EPA/ROD/R04-95/254
1995

# EPA Superfund
# Record of Decision:

**BEAUNIT CORP. (CIRCULAR KNIT & DYEING PLANT)**
**EPA ID: SCD000447268**
**OU 01**
**FOUNTAIN INN, SC**
**09/29/1995**

# RECORD OF DECISION
# SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

## BEAUNIT CIRCULAR KNIT & DYEING
## SUPERFUND SITE

## FOUNTAIN INN, GREENVILLE COUNTY
## SOUTH CAROLINA

<IMG SRC 0495254>

PREPARED BY:

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
ATLANTA, GEORGIA

SEPTEMBER 29, 1995

# DECLARATION FOR THE RECORD OF DECISION

## SITE NAME AND LOCATION

Beaunit Circular Knit & Dyeing
Fountain Inn, Greenville County, South Carolina

## STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Beaunit Circular Knit & Dyeing Superfund Site (the Site) in Fountain Inn, South Carolina, which was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), 42 U.S.C. §9601 et seq., and, to the extent practicable, the National Oil and Hazardous Substances Contingency Plan (NCP), 40 C.F.R. Part 300 et seq. This decision is based on the administrative record file for this Site.

The State of South Carolina concurs with the selected remedy.

## ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

## DESCRIPTION OF THE SELECTED REMEDY

This remedial action addresses on-Site soil contamination.

The major components of the selected remedy include:

- Containment of soils and sediments contaminated with volatile organic compounds (VOCs) and metals by capping of the lagoon area.

- Additional monitoring of groundwater and soils on a regular schedule to determine effects of construction of lagoon cap, and to insure effectiveness of cap after constuction. Modifications to the frequency or termination of continued monitoring will be determined during the Remedial Action and the Five Year Review.

## DECLARATION

The selected soil and groundwater remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy utilizes permanent solutions and alternative treatment technology to the maximum extent practicable for this Site. The selected remedy component satisfies the preference for treatment. The remedy is protective of human health and the environment and meets statutory findings.

Because selection of this remedy will result in contaminated soil remaining on-Site above health-based levels while limiting exposure and mobility, a five year review will be conducted after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

<IMG SRC 0495254A>

Richard D. Green Date
Associate Director
Office of Superfund & Emergency Response

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## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AOC | Administrative Order by Consent |
| ARAR | Applicable or Relevant and Appropriate Requirements |
| BLS | below land surface |
| CAG | Carcinogen Assessment Group |
| CDM FPC | CDM Federal Programs Corporation |
| CERCLA | Comprehensive Environmental Response, Compensation and Liability Act of 1980 |
| CFR | Code of Federal Regulations |
| cfs | cubic feet per second |
| CLP | Contract Laboratory Program |
| CRDL | Contract Required Detection Limit |
| CRQL | Contract Required Quantification Limit |
| CWA | Clean Water Act |
| DQO | Data Quality Objectives |
| EEI | Environmental Exploration, Inc. |
| EPA | Environmental Protection Agency |
| ES | Engineering-Science, Inc. |
| ESD | Environmental Services Division |
| FCR | Field Change Request |
| FPDWS | Federal Primary Drinking Water Standards |
| FS | Feasibility Study |
| FSDWS | Federal Secondary Drinking Water Standards |
| FSP | Field Sampling Plan |
| FWQC | Federal Water Quality Criteria |
| GC | gas chromatograph |
| gpd | gallons per day |
| GPR | ground penetrating radar |
| hr | hour |
| HSWA | Hazardous and Solid Waste Amendments of 1984 |
| in | inch |
| kg | kilogram |
| L | liter |
| MCL | Maximum Contaminant Levels |
| MCLG | Maximum Contaminant Level Goals |
| MDRD | Minimum Detectable Relative Difference |
| ug | microgram |
| mm | millimeters |
| MS | matrix spike |
| MSD | matrix spike duplicate |
| MSL | mean sea level |
| NCP | National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, 8 March 1990 |
| NOAA | National Oceanic and Atmospheric Administration |
| NPL | National Priorities List |
| OVA | Organic Vapor Analyzer |
| PCB | polychlorinated biphenyl |
| PEL | Permissible Exposure Limit |
| ppb | parts per billion |
| PPM | parts per million |
| PSCS | Preliminary Site Characterization Summary |
| PVC | polyvinylchloride |
| QA | Quality Assurance |
| QAPP | Quality Assurance Project Plan |
| QC | Quality Control |
| RCRA | Resource Conservation and Recovery Act |
| RfC | Reference Concentration |
| RfD | Reference Dose |
| RI | Remedial Investigation |
| RPD | Relative Percent Difference |
| RRF | Relative Response Factor |
| SAP | Sampling and Analysis Plan |
| SARA | Superfund Amendments and Reauthorization Act of 1986 |
| SCDHEC | South Carolina Department of Health and Environmental Control |
| SCS | Soil Conservation Service |
| SDWA | Safe Drinking Water Act |

| | |
|---|---|
| SMCL | Secondary Maximum Contaminant Level |
| SOW | Statement of Work |
| SVOC | Semivolatile Organic Compound |
| TBC | to be considered |
| TC | Toxicity Characteristic |
| TCLP | Toxicity Characteristic Leaching Procedure |
| TDS | Total Dissolved Solids |
| TLV | Threshold Limit Value |
| TOt | Total Organic Carbon |
| TSS | Total Suspended Solids |
| TWA | Time Weighted Average |
| USDA | U.S.  Department of Agriculture |
| USGS | U.S.  Geological Service |
| VOC | Volatile Organic Compound |

## 1.0 INTRODUCTION

The United States Environmental Protection Agency (EPA) is issuing this Record of Decision for the Beaunit Circular Knit & Dyeing Superfund site in Fountain Inn, South Carolina. This Record of Decision presents the alternatives that the EPA has considered for the surface soil and groundwater contamination found at the Beaunit site.

EPA, in consultation with South Carolina Department of Health and Environmental Control (SCDHEC), selected this final remedy for the site after publication of a Proposed Plan, a Public Meeting, and a Public Comment period of two months. The fact sheet and notice of the Public Meeting were mailed to those on a mailing list developed during initial public participation activities including extensive interviews with local officials and area residents. The Public Comment period was extended from the required one month to two months because of a request from the public. Changes to the preferred alternative contained in the Proposed Plan, or a change from the preferred alternative to another, might have been made if public comments or additional data indicated that such a change would result in a more appropriate solution. The final decision regarding the selected remedy in this Record of Decision (ROD) has taken into consideration all comments from SCDHEC and the public. The selected alternative has not changed from that selected for the Proposed Plan. Several written comments were received from the public. Those comments along with EPA's response is contained in the attached Responsiveness Summary.

EPA is issuing this Record of Decision as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). This document summarizes information that can be found in greater detail in the Remedial Investigation/ Feasibility Study (RI/FS) Reports and other documents contained in the Administrative Record, located at the Information Repository at the Fountain Inn Public Library located on Main Street in Fountain Inn, South Carolina and at the Superfund Record Center at EPA Region 4 Headquarters located at 345 Courtland Street, Atlanta, GA.

## 2.0 BEAUNIT NPL SITE LOCATION AND DESCRIPTION

The Beaunit site occupies approximately 1.3 acres on the northwest side of Fountain Inn, South Carolina. Fountain Inn is 15 miles southeast of the City of Greenville. The site is the former wastewater lagoon, and its surroundings, that Served a former knitting, dyeing, and finishing plant about 400 yards east of the site. The wastewater lagoon was built in 1951 and ceased operations in 1977 when the adjacent plant connected to municipal sewage. In 1980 the wastewater treatment structures around the lagoon were demolished and the lagoon partially filled in. The Site is currently inactive and enclosed within a secured fence. The adjacent plant currently is operated by Wilson Sporting Goods for the manufacture of tennis balls.

The site is located off Valley View Road. Land use within one mile of the site includes small farms, residential areas, several businesses, and industrial facilities. Within .25 miles of the site along Valley View Road are Valley View Apartments, power lines, and a small pond. The nearest dwellings to the site are the Valley View apartments located about 100 yards northeast of the site. Water is available to area residents and businesses through a public water supply system. No groundwater supply wells exist at .the site or in the vicinity.

### 2.1 Site Location

The Site is located on the northwest side of Fountain Inn within Greenville County, South Carolina. The City of Fountain Inn is approximately 15 miles southeast of Greenville, South Carolina. The Site is 1.3 acres at latitude 34o 41' 53.8" and longitude 820 12' 48.8". The Site is the former location of a sewage treatment system, comprised of a sewage lagoon, sludge drying beds, and related treatment equipment. The Site is fenced with a locked gate and has signs posted identifying it as a Superfund Site.

### 2.2 Topography

Greenville County is located in the north central part of South Carolina in the Piedmont Physiographic Province. The Piedmont Province is characterized by rolling rounded hills, and long rolling, northeast-southwest trending ridges. Most of this area is gently sloped with area near creeks and streams having more moderate to steep slopes. Greenville County generally slopes southeasterly, which is the prevalent direction of drainage. While the highest point in Greenville County is 3,297 feet, the elevation around the Site ranges from 700 to 1200 feet.

More specifically, the area around the Site is gently sloping to moderately steep. Elevations in the immediate area range from approximately 900 feet MSL west of Fountain Inn to 790 feet northwest of the Site along Howards Branch. The topography around the Site is shown in Figure 1.

The elevation of the Site ranges between 860 feet at sampling location P7 at the east of the site to 819 feet at the surface water sampling station SW1 on Howards Branch. In general the Site slopes westerly towards the unnamed creek west of the lagoon and toward the northwest and Howards Branch.

## 2.3 Meteorology

South Carolina has a climate with mild winters and warm humid summers. The average daily maximum temperature for Greenville County is 71°F and the average daily minimum temperature is 52°F. In summer the temperature rises above 90°F for an average of 56 days, but seldom reaches above 100°F. Winter in Greenville County is mild and the temperatures are above freezing about 50 percent of the time.

Annual rainfall in Greenville County averages between 47 to 51 inches, well distributed through the year. May and November receive the least average rainfall per month (approximately 3.0 inches). March and July have the highest average rainfall per month (over 5.0 inches). Snowfall of over an inch occurs an average of only four days per year.

Severe weather such as tornadoes, tropical storms, and hurricanes can occur in the area. No full-fledged hurricanes have been recorded in Greenville County in the last 70 years. Violent storms with heavy rains and damaging winds occur only once every 5 to 10 years. Prevailing winds in Greenville County are from the northeast in the autumn and winter and from the southeast in spring and summer. The average wind speed is about eight miles per hour.

## 2.4 Regional Geology

Greenville County lies within the Inner Piedmont Belt of the Piedmont Geologic Province. Most of Greenville County is located on the inner Piedmont Belt of the Piedmont Plateau; whereas, the northern 25 percent of the county is located on the Blue Ridge mountains. The Blue Ridge and Piedmont are generally made up of the same kind of rock. The geology of this area is characterized by medium to high grade metamorphic rocks of Precambrian to early Paleozoic age. Some areas of alluvium exist along stream valleys. The metamorphic rocks generally consist of meta-sediments and meta-igneous rocks including horneblende-gneiss, granite, and schists. These rocks weather to clay-rich soils and saprolite. The soils and saprolites range from approximately 5 to 100 feet thick in most areas and may be thicker along some ridge areas. Structurally, the area is characterized by northeast trending lineations which generally dip to the southeast. Structural features include recumbent folds, cross-folds which trend northwest-southeast, faulting, and igneous intrusions. The rock units are highly deformed. Granitic and gabbroic intrusions are common in the Piedmont Province. The inner Piedmont belt is the most intensely deformed and metamorphosed segment of the Piedmont. The northeast-trending Bervard fault zone forms much of the boundary between the Blue Ridge and Piedmont belts. Although this zone of strongly deformed rocks is one of the major structural features in the southern Appalachians, its origin is poorly understood.

The regional geology consists of highly metamorphosed gneiss and schists, with igneous rock intrusions that are covered by a mantle of weathered rock material called saprolite. Saprolite is a result of rocks that have weathered in place as a result of chemical alteration from infiltration of rainwater. Saprolite exhibits some structural and mineralogical characteristics of the underlying parent rock such as foliation, bedding and fractures. The weathering of rock into saprolite has changed the mineralogy 3f the rock by more clayey and sandy conditions. These mineralogics have produced an upper soil horizon in many places That has been further altered by decaying vegetation where the structures sometimes found in deeper saprolite are no longer visible. There are eight geologic formations in Greenville County. These formations are made of alluvium, fine-grained rocks, fine-grained to medium-grained rocks, and coarse-grained rocks Alluvium consists of material recently deposited on flood plains. The fine-grained rocks are diabase dikes that cut across formations of granite and gneiss. The fine-grained to medium-grained rocks are biotite gneiss, biotite schist, and megmatite. The fine-grained to coarse-grained rocks are biotite schist and hornblende gneiss. The medium-grained rocks are biotite granite gneiss and granite undivided. The coarse-grained rocks are muscovite pegmatite dikes.

## 2.5 Regional Hydrogeology

The area hydrogeologic setting consists of an unsaturated zone consisting mostly of saprolite extending from the surface down to a water table aquifer. The saprolite or in some places alluvium is recharged by precipitation which infiltrates from the surface and moves downward to form the water table. The water in the shallow water table aquifer moves downgradient until it discharges into springs and streams. The surface of the water table is a subdued replica of the topographic surface and is generally near the surface near streams (discharge areas) and is somewhat deeper beneath ridges and hills (recharge areas).

Groundwater in the Piedmont Province is found in alluvial materials, saprolite, and, to a limited extent, in bedrock. Groundwater moves freely in the more permeable unconsolidated alluvium along stream valleys

and river banks. Groundwater also moves fairly easily through the saprolite and weathered rock zones. The availability of groundwater in an area depends upon rock type, thickness of soils and saprolite, extent of fracturing, joints, schistosity in the rock, and the amount, distribution, and density of rainfall.

## 3.0 SITE HISTORY AND REGULATORY HISTORY

### 3.1 Site History

A wastewater treatment plant, which consisted of a modified activated sludge system, was built at the site location in 1951. It was constructed to treat industrial wastewater from a knitting, dyeing, and finishing plant that was located approximately 400 yards to the east. The treatment plant units included a bar screen, an aeration basin (lagoon), an aeroaccelerator, a clarifier, and a post aeration tank. "As built" drawings for these units could not be located, but these units were believed to be located as indicated on Figure 2. The original design of the plant was to provide treatment for an average flow rate of 300,000 gallons per day (gpd) of textile wastewater. The lagoon had a volumetric capacity of 430,100 gallons and received wastewater via a pipeline (the influent pipe).

In 1973, wastewater from the plant was described as passing through an oil separator into the lagoon. The lagoon was equipped with five 15 h.p. aerators, which were also used to supply air to the aeroaccelerator. The wastewater discharge may also have been treated with coagulants and neutralizers, e.g., lime and alum, in the clarifier at the lagoon site. A suction pump was operated to return collected sludge from the aeroaccelerator to the lagoon. A sludge drying bed, located approximately 20 yards north of the lagoon, was used to dry accumulated waste sludge from the treatment operation. The lagoon was designed to discharge into an unnamed creek that is located to the west end of the lagoon. There may also be a pipeline that bypassed flow around the lagoon and discharged flow to the unnamed creek. The unnamed creek flows northwest and eventually joins Howards Branch.

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The lagoon was originally put into operation in October 1952, and accepted treated wastewater from knitting and dyeing operations for a textile plant manufacturing fabric for wearing apparel. Records available do not permit an accurate summation of the chemicals used or quantities discharged. However, the following substances were germane to the textile knitting industry and may have been used: soluble and insolubilized wetting agents, dispersing agents, surfactants, defoamers, soaps, detergents, weightors, direct, vat, napthol, acid, and disperse dyes and pH adjusters. Although these materials may have been used in the process, it is unlikely that all of them would be present in the wastewater. These materials were highly diluted by successive rinses. Others reacted and were neutralized or precipitated out during the dyeing process, prior to the subsequent final treatment through the wastewater treatment system. Many substances were absorbed in the materials being dyed, particularly the dyes.

The flow rates to the treatment plant varied with the production rate of the plant. The design capacity of the treatment plant, constructed in 1951, was 300,000 gpd. By 1963, the discharge flow rate increased to 750,000 gpd. In 1966, the design capacity of the treatment plant was rated at 600,000 gpd. In 1976, the permitted discharge flow rate was 540,000 gpd. In September/October 1977, the discharge of wastewater to the lagoon from the knitting, dyeing, and finishing plant was discontinued due to the plant's shutdown. From December 1977 until sometime in 1988, the discharge to the lagoon consisted of water from roof drains, a cooling tower blowdown, and chiller overflow.

In 1979 the plant operators determined that the former wastewater treatment structures on the site should be razed, and that the then-existing lagoon be filled. The City of Fountain Inn demolished a small brick building and miscellaneous structures on site, graded the site, and partially filled the lagoon with the demolition debris and surrounding soil. Additional fill from the tennis ball manufacturing facility was placed in the lagoon and was comprised of thin sheets of blue polyethylene, rubber tennis ball and racquet ball flashing and cores, tennis and racquet ball containers, excess tennis ball felt, golf balls, old roofing material, wooden pallets, and surrounding soils.

During a site inspection in 1985, South Carolina Department of Health and Environmental Control (SCDHEC) personnel noted that a portion of the site fence was missing. Wilson Sporting Goods (tennis ball manufacturer) subsequently repaired the site fence. The fence is inspected on a regular basis. The Site has remained inactive since 1988 and access is restricted by the fence and locked gate.

### 3.2 Regulatory History

Regulatory involvement on the site began in the early 1970s when citizens complained to SCDHEC regarding discoloration of the "stream below Beaunit" (probably referring to the unnamed creek and Howards Branch).

On November 7, 1973, SCDHEC conducted a public hearing to consider whether possible violations of South Carolina's Water Classification System had occurred. SCDHEC conducted a site investigation on June 13, 1985, and reported detections of volatile organic compounds in surface water samples collected from the lagoon and nearby unnamed creek, and PCBs and metals in the soil and sediment samples collected from the Site. Based on the results obtained from SCDHEC's 1985 site investigation, EPA developed a Hazard Ranking System (HRS) score of 32.44 for the Site. In June 1988, EPA proposed to include the Site on the National Priorities List (NPL). The Site is ranked amongst the Group 18 sites (HRS scores 32.87 - 31.94) on the NPL.

The United States Environmental Protection Agency (EPA) negotiated an Administrative Order by Consent (AOC) with Continental Assurance Company, El Paso Natural Gas Company, Kayser-Roth Corporation, PepsiCo, Inc., and Wilson Sporting Goods Co. (Respondents) regarding the Beaunit Corp. Circular Knit and Dyeing Plant Site (Site). The AOC was negotiated under Sections 104, 122(a) and 122(d) (3) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. §§9604, 9622(a) and 9622 (d) (3). The Respondents (hereinafter referred to as the Beaunit Lagoon Site Group) agreed to comply with the AOC effective February 21, 1992.

The AOC and the Scope of Work (SOW), incorporated therein by reference, required the Beaunit Lagoon Site Group to conduct a remedial investigation and feasibility study (RI/FS) of the Site in accordance with the National Oil and Hazardous Pollution Contingency Plan (NCP), as codified in the Code of Federal Regulations, Title 40, Part 300 (40 CFR 300). The Beaunit Lagoon Site Group retained Engineering Science to conduct the RI/FS of the Site.

The Beaunit Lagoon Site Group submitted a draft RI/FS Work Plan, a draft Sampling and Analysis Plan (SAP), and a draft Health and Safety Plan (HSP) to EPA Region IV on May 29, 1992. EPA's review comments on the draft RI/FS Work Plan and the draft SAP were addressed in a final RI/FS Work Plan and a final SAP which were submitted to EPA Region IV on August 17, 1992. The comments on the draft HSP were addressed in a final HSP. The Beaunit Lagoon Site Group received comments from EPA on the final RI/FS Work Plan and the final SAP. The Beaunit Lagoon Site Group submitted a response to comments (i.e., EPA's review comments on the final plans) to EPA Region IV on September 15, 1992. Also, the Beaunit Lagoon Site Group submitted a revised final RI/FS Work Plan and a revised final SAP to EPA Region IV on September 30, 1992. EPA approved the revised final RI/FS Work Plan and the revised final SAP on October 9, 1992.

