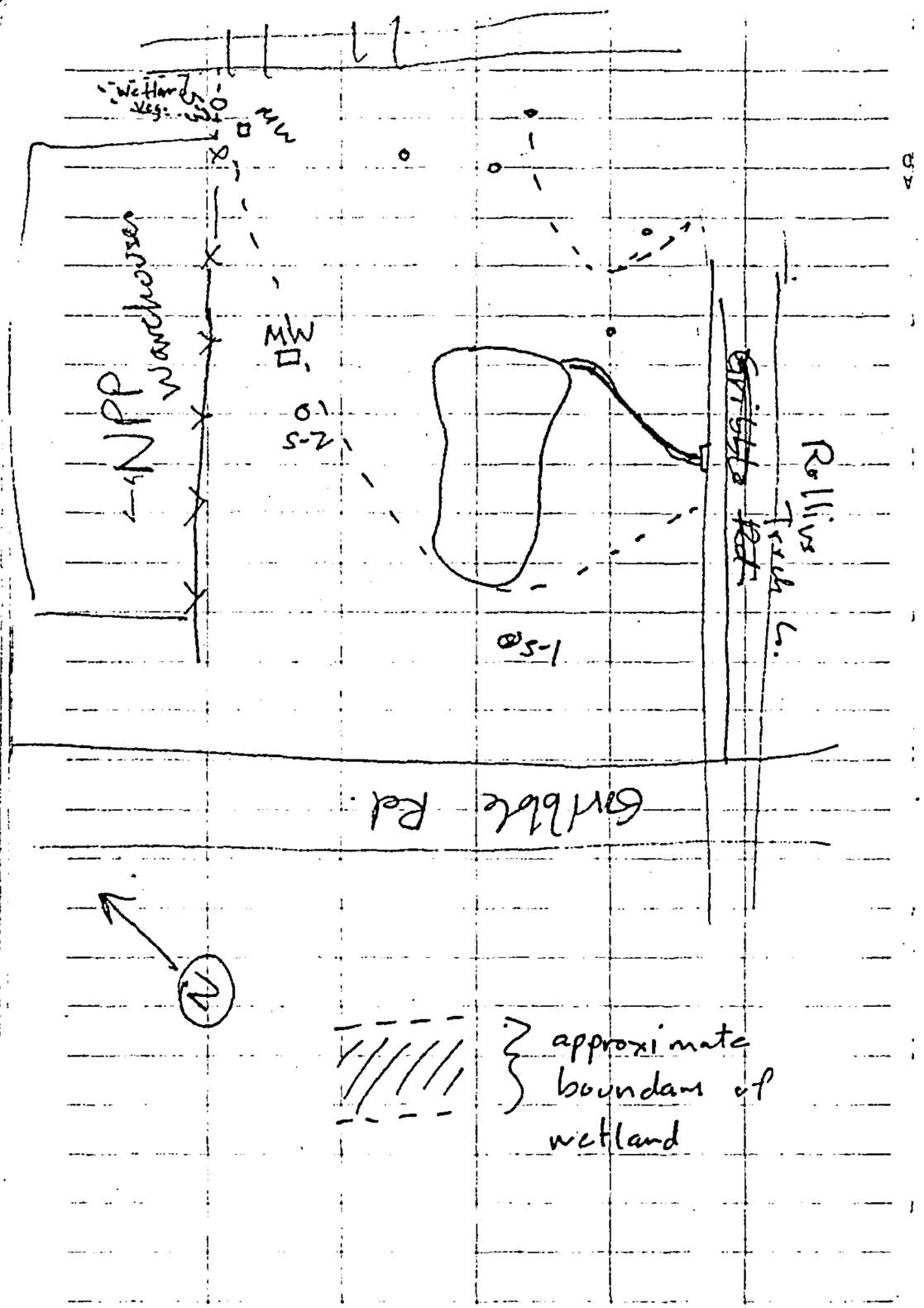
chromium in low spot in parking lot and where initial runoff enters the side ditch. Not sure about chromium detected in side ditch. Sampled sediments behind site in U.T. and on opposite side of Toomey Avenue. Very little chromium levels in sediments. Will send a copy of sample results and sample map showing locations. removal should take roughly 10 days - sources to remove = 50 drums and roll-off boxes. Tested drums inside warehouse found basic chromic acid waste in drums. will provide copy of hazcat tests, and analytical results.

11:45 AM

John Allison and Samar - BouGhazale arrived onsite. briefed on wetland.

11:50 AM

broke for lunch.



S-1

gray mottles encountered @ ~20 inches
appears to have a cut/scraped surface (borrow area).
J. Allison chose spot because of appears to be the of slope.
- soil hydrology is:
freely drained - no free water
no wetland at S-1, based upon soil

S-2

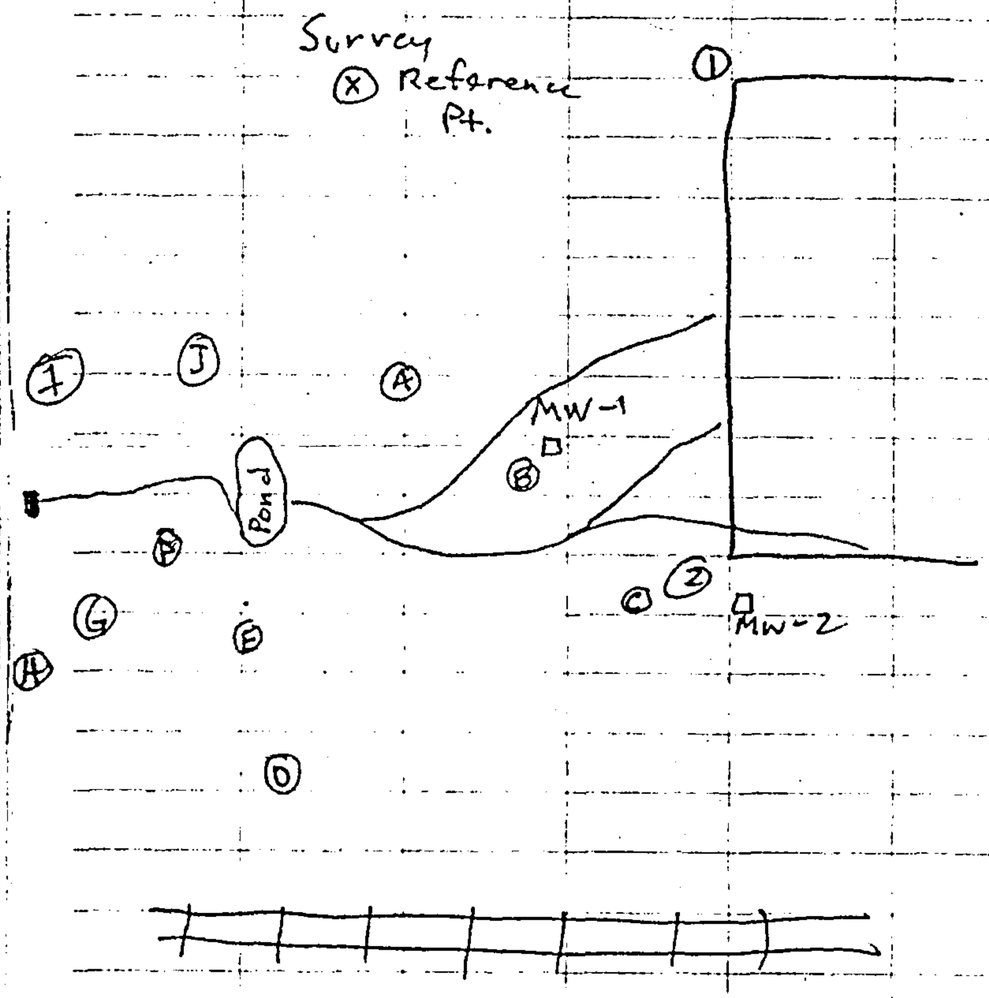
reduced zone located at the surface.
declared "hydric soil" by COE definition.

S-3

reduced conditions up to property boundary near MW indicating "hydric soils."

∴ seep ~~original~~ passing under Wagner property travelling 130° East of North.

Gribble Rd



Area = 65144.9327 ft^2

Perimeter = 1196.0757 ft

Feet' & Inches" to Prism for each station

1	4'5"
2	4'5"
A	4'5"
B	4'5"
C	4'5"
D	4'5"
E	4'5"
F	10'2"
G	7'2"
H	6'9"
I	5'4½"
J	4'5"
MW-1	4'5"
MW-2	4'5"

1300 – arrived @ Wagner property

1430 – between 1300-1430, John Allison delineated the dimensions of the potential wetlands. based upon hydrology, hydric soil type and hydrophytic vegetation.

Photo log

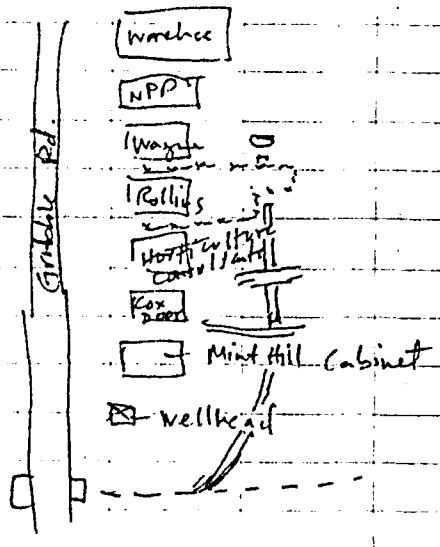
1-6 } Pond and Drainge leaving pond
7 - facing towards tracks
8 } facing SE toward Rollins
9 } Truck Parking lot - drainage extra culvert
10 - facing NNW from Rollins Parking lot towards NPP tanks for reference. drainage overland from pond to culvert.

The dimensions of the potential wetland fit the Army Corps of Engineers definition. The dimensions were staked out by John Allison and Doug Moore with Mr. Allison making the determinations. Hydrophytic vegetation types included cattails and bullrushes as indicator types. Mr. Allison drew the approximate dimensions on a aerial photo from 1993.

1430 - 1530 - the dimensions of the wetland (potential) were surveyed using a TopCon Theodolite Model TLCO-SE surveyor. A prism mounted on top of a solodex camera pod was used in place of a surveying stick. The length of the stick/pod was determined and recorded for each individual measurement using a Lufkin 100' measuring tape. The slope distance from the surveyor to the stick was determined using a TopCon DM-A5 electronic distance measure.

Observed wellhead near site.
Drilled 1980
Mullis Well Drillers, Mint Hill.
Water Tastes Bad, Do Not Drink.
No Odor.
Reg. tag # 345.

Mint Hill Cabinet Shop
3901 Grilbde Rd.
John Carrikor, owner



The slope distance was determined by using 2 bldg corners as reference pts and backsighted the instrument at the 2 known pts. Then, the distance to each survey stake was determined on the EDM. The horizontal angle was recorded and the vertical angle was recorded at each station.

Depart site @ 1630 for Monroe.
Arrived @ Monroe 1645. H. Zinn met w/ Charles O'Cain to update water lines ~~map~~ map of Union Co. D. Moore met with Garrett Alexander and requested copy of names/addresses for 1/2 mile radius maps adjoining site.

At 1720, Departed Monroe for Raleigh.

2100 - Arrived @ Oberlin Rd Office, Raleigh, NC.