Engineering-Science conducted initial site surveys (i.e., geophysical and topographical surveys) in April 1992. The information obtained from those surveys was used to prepare the RI/FS Work Plan and the SAP. ES began mobilization on October 12, 1992 for performing the remaining RI ,field activities at the Site. ES conducted field activities at the Site from October 19, 1992 to December 10, 1992. The Preliminary Site Characterization Summary (PSCS) was submitted to EPA Region IV on February 16, 1993. All information from the PSCS and additional findings on the fate and transport of contaminants are contained in the RI report.

## 4.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

Initial RI/FS community relations activities at the Beaunit Circular Knit & Dyeing NPL Site began with extensive community interviews in Fountain Inn during May, 1992 and the finalization of a Community Relations Plan in August, 1992. Area residents around the site, local government officials both elected and appointed, local business leaders, and the local newspaper staff were all interviewed. There was little knowledge about the site and some confusion with other remediation efforts from a mineral spirits spill from the Wilson Sporting Goods Plant. There were unrelated concerns also expressed regarding odor problems from the Wilson facility. There was some overall concern regarding children's exposure to the site. All concerns raised were responded to during the interviews and later public meetings. Additionally, an information repository was established at the Fountain Inn Public Library on Main Street.

An initial fact sheet announcing the start of the RI/FS was issued in August, 1992. Community interest during the RI/FS preparation was very low. EPA received only a few telephone calls regarding the Site or the RI/FS study. EPA has regularly updated the Site Information at the Information Repository and posted signs on the Site perimeter fencing and the gate listing contacts at EPA and SCDHEC. The Site is fenced and routinely inspected for signs of trespassing.

Following completion of the RI and the FS, the Site mailing list was updated and the Proposed Plan was mailed out in late October, 1994. Both the advertisement and the Proposed Plan stated that the Public Comment period would be from November 7, 1994 to December 7, 1994.

The Proposed Plan public. meeting was held on November 14, 1994, to present the Agency's selection of Preferred Alternatives for addressing contamination at the Site. The local newspaper, several citizens,

and representatives from the Potentially Responsible Parties were present. In early December a request was received to extend the public comment period to provide additional time for review of the Proposed Plan and the RI/FS documents. EPA approved the request and extended the comment period to conclude on January 13, 1995.

EPA received three written comments during the public comment period. EPA's responses to the comments are contained in the Responsiveness Summary, Appendix B to this document. Other documents related to public participation at this site including copies of the advertisements for the public meetings, the initial comment period and its extension, as well as the transcript of the public meeting are also included in appendices to this document. This decision document presents the selected remedial action for the Beaunit NPL Site, in Fountain Inn, South Carolina, chosen in accordance with CERCLA, as amended by SARA and, to the extent practicable, the NCP. The decision of a remedial action for this Site is based on the Administrative Record.

## 5.0 SCOPE AND ROLE OF THIS ACTION WITHIN SITE STRATEGY

The site principally poses a threat to the environment through contaminated surface soils. The contaminated soils could cause deleterious effects to environmental receptors who ingest organisms living in the contaminated soils. A possibility exists that contaminants in the soils could leach into the shallow groundwater aquifer. While the shallow groundwater aquifer is not utilized as a potable water source, it is used for irrigation from a few wells in the vicinity of the site. The contamination at the site does not pose an unacceptable risk for human health at the site at present or in the unlikely scenario of future residential usage at the site. EPA's plan for remediation of the Beaunit Site will address all threats posed by the Site, namely contaminated soil on-Site and potential groundwater contamination by leaching of the soils on-Site. This is the only ROD contemplated for this Site.

## 6.0 SUMMARY OF SITE CHARACTERISTICS

### 6.1 Surface Water Hydrology

Surface water is present at the Site in the lagoon, and in small streams, drainage pathways and a small man-made pond adjacent to the Site. A small unnamed creek located west of the Site flows north and discharges to Howards Branch about 500 feet northwest of the Site. Howards Branch eventually joins Durbin Creek. Durbin Creek is a tributary of the Enoree River. Both Durbin Creek and the Enoree River are classified as Class B streams by South Carolina. Streams and ponds in the area of the site are shown in Figure 3.

The lagoon currently is about 7,000 square feet, containing rain water accumulation and groundwater infiltration from the water table. While the water level in the lagoon varies, it is never dry, and at the time of the Remedial Investigation was 3 feet in depth.

Sediments along the unnamed creek and Howards Branch were collected. The sediments were generally sands, gravel, silts, and clay. The bottom of the lagoon contains a sludge layer about one foot thick containing a small amount of textile threads. Below this sludge layer are soils similar to other collected elsewhere around the site.

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### 6.2 Site Hydrogeology

Seven groundwater monitoring wells were installed at the Site during the RI field activities. A summary of well construction and water-level data is presented in Table 2.2 of the Remedial Investigation. Five monitoring wells are shallow (MW1S, MW2S, MW3S, MW4S, and MW5S), ranging in depth from 20 to 27.S feet BLS. Two monitoring wells (MW1D and MW5D) are screened deeper (55 feet BLS and 57 feet BLS)to provide information on the vertical direction of flow. The upgradient monitoring wells are MW1S, MW1D, and MW2S. The downgradient monitoring wells are MW3S, MW4S, MW5S, and MW5D. Depth to groundwater across the Site ranged from approximately 3 feet below the top of casing in MW5S to 11 feet below top of casing in MW2S.

General groundwater flow directions across the Site are from south-southeast to north-northwest. The movement of groundwater at the Site generally follows the topography which slopes northwesterly. Groundwater leaving the Site discharges into the unnamed creek and Howards Branch. The well pair (MW1S and MW1D) located upgradient of the Site indicate that groundwater in this area has a downward vertical gradient, which is consistent with an area of groundwater recharge. The vertical gradient at the well pair farthest downgradient of the Site (i.e., MW5S and MW5D near the unnamed creek) is upward, which is consistent with an area of groundwater discharge. The horizontal gradient across the Site was determined to be approximately 0.038 ft/ft. Slug tests were performed on all monitoring wells. The average

hydraulic conductivity was 11.41 ft/day and the average velocity of groundwater flow, for an effective porosity of 0.15, was approximately 2.88 ft/day.

### 6.3 Site Geology

Soil borings were drilled at various locations across the Site. These borings ranged in depth from about 6 feet to 100 feet. The borings encountered fill materials and residual or saprolite soils consisting of sands, silts, and clays, and weathered rock. Bedrock was encountered in only one of the borings drilled near a rock outcrop during this investigation at a depth of 9 ft. Bedrock is a biotite gneiss, and is probably deeper than 100 feet below land surface (BLS) over most of the Site. However, rock was encountered very shallow at one location (SB3) north of the Site. In the immediate area of this boring rock is exposed at the surface. Sand, silt and clay were encountered in several borings. Biotite and quartz were the two major mineralogical constituents found in the soils at the Site. A micacaceous saprolite exhibiting a gneissic texture was encountered at an average depth of 7.5 feet BLS.

### 6.4 Site Soils

The surficial soils in the vicinity of the Site have been identified as Cecil and Appling soils, which consist of Cecil sandy and Appling sandy loam. These soils, are derived from saprolite that has weathered from the underlying bedrock of granite, gneiss, or schist. The surficial soils are well drained.

Cecil soils have a surface layer of dark-brown sandy loam. The subsurface soil is normally a yellowish-red sandy clay loam in the upper part, red clay in the middle, and red sandy clay loam in the lower part.

Appling soils have a surface layer of dark grayish-brown sandy loam. The subsurface soil is normally a light yellowish-brown clay in the upper part, yellowish brown and reddish-yellow clay in the middle, and mottled brownish-yellow, brown, and red clay in the lower part.

The soils at the Site have been identified as Cecil soils which consist of sandy loam. The estimated soil depth is 0 to 6 feet. The soils at the Site are fairly permeable.

### 6.5 Site Biota

Investigative methods for establishing aquatic and terrestrial resource characteristics included a field reconnaissance survey conducted April 6 and 7, 1993, contact with local resource authorities, and compilations of existing information. The characterization investigations focused on the aquatic and terrestrial resources of the Site and the area within a half-mile radius of the Site. A walk-through survey of the Site was conducted. Five natural resource categories were examined: vegetation, aquatic life, wetland resources, wildlife, and species of concern. Each resource description addresses general community and habitat characteristics and environmentally sensitive areas or aspects. All descriptions were based on a two-day field reconnaissance conducted by ES personnel, except where noted.

### 6.6 Vegetation

The type, composition, location and general appearance of vegetation were determined from observations made during the field reconnaissance survey. Site aerial photographs (scales ranging from 1:1,900 to 1:5,400) and the USGS Fountain Inn Quadrangle (7.5 minute series) were used to locate and map boundaries of each vegetation type that was identified in the field. Technical documents were also referenced to support the field assessment.

The approximate location and extent of vegetative cover types are shown on Figure 4. A list of species identified during the field reconnaissance is provided in Appendix B of the RI. There are no vegetation types of major economic importance or that represent a resource of unique or special concern. All types are widely distributed and abundant throughout the vicinity. The mixed hardwood-pine forest and scrub or old fields are described below.

#### 6.6.1 Mixed Hardwood-Pine Forest

A natural plant community, the successional mixed hardwood-pine forest, was recognized outside the Site, within the one-half mile radius of the Site. The predominance of this community is due primarily to the fact that the study area is located on well-drained upland soils of two major soil series, the Appling and Cecil series. Soils in these series consist of sandy loams. The soils are described as low in natural fertility and slightly to moderately acidic. Water capacity is moderate and erosion is reported as a moderate hazard (SCS 1975).

A third soil type, the Wehadkee soils, is found along and adjacent to the streams and drainageways in the study area. This poorly drained soil, has moderate organic content and moderate natural fertility. Flooding is a major concern. The mixed hardwood-pine plant community is also supported on this soil with an increase in the plants more tolerant of wetter soils (e.g., red maple, water oak).

The mixed hardwood-pine successional forest is characteristic of a very large portion of the Piedmont physiographic region, especially where the soils are well drained and slightly to moderately acidic. Random pH readings of 6 were noted for the soils in the study area. White oak, southern red oak, water oak, sweet gum, tulip-poplar and shortleaf pine are common tree species in the vicinity of the Site. Pines are generally absent along the stream corridors while sweet gum and red maple occur more frequently in these areas. The subcanopy is composed of black cherry, Rubus sp., red cedar, and American holly.

Species diversity of ground cover in the forested areas appeared to be somewhat low. Most prominent in the herbaceous layer were species such as spotted wintergreen, sphagnum moss, lycopodium, yellow wood sorrel, blue violet, and bird's foot violet. Common vines observed in the area included poison ivy, greenbrier, and Japanese honeysuckle. Kudzu occurred along Howard Branch, west of Valley View Road. Cane was observed infrequently. Forest cover in the immediate vicinity of the Site is similar in composition and condition to other forested areas observed throughout the one-half mile study area.

Portions of the plant community have been substantially altered due to road building, utility corridor clearing, sewer routing/installation and home-building. Historic aerial photos indicate that much of the forested area adjacent to the Site had been cleared and was utilized for agricultural purposes prior to approximately 1965. Remnants of terracing were observed in wooded areas east of the Site during the field reconnaissance.

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### 6.6.2 Old Field/Scrub/Pasture

Deforestation and subsequent regeneration has occurred in several locations within the study area resulting in the occurrence of old field and scrub vegetation. The Site, mowed routinely, is comprised mainly of early successional herbaceous and woody plants. For example, willow is regenerating on some portions of the Site. Shrubs occur around the perimeter of the lagoon and on the berm. Species included willow, rush, honeysuckle, Rubus sp., greenbrier. The area bordering the west side of the lagoon outside of the Site is within the power easement and the saplings and shrubs have been periodically cut.

## 6.7 Aquatic Life

Surface water is present in a lagoon at the Site and in small streams, drainage pathways and two small, man-made ponds within the study area. Sections of the small streams and ponds in the study area may support populations of aquatic organisms. According to Mr. Gene Hayes, District Fisheries Biologist with the South Carolina Wildlife & Marine Resources Department (SCWMRD), no data is available for Howard Branch or other water bodies within the study area. However, limited data exists for Durbin Creek into which Howard Branch flows nearly 2.5 miles to the northeast of the Site. Physical conditions of the streams and ponds within the study area were recorded and random observations of benthic life were noted. The streams and ponds within a one-half mile radius of the Site are shown on Figure 3, included previously in this Record of Decision.

## 6.8 Wetland Resources

Wetland resources were identified on the Site and within the study area using aerial photographs, the USGS topographic map and the Greenville County soil survey (SCS 1975). Potential wetland areas were then verified by field inspection. No jurisdictional delineations were conducted; however, wetland areas were identified generally using criteria set forth in the U.S. Army Corps of Engineers (COE) 1987 Wetlands Delineation Manual.

## 6.9 Wildlife

The presence and current status of wildlife resources were determined primarily by reviewing existing information sources, by interviewing local authorities and agency personnel, and by conducting a field reconnaissance. Typical wildlife habitats, uses, and prevalent species were noted during the field reconnaissance. Availability of relevant data on wildlife species is limited. The presence and status of endangered, threatened, and special-concern species were determined primarily by reviewing existing information sources. Potential habitat occurrence within the vicinity of the site was also evaluated during the field reconnaissance. Technical documents received from the SCWMPD Heritage Trust Section (Boyle 1993) and the U.S. Fish and Wildlife Service (EuDaly 1993) were reviewed to identify the species

of concern.

Numerous game and nongame species exist in the area of the site. The actual proportions of the wildlife population are unknown. Larger species may be excluded from the Site due to a chainlink fence topped with three-strand barbed wire surrounding the Site. Smaller animals may gain access to the Site under the fence. No animals or signs were observed inside the fence and there was no evidence of burrowing on the Site.

Typical animals that may be found in the area include rabbit, skunk, opossum, raccoon, deer, fox, and squirrel. During the field reconnaissance, signs (scats and tracks) of rabbit and raccoon were found throughout the study area. A deadshrew was observed in a wooded area east of the substation. No signs of deer were observed although the habitat conditions of the study area offer food and cover.

Birds noted in the area during the site reconnaissance include mourning dove, common crow, robin, bluejay, mockingbird, wood thrush, red-tailed hawk, northern cardinal, common flicker, chickadee, killdeer, downy woodpecker, Canada goose and green heron.

The site and surrounding area generally provides less than optimal wetland and riparian habitats to accommodate waterfowl populations or uses. Waterfowl may utilize the pond adjacent to the Site and the Howard Branch headwater pond for resting and foraging. Signs of wading birds were observed in the unnamed creek downstream of the pond and in Howard Branch downstream of its confluence with the unnamed creek. In addition, a green heron was observed near Howard Branch during the field reconnaissance.

There is no information available concerning reptiles and amphibians commonly found in the study area. No reptiles or amphibians (other than tadpoles on the Site) were observed during the field reconnaissance.

### 6.9.1 Endangered, Threatened, and Special-Concern Species

A status review was conducted of all potential plant, wildlife, and fish species reported from the region. There are no known resident populations or designated critical habitats for any state or Federally listed threatened or endangered species occurring on the Site or within a one-half mile radius of the Site. In addition, no populations or supporting habitats were observed on the Site or in the study area for species of special concern.

## 7.0 SUMMARY OF SITE RISKS

### 7.1 Remedial Investigation

The AOC and the Scope of Work (SOW), incorporated therein by reference, required the Beaunit Lagoon Site Group to conduct a remedial investigation and feasibility study (RI/FS) of the Site in accordance with the National Oil and Hazardous Pollution Contingency Plan (NCP), as codified in the Code of Federal Regulations, Title 40, Part 300 (40 CFR 300). The Beaunit Lagoon Site Group retained Engineering Science, an Atlanta consulting firm, 5o conduct the RI/FS of the Site.

The Beaunit Lagoon Site Group submitted a draft RI/FS Work Plan, a draft Sampling and Analysis Plan (SAP), and a draft Health and Safety Plan (HSP) to EPA Region IV on May 29, 1992. EPA's review comments on the draft RI/FS Work Plan and the draft SAP were addressed in a final RI/FS Work Plan and a final SAP which were submitted to EPA Region IV on August 17, 1992. The comments on the draft HSP were addressed in a final HSP. The Beaunit Lagoon Site Group received comments from EPA on the final RI/FS Work Plan and the final SAP. The Beaunit Lagoon Site Group submitted a response to color, Lents (i.e., EPA's review comments on the final plans) to EPA Region IV on September 15, 1992. Also, the Beaunit Lagoon Site Group submitted a revised final RI/FS Work Plan and a revised final SAP to EPA Region IV on September 30, 1992. EPA approved the revised final RI/FS Work Plan and the revised final SAP on October 9, 1992.

Engineering-Science conducted initial site surveys (i.e., geophysical and topographical surveys) in April 1992. The information obtained from those surveys was used to prepare the RI/FS Work Plan and the SAP. ES began mobilization on October 12, 1992 for performing the remaining RI field activities at the Site. ES conducted field activities at the Site from October 19, 1992 to December 10, 1992. The PSCS was submitted to EPA Region IV on February 16, 1993. The information contained in the PSCS along with information on the fate and transport of contaminants are presented in the RI report.

### 7.1.1 Remedial Investigation Field Activities

The RI field activities were as follows:

- Topographical and geophysical surveys in April 1992 before preparing the draft RI Work Plan;
- Installed seven (three upgradient and four downgradient) monitoring wells;
- Collected groundwater samples from monitoring wells;
- Collected surface water and sediment samples from the lagoon, the unnamed creek, a pond (located upstream of the unnamed creek), and Howards Branch;
- Collected surface soil samples from 24 locations that included 3 background surface soil samples;
- Collected subsurface soil samples from 15 soil borings that included 3 background soil borings, 5 soil borings along the influent pipeline to the lagoon, 2 soil borings along an effluent pipeline from the lagoon, 2 soil borings in the former sludge drying bed area, and 3 soil borings in the fill material area;
- Surveyed monitoring wells and sampling locations; and conducted biota survey.

The sampling locations for surface water, sediment samples, groundwater samples, and surface soil samples, and the data collected are shown in attached Figures 5, 6, 7, 8, 9, 10, 11, & 12.

### 7.2 Remedial Investigation Conclusions

The conclusions presented in this section are based on the site background and setting, the physical characteristics of the study area, the nature and extent of contamination, and the fate and transport of contaminants.

- The potential contaminants of concern for surface soil are polynuclear aromatic compounds (PNAs), arsenic, and manganese.
- The potential contaminants of concern for subsurface soil are PNAs and manganese.
- The potential contaminants of concern for lagoon sediments are polychlorinated biphenyls (PCBs), benzo(a)pyrene, antimony, beryllium, and manganese.
- The potential contaminants of concern for lagoon surface water are arsenic, barium, and manganese; none of these metals exceed drinking water standards.
- The potential contaminants of concern for groundwater are barium, chromium, and manganese; none of these metals exceed drinking water standards.
- The rock outcrops and the unnamed creek are the controlling features for the groundwater in the vicinity of the Site; the groundwater flows towards the unnamed creek and has an upward component near the unnamed creek.
- From the standpoint of human health or environmental risk the four elements of a migration pathway, i.e., an affected source, a transport medium, an exposure pathway, and an exposure source must occur for the pathway to be considered as complete. The evaluation of contaminant transport from the affected areas at the site indicates that the potential contaminants of concern are not likely to migrate. Therefore, the migration pathways for the potential contaminants of concern at the site are not likely to be completed.

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## 7.3 Summary of Risk Assessment

CERCLA directs EPA to protect human health and the environment from current and potential future exposure to hazardous substances at the site. A risk assessment was conducted to evaluate the potential current and future risks associated with exposure to the site contaminants.

The Baseline Risk Assessment (BRA) for the Site was prepared by Roy F. Weston, Inc. for EPA Region IV. The BRA was finalized on November 24, 1993. EPA determined as a result of the risk assessment that potential future residential exposures to benzene, beryllium, chromium, manganese, 2-methylnaphthalene, and naphthalene in groundwater were of concern. It should be noted these risk levels incorporated both site related and background related risks (since some contaminants such as beryllium, chromium, and manganese, existed in the study area naturally). EPA determined that the risks to human health from contaminants in surface soils were within EPA's acceptable risk range and stated that remediation of surface soils would not be required for the protection of human health. However, the BRA also determined that site surface soils did present a risk to ecological receptors. Arsenic and nickel were identified as the chemicals of concern. While EPA determined that there were no significant concerns over surface soil contamination as applied to human health, the agency required that soil contamination still be addressed in the feasibility study for the Site because of concern for ecological receptors. Subsurface soil, surface water and sediments were not identified as media of concern for the Site. The contaminants of concern, exposure concentrations, risk levels, and hazard indices are provided in Tables 1.1 & 1.2 of the Feasibility Study.

Actual or threatened releases of contaminants from the site, if not addressed by one of the alternatives in this plan, may present an imminent and substantial endangerment to public health, welfare or the environment.

### 7.3.1 Human Risk

An evaluation was made of all potential exposure routes which could connect contaminants of concern (COC's) at the Site with people living or working in the area. Exposure by each of these pathways was mathematically modeled using generally conservative assumptions. Of the five media (surface water, sediment, groundwater, surface soil, and subsurface soil) investigated during the RI, groundwater was identified in the BRA as the only media of concern for human receptors.

The EPA determined that the contaminants of concern associated with groundwater were benzene, beryllium, chromium VI, manganese, 2-methylnaphthalene, and naphthalene. Of these contaminants, benzene and beryllium are classified as carcinogenic constituents and chromium VI, manganese, 2-methylnaphthalene, and naphthalene are classified as noncarcinogenic constituents. Carcinogenic and noncarcinogenic risk levels for contaminants in groundwater were presented in the final BRA. Carcinogenic risks are presented as an incremental risk to a population subgroup, e.g., child, and noncarcinogenic risks are presented as hazard indices in Table 1.

### 7.3.2 Environmental Risk

A qualitative risk assessment was conducted to determine if contaminants present at the site have impacted plant life or animals in the area. Given the small size and industrial nature of the site, significant impact to local plants and animals are not expected. While endangered or threatened species have been identified in this area of the State, none were specifically located at the Site during the RI/FS. Regardless, the environmental risk assessment did indicate that surface soil exposure to environmental receptors would need to be addressed in the development of remediation alternatives.

Of the five media investigated during the RI, the baseline risk assessment determined that surface soil is the only medium of concern for ecological receptors. Arsenic and nickel are identified as the contaminants of concern (those that exceed an ecological hazard index of 1.0 in surface soil) in the final BRA. The hazard indices for these contaminants are listed in Table 1.

The risk posed to terrestrial wildlife was based on arsenic and nickel detected in surface soil samples. The arsenic and nickel concentrations used to compute risks were 9.71 mg/kg and 8.08 mg/kg, respectively. The background arsenic concentrations at the Site are 3 mg/kg (SB1, 0-2 ft), 1.2 mg/kg (SB2, 0-2 ft), and 5.6 mg/kg (SB3, 0-2 ft). Nickel was detected only in the SB1 (0-2 ft) background sample at a concentration of 4.2 mg/kg. Nickel was not detected at SB2 (0-2 ft, 1.9U mg/kg) and SB3 (0-2 ft, 7.1U mg/kg). The average elemental concentrations for arsenic and nickel in United States soil and other surficial materials are presented in Table 2.1 of the BRA. The site-specific averages for arsenic and nickel are less than the reported average elemental concentrations in United States soil.

**Table 1**
**Beaunit ROD**
**Baseline Risk Assessment Summary**
**RI/FS of Beaunit Corp. Circular Knit and Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Medium | Chemical | Risk Type | Exposure Concentration(1) | Risk Level | Hazard Index | Subgroup Type |
|---|---|---|---|---|---|---|
| | | | Human Health | | | |
| Groundwater | Benzene | Carcinogenic | 11 ug/L | 1E-05 | na | not specified |
| Groundwater | Chromium | Noncarcinogenic | 39.7 ug/L | na | 1 | Child |
| Groundwater | Manganese | Noncarcinogenic | 2620 ug/L | na | 67 | Child |
| Groundwater | Manganese | Noncarcinogenic | 2620 ug/L | na | 22 | Youth |
| Groundwater | Manganese | Noncarcinogenic | 2620 ug/L | na | 14 | Adult |
| Groundwater | 2-Methylnaphthalene | Noncarcinogenic | 19.5 ug/L | na | 7 | Child |
| Groundwater | 2-Methylnaphthalene | Noncarcinogenic | 19.5 ug/L | na | 2 | Youth |
| Groundwater | 2-Methylnaphthalene | Noncarcinogenic | 19.5 ug/L | na | 1 | Adult |
| Groundwater | Naphthalene | Noncarcinogenic | 77.5 ug/L | na | 27 | Child |
| Groundwater | Naphthalene | Noncarcinogenic | 77.5 ug/L | na | 9 | Youth |
| Groundwater | Naphthalene | Noncarcinogenic | 77.5 ug/L | na | 6 | Adult |
| Groundwater | Beryllium | Carcinogenic | 4.5 ug/L | 4E-04 | na | not specified |
| | | | Terrestrial Wildlife | | | |
| Surface Soil | Arsenic | na | 9.71 mg/Kg | na | 80.9 | Least Shrew |
| Surface Soil | Nickel | na | 8.08 mg/Kg | na | 1.85 | Least Shrew |

(1) 95% upper confidence limit of the arithmetic mean of detections and ½ detection limit for nondetects, or the maximum amount detected, whichever is less.

### 7.3.3 Exposure Pathways and Receptors

The exposure routes for both the groundwater and surface soil were presented in the final BRA. There are no residents on the Site. The final BRA, however, states that there is the possibility of visitors gaining access to the Site and the surrounding areas. Hypothetically, a visitor (youth, 7 to 16 years old). is assumed to receive the maximum current chemical exposure from surface soil, surface water, and sediment during recreational activities. The potential carcinogenic risk for the hypothetical visitor does not exceed 1E-06, and the potential hazard index for the hypothetical visitor does not exceed 1.0.

The BRA also states that the Site has a reasonable potential to be developed for future residential use. Potential soil and groundwater exposure pathways were evaluated for children (less than 7 years old), youths (7-16 years old), and adults (older than 16 years) as future residents. The surface soil pathway is based on exposure through incidental ingestion, dermal contact, and inhalation of airborne soil/dust. Subsurface soil pathway was not addressed since, as described in the BRA, "Exposure to contaminants detected in soil borings is not evaluated for either the current or future use scenarios because the depth at which the samples were taken precludes direct contact." The Site is currently owned by a Beaunit PRP. Therefore, the potential exposure to a hypothetical future resident could be eliminated through access and deed restrictions. The groundwater pathway is based on future site residents being exposed to the contaminants of concern through: (1) possible future off-site private drinking wells containing contamination (in the vicinity of the Site); or (2) the installation of a residential well onsite. The potential groundwater exposure pathways include ingestion of drinking water and non-ingestion uses (i.e., showering). However, the probability for completion of groundwater exposure pathways is very low because drinking water wells are not located on the Site or properties adjoining the Site. In addition, the probability of a future resident using the groundwater for ingestion (e.g., drinking) and non-ingestion (e.g., showering) purposes is low because the City of Fountain Inn supplies water to residents via a water distribution system. Therefore, a large uncertainty would be factored in the assessment of any future risks that are based on the completion of the groundwater exposure pathway.

In addition to these pathways, exposure to surface water and sediment (while playing in the unnamed creek, Howards Branch, and the lagoon) was evaluated for a resident youth (age 7-16 years old). These pathways include incidental ingestion and dermal contact with sediment and dermal contact with water.

The final BRA stated that the hazard indices were greater than a value of 1.0 for the hypothetical future child, youth, and adult resident due to the groundwater pathway. The final BRA also stated that the carcinogenic risk exceeded 1E-06 for the unspecified, future, lifetime resident from the groundwater pathway. It should be noted, however, that according to calculations conducted outside the BRA, carcinogenic risk also exceeds 1E-06 for groundwater at background quality due to beryllium and chromium. Additionally, according to calculations conducted outside the BRA, noncarcinogenic risks also exceeds a hazard index of 1.0 for groundwater at background quality due to manganese.

The final BRA also presented the ecological risk to terrestrial wildlife. The Least Shrew was chosen as the target species to represent terrestrial wildlife. The BRA determined that an adverse effect on the Least Shrew could result from exposure to chemicals of concern in surface soil at the Site. The surface soil and groundwater pathways and receptors are described in the following subsections.

## 8.0 DESCRIPTION OF REMEDIAL ALTERNATIVES

### 8.1 Scope of the Remedial Action

This Record of Decision for the Beaunit Superfund site addresses remedies for surface soil and groundwater contamination present at the site. Sediments and surface water were also sampled during the Remedial Investigation as well. The Remedial Action is necessary to protect the public and environmental receptors from exposures to contaminated surface soils and groundwater. Additional sources or operable units are not expected.

The FS for the Site included the following five phases: i) development of remedial action objectives (RAOs); ii) development of general response actions; iii) identification of potential Technologies and process options; iv) development and screening of potential technologies and process options; and v) development and detailed analysis of the proposed remedial action alternatives. The RAOs for groundwater and surface soil were developed based on the information provided to the Beaunit Lagoon Site Group by EPA. The general response actions for groundwater included no action, institutional controls, collection, and treatment. The general response actions for surface soil included no action, diversion of surface water, containment, and removal/disposal.

## 8.2 Remedial Goal Options for Groundwater (RGOs)

The Remedial Action Objective (RAO) for groundwater remediation at the Site is to prevent human exposure, via any exposure route [ingestion and non ingestion (i.e., showering)] to groundwater containing contaminants in concentrations that exceed ARARs and appropriate risk levels.

EPA required that the Remedial Investigation's terminology of Preliminary Remedial Goals (PRGs), be referred to as remedial goal options (RGOs). The RGOs for groundwater at the Site were developed for the future resident and they were calculated for the contaminants of concern in groundwater using the following equation:

$$RGO = (TR \times EC)/CR$$

Where:

| | |
|---|---|
| RGO | Remedial Goal Options |
| TR | Target risk level (HQ = 1.0 for noncarcinogenic effects and risk level = 1E-06, 1E-05, and 1E-04 for carcinogenic effects). |
| EC | Exposure concentration in soil and groundwater. |
| CR | Calculated risk level |

The RGO's for groundwater are shown in attached Table 2.

## 8.3 Remediation Goal Options for Surface Soil (RGOs)

The Remedial Action Objective (RAO) for surface soil remediation at the Site is to prevent exposure of terrestrial species to the contaminants of concern in surface soils above appropriate risk levels.

The RGOs for surface soil were computed using the same equation that was used for groundwater. The RGOs for the contaminants of concern i.e., arsenic and nickel in surface soil for ecological risk calculated based on a hazard index of 1 are presented in attached Table 3. The RGO for arsenic (0.1 mg/kg) calculated based on a hazard index of 1 is one order of magnitude lower than the concentrations of arsenic detected in background surface soil samples (SB1 3 mg/kg, SB2 1.2 mg/kg, and SB3 5.6 mg/kg). ARGO for arsenic lower than background concentrations would lead to a cleanup of the Site to below background value. Therefore, the RG0 for arsenic should be based on background concentrations and not on the concentration calculated based on a hazard index of 1. An average background concentration of 3.2 mg/kg could be used as a RGO for arsenic in surface soil.

The concentration of nickel in surface soil based on a hazard index of 1 is 4.4 mg/kg. The concentration of nickel detected in background surface soil sample was 4.2 mg/kg. Therefore 4.4 mg/kg could be used as the RGO for nickel in surface soil.

## 8.4 Development of Alternatives

The NCP requires that the following alternatives be considered for development in-the Feasibility Study (FS) for a NPL site:

- An alternative that removes or destroys the hazardous constituents to the maximum extent feasible and eliminates the need for long-term monitoring and management;
- One or more alternatives that reduce the toxicity, mobility, or volume of the hazardous constituents;
- One or more alternatives that involve little or no treatment, but provide protection to human health and the environment by containing the hazardous constituents to control exposure to the wastes;
- One that involves innovative treatment technologies if those technologies offer the potential for comparable or superior performance or implementability, fewer adverse effects, or lower costs than demonstrated technologies; and
- The no action alternative.

Process options were identified for groundwater and surface soil based on the general response actions for each medium. The process options retained after initial screening phase for groundwater were natural attenuation, monitoring, groundwater pumping, precipitation, filtration, ion exchange, adsorption, and air stripping. The process options retained after the initial screening phase for soil were natural attenuation, grading and drainage controls, native soil/clay cap, excavation of surface soil, excavation of fill material, and off-site disposal.

The process options were further screened based on their effectiveness, implementability and cost. Eight remedial action alternatives for the Site were developed based on the process options retained after the screening phases. The remedial action alternatives are shown in Table 4.

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**Table 2**
**Beaunit ROD**
**Remediation Goal Options For Groundwater**
**RI/FS of Beaunit Corp. Circular Knit and Dyeing Plant Site**
**Fountain Inn, South Carolina**

| | | Remedial Goal Option | |
|---|---|---|---|
| Contaminant | Types of Risk | Risk-Based(1) | ARAR-Based |
| | Human Health | | |
| Benzene | Carcinogenic | 2 to 200 ug/L | 5 ug/L(2) |
| 2-Methylnaphthalene | Noncarcinogenic | 3 ug/L | NA |
| Naphthalene | Noncarcinogenic | 3 ug/L | NA |
| Beryllium | Carcinogenic | 0.01 to 1 ug/L | 4 ug/L(2) |
| Chromium VI | Noncarcinogenic | 40 ug/L | 100 ug/L(3) |
| Manganese | Noncarcinogenic | 40 ug/L | 200 ug/L(4) |

(1) Carcinogenic risk-based remediation goals are based on the risk range 1E-6 to 1E-4
Noncarcinogenic risk-based remediation goals are based on a hazard index of 1.0.
(2) ARAR-Based goal is based on MCL
(3) ARAR-Based goal is for total chromium
(4) ARAR-Based goal is based on MCLG
NA - Not applicable

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**Table 3**
**Beaunit ROD**
**Remediation Goal Options For Surface Soil**
**RI/FS of Beaunit Corp. Circular Knit and Dyeing Plant Site**
**Fountain Inn, South Carolina**

| | | Remediation Goal Options (RGOs) | |
|---|---|---|---|
| Contaminant | Types of Risk | Risk-Based | ARAR-Based |
| | Terrestrial Wildlife | | |
| Arsenic | Noncarcinogenic | 0.1 mg/Kg(1) | NA |
| Nickel | Noncarcinogenic | 4.4 mg/Kg(2) | NA |

(1) Noncarcinogenic risk-based goal has been calculated based on a hazard index of 1.0. The risk-based goal is lower than average background concentration by at least one order of magnitude. Therefore, the average background concentration of 3.2 mg/kg could be used as the RGO for arsenic in surface soil.

(2) Noncarcinogenic risk-based remediation goal has been calculated based on a hazard index of 1.0.
NA - Not applicable

## 8.5 Summary of Alternatives

Based on the results of the RI/FS reports and the risk assessment, cleanup levels were developed that would be protective of human health and the environment. These cleanup levels form the basis of any remedial activity. Various alternatives were evaluated in the FS report using these cleanup levels as goals for site cleanup. The ground water cleanup levels are based on state and federal standards, referred to as Maximum Contaminant Levels (MCLs). The soil/source cleanup levels were established to minimize site risks and insure future protection of ground water. The cleanup standards for the Beaunit site are presented in Table 2 and 3.

The FS report evaluated a variety of cleanup methods that could be used at this site. As required by CERCLA, a no further action alternative was evaluated to serve as a basis for comparison with the other active cleanup methods. The cleanup methods to address site related contamination which exceeds the cleanup goals are presented in this Record of Decision.

Costs shown in the Record of Decision for each alternative represent the midpoint of the low and high estimates for each alternative which are provided in greater detail in the Feasibility Study. A summary table of the high and low estimates for the costs of each alternative is attached as Table 5.

### 8.5.1 Alternative 1: No Action

A no action alternative is required by the NCP to be carried forward as a baseline for detailed comparison. Under this alternative no remedial actions will be conducted for groundwater and surface soil. Site monitor wells will be plugged and abandoned. The current site fence will not be actively maintained under this program. No groundwater monitoring or remediation activities will be conducted. This option does, however, include natural attenuation of groundwater and surface soil contaminants. Under this option, organic contaminants in groundwater and surface soil will biodegrade naturally. Metals will tend to persist in sediment and soils. Investigative derived waste (materials from well drilling and soil sampling) from the RI will be disposed and the Site will remain in its current condition. Mid-point of the range of costs for Alternative 1 in present worth is $5439.

### 8.5.2 Alternative 2 - Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Deed Restrictions

Alternative 2 combines an institutional control general response action for groundwater and the no action general response action for surface soil. Under this alternative, a monitoring program for groundwater, stream surface water, and stream sediment will be implemented to provide a method for identifying changes in the site conditions. Groundwater samples will be collected from six of the monitoring wells and from three surface water and sediment sampling locations (from the unnamed creek); these samples will be analyzed semi-annually for the first two years and annually for three years thereafter. The results will be assessed for future monitoring requirements. Site monitoring will (1) provide early warning of unacceptable contaminant migration, and (2) allow for a better understanding of the natural attenuation rates. Based on currently available information, no remedial action will be conducted for groundwater and surface soil. If future monitoring indicates a need for additional remedial action, such action will be considered. This alternative does include natural attenuation and biodegradation of groundwater and surface soil contaminants. Under this alternative, organic contaminants in groundwater and surface soils will degrade naturally. Institutional controls would prevent use of the shallow groundwater and preclude use of the site for new home construction. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties. Metals will not biodegrade and will tend to persist in soils. The investigative derived waste from the RI will be disposed and the site area will be maintained in its current condition. Mid-point of the range of present worth estimate costs for Alternative 2 is $276,887.

**Table 4**
**Beaunit ROD**

**Remedial Action Alternatives**
**RI/FS of Beaunit Corp. Circular Knit and Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Alternative Number | General Response Action | Remedial Alternative |
|---|---|---|
| 1 | No Action | No Action Alternative |
| 2 | Institutional Controls (gw) / No Action (ss) | Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions |
| 3 | Institutional Controls (gw) / Containment (ss) | Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions / Grading-Drainage Control-Soil and Clay Cap |
| 4 | Collection and Treatment (gw)/ Containment (ss) | Groundwater Pumping Treatment, Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions / Grading-Drainage Control-Soil and Clay Cap |
| 5 | Institutional Controls (gw)/Removal/Disposal of "Hot Spots" (ss) | Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Mechanical Excavation of "Hot Spots", Off-site Disposal of Excavated Material, and Backfill and Grade |
| 6 | Collection and Treatment (gw)/Removal/Disposal of "Hot Spots" (ss) | Groundwater Pumping and Treatment, Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Mechanical Excavation of "Hot Spots", Off-site Disposal of Excavated Material, and Backfill and Grade |
| 7 | Institutional Controls (gw)/Removal/Disposal of Site Surface Soils and Fill Area (ss) | Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Mechanical Excavation of Site Surface Soils and Fill Area, and Off-site Disposal of Excavated Material, and Backfill and Grade |
| 8 | Collection and Treatment (gw)/Removal/Disposal of Site Surface Soils and Fill Area (ss) | Groundwater Pumping and Treatment, Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Mechanical Excavation of Site Surface Soils and Fill Area, Off-site Disposal of Excavated Material, and Backfill and Grade |

**Table 5**
**Beaunit ROD**

**Comparison of Total Present Worth Costs for Remedial Alternatives**
**RI/FS of Beaunit Corp. Circular Knit and Dyeing Plant Site**
**Fountain Inn, South Carolina**

| | Alternative | High Estimate | Low Estimate |
|---|---|---|---|
| 1 | No Action | $7,417 | $3,461 |
| 2 | Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions | $377,622 | $176,151 |
| 3 | Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Grading-Drainage Control-Soil and Clay Cap | $748,625 | $349,159 |
| 4 | Groundwater Pumping Treatment, Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Grading-Drainage Control-Soil and Clay Cap | $8,239,948 | $3,845,376 |
| 5 | Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Mechanical Excavation of "Hot Spots", Off-site Disposal of Excavated Material, and Backfill and Grade | $1,370,675 | $243,193 |
| 6 | Groundwater Pumping and Treatment, Groundwater, Surface Water, and Sediment Monitoring, and Groundwater Use Restrictions/Mechanical Excavation of "Hot Spots", Off-site Disposal of Excavated Material, and Backfill and Grade | $8,865,058 | $3,740,838 |
| 7 | Groundwater, Surface Water, and Sediment Monitoring, and Groundwater Use Restrictions/Mechanical Excavation of Site Surface Soils and Fill Area, and Off-site Disposal of Excavated Material, and Backfill and Grade | $2,002,775 | $934,429 |
| 8 | Groundwater Pumping and Treatment, Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Mechanical Excavation of Site Surface Soils and Fill Area, Off-site Disposal of Excavated Material, and Backfill and Grade | $9,497,158 | $4,432,074 |

### 8.5.3 Alternative 3 - Groundwater, Surface Water, and Sediment Monitoring/Grading-Drainage Control-Soil and Clay Cap and Deed Restrictions

Alternative 3 combines the institutional control general response action for groundwater and the containment general response action for surface soil. Under this alternative, a monitoring program for groundwater, stream surface water, and stream sediment will be implemented to provide a method for identifying changes in the Site conditions. Groundwater samples will be collected from six of the monitoring wells. Three surface water and sediment sampling locations (from the unnamed creek) will also be sampled. Samples from these locations will be collected and analyzed semi-annually for the first two years and annually for three years thereafter. The results will then be assessed for future monitoring requirements. Site monitoring will (1) provide early warning of unacceptable contaminant migration, and (2) allow for a better understanding of the natural attenuation rates. If future monitoring indicates a need for additional remedial action, such action will be considered. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties.