Summit Resources

				2-2-94	
	H	V	S	Height Prism	
1	0	88 22.0	114.755	4'-5"	
2	50 04.7	87 09.0	245.325	4'-5"	
3	83 02.2	92 19.5	130.935	4'-5"	
4	68 06.2	91 00.0	235.265	4'-5"	
5	65 14.2	90 08.6	346.170	4'-5"	
6	26 05.5	90 31.5	398.670	4'-5"	
7	97 09.4	90 46.0	334.455	4'-5"	
8	114 13.2	90 19.2	283.440	10'-2"	Raised
9	116 58.2	90 47.0	354.570	7'-2"	
10	126 30.2	91 25.0	364.240	6'-9"	Raised
11	144 13.8	92 20.4	229.730	5'-4½"	
12	116 18.0	93 00.0	144.205	4'-5"	
MW 1	66 18.0	90 41.0	248.250	4'-5"	
MW 2	62 12.2	90 02.0	373.375	4'-5"	

HI = 5'-2"

H EDM - 5'-8¾"

33 °F 30.3 "Hg

State of North Carolina
Department of Environment,
Health and Natural Resources
Asheville Regional Office

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
Nann B. Guthrie, Regional Manager

DEHNR

RECEIVED
MAR 02 1994
SUPERFUND SECTION

DIVISION OF SOIL AND WATER CONSERVATION
SOIL SURVEY SECTION

February 24, 1994

Mr. Douglas B. Moore
Environmental Chemist
Division of Solid Waste Management
Superfund Section
P.O. Box 27687
Raleigh, North Carolina 27611-7687

Dear Mr. Moore:

On February 2, 1994, you, Harry Zinn, Samar Bou-Ghazale, Division of Environmental Management, Water Quality Section, Mooresville Regional Office and myself met on the location of the Summit Resources site on Gribble Road in Union County to determine if a wetland was present.

As a Soil Scientist, my responsibility and expertise is to identify hydric soils. Hydric soils are defined in the January 10, 1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands as follows:

> Hydric Soils
>
> 2.6 Hydric soils are defined as soils that are saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions in the upper part (USDA Soil Conservation Service 1987). In general, hydric soils are flooded, ponded or saturated for usually one week or more during the period when soil temperatures are above biologic zero 41^0 F as defined by "Soil Taxonomy" (USDA Soil Survey Staff 1975.) These soils usually support hydrophytic vegetation.

Using an auger and a shovel, we proceeded to identify areas of soils that were saturated long enough to develop anaerobic conditions suitable to support hydrophytic vegetation, and delineate their boundary from soils that were not saturated.

The criteria used to identify saturated conditions are redoximorphic features developed in the soil due to the oxidation-reduction of iron and manganese. In the case of the Summit Resources site, iron depletions were the main Redox feature indicating hydric soils. Iron depletions are zones which contain low amounts of iron and manganese but have a clay content similar to the surrounding matrix. This soil property is usually manifest by a matrix soil color chroma of two or less on the Muncell Color chart.

In terms of EPA, 40 CFR 230.3, the area of hydric soil delineated on the Summit Resources site was saturated by groundwater (indicated by the iron depletions) for a sufficient duration to support Bullrush (Scirpus) and Cattail

Interchange Building, 59 Woodfin Place, Asheville, N.C. 28801 Telephone 704-251-6208 FAX 704-251-6452
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(Typha) populations which were observed on-site. This would match the USFWS Palustrine Emergent Wetlands classification.

The information you requested on my background is as follows:

- BS Agronomy - 1974
- MS Soil Science - 1976
- 18 years experience in research, soil mapping and classification
- Certified Professional Soil Scientist with NCRCPS since 1981
- Currently a Regional Soil Scientist with DEHNR - DSWC serving the western third of the state from the Asheville Regional Office.

Sincerely,

John B. Allison

John B. Allison
Soil Scientist

JBA/mt

Memo

Date: February 15, 1995

To: File

From: Douglas Moore
Environmental Chemist
NC Superfund Section

Topic: Flow Calculations

Summit Resource Management Site
Stallings, Union County, North Carolina
US EPA ID: NCD 986 232 213

Using a 1:24000 Scale topographic map (figure 1), the approximate boundaries for the drainage area of the Wagoner property wetland were determined by tracing onto a piece of trace paper the topographic divides that drain to the wetland. Then, using a 1:24000 scale calibrated planimeter, the drainage area for the wetland was calculated to be 17.08 acres, or 0.027 square miles. The average estimated flow for the wetland was next determined by multiplying the drainage area by the mean annual runoff as determined in plate 2, USGS Water Supply Paper 2403 titled "Low Flow Characteristics of Streams in North Carolina". The mean annual runoff for the site was approximately 1.05 cubic feet/sec/sq. mile. The mean annual flow is roughly 0.028 cubic feet/second.

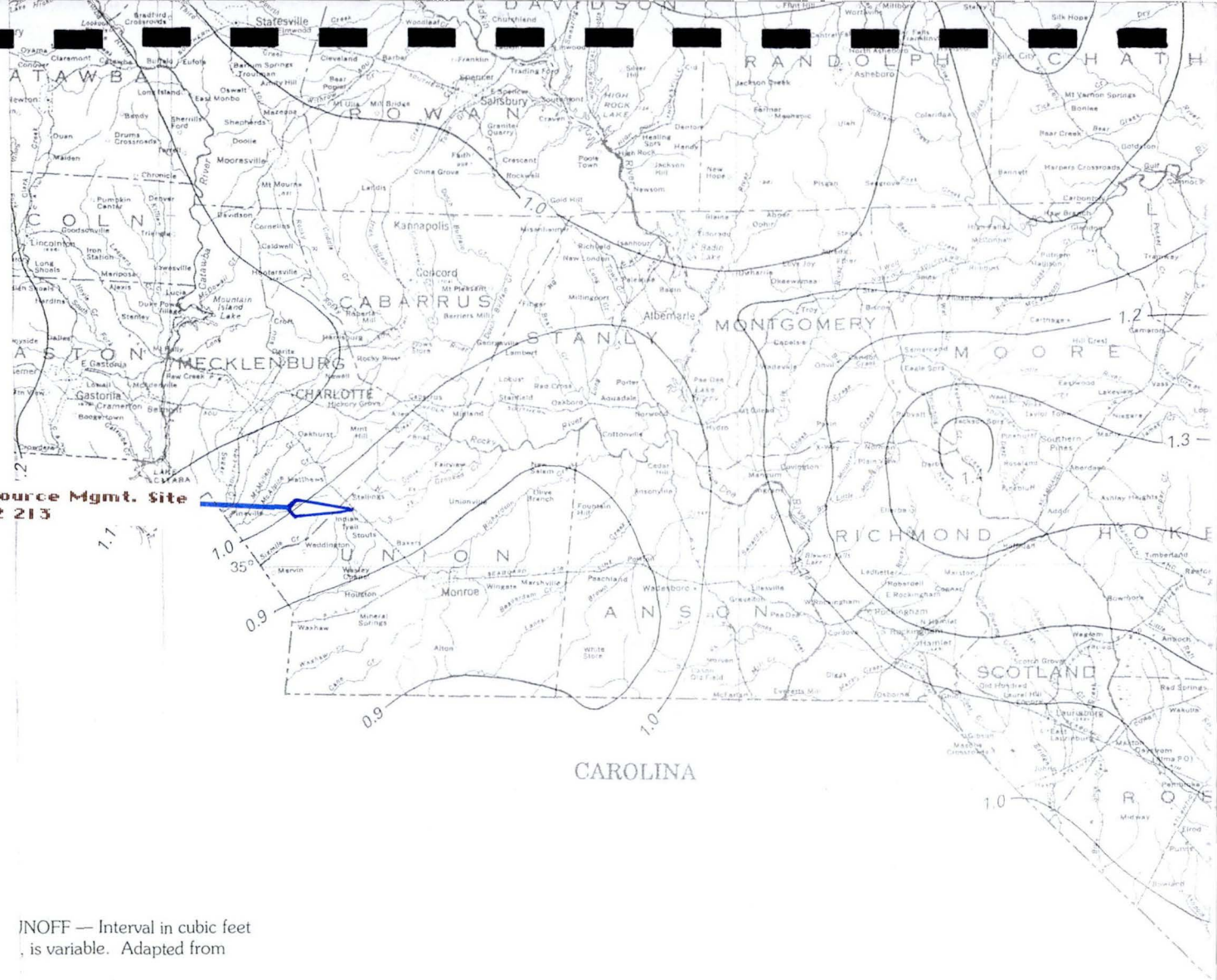
Then, the flow characteristics for the South Fork and North Fork Crooked Creeks were determined by multiplying the drainage area calculations as published in the USGS Open File Report 83-211 titled "Drainage Areas of Selected Sites on Streams in North Carolina" by the mean annual runoff as determined in plate 2, USGS Water Supply Paper 2403 titled "Low Flow Characterisitcs of Streams in North Carolina". Using this method, it was determined there was a change in flow regime from the 1-10 cfs to the 10-100 cfs regime that occurs in the South Fork Crooked Creek at State Road 1501 crossing near the town of Bakers. The first flow segment in the South Fork Crooked Creek occurs at the confluence of the intermittent tributary from the site and extends approximately 5.5 miles downstream. The flow at the confluence was roughly 3.96 cubic feet per second (cfs). The second flow segment begins at the SR1501 crossing over the South Fork Crooked Creek and extends 5.35 miles downstream to the confluence with the North Fork Crooked Creek. The flow in this segment was approximately 11.34 cfs. The last flow segment begins at the confluence of the South and North Forks of Crooked Creek and extends downstream along Crooked Creek to the end of the 15 mile surface water target distance limit near the SR1601 crossing over the North Fork Crooked Creek. The flow in this segment was approximately 40.0 cfs.

Low-Flow Characteristics of Streams in North Carolina

By G.L. GIESE and ROBERT R. MASON, Jr.

Prepared in cooperation with the
North Carolina Department of Environment,
Health, and Natural Resources

U.S. GEOLOGICAL SURVEY WATER-SUPPLY PAPER 2403



JNOFF — Interval in cubic feet
, is variable. Adapted from

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DRAINAGE AREAS OF SELECTED SITES ON STREAMS IN NORTH CAROLINA

By Robert L. Meikle

Open-File Report 83-211

Prepared in cooperation with the
NORTH CAROLINA DEPARTMENT OF NATURAL
RESOURCES AND COMMUNITY DEVELOPMENT