The "hot spot" at pipeline location P5 will be excavated and tested by TCLP procedures to insure that the soil is not characteristically hazardous. Based on information gained during the RI, the soil should pass TCLP criteria. If the "hot spot" soil fails the TCLP procedures and is characterized as hazardous, then the soil will be excavated and sent to a RCRA Class C disposal facility. Assuming the criteria are met, the excavated material will be placed within the fenced area. Initially a 5' by 5' grid will be sampled. The extent of contamination will determine the amount of soil to be excavated. It is believed that 2' of depth will be sufficient with an area 20' by 20' or less. A native soil/clay cap will be placed over contaminated surface soil within the fenced area to serve as a barrier to potential ecological receptors that may be exposed to the surface soils. The Site will be graded, the lagoon will be backfilled, and 18 inches of clay will first be compacted over the graded surface soils. The waste located on the east side of the lagoon will also be used to backfill the lagoon. The water currently in the lagoon will not be removed. The cap will be placed over the filled lagoon. Then 12 inches of native soil will be graded over the clay. The cap will have a maximum permeability of 1 x 10-5 cm/sec. The natural soil will facilitate grass growth. Grass will provide erosion control. Approximately 5,000 yd3 of clay and 3,000 yd3 of soil will be required for the construction. These materials, at the required thicknesses, will be spread and graded over the entire Site. The cap will be of appropriate gradient as to facilitate direct stormwater run-off.

The grading work at the site will involve the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread and compact loose soil and modify the surface gradient. Grading the site will control surface runoff and reduce erosion. After placement of a natural soil and clay cap, grass will grow on the site and the site will be maintained by cutting the grass and periodically inspecting the cap for damage. An earthen berm, ditch or other drainage control feature will also be constructed to divert surface water away from and around the Site. Therefore, surface water run-off will not cause excessive soil erosion and contaminant transport. Based on the gradient of the Site, drainage controls could be constructed along the southern and southeastern border of the Site. The mid-point of the range of present worth costs for Alternative 3 is $548,892.

A diagram of Alternative 3 is attached as Figure 13, and a detailed breakdown of the implementation costs for this alternative is attached as Table 6.

<IMG SRC 0495254N>

### 8.5.4 Alternative 4 - Groundwater Pumping and Treatment/Grading & Drainage Control-Soil and Clay Cap and Deed Restrictions

Alternative 4 combines the removal and treatment general response action for groundwater and the containment general response action for surface soil. Deed restrictions are also included. Under this alternative, groundwater will be pumped from monitoring wells that will be determined during the remedial design. For cost and design estimation purposes, MW4S and MW5S have been designed as the extraction wells. These wells will be pumped at a combined rate of approximately 5 gallons/minute. The contaminants of concern include benzene, chromium VI, manganese, naphthalene, 2-methylnaphthalene, and beryllium. To remove beryllium, chromium, and manganese a dual filtration cartridge system will be used. The first cartridge will be a 3 micron filter. This cartridge will remove the larger particulate that may foul the smaller (second) filtration cartridge. A precipitation system may also be needed prior to the filtration system to remove silt or other larger particles, i.e., iron, manganese, and chromium.

**Table 6**
**Beaunit ROD**

**Remedial Technology Cost Estimates - Alternative 3**
**RI/FS of Beaunit Corp. Circular Knit and Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Item | Capital Cost | | Annual Cost | |
|---|---|---|---|---|
| | High Estimate | Low Estimate | High Estimate | Low Estimate |
| Technology | | | | |
| Grading, Drainage Control Soil and Clay Cap (1) | $225,000 | $105,000 | $3,750 | $1,750 |
| Total | $225,000 | $105,000 | $3,750 | $1,750 |
| Technology | | | | |
| Groundwater and Surface Water Monitoring (Years 1 & 2) | | | $90,015 | $42,007 |
| Total | $0 | $0 | $90,015 | $42,007 |
| Groundwater and Surface Water Monitoring (Years 3 through 5) | | | $58,500 | $27,300 |
| Total | $0 | $0 | $58,500 | $27,300 |
| Engineering Management (Years 1 & 2) | | | | |
| Travel (2) | | | $600 | $280 |
| Per Diem (3) | | | $1,800 | $840 |
| Biannual Report Submittal (4) | | | $9,600 | $4,480 |
| Well Abandonment | $1,312 | $613 | | |
| Support Plans (H&S, SAP) (5) | $24,000 | $11,200 | | |
| RD Work Plan (6) | $24,000 | $11,200 | | |
| Design Plans (7) | $24,000 | $11,200 | | |
| Total | $73,312 | $34,213 | $12,000 | $5,600 |
| Engineering Management (Years 3 through 5) | | | | |
| Travel (2) | | | $300 | $140 |
| Per Diem (3) | | | $900 | $420 |
| Annual Report Submittal (4) | | | $4,800 | $2,240 |
| Total | $0 | $0 | $6,000 | $2,800 |

| | | | | |
|---|---|---|---|---|
| Construction Management | | | | |
| Bidding & Contracting (8) | $15,000 | $7,000 | | |
| Oversight (9) | $24,000 | $11,000 | | |
| Surveying (10) | $4,500 | $2,100 | | |
| TOTAL | $43,500 | $20,100 | $0 | $0 |
| | | | | |
| Present Worth (Years 1 & 2) | | | | |
| Interest Rate | 0.05 | | | |
| Number of Years | 2 | | | |
| Present Worth Factor = [(1+i)^n-1]/i(1+i)^n | 1.86 | | | |
| Present Worth | | | $531,560 | $247,862 |
| | | | | |
| Present Worth (Years 3 through 5) | | | | |
| Interest Rate | 0.05 | | | |
| Number of Years | 3 | | | |
| Present Worth Factor = [(1+i)^n-1]/i(1+i)^(n+2) | 2.47 | | | |
| Present Worth | | | $159,315 | $74,347 |
| | | | | |
| Present Worth of Cap | | | | |
| Maintenance Cost (30 years) | | | | |
| Interest Rate | 0.05 | | | |
| Number of Years | 30 | | | |
| Present Worth Factor = [(1+i)^n-1]/i(1+i)^n | 15.4 | | | |
| Present Worth | | | $57,750 | $26,950 |
| | | | | |
| Total Present Worth | | | $748,625 | $349,159 |

Low and high estimates based on -30% to +50% variation.

(1) - Annual costs associated with maintenance activities will accrue for 30 years.
(2) - Each trip, 4 days, $50/day
(3) - Each trip, 8 Man days, $75/day
(4) - Each report, 40 manhrs/report, $80/hr
(5) - 200 man-hr, $80/hr = $16,000
(6) - 200 man-hrs, $80/hr = $16,000
(7) - 200 man-hrs, $80/hr = $16,000
(8) - Lump Sum, $10,000
(9) - 200 man-hrs, $80/hr = $16000
(10) - Lump Sum, $3000

The second filtration cartridge will be a 0.3-micron filter. This cartridge will remove the beryllium to below 4 ug/L. The effluent from the submicron filtration cartridge will pass through a carbon adsorption unit. The carbon adsorption unit will remove the benzene, naphthalene, and 2-methylnaphthalene. The adsorption unit will hold approximately 180 lbs. of carbon. The activated carbon system sized for the groundwater characteristics and extraction rate from MW4S and MW5S will require carbon replacement every 60 days. The removed carbon will be sent off-site for regeneration or disposal. The effluent from the carbon system will be discharged via a pipe to the unnamed creek. The entire water treatment unit will be located on the Site property. A concrete foundation with a protective overhead shed will be constructed to protect the units. The duration of groundwater treatment is based on the size of the contaminated plume, pumping and treatment flow rates, and extraction efficiency (i.e., removal of contaminants from the water bearing zone). The extent of contaminants in groundwater is expected to be localized because the RI data did not indicate the existence of a significant plume. The pumping and treatment flow rates are 5 gpm. For estimation purposes, it is assumed that water treatment would continue for five years. Water samples will be collected monthly from the influent and effluent of the treatment units to periodically verify that treatment standards are being met. Samples will be analyzed for benzene, PNAs, beryllium, chromium VI, and manganese. After five years, an evaluation will be conducted to determine if further treatment is necessary. After treatment has discontinued, a groundwater, stream surface water, and stream sediment monitoring program similar to Alternative 2 will be initiated. Treatment would not begin until each monitor well is sampled and groundwater samples are analyzed at least one time to confirm the presence of the contaminants of concern (COCs) and their concentrations. If future monitoring indicates a need for additional remedial action, such action will be considered. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties.

The "hot spot" at pipeline location P5 will be excavated, tested by TCLP procedures to insure it is not characteristically hazardous. If the "hot spot" fails TCLP procedures and is characterized as hazardous, then the soil will be excavated and sent to a RCRA Class C disposal facility. Assuming TCLP criteria are met and the soil is not hazardous, then the excavated material will be placed within the fenced area. A native soil/clay cap can be placed over contaminated surface soil within the fenced area to serve as a barrier to potential ecological and human receptors that may be exposed to the surface soils. The Site will be graded, the lagoon will be backfilled, and 18 inches of clay will first be compacted over the graded surface soils. The waste located on the east side of the lagoon will also be used to backfill the lagoon. The water currently in the lagoon will not be removed. The cap will be placed over the filled lagoon. Then 12 inches of native soil will be graded over the clay. The cap will have a maximum permeability of 1 x 10-5 cm/sec.

The natural soil will facilitate grass growth. Grass will provide erosion control. Approximately 5,000 yd3 of clay and 3,000 yd3 of soil will be required for the construction. These materials, at the required thicknesses, will be spread and graded over the entire Site. The cap will be of appropriate gradient as to facilitate direct stormwater run-off.

The grading at the Site involves the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread and compact loose soil and modify the surface gradient. Grading the site will control surface runoff and reduce erosion. With the implementation of a natural soil and clay cap, grass will grow on the site and the site will be maintained by cutting the grass and periodically inspecting the cap for damage.

An earthen berm, ditch, or other drainage feature will be constructed to divert surface water away from and around the Site. Therefore, excessive surface water run-off will be diverted from the Site and not cause surface soil erosion and contaminant transport. Based on the gradient of the Site, drainage control could be constructed along the southern and southeastern border of the Site. Deed restrictions are also a component of Alternative 4. Costs for Alternative 4 in present worth have a mid-point of $6,042,662.

### 8.5.5 Alternative 5 - Groundwater, Surface Water, and Sediment Monitoring/Excavation of "Hot Spots" and Off-site Disposal and Deed Restrictions

Alternative 5 combines the institutional control general response action for groundwater and the removal and off-site disposal general response actions for surface soil. Under this alternative, a monitoring program for groundwater, stream surface water, and stream sediments will be implemented to provide a method for identifying changes in the Site Conditions. Groundwater samples will be collected from six of the monitoring wells. Three surface water and sediment sampling locations (from the unnamed creek) will also be sampled. Samples from these locations will be collected and analyzed semiannually for the first two years and annually for three years thereafter. The results will be assessed for future monitoring requirements. Site monitoring will (1) provide early warning of unacceptable contaminant migration, and (2) allow for a better understanding of the natural attenuation rates. If future

monitoring indicates a need for additional remedial action, such action will be considered. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties. Within the Site, surface soil that contains COC concentrations above cleanup levels will be excavated and disposed at an off-site landfill. Four surface soil samples collected during the RI had arsenic and/or nickel concentrations above soil action levels. Additional soil samples will be collected in a 20-ft grid around the sampling location. At the pipeline location P5, soil samples will be collected at the corners of a 5-ft grid. The soil samples will be analyzed for arsenic and nickel and, if a sample from this additional sampling exceeds the cleanup levels for arsenic or nickel, soil samples will be collected from a 20-ft grid around that sampling location or a 5-ft grid for the pipeline location around the exceedance location. Excavation will be completed within a boundary of soil sample locations that have nickel and arsenic concentrations below their respective preliminary remediation goals.

A range of costs was developed for this option. The lower range assumes the surface soil excavation will be limited to a volume of 20 ft by 20 ft by 2 ft around four RI sample locations (shown in Figure 3.6 of the Feasibility Study) and a volume of 5 ft by 5 ft by 2 ft at pipeline location P5. This scenario assumes all samples collected around the "hot spots" are below Remedial Goal Options (RGO's) for surface soil. The total volume of excavation for this scenario is approximately 120 yd3. The higher range costs for this Alternative assumes that all surface soils within the site will require excavation and disposal. The total volume of excavation for this scenario is approximately 5,000 yd3. Additionally the cost of surface soil sampling and analyses will be a significant part of the total cost of this option. Soil will be excavated to a 2 ft. depth. The excavated soil will be transported to an off-site landfill for disposal.

The soil may be disposed in a Subtitle D landfill if the soil is not characteristically hazardous. Based on information gained during the RI, the soil would pass TCLP criteria and may be accepted for disposal at an off-site solid waste landfill. If the soil should fail TCLP criteria and be characterized as hazardous, the soils would be transported to a Subtitle C disposal facility, raising the cost of Alternative 5 substantially.

The excavated areas will be backfilled and graded. The grading work at the site will involve the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread and compact loose soil and modify the surface gradient. Grading the site will control surface runoff and reduce erosion. Grass seeding will be used to grow grass within the excavated areas.

The extent of soil excavation will impact the number of analyses, amount of soil needing excavation, amount of backfill required, and the amount of grading required following backfill.

The present worth costs of Alternative 5 are estimated to be in the range of $243,193 to $1,370,675, with the mid-point of costs for this Alternative as $806,934.

### 8.5.6 Alternative 6 - Groundwater Pumping and Treatment/Excavation of "Hot Spots" and Off-site Disposal and Deed Restrictions

Alternative 6 combines the removal and treatment general response action for groundwater and the removal and disposal general response action for surface soil. Under this alternative groundwater will be pumped from monitoring wells that will be determined during the remedial design. For cost and design estimation purposes, MW4S and MW5S have been designed as the extraction wells. These wells will be pumped at a combined rate of approximately 5 gallons/minute. The contaminants of concern include benzene, chromium VI, manganese, naphthalene, 2-methylnaphthalene, and beryllium. To remove beryllium, a dual filtration cartridge system will be used. The first cartridge will be a 3-micron filter. This cartridge will remove the larger particulate that may foul the smaller (second) filtration cartridge. (A precipitation system may also be needed prior to the filtration system to remove silt or other larger particles, e.g., iron, manganese, and chromium.) The second filtration cartridge will be a 0.3-micron filter. This cartridge will remove beryllium to below 4 ug/L.

The effluent from the submicron filtration cartridge will pass through a carbon adsorption unit. The carbon adsorption unit will remove the benzene, naphthalene, and 2-methylnaphthalene. The adsorption unit will hold approximately 180 lbs. of carbon. The activated carbon system sized for the groundwater characteristics and extraction rate from MW4S and MWSS will require carbon replacement every 60 days. The removed carbon will be sent off-site for regeneration or disposal. The effluent from the carbon system will be discharged via a pipe to the unnamed creek.

The entire water treatment unit will be located on the Site property. A concrete foundation with a protective overhead shed will be constructed to protect the units.

The duration of groundwater treatment is based on the size of the contaminated plume, pumping and treatment flow rates, and extraction efficiency (for example, removal of contaminants from the water bearing zone). The extent of contaminants in groundwater is expected to be localized because the RI data did not indicate the existence of a significant plume. The pumping and treatment flow rates are 5 gpm. For estimation purposes, it is assumed that water treatment would continue for five years. Water samples will be collected monthly from the influent and effluent of the treatment units to periodically verify that treatment standards are being met. Samples will be analyzed for Benzene, poly nuclear aromatics (PNA's), beryllium, chromium, and manganese. After five years, an evaluation will be conducted to determine if further treatment is necessary. After treatment has discontinued, a groundwater, stream surface water, and stream sediment monitoring program similar to Alternative 2 will be initiated. Treatment will not begin until each monitoring well is sampled and analyzed at least one time to confirm the presence of the COCs and their concentrations. If future monitoring indicates a need for additional remedial action, such action will be considered. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties.

Within the Site, surface soil that contains COC concentrations above cleanup levels will be excavated and disposed at an off-site landfill. Four surface soil samples collected during the RI had arsenic and/or nickel concentrations above soil action levels. Additional soil samples will be collected in a 20-ft grid around the sampling location. At the pipeline location P5, soil samples will be collected at the corners of a 5-ft grid.

The soil samples will be analyzed for arsenic and nickel and, if a sample from this additional sampling exceeds the cleanup levels for arsenic or nickel, soil samples will be collected from a 20-ft grid around that sampling location or a 5-ft grid for the pipeline location around the exceedance location. Excavation will be completed within a boundary of soil sample locations that have nickel and arsenic concentrations below their respective preliminary remediation goals. A range of cost was developed for this option. The lower range will assume the surface soil excavation will be limited to a volume of 20 ft by 20 ft by 2 ft around four RI sample locations and a volume of 5 ft by 5 ft by 2 ft at pipeline location P5. This scenario assumes all samples collected around the "hot spots" are below RGOs for surface soil. The total volume of excavation for this scenario is approximately 120 yd3. The higher range units of excavation for removal of "hot spots" assumes that all surface soils within the site will require excavation and disposal. The total volume of excavation for this scenario is approximately 5,000 yd3. Additionally the cost of surface soil sampling and analyses will be a significant part of the total cost of this option. Soil will be excavated to a 2 ft. depth. The excavated soil will be transported to an off-site landfill for disposal. The soil may be disposed in a Subtitle D landfill if the soil is not characteristically hazardous. Based on information gained during the RI, the soil would pass TCLP criteria and may be accepted for disposal at an off-site solid waste landfill. If the soil should fail TCLP criteria and be characterized as hazardous, the soils would be transported to a Subtitle C disposal facility, raising the cost of Alternative 6 substantially.

The extent of soil excavation will impact the number of analyses, amount of soil needing excavation, amount of backfill required, and the amount of grading required following backfill.

Present worth cost estimates for Alternative 6 range from $3,740,838 to $8,865,058, with a mid-point cost of $6,302,948.

### 8.5.7 Alternative 7 - Groundwater, Surface Water, and Sediment Monitoring/Excavation of Site Surface Soils and Fill Area and Offsite Disposal

Alternative 7 combines the institutional control general response action for groundwater and a second combined removal and disposal general response action for surface soil. Under this alternative, a monitoring program for groundwater, stream surface water, and stream sediment will be implemented to provide a method of identifying changes in the Site conditions. Groundwater samples will be collected from six of the seven RI monitoring wells and from three surface water and sediment sampling locations (from the unnamed creek). The routines for sampling and analyses will be the same as in Alternative 5. Site monitoring will (1) provide early warning of unacceptable contaminant migration, and (2) allow for a better understanding of the natural attenuation rates, If future monitoring indicates a need for additional remedial action, such action will be considered. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties.