Raleigh, North Carolina
1983

STATION NUMBER	STATION NAME	DRAINAGE AREA (SQ MI)	SITE TYPE	LAT	LONG	QUAD NAME	COUNTY CODE
0212459600	DUTCH BUFFALO C AT GEORGEVILLE	98.2	02	351851	802752	MOUNT PLEASANT	025
0212459800	BOST C AT MTH NR MIDLAND	2.72	20	351654	802916	MOUNT PLEASANT	025
0212462010	ANDERSON C TRIB NR CABARRUS	2.41	20	351651	803141	CONCORD SE	025
0212462025	ANDERSON C NR FLOWS STORE	2.44	20	351547	803304	CONCORD SE	025
0212462075	ANDERSON C AT SR 1145 NR CABARRUS	8.49	20	351617	803126	CONCORD SE	025
0212462100	ANDERSON C NR CABARRUS	11.4	02	351600	803008	CONCORD SE	025
0212462150	ANDERSON C AT MTH NR MIDLAND	12.4	20	351607	802912	MOUNT PLEASANT	025
0212464305	L MEADOW C AT MTH NR MIDLAND	5.58	20	351537	802832	MOUNT PLEASANT	025
0212464355	ROCKY R TRIB AT MTH NR GEORGEVILLE	8.33	20	351533	802824	MOUNT PLEASANT	025
0212464400	ROCKY R NR LOCUST	536.	20	351516	802822	MOUNT PLEASANT	025
0212464650	ROCKY R TRIB AT MTH NR MIDLAND	1.10	20	351409	802842	STANFIELD	025
0212464800	ROCKY R NR MIDLAND	542.	02	351315	802915	STANFIELD	025
0212464815	MUDDY C AT CABARRUS	1.54	20	351403	803237	MIDLAND	025
0212464825	MUDDY C AT MIDLAND	7.32	20	351332	803038	MIDLAND	025
0212465810	CLEAR C TRIB AT NC 51 NR WILGROVE	3.90	20	351214	803758	MINT HILL	119
0212465855	CLEAR C NR ALLEN	8.66	20	351141	803629	MIDLAND	119
0212466000	CLEAR C AT SR 3181 NR MINT HILL	12.6	20	351229	803448	MIDLAND	119
0212466725	WILEY B AT SR 1121 NR CABARRUS	3.64	20	351309	803359	MIDLAND	025
0212466775	WILEY B AT SR 1118 NR CABARRUS	18.8	20	351258	803244	MIDLAND	025
0212466800	CLEAR C AT BRIEF	22.5	02	351140	803146	MIDLAND	179
0212466850	CLEAR C NR BRIEF	24.6	20	351108	803041	MIDLAND	179
0212467520	GOOSE C AT SR 1004 NR MINT HILL	1.94	20	350856	803808	MINT HILL	119
0212467525	STEVENS C AT SR 3125 NR MINT HILL	1.63	20	350826	803930	MINT HILL	119
0212467550	GOOSE C AT SR 1524 NR MINT HILL	8.50	20	350749	803753	MINT HILL	119
0212467595	GOOSE C AT SR 1525 NR INDIAN TRAIL	11.0	20	350728	803611	BAKERS	179
0212469155	GOOSE C AT SR 1533 NR INDIAN TRAIL	16.40	20	350726	803440	BAKERS	179
0212469165	GOOSE C AT SR 1533 NR INDIAN TRAIL	21.4	20	350726	803440	BAKERS	179
0212469200	GOOSE C AT FAIRVIEW	24.0	02	350914	803209	MIDLAND	179
0212471765	DUCK C TRIB AT HWY 218 NR MINT HILL	2.80	20	350950	803513	MIDLAND	179
0212471775	DUCK C AT SR 1525 NR MINT HILL	6.48	20	351014	803440	MIDLAND	179
0212471800	DUCK C AT BRIEF	12.1	02	351052	803228	MIDLAND	179
0212471905	GOOSE C AT SR 1547 NR FAIRVIEW	41.4	20	351133	803042	MIDLAND	179
0212474175	CAMP B AT MTH NR STANFIELD	1.58	20	351043	802842	STANFIELD	167
0212474200	ROCKY R NR STANFIELD	628.	02	351010	802824	STANFIELD	179
0212474460	N F CROOKED C HEADWATERS NR WESLEY CHAPEL	3.74	20	350604	803927	MATTHEWS	179
0212474470	N F CROOKED C AT SR 1501 NR WESLEY CHAPEL	8.97	20	350615	803754	MATTHEWS	179
0212474495	N F CROOKED C AT SR 1514 NR INDIAN TRAIL	14.9	20	350608	803504	BAKERS	179
0212474550	N F CROOKED C AT SR 1004 NR BENTONS X RDS	16.0	20	350632	803346	BAKERS	179
0212475150	S F CROOKED C AT INDIAN TRAIL	3.77	20	350418	803853	MATTHEWS	179
0212475952	S F CROOKED C AT US 74 NR BAKERS	2.03	20	350314	803725	BAKERS	179
0212475996	S F CROOKED C AT SR 1501 NR BAKERS	10.8	20	350352	803610	BAKERS	179
0212476050	S F CROOKED C AT SR 1508 NR BAKERS	13.5	20	350451	803442	BAKERS	179
0212476100	S F CROOKED C NR UNIONVILLE	18.4	20	350626	803256	BAKERS	179
0212476600	CROOKED C AT FAIRVIEW	36.9	02	350744	803214	MIDLAND	179
0212476675	CROOKED C AT SR 1601 NR FAIRVIEW	38.1	20	350817	803021	MIDLAND	179
0212476710	CROOKED C AT SR 1547 NR FAIRVIEW	47.3	20	350841	802817	STANFIELD	179
0212476725	CROOKED C AT MTH NR FAIRVIEW	48.5	20	350943	802720	STANFIELD	179
0212476750	PUMPKIN C AT MTH NR STANFIELD	1.94	20	350955	802711	STANFIELD	167
0212476775	ROCKY R AT SR 1001 NR NEW SALEM	683.	20	350946	802617	STANFIELD	179
0212477200	GRASSY C NR FAIRVIEW	4.50	02	350753	802634	STANFIELD	179
0212477290	GRASSY C AT MTH NR NEW SALEM	8.25	20	350949	802450	STANFIELD	179
0212477300	ROCK HOLE C NR STANFIELD	4.27	02	351258	802634	STANFIELD	167
0212477450	ROCK HOLE C AT NC 200 AT STANFIELD	0.74	20	351356	802518	STANFIELD	167
0212477600	ROCK HOLE C AT STANFIELD	7.55	20	351214	802558	STANFIELD	167
0212477695	ROCK HOLE C TRIB AT SR 1124 NR STANFIELD	0.74	20	351144	802522	STANFIELD	167
0212477800	ROCK HOLE C AT SR 1122 NR STANFIELD	11.7	20	351039	802437	STANFIELD	167
0212478100	ROCKY R NR STANFIELD	708.	02	350955	802351	STANFIELD	179
0212478300	ISLAND C NR LOCUST	3.10	02	351538	802406	MOUNT PLEASANT	167
0212478345	ISLAND C AT SR 1130 NR STANFIELD	7.66	20	351353	802328	STANFIELD	167
0212478390	ISLAND C AT SR 1115 NR STANFIELD	10.7	20	351243	802307	STANFIELD	167
0212478995	CUCUMBER C AT SR 1130 NR OAKBORO	2.83	20	351357	802143	OAKBORO	167
0212478998	CUCUMBER C AT SR 1117 NR STANFIELD	4.94	20	351302	802233	STANFIELD	167
0212479335	ISLAND C AT SR 1109 NR STANFIELD	17.2	20	351216	802255	STANFIELD	167
0212479400	ISLAND C NR STANFIELD	19.2	02	351151	802228	OAKBORO	167
0212479450	ISLAND C AT MTH NR OAKBORO	22.0	20	351047	802216	OAKBORO	167
0212479460	CRISCO R AT SR 1662 NR NEW SALEM	2.30	20	350850	802218	OAKBORO	179
0212479470	CRISCO R AT MTH NR NEW SALEM	3.85	20	350958	802140	OAKBORO	179
0212479750	ROCKY R TRIB NR NEW SALEM	2.45	20	351007	802047	OAKBORO	179
0212479800	ROCKY R AT NC 205 NR OAKBORO	744.	20	351009	802044	OAKBORO	167
0212479825	ROCKY R TRIB AT MTH NR OAKBORO	2.33	20	351031	801919	OAKBORO	167
0212479850	COLDWATER B AT SR 1103 NR OAKBORO	2.46	20	351152	801945	OAKBORO	167
0212479875	COLDWATER B AT SR 1100 NR OAKBORO	5.07	20	351050	801929	OAKBORO	167
0212480800	ROCKY R AT SR NC 742 NR OAKBORO	755.	20	351052	801830	OAKBORO	167
0212480903	GILBERTS C AT MTH NR OAKBORO	1.99	20	351140	801735	OAKBORO	167
0212480950	ROCKY R TRIB AT MTH NR OAKBORO	2.30	20	351130	801706	OAKBORO	179
0212481300	ROCKY R NR OAKBORO	763.	02	351142	801658	OAKBORO	179
0212482300	LONG C AT SR 1454 NR RICHFIELD	5.29	20	352821	801737	MOUNT PLEASANT	167
0212482400	LONG C AT NC 49 NR RICHFIELD	5.80	11	352802	801727	MOUNT PLEASANT	167
0212482700	LONG C NR RICHFIELD	12.6	02	352624	801628	MOUNT PLEASANT	167
0212482775	LONG C TRIB AT MTH NR MILLINGPORT	3.24	20	352437	801532	MOUNT PLEASANT	167
0212482795	LONG C TRIB AT MTH NR PLYLER	3.49	20	352328	801503	MOUNT PLEASANT	167
0212483500	LONG C NR PLYLER	27.5	02	352251	801448	ALBEMARLE	167
0212484925	L LONG C NR NEW LONDON	1.21	20	352544	801223	ALBEMARLE	167
0212484950	L LONG C AT PALESTINE	2.76	20	352421	801146	ALBEMARLE	167
0212485100	L LONG C AB TOWNS C AT ALBEMARLE	6.92	20	352200	801155	ALBEMARLE	167

Memo

Date: March 30, 1995

To: File

From: Douglas Moore Douglas Moore.
Environmental Chemist
NC Superfund Section

Topic: Fisheries in the North and South Fork Crooked Creek

Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union County, North Carolina
US EPA ID: NCD 986 232 213

On this day, I spoke with Perry Smith, Area Sergeant, District 6, NC Wildlife Resources Commision (704) 753-4258. Mr. Smith stated that he has been employed for three years as a wildlife enforcement officer in Union County. During that time, he has not observed any fisherman in either the North or South Fork Crooked Creek. He also stated that he has not observed any regularly traveled foot paths at any of the state maintained bridge crossings which would indicate regular fishing pressure. He stated that he has no first-hand knowledge of fish species in either creek, but believes both creeks are large enough to support populations of common fish species such as largemouth bass, bream, chain pickerel, catfish and suckers. He did not have any information if any surface water intakes were located on either of the creeks for agriculture or industrial use.

Memo

Date: January 11, 1994

To: File

From: Douglas Moore
Environmental Chemist
NC Superfund Section

Douglas B Moore.

Topic: Endangered Species

Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union County, NC
US EPA ID: NCD 986 232 213

On this day, I visited the North Carolina Natural Heritage Program to determine if any endangered/threatened species were located within a 4 mile radius or along the 15 mile downstream surface water target distance limit. A review of their topographic maps indicated that there were no federal or state recognized threatened or endangered species within the areas described above. The Carolina Darter, *Etheostoma collis*, a North Carolina recognized "special concern" species was found in the South Fork Crooked Creek. The nearest observation was approximately 3.0 miles downstream of the point where the intermittent drainage from the site enters the South Fork Crooked Creek.

Memo

Date: March 15, 1995

To: File

From: Douglas Moore Douglas B Moore
Environmental Chemist
NC Superfund Section

Topic: Wetland Investigation of South Fork Crooked Creek

Summit Resource Management Site
Stallings, Union County, NC
US EPA ID: NCD 986 232 213

On Tuesday, March 14, 1995, Harry Zinn and Douglas Moore of the NC Superfund Section travelled to the subject site to meet with John Allison, soil scientist and wetland identification expert. I requested that Mr. Allison meet us at the site to investigate the presence of a potential target wetland approximately 0.5 miles downgradient of the site near the confluence of the South Fork Crooked Creek (SFCC) with the drainage ditch that carries runoff away from the site. We arrived at the site at 11:30 and met with Mr. Allison at 11:50. Following lunch, we parked the state van at a warehouse owned by Mint Hill Cabinet Shop and walked to the confluence of the drainage ditch and South Fork Crooked Creek.

Using an 4 inch open bucket augur, Mr. Allison probed the soil in the vicinity of the confluence and determined that hydric soil conditions existed in a low area approximately 50 feet northeast of SFCC. Hydrophytic vegetation present in this area includes sweet gum, privet and red maple and spike rushes. An additional unidentified plant was also found in this area which appears in prevalence on the Wagoner property wetland area.

Between 1302 and 1400, John Allison determined the approximate boundaries of the wetland associated with the South Fork Crooked Creek. Mr. Allison determined that the profile of the stream bed in conjunction with periodic flooding had created a berm along the bank of SFCC. This berm created a wetland boundary adjacent to the stream for 10-20 feet where non-wetland vegetation and non-hydric soil was observed. Attached is a figure representing the wetland boundary and profile. The runoff from upland areas in conjunction with the berm had resulted in a low depression forming parallel to the stream for a distance of 300-400 feet downgradient of the confluence. This floodplain exhibited the typical vegetation and soil patterns for a wetland area. However, the wetland was not contiguous to the South Fork Crooked Creek due to the berm. Thus, under the Hazard

Ranking System, the wetland does not count as a target for the purposes of scoring under the surface water pathway.

Harry Zinn collected surface water and sediment samples from the South Fork Crooked Creek upstream and downstream of the confluence with the drainage ditch. The samples were labelled "SR-003-SW" for upstream surface water, "SR-003-SD" for upstream sediment, "SR-004-SW" for downstream surface water and "SR-004-SD" for downstream sediment.

South Fork Crooked Creek is a small stream at this point. The banks are 3-5 feet deep, are seperated by 5 feet and the depth of the creek is about 1-2 feet in pools. No fish species or evidence of fishing were observed at or between the sample points.

After conferring on Wednesday, March 15, 1995 with CERCLA Branch Head Pat DeRosa, it was determined since wetland and fishery targets were not confirmed in SFCC, there was no need to have these samples analysed.

Sunny
70's

SUMMIT RESOURCE MGMT.
STALLINGS, UNION CO., NC
NCD 986 232 213

PA/SI Resampling trip
Tuesday, March 14, 1995

Team: Douglas Moore
Harry Zinn

Purpose of trip: to collect additional surface water & sediment sample from additional wetland dam-gradient of site in S. Fork Crooked Creek.

Left Raleigh at 8:00 AM.
Arrived at site at 11:30 AM.

11:50 - John Allison arrived at site

12:00 - brake for lunch

12:50 - arrived back at site & inspected wetland area below NPO on Wagner property. Observed oily sheen and strong odor at wetland. Dark brown discoloration

Photo Log

1 & 2 - wetland pond on Wagner property

3 & 4 - drainage ditch enters wetland area at confluence w/ S. Fork Crooked Creek.

5 - wetland vegetation privet on left, ? on right.

6 & 7 - downstream - confluence of drainage ditch and S. Fork Crooked Creek.

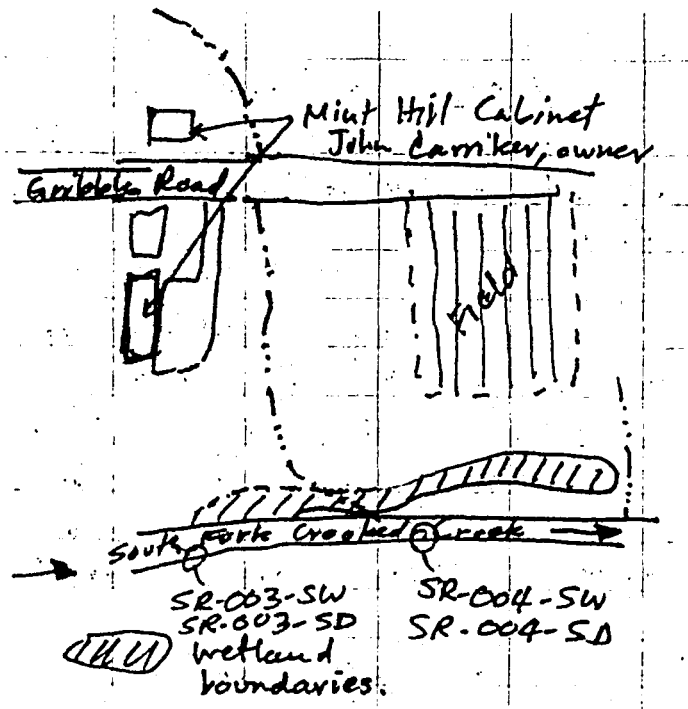
8 - Harry Zinn collecting sw and sed. sample at downstream location "SR 004-SW/SD".

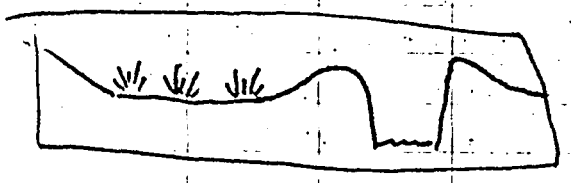
of soil at edge of wetland. Some bush-hogging of vegetation visible along edge of wetland, but majority is in tact.

1305 - drove to Mint Hill Cabinet Shop warehouse. Told Richard Carriker our purpose and rec'd permission to park truck and cross property to collect wetland and stream sample in S. Fork Crooked Creek.

1320 - John Allison poked soil at vicinity of confluence of ditch and S. Fork Crooked Creek. Found hydric soil conditions. Vegetation that is hydrophytic: spike rushes red maple, privet, sweet gum

1330 - photo of wetland vegetation leaves - privet on left unknown on right - unk. has downy white powder covered leave with serrated edges.





Stream Profile: According to John Allison, steep banked stream of S. Fork Crooked Creek. builds alluvial floodplain that is wetland (hydric soil) except along the banks - means wetland is not contiguous to S. Fork Crooked Creek.

1405 - Harry Zinn sampled surface water and sediments in S. Fork Crooked Creek above the confluence with the drainage ditch. Samples taken for valatile, semi-volatile and inorganics. Labelled "SR-003-SW" and "SR-003-SD" Sediments were sampled at 1410
GPS # R031419A

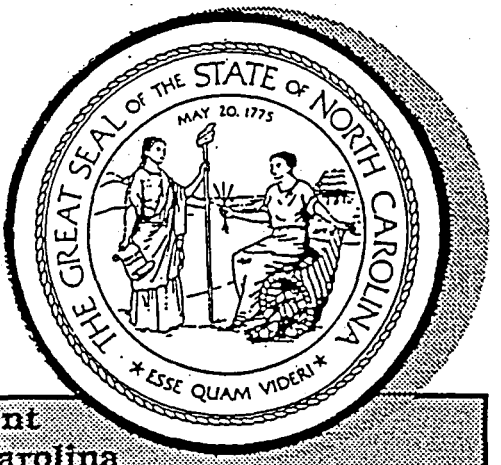
1430 - Harry Zinn sampled surface water and sediments in S. Fork Crooked Creek below the confluence with the drainage ditch. Samples taken were Volatiles, semi-volatiles and inorganics. Labelled "SR-004-SW" and "SR-004-SD". Sediments were sampled at 14:35.
GPS # R031419C

Departed Cabinet Shop for Raleigh at 1510.

Ref. 41

STATE OF
NORTH CAROLINA
DEPARTMENT OF
ENVIRONMENT, HEALTH,
AND NATURAL RESOURCES

Classifications and Water Quality Standards Assigned to The Waters of the Yadkin-Pee Dee River Basin



Division of Environmental Management
Raleigh, North Carolina

Reprint from North Carolina Administrative Code: 15A NCAC 2B .0309
Current through: February 1, 1993

SECTION .0300 - ASSIGNMENT OF STREAM CLASSIFICATIONS

.0301 CLASSIFICATIONS: GENERAL

(a) Schedule of Classifications. The classifications assigned to the waters of the State of North Carolina are set forth in the schedules of classifications and water quality standards assigned to the waters of the river basins of North Carolina, 15A NCAC 2B .0302 to .0317. These classifications are based upon the existing or contemplated best usage of the various streams and segments of streams in the basin, as determined through studies and evaluations and the holding of public hearings for consideration of the classifications proposed.

(b) Stream Names. The names of the streams listed in the schedules of assigned classifications were taken as far as possible from United States Geological Survey topographic maps. Where topographic maps were unavailable, U.S. Corps of Engineers maps, U.S. Department of Agriculture soil maps, and North Carolina highway maps were used for the selection of stream names.

(c) Classifications. The classifications assigned to the waters of North Carolina are denoted by the letters WS-I, WS-II, WS-III, WS-IV, WS-V, B, C, SA, SB, and SC in the column headed "class." A brief explanation of the "best usage" for which the waters in each class must be protected is given as follows:

Fresh Waters

Class WS-I:	waters protected as water supplies which are in natural and undeveloped watersheds; point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this Subchapter; local programs to control nonpoint source and stormwater discharge of pollution are required; suitable for all Class C uses;
Class WS-II:	waters protected as water supplies which are generally in predominantly undeveloped watersheds; point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this Subchapter; local programs to control nonpoint source and stormwater discharge of pollution are required; suitable for all Class C uses;
Class WS-III:	waters protected as water supplies which are generally in low to moderately developed watersheds; point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this Subchapter; local programs to control nonpoint source and stormwater discharge of pollution are required; suitable for all Class C uses;
Class WS-IV:	waters protected as water supplies which are generally in moderately to highly developed watersheds; point source discharges of treated wastewater are permitted pursuant to Rules .0104 and .0211 of this Subchapter; local programs to control nonpoint source and stormwater discharge of pollution are required; suitable for all Class C uses;
Class WS-V:	waters protected as water supplies which are generally upstream and draining to Class WS-IV waters; no categorical restrictions on watershed development or treated wastewater discharges are required, however, the Commission or its designee may apply appropriate management requirements as deemed necessary for the protection of downstream receiving waters (15A NCAC 2B .0203); suitable for all Class C uses;
Class B:	primary recreation and any other usage specified by the "C" classification;
Class C:	aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture.

Tidal Salt Waters

Class SA:	shellfishing for market purposes and any other usage specified by the "SB" and "SC" classification;
Class SB:	primary recreation and any other usage specified by the "SC" classification;
Class SC:	aquatic life propagation and survival, fishing, wildlife, and secondary recreation.