Within the Site, all surface soil and the fill material (located east of the lagoon) will be excavated, contained and disposed off-site. With this option, surface soils within the site boundaries and at pipeline location P5 (5 ft by 5 ft) will be excavated to 2 ft depth. Approximately 5,000 yd3 of surface soil would require excavation. The fill area is approximately 1,800 yd3. The fill extends to an average

of approximately 10 ft. Therefore approximately 6,000 yd3 would require excavation. The excavated soil will be contained for disposal. The soil may be disposed in a Subtitle D landfill if the soil is not characteristically hazardous. Based on information gained during the RI, the soil should pass TCLP criteria and may be accepted to an off-site solid waste landfill. The excavated areas would then be backfilled with natural soil. If the soil should fail TCLP criteria and be characterized as hazardous, the soils would be transported to a Subtitle C disposal facility, raising the cost of Alternative 7 substantially.

Under Alternative 7, the existing lagoon would be backfilled and the entire site will be graded. The grading work at the site will involve the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread and compact loose soil and modify the surface gradient. Grading the site will control surface runoff and reduce erosion. Grass seeding will be used to grow grass within the site.

The estimated present worth costs for Alternative 7 range from a low of $934,429 to a high of $2,002,775, with a mid-point of $1,468,602.

### 8.5.8 Alternative 8 - Groundwater Pumping and Treatment/Excavation of Site Surface Soils and Fill Area and Off-site Disposal

Alternative 8 combines the removal and treatment general response action for groundwater and a second combined removal and disposal general response action for surface soil. Under this alternative groundwater will be pumped from Monitoring wells that will be determined during the remedial design. For cost and design estimation purposes, MW4S and MWSS have been initially chosen as the extraction wells. These wells will be pumped at a combined rate of approximately 5 gallons/minute. The contaminants of concern include benzene, chromium VI, manganese, naphthalene, 2-methylnaphthalene, and beryllium. To remove beryllium, a dual filtration cartridge system will be used. The first cartridge will be a 3 micron filter. This cartridge will remove the larger particulate that may foul the smaller (second) filtration cartridge. (A precipitation system may also be needed prior the filtration system to remove silt or other larger particles, i.e., iron, manganese, and chromium.) The second filtration cartridge will be a 0.3-micron filter. This cartridge will remove the beryllium to below 4 ug/L.

The effluent from the submicron filtration cartridge will pass through a carbon adsorption unit. The carbon adsorption unit will remove the benzene, naphthalene, and 2-methylnaphthalene. The adsorption unit will hold approximately 180 lbs. of carbon. The activated carbon system sized for the groundwater characteristics and extraction rate from MW4S and MW5S will require carbon replacement every 60 days. The removed carbon will be sent off-site for regeneration or disposal. The effluent from the carbon system will be discharged via a pipe to the unnamed creek.

The entire water treatment unit will be located on the Site property. A concrete foundation with a protective overhead shed will be constructed to protect the units.

The duration of groundwater treatment is based on the size of the contaminated plume, pumping and treatment flow rates, and extraction efficiency. The extent of contaminants in groundwater is expected to be localized because the RI data did not indicate the existence of a significant plume. The pumping and treatment flow rates are 5 gpm. For estimation purposes, it is assumed that water treatment would continue for five years. Water samples will be collected monthly from the influent and effluent of the treatment units to periodically verify that treatment standards are being met. Samples will be analyzed for benzene, PNAs, beryllium, chromium, and manganese. After five years, an evaluation will be conducted to determine if further treatment is necessary. After treatment has discontinued, a groundwater, stream surface water, and stream sediment monitoring program similar to Alternative 5 will be initiated. Prior to treatment, each well will be sampled and analyzed at least one time to confirm the presence of the COCs and their concentrations. If future monitoring indicates a need for additional remedial action, such action will be considered. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties.

Within the Site, all surface soil and the fill material (located east of the lagoon) will be excavated, contained and disposed off-site. With this option, surface soils within the site boundaries and at pipeline location P5 (5 ft by 5 ft) will be excavated to 2 ft depth. Approximately 5,000 yd3 of surface soil would require excavation. The Fill area is approximately 1,800 yd3. The fill extends to an average of approximately 10 ft. Therefore approximately 6,000 yd3 would require excavation. The excavated soil will be contained for disposal. The soil may be disposed in a Subtitle D landfill if the soil is not characteristically hazardous. Based on information gained during the RI, the soil should pass TCLP criteria and will be accepted to an off-site solid waste landfill. The excavated areas would then be backfilled with natural soil. If the soil should fail TCLP criteria and be characterized as hazardous, the soils would De transported to a Subtitle C disposal facility, raising the cost of Alternative 8

substantially.

Under this alternative the existing lagoon will be backfilled and the entire site will be graded. The grading, work at the site will involve the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread and compact loose soil and modify the surface gradient. Grading the site will control surface runoff and reduce erosion. Grass seeding will be used to grow grass within the site.

The range of present worth costs for Alternative 8 range from a low of $4,432,074 to $9,497,158, with a mid-point of $6,964,616.

## 9.0 COMPARATIVE ANALYSIS OF ALTERNATIVES

The NCP lists nine criteria to serve as the basis for conducting the alternative screening and detailed analysis during the feasibility study, and for subsequently selecting an appropriate remedial action. The evaluation criteria are as follows:

- Overall protection of human health and the environment
- Compliance with ARARs
- Long-term effectiveness and permanence
- Short-term effectiveness
- Reduction of toxicity, mobility, and volume through treatment
- Implementability
- Cost
- State Acceptance
- Community Acceptance

EPA has established criteria for use in comparing the advantages/disadvantages of each alternative. The nine evaluation criteria fall into three groups: threshold criteria, primary balancing criteria, and modifying criteria. The first two criteria, threshold criteria, are essential and must be met before an alternative is considered further. The next five criteria, primary balancing criteria, are used to further evaluate all options that meet the first two criteria. The final two criteria, modifying criteria, are used to further evaluate EPA's Proposed Plan after public and State comments have been received.

The following discussion compares the various alternatives to the criteria.

### 9.1 Overall Protection of Human Health and the Environment

This criterion is used to assess whether a remedial alternative provides adequate protection of human health and the environment. The overall assessment takes into account the assessments conducted under all other evaluation criteria, especially long and short-term effectiveness and compliance with ARARS. The assessment of overall protection should focus on whether an alternative achieves adequate protection, and should describe how site risks are reduced, controlled, or eliminated by the implementation of the alternative.

Relative to groundwater concerns, the alternatives without groundwater pumping and treatment (Alternatives 1,2,3,5,7) will have decreases in the concentrations of organic contaminants through natural attenuation. While metals would tend to persist, migration of metals was not observed during the RI. Alternatives with pump and treatment of groundwater (Alternatives 4,6) would enhance the speed of the reduction of organic contaminants. Groundwater monitoring and use restrictions of all alternatives except the no action alternative would preclude exposure to the groundwater and provide early warning of unacceptable contaminant migration.

Relative to surface soil, alternatives 1 and 2 do not reduce risks to ecological receptors. All other alternatives eliminate risk to area biota.

### 9.2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

This criterion is used to determine whether each remedial alternative complies with ARARS, as defined in CERCLA Section 121 (d).

All non pump and treat alternatives will not immediately meet chemical-specific ARARs including MCLs, but the concentrations of organic contaminants of concern in groundwater will decrease over time (about 5 years) through natural attenuation and will be in compliance with chemical specific ARARs. While metals would tend to persist, monitoring and groundwater use restrictions would prevent exposure and provide warning of contaminant migration, as yet undetected. Groundwater pump and treat alternatives would provide compliance sooner than non pump and treat alternatives.

Relative to action-specific ARARs, Alternatives 3 through 8 comply with requirements of the SC Groundwater Use Act (Title 49, Chapter 5) and the SC Stormwater Management and Sediment Reduction Act (Title 48, Chapter 14) relative to monitoring wells and excavation of surface soils. Alternatives 3 through 8 shall also comply with RCRA as an ARAR with the respective characterization of "hot spot" or surface soils determining whether disposal can be on-site within the fence or off-site at a Subtitle C or Subtitle D facility. Subtitle C facility disposal would be necessary for any soil characterized as hazardous. Non-hazardous soils could be disposed at a Subtitle D landfill, or moved within the fenced area. No location specific ARARs have been identified for the site.

### 9.3 Cost

The cost estimates for implementing an alternative are addressed by the following factors:

- Capital Costs: The direct and indirect capital costs for each remedial alternative are evaluated. Direct capital costs may include construction, equipment, land and site development, buildings and services, and waste disposal costs. Indirect capital cost may include engineering expenses, legal fees, license or permit costs, start-up costs, and contingency allowances.

- Operation and Maintenance Cost: Operation and maintenance (O&M) costs are post-construction costs necessary to maintain the effectiveness of a remedial action. These costs include raw material costs, maintenance materials and labor costs, operating labor costs, energy, disposal of residues, insurance, taxes, costs of periodic site reviews, and licensing.

- Present Worth: Present worth analysis allows the evaluation of future expenditures for each remedial alternative relative to a common base year. It is a combination of capital costs and the present worth of operation and maintenance costs over the life of the remedy.

A summary of the present worth cost which includes the capital as well as the operation and maintenance cost for each of the alternatives is presented within the explanation of the alternative.

### 9.4 Implementability

This criterion addresses the technical and administrative feasibility of implementing an alternative and the availability of services and materials for its implementation. The following factors are analyzed by this criterion:

- Technical feasibility: this factor addresses the difficulties and unknowns associated with the remedial technologies proposed in each alternative as well as their reliability. Most treatment alternatives will require some level of predesign testing. Bench and pilot-scale testing may be required for technologies that are not proven.

- Administrative feasibility: this factor addresses the level of agency activity needed to coordinate the implementation of an alternative.

- Availability of services and materials: this factor addresses the availability of adequate treatment, storage, or disposal facilities, the availability of vendors, and the availability of necessary equipment required for implementing an alternative.

The implementability of an alternative is based on technical feasibility, administrative feasibility and the availability of services and materials. All components of each alternative are both technically and administratively feasible. The design and construction of soil caps is commonly done. Soil excavation and removal would be difficult and require significant administrative requirements, but is commonly done. Necessary technology, services, and materials are all readily available. Pump and treat remedies are commonly installed at Superfund Sites, although due to the long term requirements of these remedies,

their effectiveness has not been fully determined at many other sites.

**9.5 Short Term Effectiveness**

This criterion addresses the effects of each alternative during the construction and implementation phase until the remedial response objectives have been attained. The following factors of this criterion are addressed for each remedial alternative:

- Potential impacts on the community during implementation of remedial alternatives: this factor addresses risk that results from the implementation of remedial alternatives, such as air pollutant emissions that might affect community health.

- Potential impacts on workers during implementation of remedial alternatives: this aspect of short-term effectiveness addresses threats that might be posed to workers during the implementation of a remedial alternative, as well as the effectiveness and reliability of protective measures that will be implemented onsite to mitigate those threats.

- Potential environmental impacts: this factor addresses the potential adverse effects on the environment resulting from the construction and implementation of an alternative, and the effectiveness and reliability of measures that may be taken to mitigate the adverse effects.

- Time until protection is achieved: this factor addresses the time required from the time that a technology is chosen until the remedial objectives are met. This factor also includes delays in implementing the technology, as well as the period of time that the technology.

During the implementation of all the alternatives, both onsite workers and people surrounding the site will be protected from possible impacts caused by construction activities. Risks from cap installation or soil excavation and removal would be addressed in health and safety plans. Installation of a cap would be immediately effective in reducing leaching from soils into the groundwater. There is no risk to the environmental receptors from implementation of any remedy, although habitats would be disrupted during installation activities. Community risks from construction truck traffic would be short term and safety could be insured by additional signage and traffic control.

**9.6 Long-Term Effectiveness and Permanence**

This criterion addresses the extent of residual risk at the Site after the remedial objectives have been met. In addition, this criterion will address whether conditions that pose unacceptable risks may reoccur at some point after the remediation is complete. The following factors are addressed by this criterion:

- Permanence: this factor addresses the permanence of remedies for the Site.

- Magnitude of total residual risk: this factor assesses the long-term risk associated with exposure to treatment residuals and untreated residual contamination.

- Adequacy and reliability of controls: this factor addresses the type and degree of long-term management, monitoring, and operation and maintenance functions that must be performed. This factor also addresses the ability of technologies to meet the required process efficiencies or performance specifications.

- Need for periodic review: this factor addresses the adequacy and suitability of controls, if any, that are used to manage treatment residuals or untreated wastes that remain on-site. It includes the assessment of potential exposure and the associated risks should the remedial action need replacement.

- Certainty of Success: this factor addresses the level of confidence for the chosen technologies to meet the remedial criteria.

All of the alternatives under consideration by EPA in this Record of Decision were evaluated for this criteria under each of its components consisting of 1) permanence, 2) magnitude of residual risk, 3) adequacy and reliability of controls, 4) need for periodic review, and 5) certainty of success. Relative to permanence and magnitude of residual risk, Alternatives 1,2,3,5, and 7 only reduce risk in groundwater after natural attenuation processes are complete. Pump and treat Alternatives 4,6, & 8 will reduce risks from groundwater more quickly. Alternatives 1 and 2 do not reduce ecological risks while all other alternatives do. Adequacy and reliability of controls for all alternatives is generally good with the proviso that institutional controls in Alternative 2 are dependent on tight governmental control. All

alternatives involving regular monitoring will require periodic review as will alternatives involving capping the site. Alternatives involving excavation and soil replacement will not require periodic review. All alternatives have approximately the same certainty of success wish the pump and treat alternatives having the ability to meet Remedial Action Objectives more quickly.

### 9.7 Reduction of Toxicity, Mobility, and Volume

This criterion addresses the preference stated in CERCLA Section 121 that remedial alternatives be selected which employ technologies that permanently and significantly reduce the toxicity, mobility, or volume of contaminants. This preference is satisfied when treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, reduction of the total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media. The following specific factors are taken into consideration:

- Treatment or recycling processes;
- Reduction of toxicity, mobility and volume of potential contaminants of concern in each medium of concern; and
- Degree to which treatment is irreversible.

This criteria was evaluated for each of its components consisting of 1) treatment used, 2) reduction of toxicity, mobility, or volume, 3) type and quantity of residuals remaining after treatment, and 4) irreversibility of treatment. Only pump and treat alternatives involve treatment and are considered irreversible. Such treatment will generate residuals which will require off-site disposal Alternatives involving soil excavation and removal will reduce the toxicity, mobility, and volume by removal of the contaminated soils. Capping alternatives will reduce the mobility of the contaminants, while soil excavation remedies are considered irreversible.

### 9.8 State Acceptance

The State of South Carolina's Department of Health and Environmental Control was consulted during the drafting of both the Proposed Plan and this Record of Decision. SCDHEC has concurred with this Record of Decision. A copy of the State Concurrence letter is attached as Appendix A.

### 9.9 Community Acceptance

The purpose of this Record of Decision and the upcoming comment period is to encourage input from the public during the remedy selection process. No adverse comments were received during the public comment period to the then-Proposed Plan for the Site. The few comments that were received are contained with an Agency response in the Responsiveness Summary attached to this document as Appendix B.

## 10.0 SELECTED REMEDY

### 10.1 Preferred Alternative Summary

In summary, based on all information available at this time, EPA has selected and supports a modification to Alternative 3: Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Grading-Drainage Control-Soil and Clay Cap and Deed Restrictions, as the selected remedy for the Beaunit Site. The only modification to Alternative 3 as described earlier in this Record of Decision and within the Feasibility Study is the design specifications for the Cap. Both EPA and SCDHEC concur that the cap should be designed to meet a specification of 10-9 permeability, rather than the 10-5 permeability contained in the alternative as developed in the Feasibility Study. The change was based on modeling the site with the Summers model, commonly used to predict effectiveness in caps to prevent leaching from soils of contaminants. EPA and SCDHEC feel the higher degree of impermeability of a cap built to 10-9 specifications would insure that the RGO's would be met in the groundwater. The exact details of the construction of the cap will be determined during the Remedial Design. Several assumptions were made during EPA/SCDHEC change in design specifications for the cap. Utilizing cost comparisons to other recent 10-9 cap designs for sites in this area capital costs are estimated to be $32,000 additional for the site remedy. Several modeling runs of caps that could achieve 10-9 were performed on RACER software.(Remedial Action Cost Engineering and Requirements System, Dept. of Air Force, 1993). From those efforts, it is believed that the capital cost of the Modified Alternative 3 site cap would be between $212,000 to $220,000, below the $225,000 high range of the Feasibility Study estimate of capital costs for the 10-9 cap. EPA believes that a conservative estimate of the total costs for the Selected Remedy, the modified Alternative 3 is $580,882. This alternative represents the best balance among the criteria used to evaluate remedies. Under this selected remedy a monitoring program

for groundwater, stream surface water, and stream sediment will be implemented to provide a method of identifying changes in the Site conditions. Groundwater samples will be collected from six of the seven RI monitoring wells and from three surface water and sediment sampling locations (from the unnamed creek). Site monitoring will (1) provide early warning of unacceptable contaminant migration, and (2) allow for a better understanding of the natural attenuation rates. If future monitoring indicates a need for additional remedial action, such action will be considered. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties. The modified Alternative 3 is believed to be protective of human health and the environment, would attain ARARs, would be cost effective, and would utilize permanent solutions and alternative treatment technologies or resource technologies to the maximum extent practicable.

Alternatives 1 and 2, i.e., no action and institutional controls, do not specifically address the risks to potential ecological receptors. Alternatives 3 through 8 would achieve the RAOs for the Site. Alternative 3 would achieve the RAOs for the Site more cost effectively than Alternatives 4 through 8.

**10.2 Applicable or Relevant and Appropriate Requirements (ARARs)**

ARARs originate from applicable requirements, intended to definitely and specifically apply to a remedial action; or relevant and appropriate requirements, which, while not intended to apply to the specific situation in question, EPA judges to be applicable to a remedial action. In addition, when establishing criteria for ensuring the proper implementation of a remedial action, EPA may develop requirements from other guidance documents and criteria, sources often referred to as "To Be Considered" material (TBC). Attached Tables 7, 8, 9, 10 and 11 summarize potential ARARs, both Federal and State. Table 12 lists "To Be Considered" material.

**10.2.1 Applicable Requirements**

Soil remediation shall comply with all applicable portions of the following Federal and State of South Carolina regulations:

49 CFR Parts 107, 171-179, promulgated under the authority of the Hazardous Materials Transportation Act. Regulates the labeling, packaging, placarding, and transport of hazardous materials off-Site.

40 CFR Parts 261, 262 (Subparts A-D), 263, and 268, promulgated under the authority of the Resource Conservation and Recovery Act. These regulations govern the identification, transportation, manifestation, and land disposal restriction requirements of hazardous wastes. If the contaminated soils fail TCLP, most likely, the land disposal restrictions in 40 CFR Part 268 will apply. In the event that the Site soils requiring remediation do not test hazardous (i.e., do not fail TCLP), the regulations listed here will be considered relevant and appropriate rather than applicable.

SCKWMR 61-79.124, 79.261, 79.262, 79.263 and 79.268, South Carolina Hazardous Waste Management Regulations, promulgated pursuant to the Hazardous Waste Management Act, SC Code of Laws, 1976, as amended, establishes criteria for identifying and handling hazardous wastes, as well as land disposal restrictions. These regulations also will become relevant and appropriate in the event that the soils requiring remediation do not prove to be hazardous, as described in the above paragraph.

**10.2.2 Relevant and Appropriate Requirements**

The following regulations are "relevant and appropriate" to source control actions (soil remediation) at the Site. Applicability of these air quality control regulations is due to the potential for release of harmful particulates (metals) or VOCs during soil excavation and handling activities.

40 CFR Parts 60 and 61, 42 U.S.C. § 7401 et. seq. promulgated under the authority of the Clean Air Act. Included are the National Emissions Standards for Hazardous Air Pollutants (NESHAPs). Ambient air quality standards and standards for emissions to the atmosphere fall under these regulations.

SC Reg. 61-62, South Carolina Air Pollution Control Regulations and Standards, promulgated pursuant to the S.C. Pollution Control Act, SC Code of Laws, 1976, as amended. Establishes limits for emissions of hazardous air pollutants and particulate matter, and establishes acceptable ambient air quality standards within South Carolina.