.0309 YADKIN-PEE DEE RIVER BASIN

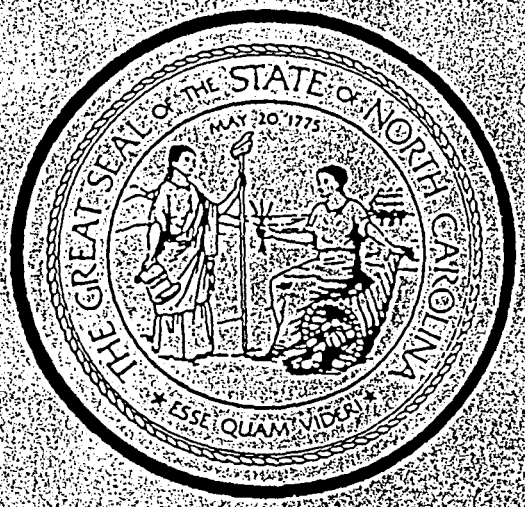
Name of Stream	Description	Class	Classification Date	Classification Index No.
Cold Water Creek	Water Creek			
Edgison Lake	Entire Lake and connecting stream to Cold Water Creek	C	8/3/92	13-17-9-4-3
Threemile Branch	From source to Cold Water Creek	C	9/1/74	13-17-9-4-5
Little Cold Water Creek	From source to Cold Water Creek	C	9/1/74	13-17-9-4-6
Willow View Lakes	Entire lakes and connecting stream to Little Cold Water Creek	C	9/1/74	13-17-9-4-6-1
Lake Lynn	Entire lake and connecting stream to Little Cold Water Creek	C	9/1/74	13-17-9-4-6-2
Hamby Branch	From source to Rocky River	C	9/1/74	13-17-10
Dutch Buffalo Creek	From source to a point 0.6 mile downstream of Cabarrus County SR 2416	WS-II	8/3/92	13-17-11-(1)
Lick Branch	From source to Dutch Buffalo Creek	WS-II	8/3/92	13-17-11-2
Jennie Wolf Creek	From source to Dutch Buffalo Creek	WS-II	8/3/92	13-17-11-3
Black Run Creek	From source to Dutch Buffalo Creek	WS-II	8/3/92	13-17-11-4
Dutch Buffalo Creek	From a point 0.6 mile downstream of Cabarrus County SR 2416 to a point 0.5 mile upstream of N.C. Hwy. 49 (Town of Mount Pleasant water supply intake)	WS-II CA	8/3/92	13-17-11-(4.5)
Dutch Buffalo Creek	From a point 0.5 mile upstream of N.C. Hwy. 49 to Rocky River	C	4/6/55	13-17-11-(5)
Little Buffalo Creek	From source to Dutch Buffalo Creek	C	4/6/55	13-17-11-6
Butcher Branch	From source to Little Buffalo Creek	C	4/6/55	13-17-11-6-1
Adams Creek	From source to Dutch Buffalo Creek	C	4/6/55	13-17-11-7
McAllister Creek	From source to Adams Creek	C	4/6/55	13-17-11-7-1
Bost Creek	From source to Rocky River	C	4/6/55	13-17-12
Anderson Creek	From source to Rocky River	C	7/1/73	13-17-13
Horton Branch	From source to Anderson Creek	C	9/1/74	13-17-13-1
Little Meadow Creek	From source to Rocky River	C	9/1/74	13-17-14
Smiths Lake	Entire lake and connecting stream to Little Meadow Creek	C	9/1/74	13-17-14-1
Big Meadow Creek	From source to Rocky River	C	9/1/74	13-17-15
Muddy Creek	From source to Rocky River	C	9/1/74	13-17-16
Clear Creek	From source to Rocky River	C	7/1/73	13-17-17
Sherman Branch	From source to Clear Creek	C	7/1/73	13-17-17-1
Wiley Branch	From source to Clear Creek	C	7/1/73	13-17-17-2
Far Branch	From source to Wiley Branch	C	7/1/73	13-17-17-2-1
Long Branch	From source to Clear Creek	C	7/1/73	13-17-17-3
Goose Creek	From source to Rocky River	C	7/1/73	13-17-18
Stevens Creek	From source to Goose Creek	C	9/1/74	13-17-18-1
Paddle Branch	From source to Goose Creek	C	7/1/73	13-17-18-2
Duck Creek	From source to Goose Creek	C	9/1/74	13-17-18-3
Camp Branch	From source to Rocky River	C	4/1/71	13-17-19
Crooked Creek	From source to Rocky River	C	7/1/73	13-17-20
North Fork Crooked Creek	From source to Crooked Creek	C	9/1/74	13-17-20-1
South Fork Crooked Creek	From source to Crooked Creek	C	9/1/74	13-17-20-2

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL MANAGEMENT

ADMINISTRATIVE CODE SECTION

15A NCAC 2B .0100 - Procedures for Assignment of Water Quality Standards

15A NCAC 2B .0200 - Classifications and Water Quality Standards Applicable to Surface Waters of North Carolina



Amended Effective February 1, 1993

Environmental Management Commission
Raleigh, North Carolina

(vi) Polychlorinated biphenyls: 0.079 ng/l;
(vii) Polynuclear aromatic hydrocarbons: 31.1 ng/l;
(viii) Tetrachloroethane (1,1,2,2): 10.8 ug/l;
(ix) Trichloroethylene: 92.4 ug/l;
(x) Vinyl chloride: 525 ug/l;
(xi) Aldrin: 0.136 ng/l;
(xii) Chlordane: 0.588 ng/l;
(xiii) DDT: 0.591 ng/l;
(xiv) Dieldrin: 0.144 ng/l;
(xv) Heptachlor: 0.214 ng/l.

The values listed in (i) through (xv) in Subparagraph (B) of this Rule may be adjusted by the Commission or its designee on a case-by-case basis to account for site-specific or chemical-specific information pertaining to the assumed BCF, FCR or CPF values or other appropriate data.

(b) Temperature. The Commission may establish a water quality standard for temperature for specific water bodies other than the standards specified in Rules .0211 and .0212 of this Section, upon a case-by-case determination that thermal discharges to these waters, which serve or may serve as a source and/or receptor of industrial cooling water provide for the maintenance of the designated best use throughout a reasonable portion of the water body. Such revisions of the temperature standard must be consistent with the provisions of Section 316(a) of the Federal Water Pollution Control Act as amended and will be noted in Rule .0218 of this Section.

History Note: Statutory Authority G.S. 143-214.1; 143-215.3(a)(1);
Eff. February 1, 1976;
Amended Eff. February 1, 1993; October 1, 1989; January 1, 1985; September 9, 1979.

.0209 VARIANCES FROM APPLICABLE STANDARDS
.0210 BEST USE CRITERIA

History Note: Statutory Authority G.S. 143-214.1;
Eff. February 1, 1976;
Amended Eff. September 9, 1979;
Repealed Eff. January 1, 1985.

.0211 FRESH SURFACE WATER CLASSIFICATIONS AND STANDARDS

(a) General. The water quality standards for all fresh surface waters are the basic standards applicable to Class C waters. Additional and more stringent standards applicable to other specific freshwater classifications are specified in Paragraphs (c) through (f) of this Rule.

(b) All fresh surface waters (Class C).

(1) Best Usage of Waters. Aquatic life propagation and maintenance of biological integrity (including fishing, and fish), wildlife, secondary recreation, agriculture and any other usage except for primary recreation or as a source of water supply for drinking, culinary or food processing purposes;

(2) Conditions Related to Best Usage. The waters will be suitable for aquatic life propagation and maintenance of biological integrity, wildlife, secondary recreation, and agriculture; sources of water pollution which preclude any of these uses on either a short-term or long-term basis will be considered to be violating a water quality standard;

(3) Quality standards applicable to all fresh surface waters:

(A) Chlorophyll a (corrected): not greater than 40 ug/l for lakes, reservoirs, and other slow-moving waters not designated as trout waters, and not greater than 15 ug/l for lakes, reservoirs, and other slow-moving waters designated as trout waters (not applicable to lakes and reservoirs less than ten acres in surface area); the Commission or its designee may prohibit or limit any discharge of waste into surface waters if, in the opinion of the Director, the surface waters experience or the discharge would result in growths of microscopic or macroscopic vegetation such that the standards established pursuant to this Rule would be violated or the intended best usage of the waters would be impaired;

(B) Dissolved oxygen: not less than 6.0 mg/l for trout waters; for non-trout waters, not less than a daily average of 5.0 mg/l with a minimum instantaneous value of not less than 4.0 mg/l; swamp waters, lake coves or backwaters, and lake bottom waters may have lower values if caused by natural conditions;

(C) Floating solids; settleable solids; sludge deposits: only such amounts attributable to sewage, industrial wastes or other wastes as will not make the water unsafe or unsuitable for aquatic life and wildlife or impair the waters for any designated uses;

(D) Gases, total dissolved: not greater than 110 percent of saturation;

(E) Organisms of the coliform group: fecal coliforms not to exceed a geometric mean of 200/100ml (MF count) based upon at least five consecutive samples examined during any 30 day period; nor exceed 400/100ml in more than 20 percent of the samples examined during such period; violations of the fecal coliform standard are expected during rainfall events and, in some cases, this violation is expected to be caused by uncontrollable nonpoint source pollution; all coliform concentrations are to be analyzed using the membrane filter technique unless high turbidity or other adverse conditions necessitate the tube dilution method; in case of controversy over results, the MPN 5-tube dilution technique will be used as the reference method;

(F) Oils; deleterious substances; colored or other wastes: only such amounts as will not render the waters injurious to public health, secondary recreation or to aquatic life and wildlife or adversely affect the palatability of fish, aesthetic quality or impair the waters for any designated uses; for the purpose of implementing this Rule, oils, deleterious substances, colored or other wastes will include but not be limited to substances that cause a film or sheen upon or discoloration of the surface of the water or adjoining shorelines pursuant to 40 CFR 110.4(a)-(b) which are hereby incorporated by reference including any subsequent amendments and additions. This material is available for inspection at the Department of Environment, Health, and Natural Resources, Division of Environmental Management, 512 North Salisbury Street, Raleigh, North Carolina. Copies may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402-9325 at a cost of thirteen dollars ($13.00).

(G) pH: shall be normal for the waters in the area, which generally shall range between 6.0 and 9.0 except that swamp waters may have a pH as low as 4.3 if it is the result of natural conditions;

(H) Phenolic compounds: only such levels as will not result in fish-flesh tainting or impairment of other best usage;

(I) Radioactive substances:

(i) Combined radium-226 and radium-228: the maximum average annual activity level (based on at least four samples collected quarterly) for combined radium-226 and radium-228 shall not exceed five picoCuries per liter;

(ii) Alpha Emitters: the average annual gross alpha particle activity (including radium-226, but excluding radon and uranium) shall not exceed 15 picoCuries per liter;

(iii) Beta Emitters: the maximum average annual activity level (based on at least four samples, collected quarterly) for strontium-90 shall not exceed eight picoCuries per liter; nor shall the average annual gross beta particle activity (excluding potassium-40 and other naturally occurring radio-nuclides) exceed 50 picoCuries per liter; nor shall the maximum average annual activity level for tritium exceed 20,000 picoCuries per liter;

(J) Temperature: not to exceed 2.8 degrees C (5.04 degrees F) above the natural water temperature, and in no case to exceed 29 degrees C (84.2 degrees F) for mountain and upper piedmont waters and 32 degrees C (89.6 degrees F) for lower piedmont and coastal plain waters. The temperature for trout waters shall not be increased by more than 0.5 degrees C (0.9 degrees F) due to the discharge of heated liquids, but in no case to exceed 20 degrees C (68 degrees F);

(K) Turbidity: the turbidity in the receiving water will not exceed 50 Nephelometric Turbidity Units (NTU) in streams not designated as trout waters and 10 NTU in streams, lakes or reservoirs designated as trout waters; for lakes and reservoirs not designated as trout waters, the turbidity will not exceed 25 NTU; if turbidity exceeds these levels due to natural background conditions, the existing turbidity level cannot be increased. Compliance with this turbidity standard can be met when land management activities employ Best Management Practices (BMPs) [as defined by Rule .0202(6) of this Section] recommended by the Designated Nonpoint Source Agency [as defined by Rule .0202 of this Section]. BMPs must be in full compliance with all specifications

governing the proper design, installation, operation and maintenance of such BMPs;

(L) Toxic substances: numerical water quality standards (maximum permissible levels) to protect aquatic life applicable to all fresh surface waters:

(i) Arsenic: 50 ug/l;

(ii) Beryllium: 6.5 ug/l;

(iii) Cadmium: 0.4 ug/l for trout waters and 2.0 ug/l for non-trout waters;

(iv) Chlorine, total residual: 17 ug/l for trout waters (Tr); (Action Level of 17 ug/l for all waters not classified as trout waters (Tr); see Paragraph (b)(4) of this Rule);

(v) Chromium, total recoverable: 50 ug/l;

(vi) Cyanide: 5.0 ug/l;

(vii) Fluorides: 1.8 mg/l;

(viii) Lead, total recoverable: 25 ug/l; collection of data on sources, transport and fate of lead will be required as part of the toxicity reduction evaluation for dischargers that are out of compliance with whole effluent toxicity testing requirements and the concentration of lead in the effluent is concomitantly determined to exceed an instream level of 3.1 ug/l from the discharge;

(ix) MBAS (Methylene-Blue Active Substances): 0.5 mg/l;

(x) Mercury: 0.012 ug/l;

(xi) Nickel: 88 ug/l;

(xii) Pesticides:

(I) Aldrin: 0.002 ug/l;

(II) Chlordane: 0.004 ug/l;

(III) DDT: 0.001 ug/l;

(IV) Demeton: 0.1 ug/l;

(V) Dieldrin: 0.002 ug/l;

(VI) Endosulfan: 0.05 ug/l;

(VII) Endrin: 0.002 ug/l;

(VIII) Guthion: 0.01 ug/l;

(IX) Heptachlor: 0.004 ug/l;

(X) Lindane: 0.01 ug/l;

(XI) Methoxychlor: 0.03 ug/l;

(XII) Mirex: 0.001 ug/l;

(XIII) Parathion: 0.013 ug/l;

(XIV) Toxaphene: 0.0002 ug/l;

(xiii) Polychlorinated biphenyls: 0.001 ug/l;

(xiv) Selenium: 5 ug/l;

(xv) Toluene: 11 ug/l or 0.36 ug/l in trout waters;

(xvi) Trialkyltin compounds: 0.008 ug/l expressed as tributyltin.

(4) Action Levels for Toxic Substances: if the Action Levels for any of the substances listed in this Subparagraph (which are generally not bioaccumulative and have variable toxicity to aquatic life because of chemical form, solubility, stream characteristics or associated waste characteristics) are determined by the waste load allocation to be exceeded in a receiving water by a discharge under the specified low flow criterion for toxic substances (Rule .0206 in this Section), the discharger will be required to monitor the chemical or biological effects of the discharge; efforts shall be made by all dischargers to reduce or eliminate these substances from their effluents. Those substances for which Action Levels are listed in this Subparagraph will be limited as appropriate in the NPDES permit based on the Action Levels listed in this Subparagraph if sufficient information (to be determined for metals by measurements of that portion of the dissolved instream concentration of the Action Level parameter attributable to a specific NPDES permitted discharge) exists to indicate that any of those substances may be a significant causative factor resulting in toxicity of the effluent;

(A) Copper: 7 ug/l;

(B) Iron: 1.0 mg/l;

(C) Silver: 0.06 ug/l;

(D) Zinc: 50 ug/l;

(E) Chloride: 230 mg/l;

(F) Chlorine, total residual: 17 ug/l in all waters except trout waters (Tr); [a standard of 17 ug/l exists for waters classified as trout waters and is applicable as such to all dischargers to trout waters; see Subparagraph (b)(3)(L)(iv) of this Rule];

For purposes other than consideration of NPDES permitting of point source discharges as described in this Subparagraph, the Action Levels in this Rule, as measured by an appropriate analytical technique, will be considered as numerical ambient water quality standards.

(c) Class WS-I Waters.

(1) Best Usage of Waters. Source of water supply for drinking, culinary, or food-processing purposes for those users desiring maximum protection of their water supplies, and any best usage specified for Class C waters;

(2) Conditions Related to the Best Usage. Waters of this class are protected water supplies within essentially natural and undeveloped watersheds with no permitted point source dischargers except those specified in Rule .0104 of this Subchapter; waters within this class must be relatively unimpacted by nonpoint sources of pollution; land use management programs are required to protect waters from nonpoint source pollution; the waters, following treatment required by the Division of Environmental Health, will meet the Maximum Contaminant Level concentrations considered safe for drinking, culinary, and food-processing purposes which are specified in the national drinking water regulations and in the North Carolina Rules Governing Public Water Supplies, 15A NCAC 18C .1500; sources of water pollution which preclude any of these uses on either a short-term or long-term basis will be considered to be violating a water quality standard. The Class WS-I classification may be used to protect portions of Class WS-II, WS-III and WS-IV water supplies. For reclassifications occurring after the July 1, 1992 statewide reclassification, the more protective classification requested by local governments will be considered by the Commission when all local governments having jurisdiction in the affected area(s) have adopted a resolution and effective appropriate ordinances to protect the watershed or the Commission acts to protect a watershed when one or more local governments has failed to adopt necessary protection measures.

(3) Quality Standards Applicable to Class WS-I Waters:

(A) Nonpoint Source Pollution: none that would adversely impact the waters for use as a water supply or any other designated use;

(B) Organisms of coliform group: total coliforms not to exceed 50/100 ml (MF count) as a monthly geometric mean value in watersheds serving as unfiltered water supplies;

(C) Phenolic compounds: not greater than 1.0 ug/l (phenols) to protect water supplies from taste and odor problems from chlorinated phenols;

(D) Sewage, industrial wastes: none except those specified in Subparagraph (2) of this Paragraph; or Rule .0104 of this Subchapter;

(E) Solids, total dissolved: not greater than 500 mg/l;

(F) Total hardness: not greater than 100 mg/l as calcium carbonate;

(G) Toxic and other deleterious substances:

(i) Water quality standards (maximum permissible concentrations) to protect human health through water consumption and fish tissue consumption for non-carcinogens in Class WS-I waters:

(I) Barium: 1.0 mg/l;

(II) Chloride: 250 mg/l;

(III) Manganese: 200 ug/l;

(IV) Nickel: 25 ug/l;

(V) Nitrate nitrogen: 10.0 mg/l;

(VI) 2,4-D: 100 ug/l;

(VII) 2,4,5-TP (Silvex): 10 ug/l;

(VIII) Sulfates: 250 mg/l;

(ii) Water quality standards (maximum permissible concentrations) to protect human health through water consumption and fish tissue consumption for carcinogens in Class WS-I waters:

(I) Beryllium: 6.8 ng/l;

(II) Benzene: 1.19 ug/l;

Memo

Date: March 31, 1995

To: File

From: Douglas Moore Douglas B Moore.
Environmental Chemist
NC Superfund Section

Topic: Wetlands Calculations

Summit Resource Management Site
3481/3501 Gribble Road
Stallings, Union County, NC
US EPA ID: NCD 986 232 213

Using a 1:24000 scale calibrated planimeter and 1:24000 scale National Wetlands Inventory maps (Bakers, N.C; Matthews, N.C; Mint Hill, N.C.), the aggregate wetland acreage was calculated within a 4 mile radius of the subject site.

Distance Ring	Wetland Acreage
0 - 0.25 mile	1.49
0.25 - 0.50 mile	0
0.50 - 1.0 mile	7.1
1.0 - 2.0 miles	106.71
2.0 - 3.0 miles	210.56
3.0 - 4.0 miles	385.67

Using a 1:24000 scale calibrated mapwheel and 1:24000 scale National Wetlands Inventory maps (Bakers, N.C; Matthews, N.C; Midland, N.C.), the total wetland frontage was calculated along the South Fork and North Fork Crooked Creeks within the 15 mile surface water pathway, downstream of the site PPE. The nearest wetland to the site is a isolated palustrine forested wetland having 0.22 miles of wetland frontage, located less than 100 feet downgradient of the site.

A total of 8.0 miles of wetland frontage were calculated bordering South Fork Crooked Creek from the site PPE to the beginning of the second flow regime in the South Fork Crooked Creek (a distance of 5.5 miles downstream of the site PPE). A total of 1.6 miles of wetland frontage bordering South Fork Crooked Creek from the beginning of the second flow regime in the South Fork Crooked Creek to the confluence with North Fork Crooked Creek (segment from 5.5 miles to 10.85 miles from the site PPE). A total of 2.0 miles of wetland frontage were calculated bordering North Fork Crooked Creek from the South Fork confluence to the end of the 15 mile surface water pathway. Copies of the above-mentioned National Wetland Inventory maps are attached.

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

MINT HILL, N.C.

SCALE 1:24 000

1 MILE — 1000 0 1000 2000 3000 4000 5000 6000 7000 FEET — 1 KILOMETER

☐ 1 acre — 10 acres — 20 acres

ACREAGE GUIDE

Other information including a narrative report concerning the wetland resources depicted on this document may be available. For information, contact:

Regional Director (ARDE) Region IV
U.S. Fish and Wildlife Service
75 Spring Street S.W.
Atlanta, Georgia 30303

SPECIAL NOTE

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with **Classification of Wetlands and Deepwater Habitats of the United States** (FWS/OBS - 79/31 December 1979). The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a detailed on the ground and historical analysis of a single site may result in a revision of the wetland boundaries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest cover may not be included on this document.

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SYMBOLOGY EXAMPLE

SYSTEM
SUBSYSTEM
CLASS
L2EM2F
SUBCLASS. WATER REGIME
UPLAND (NON-WETLAND)
R2OWH
(LINEAR DEEPWATER HABITAT)

Ü — Primarily represents **upland** areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions.

NOTES TO THE USER

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- This map uses the class Unconsolidated Shore (US). On earlier NWI maps that class was designated Beach/Bar (BB), or Flat (FL). Subclasses remain the same in both versions.

AERIAL PHOTOGRAPHY

DATE:	3 / 83	DATE: / /
SCALE:	1:58 000	SCALE:
TYPE:	CIR	TYPE:

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Prepared by National Wetlands Inventory
1991

M — MARINE

SYSTEM / SUBSYSTEM / CLASS / Subclass

1 — SUBTIDAL: RB — ROCK BOTTOM (1 Bedrock, 2 Rubble); UB — UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); AB — AQUATIC BED (1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*); RF — REEF (1 Coral, 3 Worm); OW — *OPEN WATER/ Unknown Bottom*

2 — INTERTIDAL: AB — AQUATIC BED (1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*); RF — REEF (1 Coral, 3 Worm); RS — ROCKY SHORE (1 Bedrock, 2 Rubble); US — UNCONSOLIDATED SHORE (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic)

E — ESTUARINE

1 — SUBTIDAL: RB — ROCK BOTTOM (1 Bedrock, 2 Rubble); UB — UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); AB — AQUATIC BED (1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*); RF — REEF (2 Mollusc, 3 Worm); OW — *OPEN WATER/ Unknown Bottom*

2 — INTERTIDAL: AB — AQUATIC BED (1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*); RF — REEF (2 Mollusc, 3 Worm); SB — STREAMBED (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); RS — ROCKY SHORE (1 Bedrock, 2 Rubble); US — UNCONSOLIDATED SHORE (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); EM — EMERGENT (1 Persistent, 2 Nonpersistent); SS — SCRUB-SHRUB (1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*); FO — FORESTED (1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*)

R — RIVERINE

1 — TIDAL: RB — ROCK (1 Bedrock, 2 Rubble); UB — UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic)

2 — LOWER PERENNIAL: *SB — STREAMBED (1 Bedrock, 2 Rubble, 3 Cobble-Gravel, 4 Sand, 5 Mud, 6 Organic, 7 Vegetated); AB — AQUATIC BED (1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*); RS — ROCKY SHORE (1 Bedrock, 2 Rubble); US — UNCONSOLIDATED SHORE (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated); **EM — EMERGENT (2 Nonpersistent)

3 — UPPER PERENNIAL: OW — *OPEN WATER/ Unknown Bottom*

4 — INTERMITTENT

5 — UNKNOWN PERENNIAL

*STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM.
**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS. The remaining CLASSES are found in all SUBSYSTEMS.