Table 7
Beaunit ROD

**Federal Chemical-Specific ARARs**
**RI/FS Of Beaunit Corp. Circular Knit And Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Standard, Requirement, Criteria, or Limitation | Citation | Description | Applicable/ Relevant and Appropriate | Comment |
|---|---|---|---|---|
| RESOURCE CONSERVATION AND RECOVERY ACT | 42 USC 6901 | | | |
| Identification and Listing of Hazardous Waste | 40 CFR 261 Subparts C and D | Defines those solid wastes that are subject to and regulated as hazardous wastes under 40 CFR 124, 262-265, 268, 270, AND 271 | No | RCRA ARARs may be applicable should "hot spot" soils fail TCLP procedures and are characterized as hazardous |
| RCRA Maximum Concentration Limits | 40 CFR 264.94 | Standards for 14 hazardous constituents as a part of RCRA groundwater protection standards | No | See above. |
| Treatment Standards | 40 CFR 268 Subpart D | Treatment standards for hazardous wastes or hazardous waste extracts before land disposal is allowed | No | See above. |
| SAFE DRINKING WATER ACT | 42 USC 300 | | | |
| SDWA Maximum Contaminant Limits (MCL) | 40 CFR 141 and 143 | Standards for select organic compounds, minerals, or metals that are enforceable standards for public drinking water systems | Yes | MCLs are relevant and appropriate for a Class IIB groundwater designation |
| CLEAN WATER ACT | 33 USC 1251-1376 | | | |
| Ambient Water Quality Criteria | (presented in CERCLA Compliance...Manual | Suggested ambient standards for the protection of human health and aquatic life | Yes | Some possible alternatives involve discharge treatment residues into a drainage body which lead to larger water systems |
| Toxic Pollutant Effluent Standards | 40 CFR 129 | Establishes effluent standards or prohibitions for certain toxic pollutants: aldrin/dieldrin, DDT, endrin, toxaphene, benzidine, PCBs | No | These pollutants have not been identified as chemicals of concern at the Site |

**Federal Chemical-Specific ARARs**
**RI/FS Of Beaunit Corp. Circular Knit And Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Standard, Requirement, Criteria, or Limitation | Citation | Description | Applicable/ Relevant and Appropriate | Comment |
|---|---|---|---|---|
| CLEAN AIR ACT | 42 USC 1857-18571 | | | |
| National Emission Standards for Hazardous Air Pollutants | 40 CFR 61 | Standards for specific constituents from specific point sources | No | Air stripping was removed as an option. |
| FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT | 7 USC 136 | | | |
| Pesticide Registration and Classification Procedures | 40 CFR 152 | Defines those substances regulated under FIFRA as pesticides | No | |
| Tolerances and exemptions from Tolerances for Pesticide Chemicals In or On Raw Agricultural Commodities | 40 CFR 180 | Sets allowable concentrations of residual pesticides, including dicamba, in plant and animal commodities | No | |

**Table 8**
**Beaunit ROD**

**Federal Chemical-Specific ARARs**
**RI/FS Of Beaunit Corp. Circular Knit And Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Standard, Requirement, Criteria, or Limitation | Citation | Description | Applicable/ Relevant and Appropriate | Comment |
|---|---|---|---|---|
| SOUTH CAROLINA NPDES PERMIT REGULATIONS | Title 61 Chapter 9 | | | |
| Toxic Pollutant Effluent Standards | Regulation 61-9.129 | Establishes effluent standards or prohibitions for toxic pollutants. | Yes | The substantive requirements of the SC NPDES Regulations may be relevant and appropriate during Site remediation because some alternatives will entail discharge of treated effluent from a groundwater pump and treat system. |
| SOUTH CAROLINA SAFE DRINKING WATER REGULATIONS | Chapter 61 | | | |
| Maximum Contaminant Levels in Drinking Water | Regulation 58.5 | Establishes the maximum concentration of contaminants allowed in drinking water. | Yes | May be applicable because benzene, beryllium and manganese were detected in groundwater samples at concentrations greater than their respective State drinking water standards |
| SOUTH CAROLINA WATER CLASSIFICATION STANDARDS | Chapter 61 | | | |
| General rules and standards applicable to all waters | Regulation 68 Section E | State standards that set contaminant levels for all state waters. | Yes | |
| Class descriptions and specific standards for surface waters | Regulation 68 Section F | State class identification system and applicable surface water quality standards. | Yes | |
| Class descriptions and specific standards for groundwaters | Regulation 68 Section G | State class identification system and applicable groundwater quality standards. | Yes | |

**Table 8 (cont.)**
**Beaunit ROD**

**Federal Chemical-Specific ARARs**
**RI/FS Of Beaunit Corp. Circular Knit And Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Standard, Requirement, Criteria, or Limitation | Citation | Description | Applicable/ Relevant and Appropriate | Comment |
|---|---|---|---|---|
| Classified Waters | Regulation 69 | Criteria and class listing for applicable streams in the State of South Carolina. | Yes | An unnamed creek discharges to Howards Branch which is a classified water. |
| SOUTH CAROLINA HAZARDOUS WASTE MANAGEMENT REGULATIONS | Chapter 61 | | | |
| Groundwater Protection: Concentration Limits | Regulation 61-79.264 Subpart F Section 264.94 | Establishes concentration limits in the groundwater for hazardous constituents. | Yes | |
| SOUTH CAROLINA AMBIENT AIR QUALITY CONTROL ACT | Regulation 61-62.5 | | | |
| Ambient Air Quality Standards | Standard No. 2 | Establishes ambient air quality standards and analytical methods for sulfur dioxide, total suspended particulates, PM10, carbon monoxide, ozone, gaseous fluorides, nitrogen dioxide, and lead. | No | |
| Toxic Air Pollutants: Toxic Air Emissions | Standard No. 8 Section II | Establishes allowable ambient air concentrations for toxic air pollutants. | No | |

Table 9
Beaunit ROD

Federal Chemical-Specific ARARs
RI/FS Of Beaunit Corp. Circular Knit And Dyeing Plant Site
Fountain Inn, South Carolina

| Standard, Requirement, Criteria, or Limitation | Citation | Description | Applicable/ Relevant and Appropriate | Comment |
|---|---|---|---|---|
| RESOURCE CONSERVATION AND RECOVERY ACT | 42 USC 6901-6987 | | | |
| Guidelines for the Thermal Processing of Solid Wastes | 40 CFR 240 | Establishes guidelines applicable to thermal processing (incineration) facilities designed to process 50 tons or more of municipal solid wastes | No | |
| Guidelines for the Land Disposal of Solid Wastes | 40 CFR 241 | Establishes minimum guidelines applicable to land disposal facilities receiving nonhazardous solid wastes, including siting, access, design, and operating conditions | No | |
| Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid waste | 40 CFR 243 | Establishes guidelines for the collection of residential, commercial, and institutional solid wastes, including guidelines on the types of containers and collection frequency | No | |
| Criteria for Classification of Solid Waste Disposal Facilities and Practices | 40 CFR 257 | Establishes criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health or the environment | No | |
| Criteria for Municipal Solid Waste Landfills | 40 CFR 258 | Establishes minimum national criteria for municipal solid waste landfills to ensure protection of human health and the environment, including siting restrictions, monitoring, corrective action, and post-closure care | No | |
| Hazardous Waste Management Systems General | 40 CFR 260 | Establishes procedures and criteria for modification or revocation of any provision in 40 CFR 260-26.5 | No | |
| Standards Applicable to Generation of Hazardous Waste | 40 CFR 262 | Establishes standards for generators of hazardous waste | No | |
| Standards Applicable to Transporters of Hazardous Waste | 40 CFR 263 | Establishes standards which apply to persons transporting hazardous waste within the U.S. if the transportation requires a manifest under 40 CFR 262. | No | |

**Table 9 (cont.)**
**Beaunit ROD**

**Federal Chemical-Specific ARARs**
**RI/FS Of Beaunit Corp. Circular Knit And Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Standard, Requirement, Criteria, or Limitation | Citation | Description | Applicable/ Relevant and Appropriate | Comment |
|---|---|---|---|---|
| Standards for Owners and Operation of Hazardous Waste Treatment, Storage, and Disposal Facilities | 40 CFR 264 | Establishes minimum national standards which define the acceptable management of hazardous waste for owners and operators of facilities which treat, store, or dispose of hazardous waste | No | |
| • General Facility Standards | Subpart B | | | |
| • Preparedness and Prevention | Subpart C | | No | |
| • Contingency Plan end Emergency Procedures | Subpart D | | No | |
| • Manifest System Record-keeping, and Reporting | Subpart E | | No | |
| • Releases from Solid Waste Management Units | Subpart F | | No | |
| • Closure and Post-closure | Subpart G | | No | |
| • Financial Requirements | Subpart H | | No | |
| • Use and Management of Containers | Subpart I | | No | |
| • Tanks | Subpart J | | No | |
| • Surface Impoundments | Subpart K | | No | |
| • Waste Piles | Subpart L | | No | |
| • Land Treatment | Subpart M | | No | |
| • Landfills | Subpart N | | No | |
| • Incinerators | Subpart O | | No | |
| • Miscellaneous Units | Subpart X | | No | |

**Table 9 (cont.)**
**Beaunit ROD**

**Federal Chemical-Specific ARARs**
**RI/FS Of Beaunit Corp. Circular Knit And Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Standard, Requirement, Criteria, or Limitation | Citation | Description | Applicable/ Relevant and Appropriate | Comment |
|---|---|---|---|---|
| Interim Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities | 40 CFR 265 | Established minimum national standards that define acceptable management of hazardous waste during the period of interim status and until certification of final closure or, if the facility is subject to post-closure requirements, until post-closure responsibilities are fulfilled | No | Remedies should be consistent with the more stringent Part 264 standards as these represent the ultimate RCRA compliance standards and are consistent with CERCLA's goal of long-term protection of human health and the environment |
| Standards for the management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities | 40 CFR 266 | Establishes requirements which apply to recyclable material that are reclaimed to recover economically significant amounts of precious metals, including gold and silver | No | |
| Interim Standards for owners and Operators of New Hazardous Land disposal Facilities | 40 CFR 267 | Establishes minimum national standards that define acceptable management of hazardous waste for new land disposal facilities | No | Remedies should be consistent with the more stringent Part 264 standards as these represent the ultimate RCRA compliance standards and are consistent with CERCLA's goal of long-term protection of human health and the environment |
| Land Disposal | 40 CFR 268 | Establishes a timetable for restriction of burial of wastes and hazardous materials | No | |
| Hazardous Waste Permit Program | 40 CFR 270 | Establishes provision covering basic EPA permitting requirements Substantive requirements are addressed in 40 CFR 264 | No | A permit is not required for on-site CERCLA response action. |
| Underground Storage Tanks | 40 CFR 280 | Establishes regulations related to underground storage tanks | No | |

**Table 9 (cont.)**
**Beaunit ROD**

**Federal Chemical-Specific ARARs**
**RI/FS Of Beaunit Corp. Circular Knit And Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Standard, Requirement, Criteria, or Limitation | Citation | Description | Applicable/ Relevant and Appropriate | Comment |
|---|---|---|---|---|
| SAFE DRINKING WATER ACT | 40 USC 300 | | | |
| National Primary Drinking Water Regulations | 40 CFR 141 | Specifies sampling, analytical, and monitoring requirements | No | |
| Underground Injection Control Regulations | 40 CFR 144-147 | Provides for protection of underground sources of drinking water | No | |
| CLEAN WATER ACT | 33 USC 1251-1376 | | | |
| National Pollutant Discharge Elimination System | 40 CFR 125 | Requires permits for the discharge of pollutants from any point source into waters of the United States. | Yes | A permit is not required for on-site CERCLA response actions, but the substantive requirements would apply |
| National Pretreatment Standards | 40 CFR Part 403 | Sets standards to control pollutants which pass through or interfere with treatment processes in publicly owned treatment works or which may contaminate sewage sludge | No | |
| CLEAN AIR ACT | 42 USC 1857-18571 | | | |
| Standards of Performance for incinerators | 40 CFR 60 Subpart E | Sets performance standards and test methods for evaluation of performance | No | |
| National Emission Standards for Hazardous Air Pollutants | 40 CFR 61 | Stipulates monitoring requirements for emissions of specific contaminants | No | |
| OCCUPATIONAL SAFETY AND HEALTH ACT | 29 USC 651-678 | Regulates worker health and safety | Yes | Under 40 CFR 300,150, requirements of the Act apply to all response activities under the NCP |

**Table 9 (cont.)**
**Beaunit ROD**

**Federal Chemical-Specific ARARs**
**RI/FS Of Beaunit Corp. Circular Knit And Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Standard, Requirement, Criteria, or Limitation | Citation | Description | Applicable/ Relevant and Appropriate | Comment |
|---|---|---|---|---|
| HAZARDOUS MATERIALS TRANSPORTATION ACT | 40 USC 1801-1813 | | | |
| Hazardous Materials Transportation Regulations | 49 CFR 107, 171-177 | Regulates transportation of hazardous materials | Yes | May be relevant and appropriate for transportation of contaminated soils or fill materials from the Site to an off-site landfill. Alternatives 5 through 8 include the off-site disposal option. |
| FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT | 7 USC 136 | | | |
| Regulation for the Acceptance of Certain Pesticides and Recommended Procedures for the Disposal and Storage of Pesticides and Pesticides Containers | 40 CFR 165 | Recommended procedures for pesticides and pesticides containers disposal | No | |

**Table 10**
**Beaunit ROD**

**Federal Chemical-Specific ARARs**
**RI/FS Of Beaunit Corp. Circular Knit And Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Standard, Requirement, Criteria, or Limitation | Citation | Description | Applicable/ Relevant and Appropriate | Comment |
|---|---|---|---|---|
| SOUTH CAROLINA POLLUTION CONTROL ACT | Title 48 Chapter 1 | | | |
| | Section 48-1-100 | Permits for discharge of water or air contaminants; jurisdiction of Department. | Yes | Substantive requirements may be relevant and appropriate during Site remediation because some alternatives will entail discharge of treated effluent from a groundwater pump and treat system. |
| | Section 48-1-110 | Permits required for construction or alteration of disposal system; classification; unlawful operation or discharges | No | |
| SOUTH CAROLINA GROUNDWATER USE ACT | Title 49 Chapter 5 | Establishes procedures to be followed to obtain a permits to withdraw, obtain, or use groundwater and for the submission of information concerning the amount of groundwater withdrawal, its intended use, and proposed aquifers. | Yes | Relevant and appropriate for institutional controls such as abandonment of monitoring wells. |
| SOUTH CAROLINA STORMWATER MANAGEMENT AND SEDIMENT REDUCTION surface soils. | Title 48 Chapter 14 | Establishes criteria for the acceptable management of stormwater and sediments during land disturbing activities. | Yes | May be relevant and appropriate during Site remediation because some alternatives entail actions that will disturb land surface, e.g., excavation of |
| SOUTH CAROLINA NPDES PERMIT REGULATIONS | Title 61 Chapter 9 | Establishes treatment standards and permitting requirements. | Yes | NPDES permitting is not required at CERCLA sites; however, substantive requirements may be relevant and appropriate during site remediation. |
| SOUTH CAROLINA SAFE DRINKING WATER REGULATIONS | Chapter 61 | Establishes criteria and standards to ensure the safety of public water supplies. | Yes | May be relevant and appropriate. |

**Table 10 (cont.)**
**Beaunit ROD**

**Federal Chemical-Specific ARARs**
**RI/FS Of Beaunit Corp. Circular Knit And Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Standard, Requirement, Criteria, or Limitation | Citation | Description | Applicable/ Relevant and Appropriate | Comment |
|---|---|---|---|---|
| SOUTH CAROLINA STORMWATER MANAGEMENT REGULATIONS | Chapter 72 | Establishes standards for the acceptable management of stormwater and sediments during land disturbing activities. | Yes | May be relevant and appropriate during Site remediation. |
| SOUTH CAROLINA SOLID WASTE MANAGEMENT ACT | Title 44 Chapter 96 | | | |
| Approval procedures for special wastes. | Section 44-96-390 | Defines special wastes and delineates the minimum requirements for the waste analysis plan and approval procedures for the disposal of special wastes. | No | |
| SOUTH CAROLINA HAZARDOUS WASTE REGULATION | Chapter 61 Regulations 79.124-79.270 | Establishes minimum state standards which define the acceptable management of hazardous wastes for owners and operators of facilities which treat, store, dispose of hazardous wastes. | No | |
| SOUTH CAROLINA AMBIENT AIR QUALITY CONTROL ACT | Regulation 61-62.5 | | | |
| Toxic Air Pollutants: Controls | Standard No. 8 Section III | A source will be required to reduce emissions by implementing controls, altering the process, or limiting production if site-specific modeling indicates that maximum allowable concentrations are exceeded. | No | This standard is not an ARAR because the activities proposed for the Site do not meet the definition of a source. |

**Table 10**
**Beaunit ROD**

**Federal Chemical-Specific ARARs**
**RI/FS Of Beaunit Corp. Circular Knit And Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Standard, Requirement, Criteria, or Limitation | Citation | Description | Applicable/ Relevant and Appropriate | Comment |
|---|---|---|---|---|
| SOUTH CAROLINA POLLUTION CONTROL ACT | Title 48 Chapter 1 | | | |
| | Section 48-1-100 | Permits for discharge of water or air contaminants; jurisdiction of Department | Yes | Substantive requirements may be relevant and appropriate during Site remediation because some alternatives will entail discharge of treated effluent from a groundwater pump and treat system. |
| | Section 48-1-110 | Permits required for construction or alternation of disposal systems; classification; unlawful operation or discharges | No | |
| SOUTH CAROLINA GROUNDWATER USE ACT | Title 49 Chapter 5 | Establishes procedures to be followed to obtain a permit to withdraw, obtain, or use groundwater and for the submission of information concerning the amount of groundwater withdrawal, its intended use, and proposed aquifers. | Yes | Relevant and appropriate for institutional controls such as abandonment of monitoring wells. |
| SOUTH CAROLINA STORMWATER MANAGEMENT AND SEDIMENT REDUCTION ACT | Title 48 Chapter 14 | Establishes criteria for the acceptable management of stormwater and sediments during land disturbing activities. | Yes | May be relevant and appropriate during Site remediation because some alternatives entail actions that will disturb land surface, e.g., excavation of surface soils. |
| SOUTH CAROLINA NPDES PERMIT REGULATIONS | Title 61 Chapter 9 | Establishes treatment standards and permitting requirements. | Yes | NPDES permitting is not required at CERCLA sites; however, substantive requirements may be relevant and appropriate during site remediation. |
| SOUTH CAROLINA SAFE DRINKING WATER REGULATIONS | Chapter 61 | Establishes criteria and standards to ensure the safety of public water supplies. | Yes | May be relevant and appropriate. |

**Table 10 (cont.)**
**Beaunit ROD**

**Federal Chemical-Specific ARARs**
**RI/FS Of Beaunit Corp. Circular Knit And Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Standard, Requirement, Criteria, or Limitation | Citation | Description | Applicable/ Relevant and Appropriate | Comment |
|---|---|---|---|---|
| SOUTH CAROLINA STORMWATER MANAGEMENT REGULATIONS | Chapter 71 | Establishes standards for the acceptable management of stormwater and sediments during land disturbing activities. | Yes | May be relevant and appropriate during Site remediation. |
| SOUTH CAROLINA SOLID WASTE MANAGEMENT ACT | Title 44 Chapter 96 | | | |
| Approval procedures for special wastes. | Section 44-96-390 | Defines special wastes and delineates the minimum requirements for the waste analysis plan and approval procedures for the disposal of special wastes. | No | |
| SOUTH CAROLINA HAZARDOUS WASTE REGULATION | Chapter 61 Regulations 79-124-79.270 | Establishes minimum state standards which define the acceptable management of hazardous wastes for owners and operators of facilities which treat, store, dispose of hazardous wastes. | No | |
| SOUTH CAROLINA AMBIENT AIR QUALITY CONTROL ACT | Regulation 61-62.5 | | | |
| Toxic Air Pollutants: Controls | Standard No. 8 Section III | A source will be required to reduce emissions by implementing controls, altering the process, or limiting production if site-specific modeling indicates that maximum allowable concentrations are exceeded. | No | This standard is not an ARAR because the activities proposed for the Site do not meet the definition of a source. |

**Table 11**
**Beaunit ROD**

**Federal Chemical-Specific ARARs**
**RI/FS Of Beaunit Corp. Circular Knit And Dyeing Plant Site**
**Fountain Inn, South Carolina**

| Standard, Requirement, Criteria, or Limitation | Citation | Description | Applicable/ Relevant and Appropriate | Comment |
|---|---|---|---|---|
| NATIONAL HISTORIC PRESERVATION ACT | 16 USC 470<br>40 CFR 6.301(b)<br>36 CFR 800 | Requires federal agencies to take into account the effect of any federally assisted undertaking or licensing on any district site building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places. | No | No alternative affect any district, site, building, structure or object listed on or eligible for the National Register. |
| ARCHEOLOGICAL AND HISTORIC PRESERVATION ACT | 16 USC 469 | Establishes procedures to provide for preservation of historical and archeological data which might be destroyed through alteration of terrain as a result of a federal construction project or a federally licensed activity or program. | No | No alternatives affect historical or archeological data. |
| HISTORIC SITES, BUILDINGS, AND ANTIQUITIES ACT | 16 USC 461-467 | Requires federal agencies to consider the existence and location of landmarks on the National Registry of National Landmarks to avoid undesirable impacts on such landmarks. | No | No alternatives affect any National Landmark. |
| FISH AND WILDLIFE COORDINATION ACT | 16 USC 661-666 | Requires consultation when a federally permitted or licensed department or agency proposes or authorizes any modification of any stream or ether water body and adequate provision for protection of fish and wildlife resources. | No | No modification to a stream or water body is proposed. |
| ENDANGERED SPECIES ACT | 16 USC 1531<br>50 CFR 200 | Requires action to conserve endangered species within critical habitats on which endangered species depend and includes consultation with Department of Interior. | No | No known resident population or designated critical habitats for any state or federally listed threatened or endangered species were identified as occurring on the site or within ½ mile of the site. |
| CLEAN WATER ACT | 33 USC | | | |
| Dredge or Fill Requirements (Section 404) alternative. | 40 CFR 230, 231 | Requires permits for discharge of dredged or fill material into navigable waters. | No | There will be no discharge of dredged or fill material into a navigable waters as part of any |

**Table 12**
**Beaunit ROD**

**Guidelines To Be Considered**
**RI/FS of Beaunit Corp. Circular Knit And Dyeing Plant Site**
**Fountain Inn, South Carolina**

Federal Criteria, Advisories, and Procedures

1. Integrated Risk Information System (IRIS) Chemical Files, USEPA, Office of Health and Environmental Assessment, Office of Research and Development, Washington, D.C. 20460.

2. Drinking Water Equivalent Levels (DWELs), medium-specific drinking water levels derived from RfDs, USEPA Health Advisories, Office of Drinking Water, 1987.

3. Maximum Contaminant Level Goals, Safe Drinking Water Act (SDWA), 40 CFR 141, and Federal Recommended Maximum Concentration Limits (RMCLs).

4. Federal Water Quality Criteria (FWQC) for evaluating toxic effects on human health and aquatic organisms.

5. Toxic Substances and Control Act (TSCA) health data and chemical advisories.

6. Public health criteria on which the decision, to list pollutants as hazardous under Section 112 of the Clean Air Act, was based.

7. Health Advisories, non enforceable contaminant limits derived from DWELs, published by USEPA, Office of Drinking Water.

8. Advisories of the Fish and Wildlife Service and the National Wildlife Federation under the Fish and Wildlife Coordination Act.

9. TSCA Compliance Program Policy, "TSCA Enforcement Guidance Manual - Policy Compendium," USEPA Office of Enforcement and Compliance Monitoring, 1985.

10. Guidelines for Groundwater Classification under the EPA Groundwater Protection Strategy.

11. Executive Order related to Wetlands (11990) as implemented by EPA's August 6, 1985 Policy on Floodplain and Wetlands Assessments for CERCLA.

USEPA RCRA Design Guidelines

12. Design Guidelines for Surface Impoundments, Liners Systems, Final Cover and Freeboard Control (1987).

Technical Resource Documents

13. Evaluating Cover Systems for Solid and Hazardous Waste (1982).

14. Soil Properties, Classification, and Hydraulic Conductivity Testing (1984).

Test Methods for Evaluating Solid Waste

15. Solid Waste Leaching Procedure Manual (1984).

16. Methods for the Prediction of Leachate Plume Migration and Mixing.

17. Test Methods for Evaluating Solid Wastes, USEPA Office of Research and Development, third edition (1986) SW-846.

18. Lab protocols developed pursuant to the Clean Water Act, Section 304(h).

USEPA Office of Water Guidance Documents

Pretreatment Guidance Document

19. Section 304(g) Guidance Document: Revised Pretreatment Guidelines, Volumes I, II, III.

Water Quality Guidance Documents

20. Technical Support Manual: Waterbody Surveys and Assessments for Conduction Use Attainability Analyses (1983).

21. Technical Support Document for Water Quality-Based Toxics Control.

22. Water-Related Environmental Fate of 129 Priority Pollutants (1979).

23. The Water Quality Control (WQC) Standards Handbook (1983).

Water Quality Guidance Documents (continued)

24. USEPA Water Quality Advisories, EPA Office of Water, Criteria and Standards Division.

NPDES Guidance Documents

25. NPDES Best Management Practices Guidance Manual (June 1981).

26. Case studies on toxicity reduction evaluation (May 1983).

### 10.2.3 "To Be Considered" and Other Guidance

Revised Procedures for Planning and Implementing Off-Site Response Actions, OSWER Directive 9834.11, November 1987. This directive, often referred to as "the off-Site policy," requires EPA personnel to take certain measures before CERCLA wastes are sent to any facility for treatment, storage, or disposal. EPA personnel must verify that the facility to be used is operating in compliance with Sections 3004 and 3005 of RCRA, 42 U.S.C. §§ 6924 and 6925, as well as all other federal and state regulations and requirements. Also, the permit under which the facility operates must be checked to ensure that it authorizes (1) the acceptance of the type of wastes to be sent, and (2) the type of treatment to be performed on the wastes.

40 CFR Part 50, promulgated under the authority of the Clean Air Act. This regulation includes the National Ambient Air Quality Standards (NAAQS), and establishes a national baseline of ambient air quality levels. The state regulation which implements this regulation, South Carolina Reg. 62-61, is applicable to the source control portion of the remedy.

Various TBC materials were utilized in the Baseline Risk Assessment and in the Feasibility Study. Because cleanup standards were established based on these documents, they are considered TBC.

In the Baseline Risk Assessment, TBC material included information concerning toxicity of, and exposure to, Site contaminants. TBC material included the Integrated Risk Information System (IRIS), Health Effects Assessment Summary Tables (HEAST), and other EPA guidance as specified in the Baseline Risk Assessment.

In the FS, soil concentrations protective of human health and the environment were calculated based on the Site-specific risk calculations from the Baseline Risk Assessment, using TBC information as described above. There are no established federal or state standards for acceptable levels of Beaunit Site contaminants in surface or subsurface soils or sediments.

For soils/sediments, the leachate-based and health-based models were both considered. In order to be most protective, the lower of the two was targeted. The chemical-specific goals produced through the leachate-based model were found to be lower, except for vinyl chloride. Due to the conservative nature of the health-based and the leachate models, certain chemical-specific cleanup goals were calculated below respective method detection limits and MCL values.

### 10.2.4 Other Requirements

Remedial design often includes the discovery and use of unforeseeable but necessary requirements which result from the planning and investigation inherent in the design process itself. Therefore, during design of the source control component of the selected remedy, EPA may, through a formal ROD modification process such as an Explanation of Significant Differences or a ROD Amendment, elect to designate further ARARs which apply, or are relevant and appropriate, to this portion of the remedy.

## 10.3 Performance Standards

The standards outlined in this section comprise the performance standards defining successful implementation of this portion of the remedy.

Excavation. The soil remediation goals (Table 3) are established as performance standards. The performance standards shall control the excavation procedure described above. Additionally, all on-Site excavation work shall comply with 29 CFR § 1910.120, the OSHA health and safety requirements applicable to remedial activities. Transport of contaminated soil. Transportation shall be accomplished in compliance with the Hazardous Materials Transportation Act (49 CFR §§ 107, 171-179).

Disposal of contaminated soil. Disposal of contaminated Site soil shall comply with the applicable, or relevant and appropriate, RCRA regulations (40 CFR Parts 261, 262 (Subparts A-D), 263, and 268). The potential disposal of characteristically hazardous soils (as determined by TCLP procedures) shall be done at a RCRA Subtitle C treatment, storage, and disposal facility. Non-hazardous soils may be disposed at RCRA Subtitle D landfills, or placed within the fenced area, in the case of the selected alternative.

Monitoring. Table 2 contains performance standards to be utilized in the evaluation of monitoring data to determine any impact on the groundwater and area surface waters during the construction of the lagoon cap and the effectiveness of the cap after construction.

## 10.4 Statutory Determinations

The selected remedy for this Site meets the statutory requirements set forth at Section 121 of CERCLA, 42 U.S.C. § 9621. This section states that the remedy must protect human health and the environment; meet ARARs (unless waived); be cost-effective; use permanent solutions, and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and finally, wherever feasible, employ treatment to reduce the toxicity, mobility or volume of the contaminants. The following subsections discuss how the remedy fulfills these requirements.

### 10.4.1 Protection of Human Health and the Environment

The selected remedy will eliminate, reduce, or control risks posed by eliminating exposure pathways through the capping of the site and deed restrictions and thus ensure adequate protection of human health and the environment. The cap will eliminate direct exposure to potential human or ecological receptors. Potential risks will be either eliminated, reduced, or controlled by the remedial action.

The installation of a cap will minimize the amount of leachate generated and will place a barrier between the contaminated surface soils such that surface water will not be allowed to percolate through the contaminated soils. The installation of a site cap designed to 10-9 permeability will prevent leaching from the contaminated soils and eliminate the potential for contaminating groundwater and possible migration off-Site. Limited access and deed restrictions will protect the cap and insure its effectiveness into the future. Contingent upon future groundwater monitoring results from wells located on nearby properties, additional institutional controls (deed notice) may be considered for such properties.

Site future risks will be reduced to within the 10-6 to 10-4 range for carcinogens and the Hazard Indices total for non-carcinogens will be less than 1.0.

### 10.4.2 Applicable or Relevant and Appropriate Requirements (ARARs)

The selected alternative shall comply will all ARARs as described earlier in this Record of Decision. Remedial design often includes the discovery and use of unforeseeable, but necessary, requirements, which result from the planning and investigation inherent in the design process itself. Therefore, during design of the site cap, EPA may, through a formal ROD modification process such as an Explanation of Significant Differences or a ROD Amendment, elect to designate further ARARs which are applicable, or relevant and appropriate, to this remedy.

### 10.4.3 Cost effectiveness

Among the alternatives that are protective of human health and the environment and comply with ARARs, the selected alternative is the most cost-effective choice because it uses a treatment technology to address the contaminated soils, eliminating exposure to environmental receptors and eliminating the potential for contaminant leaching to the aquifer.

The selected remedy is cost-effective because it has been determined to provide overall effectiveness proportioned to its costs. The modification to Alternative 3 is the only alternative that will prevent both the generation of leachate and exposure to the contaminated soils.

### 10.4.4 Utilization of permanent solutions, and alternative treatment technologies or resource recovery technologies to the maximum extent practicable

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost-effective manner.

Based upon the information presented, the selected remedy will protect environmental receptors, surface water and groundwater quality by reducing exposure leachate production. It provides the best balance among all evaluation criteria, with the following being the most important considerations for the Site:

1. Compliance with applicable or relevant and appropriate requirements;

2. Availability of equipment and materials;

3. Cost of construction, O & M;

4. Elimination of rain water infiltration and, thus, reduction in the volume of leachate and potentially contaminated groundwater released to the environment; and,

5. Elimination of direct contact by environmental receptors

6. Continued monitoring to ensure the remedy continues to be protective of human health and the environment.

**10.4.5 Preference for treatment as a principal remedy element**

The selected remedy does not satisfy the statutory preference for treatment because treatment of soils at the Beaunit Site considering the minor risk is considered impractical. The remedy does not include treatment of any contaminated soils. Treatment of the source of contamination (the entire lagoon area) is impracticable, because of the large volume of material and the low average contaminant concentrations present. The excavation of such materials would increase the potential for exposure to environmental receptors and temporarily increase the potential for leaching to area groundwater.

APPENDIX A

STATE OF SOUTH CAROLINA

LETTER OF CONCURRENCE

South Carolina
Department of Health and Environmental Control

2600 Bull Street, Columbia, SC 29201



September 29, 1995

John H. Hankinson, Jr.
Regional Administrator
U.S. EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

RE: Beaunit Circular Knit and Dyeing Superfund Site
Record of Decision

Dear Mr. Hankinson:

The Department has reviewed the Draft Record of Decision (ROD), dated September 29, 1995, for the Beaunit Circular Knit and Dyeing site and concurs with the selected remedial alternative. The selected alternative includes source remediation by means of capping contaminated surface and subsurface soil. EPA's selected alternative also includes deed restrictions to preclude the use of the site for future residential use and the restriction of groundwater use beneath the site for potable purposes. In addition, the Department concurs with the decision to grade the site prior to capping and construct drainage control features to divert surface water away from and around the site. The Department also concurs with the proposals for future monitoring of groundwater, surface water and sediment to determine the effectiveness of the remedial action.

In concurring with this ROD, the Department does not waive any right or authority it may have under federal or state law. The Department reserves any right and authority it may have to require corrective action in accordance with the South Carolina Hazardous Waste Management Act and the South Carolina Pollution Control Act. These rights include, but are not limited to, the right to ensure that all necessary permits are obtained, all clean-up goals and criteria are met, and to take a separate action in the event clean-up goals and criteria are not met. Nothing in the concurrence shall preclude the Department from exercising any administrative, legal and equitable remedies available to require additional response actions in the event that: (1) (a) previously unknown or undetected conditions arise at the site, or (b) the Department receives additional information not previously available concerning the premises upon which the Department relied in concurring with the selected remedial alternative; and (2) the implementation of the remedial alternative selected in the ROD is no longer protective of public health and the environment.

This concurrence with the selected remedy for the Beaunit Circular Knit and Dyeing Site is contingent upon the Department's above-mentioned reservation of rights. If you have any questions, please feel free to contact Mr. Gary Stewart at (803) 896-4054.

Sincerely,

<IMG SRC 04952540>

R. Lewis Shaw, P.E.
Deputy Commissioner
Environmental Quality Control

RLS/JAB

cc: Harry Mathis
Kent Coleman
Keith Lindler
Mary Anderson
Gary Stewart

# APPENDIX B

# RESPONSIVENESS SUMMARY

## Overview

The Environmental Protection Agency (EPA) held an initial public comment period from November 7, 1994 to December 7, 1994, for interested parties to comment on the Proposed Plan which was based on the findings of the Remedial Investigation/Feasibility Study (RI/FS) for the Beaunit Circular Knit & Dyeing Superfund Site in Fountain Inn, South Carolina. A request was made for an extension to the comment period, and the comment period was extended until January 19, 1995.

EPA held a public meeting at 7:00 p.m. on November 14, 1994 at the Fountain Inn Activity Center in Fountain Inn, South Carolina, to overview the results of the RI/FS and the Baseline Risk Assessment, to present the Proposed Plan, and to receive comments from the public.

EPA proposed a remedy consisting of: 1) Groundwater, Surface Water, and Sediment Monitoring/ Grading-Drainage Control, and 2) Capping of the Site and Deed Restrictions. Judging from the comments received during the public comment period and the public meeting, the residents and local officials in the Fountain Inn, South Carolina area support the cleanup alternatives proposed by EPA. It should be noted that the Remedy was modified from Alternative Three as developed in the Feasibility Study. The modification was done in consultation with the South Carolina Department of Health and Environmental Control. The design for the cap was modified from a specification of 10-5 to 10-9.

This Responsiveness Summary provides a summary of citizen and agency comments, concerns, and questions identified and received during the public comment period, and EPA's responses to those comments and concerns. Section 5.5 of the ROD contains a history of public participation activities during the RI/FS. Other appendices to this document contain related documents including the Proposed Plan, Public Notices, the Official Transcript of the Proposed Plan Public Meeting, and copies of the actual comments received.

## 2. Response to Public Concerns

During the preparation of the Remedial Investigation and the Feasibility Study, EPA's initial Community Interviews, the Proposed Plan Public Meeting, and the Comment Period with its subsequent extension, there was little concern or prior knowledge expressed regarding the Beaunit NPL Site. There was a general confusion among the public regarding other required environmental response actions involving the former Beaunit Plant that previously generated sewage that was treated at the former wastewater lagoon that has become the current NPL Site. Area residents expressed concerns regarding odors from the old Beaunit Plant, currently owned and operated by Wilson Sporting Goods for the manufacture of tennis balls. A leak of mineral spirits from the facility resulted in a contaminant plume and subsequent remedial action under separate State/Federal control under the RCRA Statutes. That mineral spirit spill and the required response led to a series of monitoring wells and later groundwater extraction wells to be installed throughout the area in a Northeastern direction from the Wilson Sporting Goods plant on Georgia Street. The Beaunit NPL Site, located off Valley View Road, has not caused a contaminant plume off-site, and groundwater contamination has not been shown to be a concern at the site itself. Furthermore, the groundwater flow from the Beaunit Lagoon is to the Northwest. Despite these facts, some area residents remain concerned about the Wilson Sporting Goods Plant and any regulatory agency activities in the area, confusing the two separate actions as one. EPA received three comments during the public comment period on the Beaunit NPL Site, all three of which reflect this general confusion.

**Responses to Comments Received During Public Comment Period**

Comment No. 1: A resident of N. Main Street wrote and stated that she wanted her property put back in the condition it was before pollution occurred.

EPA Response to Comment No. 1: As stated above, the Beaunit Lagoon is not the source of any contamination beyond its boundaries. This resident's comment will be brought to the attention of Wilson Sporting Goods and the district office of SCDHEC. The resident's property was disturbed by the response actions for the mineral spirit spill, not any activities related to the Beaunit Superfund Site.

Comment No. 2: A resident of Georgia Street wrote with several concerns. As a neighbor of the Wilson Sporting Goods Plant, she was concerned about contamination and the effect on her home's value. She expressed concern regarding the deaths of several neighbors from cancer. She specifically asked about the presence of contaminants from the site near her home, if the contaminants were cancer causing or a threat, and lastly, if there would be a cleanup.

EPA Response to Comment No. 2: The resident's location is near Wilson Sporting Goods Plant, on Georgia Street, not the Beaunit Lagoon, located off Valley View Road. Her comment will be forwarded to the SCDHEC Division of Health Hazard Evaluation. The Beaunit RI/FS did not detect any migration of contaminants, either carcinogenic or noncarcinogenic off-site. Furthermore, as to future cleanup activities the Beaunit Lagoon will be capped to prevent the potential for any leaching of contaminants detected in the soil into the groundwater.

Comment No. 3: The SCDHEC Division of Health Hazard Evaluation commented on the Beaunit Proposed Plan, after it had been issued. The majority of comments received offered grammatical or word phrasing recommendations. The comments also requested a definition of the NCP. The last item in the comments requested that the Beaunit Superfund Site's Remedial Action include the monitoring of private drinking wells in the area. It should be noted that the reviewer prefaced this request after stating that "we have not evaluated the most recent data to the extent that we can make a complete assessment of public health and how EPA's selected remedy will mitigate any public health implications..."

EPA's Response to Comment No. 3: Since the majority of comments were received after the Proposed Plan was issued, the comments regarding grammar and phrasing were not timely and can't be addressed. In answer to the request for a definition of the NCP, this ROD has included a glossary following the Table of Contents. The NCP is the National Contingency Plan, the specific regulations published in the Federal Register outlining how EPA is to implement CERCLA, commonly known as Superfund. Relative to the request for required monitoring of area private drinking wells, EPA wishes to again note that the SCDHEC agency comment's preface stated a lack of evaluation of the data. The data showed no off-site groundwater contamination, therefore any detection of contamination in a private drinking well would be from another source, and beyond the scope of the Beaunit RI/FS and this ROD. The comment has been referred to the local SCDHEC District Office for their attention.