L — LACUSTRINE

1 — LIMNETIC: RB — ROCK BOTTOM (1 Bedrock, 2 Rubble); UB — UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); AB — AQUATIC BED (1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*); OW — *OPEN WATER/ Unknown Bottom*

2 — LITTORAL: RB — ROCK BOTTOM (1 Bedrock, 2 Rubble); UB — UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); AB — AQUATIC BED (1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*); RS — ROCKY SHORE (1 Bedrock, 2 Rubble); US — UNCONSOLIDATED SHORE (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated); EM — EMERGENT (2 Nonpersistent); OW — *OPEN WATER/ Unknown Bottom*

P — PALUSTRINE

CLASS / Subclass: RB — ROCK BOTTOM (1 Bedrock, 2 Rubble); UB — UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); AB — AQUATIC BED (1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular); US — UNCONSOLIDATED SHORE (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); ML — MOSS-LICHEN (1 Moss, 2 Lichen); EM — EMERGENT (1 Persistent, 2 Nonpersistent); SS — SCRUB-SHRUB (1 Broad-Leaved Deciduous, 2 Needle-Leaved); FO — FORESTED (1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen); OW — *OPEN WATER/ Unknown Bottom*

MODIFIERS

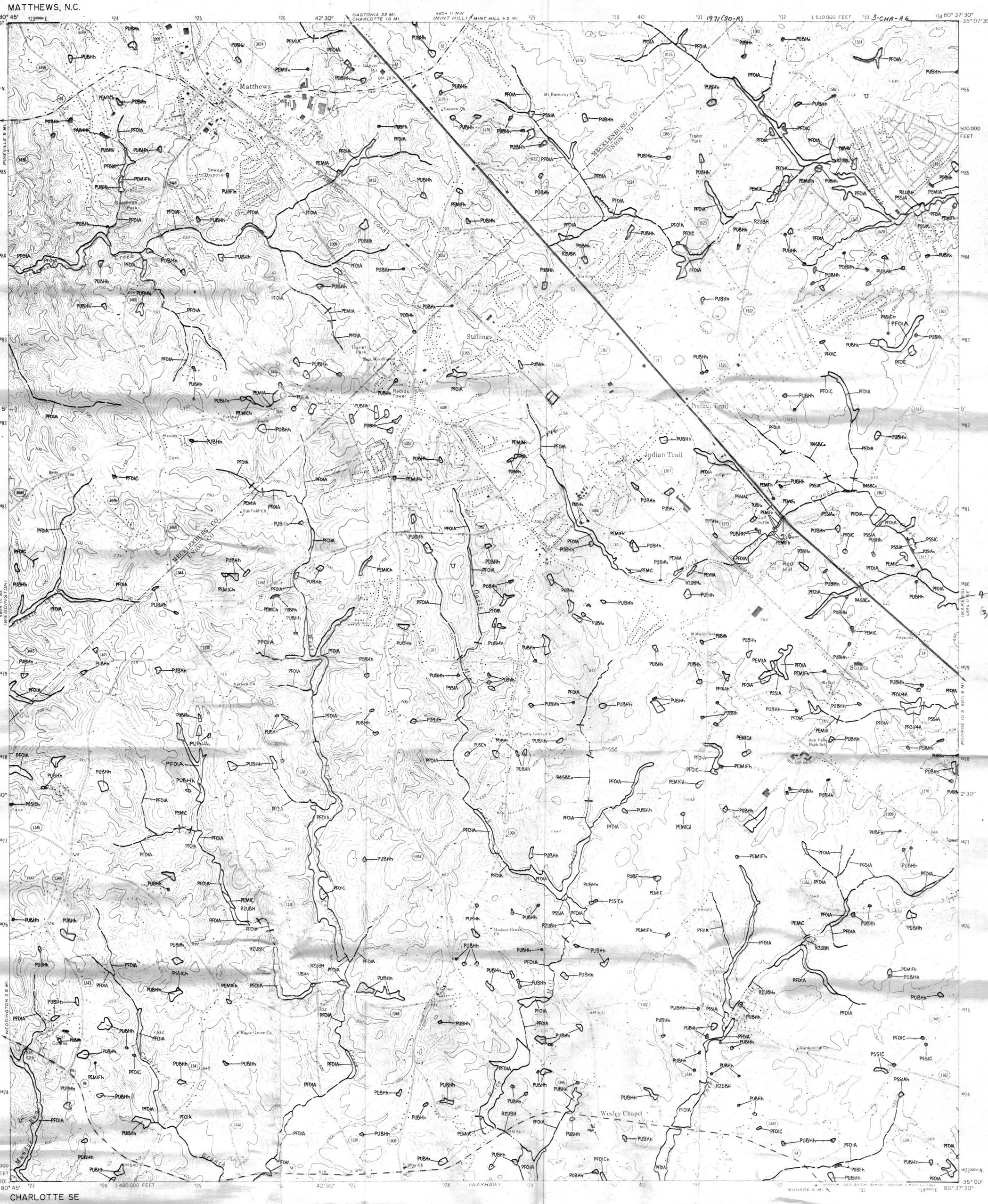
In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME			WATER CHEMISTRY			SOIL	SPECIAL MODIFIERS
Non-Tidal	Tidal		Coastal Halinity	Inland Salinity	pH Modifiers for all Fresh Water		
A Temporarily Flooded	H Permanently Flooded	K *Artificially Flooded*	1 Hyperhaline	7 Hypersaline	a Acid	g Organic	b *Beaver*
B Saturated	J Intermittently Flooded	L Subtidal	2 Euhaline	8 Eusaline		n Mineral	d *Partially Drained/Ditched*
C Seasonally Flooded	K Artificially Flooded	M Irregularly Exposed					h *Diked/Impounded*
		*S Temporary-Tidal					
		*R Seasonal-Tidal					

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

MATTHEWS, N.C.



4.25 miles
3.0 miles frontage
x 2 sided
6.0 miles

SCALE 1:24 000

1 MILE — 1000 0 1000 2000 3000 4000 5000 6000 7000 FEET — 1 KILOMETER

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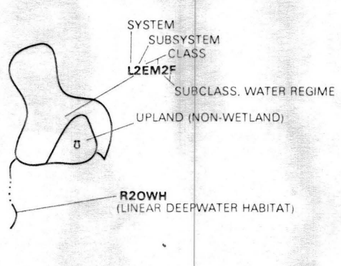
SYMBOLOGY EXAMPLE



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AERIAL PHOTOGRAPHY

DATE:	3/ /89	/ /
SCALE:	1:58 000	
TYPE:	CIR	

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Prepared by National Wetlands Inventory
1991

SYSTEM: M — MARINE

SUBSYSTEM	1 — SUBTIDAL					2 — INTERTIDAL				
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RF — REEF	OW — *OPEN WATER/ Unknown Bottom*	AB — AQUATIC BED	RF — REEF	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 3 Worm		1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 3 Worm	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic

SYSTEM: E — ESTUARINE

SUBSYSTEM	1 — SUBTIDAL					2 — INTERTIDAL							
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RF — REEF	OW — *OPEN WATER/ Unknown Bottom*	AB — AQUATIC BED	RF — REEF	SB — STREAMBED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	EM — EMERGENT	SS — SCRUB-SHRUB	FO — FORESTED
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusc 3 Worm		1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusc 3 Worm	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*

SYSTEM: R — RIVERINE

SUBSYSTEM	1 — TIDAL		2 — LOWER PERENNIAL		3 — UPPER PERENNIAL	4 — INTERMITTENT	5 — UNKNOWN PERENNIAL	
CLASS	RB — ROCK	UB — UNCONSOLIDATED BOTTOM	*SB — STREAMBED	AB — AQUATIC BED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	**EM — EMERGENT	OW — *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

*STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM.
**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS. The remaining CLASSES are found in all SUBSYSTEMS.

SYSTEM: L — LACUSTRINE

SUBSYSTEM	1 — LIMNETIC				2 — LITTORAL					
CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	OW — *OPEN WATER Unknown Bottom*	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	EM — EMERGENT	OW — *OPEN WATER Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*		1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

SYSTEM: P — PALUSTRINE

CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	US — UNCONSOLIDATED SHORE	ML — MOSS-LICHEN	EM — EMERGENT	SS — SCRUB-SHRUB	FO — FORESTED	OW
Subclass	1 Bedrock	1 Cobble-Gravel							

MODIFIERS

In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME	WATER CHEMISTRY			SOIL	SPECIAL MODIFIERS
	Tidal	Coastal Halinity	Inland Salinity	pH Modifiers for all Fresh Water	

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

BAKERS, N. C.

CHARLOTTE SE

CHARLOTTE

BAKERS, N. C.

SCALE 1:24 000

1 acre — 5 acres — 10 acres — 20 acres — 40 acres

ACREAGE GUIDE

For information on availability of NWI maps, call 1-800-USA-MAPS.

1:100,000 NAME: CHARLOTTE SE CHARLOTTE	TOPO NAME: BAKERS, N. C.	TECHNICAL RESPONSIBILITY		
		TASK	NAME	DATE
		ZTS Transfer	Barry D. Stiles	6-22-93
		ZTS Lettering		6-23-93
		ZTS QC	KATE HORNUNG	7-7-93
		MAP PI QC	L. BELLACQUA	7/12/93
		ZTS CORRECTION	Barry D. Stiles	7-13-93
		CORRECTION CHECK	C. GLEASON	7.14.93
		F.W.S. ACCEPT	K. Thomas	8-4-93

SPECIAL NOTE

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with **Classification of Wetlands and Deepwater Habitats of the United States** (FWS/OBS - 79/31 December 1979). The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a detailed on the ground and historical analysis of a single site may result in a revision of the wetland boundaries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest cover may not be included on this document.

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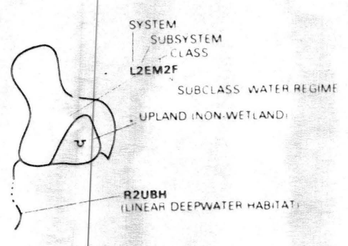
DRAFT

SYMBOLOGY EXAMPLE



U — Primarily represents **upland** areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions

NOTES TO THE USER

- Subsystems, Classes, Subclasses, and Water Regimes in *italics* were developed specifically for NATIONAL WETLANDS INVENTORY mapping
- Some areas designated as R4SB, R4SBW, OR R4SBJ (INTERMITTENT STREAMS) may not meet the definition of wetland
- This map uses the class Unconsolidated Shore (US). On earlier NWI maps that class was designated Beach/Bar (BB), or Flat (FL). Subclasses remain the same in both versions

AERIAL PHOTOGRAPHY

DATE	3/ /83	DATE	/ /
SCALE	1:58 000	SCALE	
TYPE	CIR	TYPE	

U.S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory

Base Imagery provided by the United States Geological Survey.

SYSTEM: M — MARINE

SUBSYSTEM: 1 — SUBTIDAL; 2 — INTERTIDAL

CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RF — REEF	OW — *OPEN WATER/ Unknown Bottom*	AB — AQUATIC BED	RF — REEF	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 3 Worm		1 Algal 3 Rooted Vascular 5 *Unknown Submergent*	1 Coral 3 Worm	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic

SYSTEM: E — ESTUARINE

SUBSYSTEM: 1 — SUBTIDAL; 2 — INTERTIDAL

CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RF — REEF	OW — *OPEN WATER Unknown Bottom*	AB — AQUATIC BED	RF — REEF	SB — STREAMBED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	EM — EMERGENT	SS — SCRUB-SHRUB	FO — FORESTED
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusc 3 Worm		1 Algal 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	2 Mollusc 3 Worm	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 *Deciduous* 7 *Evergreen*

SYSTEM: R — RIVERINE

SUBSYSTEM: 1 — TIDAL; 2 — LOWER PERENNIAL; 3 — UPPER PERENNIAL; 4 — INTERMITTENT; 5 — *UNKNOWN PERENNIAL*

CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	*SB — STREAMBED	AB — AQUATIC BED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	**EM — EMERGENT	OW — *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

*STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM

**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS

SYSTEM: L — LACUSTRINE

SUBSYSTEM: 1 — LIMNETIC; 2 — LITTORAL

CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	OW — *OPEN WATER/ Unknown Bottom*	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	RS — ROCKY SHORE	US — UNCONSOLIDATED SHORE	EM — EMERGENT	OW — *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*		1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular 5 *Unknown Submergent* 6 *Unknown Surface*	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

SYSTEM: P — PALUSTRINE

CLASS	RB — ROCK BOTTOM	UB — UNCONSOLIDATED BOTTOM	AB — AQUATIC BED	US — UNCONSOLIDATED SHORE	ML — MOSS-LICHEN	EM — EMERGENT	SS — SCRUB-SHRUB	FO — FORESTED	OW — *OPEN WATER/ Unknown Bottom*
Subclass	1 Bedrock	1 Cobble-Gravel	1 Algal	1 Cobble-Gravel	1 Moss 2 Lichen	1 Persistent 2 Nonpersistent	1 Broad-Leaved Deciduous	1 Broad-Leaved Deciduous	

MODIFIERS

In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system

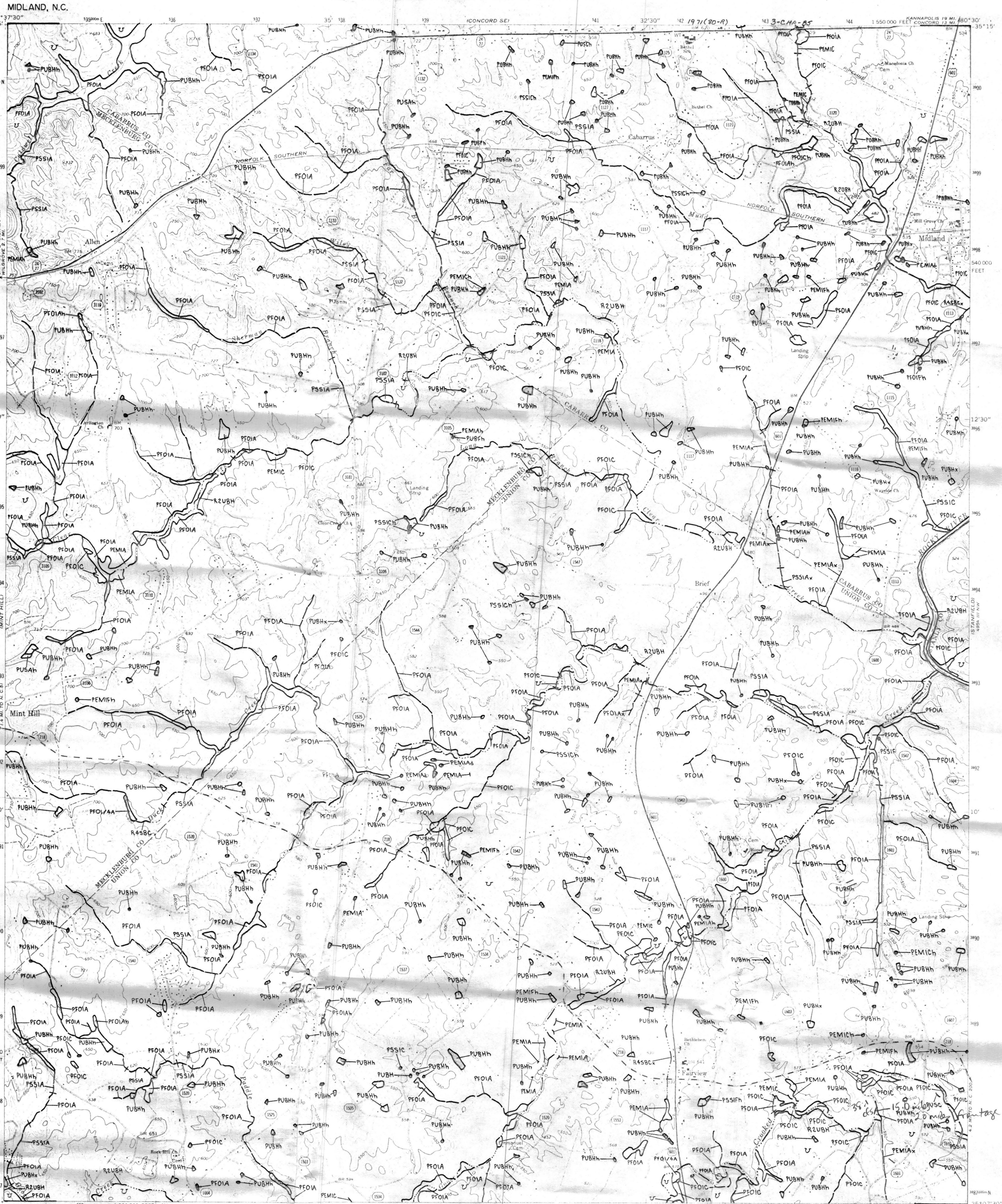
WATER REGIME						WATER CHEMISTRY			SOIL	SPECIAL MODIFIERS
Non-Tidal			Tidal			Coastal Halinity	Inland Salinity	pH Modifiers for all		
A Temporarily Flooded B Saturated C Seasonally Flooded	H Permanently Flooded J Intermittently Flooded	K Artificially Flooded L Subtidal	*S Temporary Tidal *R Seasonal Tidal *T Semi-permanent Tidal			1 Hyperhaline 2 Euhaline 3 Mixohaline (Brackish)	7 Hypersaline 8 Eusaline 9 Mixosaline		n Organic n Mineral	b Beaver d Partially Drained/Impounded f Farmed h Artificial Substrate x Excavated

DRAFT

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

MIDLAND, N.C.



CHARLOTTE SE

CHARLOTTE

MIDLAND, N.C.

SCALE 1:24 000

1 MILE — 7000 FEET

1 KILOMETER

1 acre — 10 acres — 20 acres

ACREAGE GUIDE

Other information including a narrative report concerning the wetland resources depicted on this document may be available. For information, contact:

Regional Director (ARDE) Region IV
U.S. Fish and Wildlife Service
75 Spring Street S.W.
Atlanta, Georgia 30303

SPECIAL NOTE

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SYMBOLOGY EXAMPLE

SYSTEM
SUBSYSTEM
CLASS
L2EM2F
SUBCLASS, WATER REGIME
UPLAND (NON-WETLAND)
R2OWH
(LINEAR DEEPWATER HABITAT)

U — Primarily represents **upland** areas, but may include unclassified wetlands such as man-modified areas, non photo-identifiable areas and/or unintentional omissions.

NOTES TO THE USER

- Wetlands which have been field examined are indicated on the map by an asterisk (*).
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated.
- Subsystems, Classes, Subclasses, and Water Regimes in *Italics* were developed specifically for NATIONAL WETLANDS INVENTORY mapping.
- Some areas designated as R4SB, R4SBW, OR R4SBJ (INTERMITTENT STREAMS) may not meet the definition of wetland.
- This map uses the class Unconsolidated Shore (US). On earlier NWI maps that class was designated Beach/Bar (BB), or Flat (FL). Subclasses remain the same in both versions.

AERIAL PHOTOGRAPHY

DATE	3/89	3/83
SCALE	1:58 000	1:58 000
TYPE	CIR	CIR

U.S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory

1991

SYSTEM: M — MARINE

- SUBSYSTEM 1 — SUBTIDAL: CLASS RB — ROCK BOTTOM (Subclass: 1 Bedrock, 2 Rubble); UB — UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); AB — AQUATIC BED (1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*); RF — REEF (1 Coral, 3 Worm); OW — *OPEN WATER/Unknown Bottom*
- SUBSYSTEM 2 — INTERTIDAL: CLASS AB — AQUATIC BED (1 Algal, 3 Rooted Vascular, 5 *Unknown Submergent*); RF — REEF (1 Coral, 3 Worm); RS — ROCKY SHORE (1 Bedrock, 2 Rubble); US — UNCONSOLIDATED SHORE (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic)

SYSTEM: E — ESTUARINE

- SUBSYSTEM 1 — SUBTIDAL: CLASS RB — ROCK BOTTOM (Subclass: 1 Bedrock, 2 Rubble); UB — UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); AB — AQUATIC BED (1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*); RF — REEF (2 Mollusc, 3 Worm); OW — *OPEN WATER/Unknown Bottom*
- SUBSYSTEM 2 — INTERTIDAL: CLASS AB — AQUATIC BED (1 Algal, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*); RF — REEF (2 Mollusc, 3 Worm); SB — STREAMBED (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); RS — ROCKY SHORE (1 Bedrock, 2 Rubble); US — UNCONSOLIDATED SHORE (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); EM — EMERGENT (1 Persistent, 2 Nonpersistent); SS — SCRUB-SHRUB (1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*); FO — FORESTED (1 Broad-Leaved Deciduous, 2 Needle-Leaved Deciduous, 3 Broad-Leaved Evergreen, 4 Needle-Leaved Evergreen, 5 Dead, 6 *Deciduous*, 7 *Evergreen*)

SYSTEM: R — RIVERINE

- SUBSYSTEM 1 — TIDAL: CLASS RB — ROCK (Subclass: 1 Bedrock, 2 Rubble); UB — UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic)
- SUBSYSTEM 2 — LOWER PERENNIAL: CLASS *SB — STREAMBED (1 Bedrock, 2 Rubble, 3 Cobble-Gravel, 4 Sand, 5 Mud, 6 Organic, 7 Vegetated); AB — AQUATIC BED (1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*)
- SUBSYSTEM 3 — UPPER PERENNIAL: CLASS RS — ROCKY SHORE (1 Bedrock, 2 Rubble); US — UNCONSOLIDATED SHORE (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated)
- SUBSYSTEM 4 — INTERMITTENT: CLASS **EM — EMERGENT (2 Nonpersistent)
- SUBSYSTEM 5 — UNKNOWN PERENNIAL: CLASS OW — *OPEN WATER/Unknown Bottom*

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SYSTEM: L — LACUSTRINE

- SUBSYSTEM 1 — LIMNETIC: CLASS RB — ROCK BOTTOM (Subclass: 1 Bedrock, 2 Rubble); UB — UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); AB — AQUATIC BED (1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*); OW — *OPEN WATER/Unknown Bottom*
- SUBSYSTEM 2 — LITTORAL: CLASS RB — ROCK BOTTOM (1 Bedrock, 2 Rubble); UB — UNCONSOLIDATED BOTTOM (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic); AB — AQUATIC BED (1 Algal, 2 Aquatic Moss, 3 Rooted Vascular, 4 Floating Vascular, 5 *Unknown Submergent*, 6 *Unknown Surface*); RS — ROCKY SHORE (1 Bedrock, 2 Rubble); US — UNCONSOLIDATED SHORE (1 Cobble-Gravel, 2 Sand, 3 Mud, 4 Organic, 5 Vegetated); EM — EMERGENT (2 Nonpersistent); OW — *OPEN WATER/Unknown Bottom*

SYSTEM: P — PALUSTRINE

CLASS: UB — UNCONSOLIDATED; AB — AQUATIC BED; US — UNCONSOLIDATED SHORE; ML — MOSS-LICHEN; EM — EMERGENT; SS — SCRUB-SHRUB; FO — FORESTED

MODIFIERS

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WATER REGIME			WATER CHEMISTRY			SOIL	SPECIAL MODIFIERS	
Non-Tidal		Tidal	Coastal Halinity	Inland Salinity	pH Modifiers for all Fresh Water			
A Temporarily Flooded	H Permanently Flooded	K Artificially Flooded	1 Hyperhaline	7 Hypersaline		g Organic	b Beaver	h Diked/Impounded

Site Name: Summit Resources
Site Number: NCD 986 232 21

Site Location: Stalling, N.C.
Union County
Latitude: 35 05 06.0
Longitude: 80 40 44.0

Date: February 01, 1994

Calculation Results

Distance from Site Location	Population Per Ring	Population Cumulative	Number of Households Per Ring	Number of Households Cumulative
0 to 1/4 mile	47	47	13	13
>1/4 to 1/2 mile	368	415	128	141
>1/2 to 1 mile	1,378	1,793	482	623
>1 to 2 miles	3,842	5,635	1,382	2,005
>2 to 3 miles	7,970	13,605	2,795	4,800
>3 to 4 miles	11,283	24,888	4,154	8,954

Note: The populations and number of households within specified target distance rings were calculated for the NC Superfund Section by the NC State Center for Geographic Information and Analysis using the 1990 US Census data. These values were calculated by summing the population and the number of households data for each census block located within each target ring. For census blocks lying only partially within the ring, the per cent area of the block within the ring was multiplied by the population and household densities of the block.