South Carolina
Department of Health and Environmental Control

Robert Mills Complex, Box 101106

Columbia, SC 29211



Promoting Health, Protecting the Environment

Memorandum

TO: Steve Sandler
Remedial Project Manager
Environmental Protection Agency

FROM: Lovyst L. Luker
Project Administrator
ATSDR Cooperative Agreement
Division of Health Hazard Evaluation

DATE: January 10, 1995

RE: Beaunit Proposed Plan

The South Carolina Department of Health and Environmental Control, Division of Health Hazard Evaluation, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry reviewed the Proposed Plan Fact Sheet for the Beaunit site. We appreciate the opportunity to review and comment on this document.

We are submitting a memorandum for your consideration of the comments that we are providing for the proposed plan for this site. We are also requesting to be added to your mailing list to receive a ROD when it is in draft form so that we can provide comments at that time. If you have any questions about our comments, or would like more information, please call Todd Going at 737-4175.

cc. Richard Kauffman, ATSDR
Bob Safay, Regional Representative

South Carolina
Department of Health and Environmental Control

Robert Mills Complex, Box 101106

Columbia, SC 29211



Promoting Health, Protecting the Environment

Memorandum

TO: Lovyst L. Luker
Project Administrator
ATSDR Cooperative Agreement
Division of Health Hazard Evaluation

FROM: William T. Going, MPH
Environmental Quality Manager
ATSDR Cooperative Agreement
Division of Health Hazard Evaluation

DATE: January 10, 1995

E: Beaunit Proposed Plan Fact Sheet Comments

Please find attached a copy of the comments for the Beaunit Proposed Plan Fact Sheet. The Environmental Protection Agency (EPA) released this document in November 1994 and the public comment period will end on January 17, 1995. Our review of this document represents an addition to our Fiscal Year 1995 workplan.

The Agency for Toxic Substances and Disease Registry (ATSDR) requested that we review the Record of Decision (ROD) for this site during first quarter, FY 1995. However, the ROD has not been finalized and we do not expect to receive it until after January 1995. Enayet Ullah requested that the EPA mail a copy of the ROD to our office for review. We will review the ROD and provide comments while it is in the draft version.

COMMENTS FOR THE PROPOSED PLAN FACT SHEET

BEAUNIT CIRCULAR KNIT & DYEING SUPERFUND SITE

The South Carolina Department of Health and Environmental Control under a cooperative agreement with the Agency for Toxic Substances and Disease Registry, submit the following comments for the Proposed Plan Fact Sheet, dated November 1994, for the Beaunit Circular Knit & Dyeing Superfund site in Greenville County, South Carolina.

Site History

1) Third Paragraph, Second Sentence. "Records available do not..."

Please consider changing this sentence to read "Available records do not..."

2) Fifth Paragraph, First Sentence. "In 1979, the plant operators determined that the former...should be razed..."

Please consider changing the word "razed" to "demolished," "torn down," etc.

3) Please consider adding the following narrative between the sixth and seventh paragraphs.

In 1991, SCDHEC, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), released a preliminary health assessment for the Beaunit site. The preliminary health assessment classified the site as an indeterminate public health hazard and recommended that additional environmental samples be collected.

Summary of Alternatives

4) Alternative 1: No Action, First Paragraph, First Sentence. "A no action alternative is required by the NCP..."

Please define NCP. Also, please consider writing the document in the active voice instead of the passive voice. The active voice will allow the writer to use less words to make his/her point and will enable the reader to grasp the meaning of the sentence easier.

EPA's Preferred Alternative

5) We have not evaluated the most recent data to the extent that we can make a complete assessment of public health and how EPA's selected remedy will mitigate any public health implications from exposure to contamination at the Beaunit site. However, we feel that the groundwater monitoring program in EPA's preferred alternative should be expanded to include private drinking water wells in the area. The community has expressed concerns about adverse health effects from exposure to contaminants in their drinking water. Therefore, EPA's monitoring of private well water will help to alleviate community health concerns about the site.

BEAUNIT SUPERFUND SITE MAILING LIST COUPON

If you have had a change of address and would like to continue to receive site related information or would like for EPA to add your name and address to the mailing list for the Beaunit Superfund Site, please complete this self-addressed form. If you have any questions regarding this mailing list, please call Cynthia Peurifoy at 1-800-435-9233.

NAME: _____

ADDRESS: _____

_____

TELEPHONE: ( )_____

USE THIS SPACE TO WRITE YOUR COMMENTS

Your input on the Proposed Plan for the Beaunit Superfund Site is important in helping EPA select a final remedy for the Site. You may use the space below to write your comments, then fold and mail. A response to your comment will be included in the Responsiveness Summary.

I want my property put back in the condition
it was before this pollution occurred.

Edna L. Reece

200 Georgia Street
Fountain Inn, SC 29644
November 29, 1994

Ms. Cynthia Peurifoy
Environmental Protection Agency
North Superfund Remedial Brands
345 Courtland Street NE
Atlanta, Georgia 30365

Dear Ms. Peurifoy:

I am a resident of Fountain Inn near the Wilson Sporting Goods manufacturing facility which was formerly the site of the Beaunit Textile plant. My concern is whether or not this has been determined to be a contaminated area.

A year or two ago, my next-door neighbor applied for a low-interest loan for home repairs and was informed that one of several particulars pending approval was the outcome of an investigation of possible contamination at or near her home. (At least, this is the best I could understand what she stated.) Obviously, I am concerned about how this affects the value of my own property.

Also, during the eleven years I have lived here, there have been five deaths of very close neighbors having cancer and yet another who has been diagnosed with some form of cancer of which type I don't know. All of these live within a few hundred feet to a few hundred yards of my own home. Most recent, was Mr. Campbell who lived on Andrews Lane who died only two or three months ago with cancer of the esophagus. There may have been more cancer related deaths, but these are the ones of which I am aware. This seems to me to be a high percentage of cancer-related deaths for such a small area and is becoming a growing concern to me.

My questions are: 1) Have contaminants been found? 2) If so, are there any cancer-causing contaminants that would be a threat to the health of those of us living in near proximity of the area? 3) If so, are there any plans for a clean-up?

These matters are respectfully submitted for your consideration, and I trust I will hear from you soon.

Sincerely yours,

<IMG SRC 0495254P>

Carolyn Rumfelt

mtf

<IMG SRC 0495254Q>

**APPENDIX C**

**PROPOSED PLAN**

**SUPERFUND PROPOSED PLAN FACT SHEET**

<IMG SRC 0495254R>

Beaunit Circular Knit & Dyeing Superfund Site
Fountain Inn, Greenville County, South Carolina

U.S. Environmental Protection Agency, Region IV, Atlanta, GA

November 1994

## INTRODUCTION

The United States Environmental Protection Agency (EPA) is issuing this Proposed Plan Fact Sheet for the Beaunit Circular Knit & Dyeing Superfund site in Fountain Inn, South Carolina. This Proposed Plan is issued to present the alternatives that the EPA has considered for the surface soil and groundwater contamination found at the Beaunit site. EPA, in consultation with South Carolina Department of Health and Environmental Control (SCDHEC) will select a final remedy for the site after the public comment period has ended and the information submitted during this time has been reviewed and considered. Changes to the preferred alternative, or a change from the preferred alternative to another, may be made if public comments or additional data indicate that such a change would result in a more appropriate solution. The final decision regarding the selected remedy will be documented in a Record of Decision (ROD) after EPA has taken into consideration all comments from the public. Upon timely request, EPA will extend the public comment period by 30 additional days. Terms in bold print are defined in a glossary on page 12 of this fact sheet.

EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). This document summarizes information that can be found in greater detail in the Remedial Investigation/Feasibility Study (RI/FS) Reports and other documents contained in the Administrative Record, located at the Information Repository.

The information used in proposing the response action is available at Fountain Inn Public Library located at 400 Main Street in Fountain Inn, South Carolina (803-862-251-1376) and at the Superfund Record Center at EPA Region TV Office located at 345 Courtland Street, Atlanta, GA (404-437-0506).

## DESCRIPTION AND HISTORY

The Beaunit Site occupies approximately 1.3 acres on the northwest side of Fountain Inn South Carolina. Fountain Inn is 15 miles southeast of the City of Greenville

(See Figure 1-1, page 13). The Site consists of the former wastewater lagoon, and its surroundings, that serve a former knitting, dyeing, and finishing plant about 400 yards east of the Site. The wastewater lagoon was built in 1951 and ceased operations in 1977 when the adjacent plant connected to municipal sewage. In 1980 the wastewater treatment structures around the lagoon were demolished and the lagoon was partially filled in. The Site is currently inactive and enclosed within a secured fence. The adjacent plant currently is operated by Wilson Sporting Goods for the manufacture of tennis balls.

The Site is located off Valley View Road. Land use within one mile of the Site includes small farms, residential areas, several businesses, and industrial facilities. Within .25 miles of the Site along Valley View Road are Valley View Apartments, power lines, and a small pond. The nearest dwellings to the Site are the Valley View apartments located about 100 yards northeast of the Site. Water is available to area residents and businesses through a public water supply system. No groundwater supply wells exist at

Public Comment Period:
Monday, November 7, 1994
- Wednesday, December 7, 1994

Public Meeting
Date: Monday, November 14, 1994
Time: 7:00 P.M.
Place: Fountain Inn Activity Center
200 N. Main Street
Fountain Inn, SC

Provide written comments or call:
Steven Sandler or Cynthia Peurifoy
U.S. Environmental Protection Agency
North Superfund Remedial Branch
345 Courtland St, NE
Atlanta, Georgia 30365
1-800-435-9233

Site History

A wastewater treatment plant, which consisted of a modified activated sludge system, was built at the location in 1951. It was constructed to treat industrial wastewater from the knitting dyeing, and finishing plant that was located approximately 400 yards to the east. The treatment plant units included a bar screen, an aeration basin (lagoon), an aeroaccelerator, a clarifier, and a post aeration tank. "As built" drawings for these units could not be located, but these units were believed to be located as indicated on Figure 1.2 (page 14). The original design of the plant was to provide treatment for an average flow rate of 300,000 gallons per day (gpd) of textile wastewater. The lagoon had a volumetric capacity of 430,100 gallons and received wastewater via a pipeline (the influent pipe).

In 1973, wastewater from the plant was described as passing through an oil separator into the lagoon. The lagoon was equipped with five 15 h.p. aerators, which were also used to supply air to the aeroaccelerator. The wastewater discharge may also have been treated with coagulants and neutralizers, e.g., lime and alum, in the clarifier at the lagoon Site. A suction pump was operated to return collected sludge from the aeroaccelerator to the lagoon. A sludge drying bed, located approximately 20 yards north of the lagoon, was used to dry accumulated waste sludge from the treatment operation. The lagoon was designed to discharge into an unnamed creek that is located to the west end of the lagoon. There may also be a pipeline that bypassed flow around the lagoon and discharged flow directly to the unnamed creek. The unnamed creek flows northwest and eventually joins Howards Branch.

The lagoon was originally put into operation in October 1952 and accepted treated wastewater from knitting and dyeing operations for a textile plant manufacturing fabric for wearing apparel. Records available do not permit an accurate summation of the chemicals used or quantities discharged. However, the following substances were germane to the textile knitting industry and may have been used: soluble and insolubilized wetting agents, dispersing agents, surfactants, defoamers, soaps, detergents, weightors, naphthol, acid, and disperse dyes and pH adjusters. Although the aforementioned materials may have been used in the process, it is unlikely that all of them would be present in the wastewater. These materials were highly diluted by successive rinses. Others reacted and were neutralized or precipitated out during the dyeing process, prior to the subsequent final treatment through the wastewater treatment system. Many substances were absorbed in the materials being dyed, particularly the dyes.

The flow rates to the treatment plant varied with the production rate of the plant. The design capacity of the treatment plant, constructed in 1951, was 300,000 gpd. By 1963, the discharge flow rate increased to 750,000 gpd. In 1963, the design capacity of the treatment plant was rate at 600,000 gpd. In 1976, the permitted discharge flow rate was 540,000 gpd. In September/October 1977, the discharge of wastewater to the lagoon from the knitting, dyeing, and finishing plant was discontinued due to the plant's shutdown. From December 1977 until sometime in 1988, the discharge to the lagoon consisted of water from roof drains, a cooling tower blowdown, and chiller overflow.

In 1979, the plant operators determined that the former wastewater treatment structures on the Site should be razed, and that the then-existing lagoon be filled. The City of Fountain Inn demolished a small brick building and miscellaneous structures on Site, graded the Site, and partially filled the lagoon with the demolition debris and surrounding soil. Additional fill from the tennis ball manufacturing facility was placed in the lagoon and was comprised of thin sheet of blue polyethylene, rubber tennis ball and racquet ball flashing and cores, tennis and racquet ball containers, excess tennis ball felt, golf balls, old roofing material, wooden pallets, and surrounding soils. The current features of the Site are presented on Figure 1.3 (page 15).

During a site inspection in 1985, South Carolina Department of Health and Environmental Control (SCDHEC) personnel noted that a portion of the Site fence was missing. Wilson Sporting Goods (tennis ball manufacturer) subsequently repaired the Site fence. The fence is inspected on a regular basis. The Site has remained inactive since 1988 and access is restricted by the fence and locked gate.

Regulatory involvement on the Site began in the early 1970's when citizens complained to SCDHEC regarding discoloration of the "stream below Beaunit" (probably referring to the unnamed creek and Howards Branch). On November 7, 1973, SCDHEC conducted a public hearing to consider whether possible violations of South Carolina's Water Classification System had occurred. SCDHEC conducted a site investigation on June 13, 1985, and reported detections of volatile organic compounds in surface water samples collected from the lagoon and nearby unnamed creek, and PCBs and metals in the soil and sediment samples collected from the Site. Based on the results obtained from SCDHEC's 1985 Site Investigation, EPA developed a Hazard Ranking System (HRS) score of 32.44 for the Site. In June 1988, EPA proposed to include the Site on the National Priorities List (NPL). The Site is ranked amongst the Group 18 Sites (HRS scores 32.87 - 31.94) on the NPL.

Engineering-Science, an Atlanta consulting firm retained by the Potentially Responsible Parties, conducted RI field activities at the Site in April 1992 and from October 19, 1992 to December 10, 1992.

The RI field activities were as follows:

- Performed topographical and geophysical surveys in April 1992 before preparing the draft RI Work Plan;
- Installed seven (three upgradient and four downgradient) monitoring wells;
- Collected groundwater samples from monitoring wells;
- Collected surface water and sediment samples from the lagoon, the unnamed creek, a pond (located upstream of the unnamed creek), and Howards Branch;
- Collected surface soil samples from 24 locations that included 3 background surface soil samples;
- Collected subsurface soil samples from 15 soil borings that included 3 background soil borings, 5 soil borings along the influent pipeline to the lagoon, 2 soil borings along an effluent pipeline from the lagoon, 2 soil boring in the former sludge drying bed area, and 3 soil borings in the fill material area;
- Surveyed monitoring wells and sampling locations; and
- Conducted biota survey.

The sampling locations are shown on Figure 1.3. The results of the RI field activities were presented to EPA in the RI report.

## RESULTS OF THE REMEDIAL INVESTIGATION

Based on the work listed above, a conceptual model was developed for the Site. There were several differences between what was believed to exist at the Site before the investigation and what the Remedial Investigation showed.

1. Bedrock was believed to occur at about 30-35 feet below land surface in the study area. During the RI bedrock was not found at this depth except for one location. Bedrock was between 60 to 100 feet beneath the surface. This finding eliminated concern that contaminants from the Site might sink and travel across a shallow bedrock layer beneath the Site.

2. Volatile organics were not found to be a concern and were not retained as contaminants of concern. The potential volatilization of chemicals from any media at the Site is not a concern.

3. Lead and cadmium, detected in earlier SCDHEC sampling of lagoon sediments, were found not to be a concern.

4. Potential contaminants of concern were as follows: a) surface soil-polynuclear aromatic compounds (PNA's) and metals (arsenic and manganese), b) subsurface soil-PNA's and manganese, c) lagoon sediments-polychlorinated biphenyls (PCBs), benzo(a)pyrene, and metals (antimony, beryllium, and manganese) and d) groundwater-barium, chromium, and manganese.

5. Beryllium was detected in one groundwater samples at 4.5 ug/L (federal drinking water MCL is 4.0 ug/L.) Manganese was detected above MCLG's in samples from three wells, one of which was a background well. No other metals exceeded federal drinking water standards that were found.

6. The RI data indicated that a) the two primary pathways that site contaminants of concern may travel were surface runoff and infiltration/leachate migration and b) a secondary pathway of migration of the contaminants would be groundwater discharge to surface waters from the former sludge drying beds or fill areas. Factoring these migration paths into the risk assessment work done at the Site, it was determined that the contaminants of concern are not likely to migrate because the four necessary elements to comprise a total migration pathway are not likely to be completed at the Site.

## SCOPE OF THE PROPOSED ACTION

This Proposed Plan for the Beaunit Superfund Site addresses remedies for surface soil and groundwater contamination present at the Site. Sediments and surface water were sampled during the Remedial Investigation as well. The planned action is necessary to protect the public, and in particular, environmental receptors from exposures to contaminated surface soils and groundwater. Additional sources or operable units are not expected.

## SUMMARY OF RISK ASSESSMENT

CERCLA directs EPA to protect human health and the environment from current and potential future exposure to hazardous substances at the Site. A risk assessment was conducted to evaluate the potential current and future risks associated with exposure to the site contaminants.

### Human Risk

An evaluation was made of all potential exposure routes which could connect contaminants of concern (COC's) at the Site with people living or working in the area. Exposure by each of these pathways was mathematically modeled using generally conservative assumptions.

The Baseline Risk Assessment (BRA) for the Site was prepared by Roy F. Weston, Inc. for EPA Region IV. The BRA was finalized on November 24, 1993. EPA determined as a result of the risk assessment that potential future residential exposures to benzene, beryllium, chromium, manganese, 2-methylnaphthalene, and naphthalene in groundwater were of concern. It should be noted these risk levels incorporated both site-related and background-related risks (since some contaminants, such as beryllium, chromium, and manganese, existed in the study area naturally). In the BRA, EPA determined that the risks to human health from contaminants in surface soils were within EPA's acceptable risk range and stated that remediation of surface soils would not be required for the protection of human health. However, the BRA also determined that site surface soils did present a risk to ecological receptors. Arsenic and nickel were identified as the chemicals of concern. While EPA determined that there were no significant concerns over surface soil contamination as applied to human health, the Agency required that soil contamination still be addressed in the feasibility study for the Site because of concern for ecological receptors. Subsurface soil, surface water and sediments were not identified as media of concern for the Site. The contaminants of concern, exposure concentrations, risk levels, and hazard indices are provided in Tables 1.1 & 1.2 of the Feasibility Study.

Actual or threatened releases of contaminants from the Site, if not addressed by one of the alternatives in this plan, may present an imminent and substantial endangerment to public health, welfare or the environment.

### Environmental Risk

A qualitative risk assessment was conducted to determine if contaminants present at the Site have impacted plant life or animals in the area. Given the small size and industrial nature of the Site, significant impact to local plants and animals are not expected. While endangered or threatened species have been identified in this area of the State, none were specifically located at the Site during the RI/FS. Regardless, the environmental risk assessment did indicate that surface soil exposure to environmental receptors would need to be addressed in the development of remediation alternatives.

## SUMMARY OF ALTERNATIVES

Based on the results of the RI/FS reports and the risk assessment, cleanup levels were developed that would be protective of human health and the environment. These cleanup levels will form the basis of any remedial activity. Various alternatives were evaluated in the FS report using these cleanup levels as goals for Site cleanup. The ground water cleanup levels are based on state and federal standards, referred to as Maximum Contaminant Levels (MCLs). The soil/source cleanup levels were established to minimize Site risks and insure future protection of ground water. The cleanup standards for the Beaunit Site are presented in Table A (see page 16).

The FS report evaluated a variety of cleanup methods that could be used at this site. As required by CERCLA, a no further action alternative was evaluated to serve as a basis for comparison with the other active cleanup methods. The cleanup methods to address site related contamination which exceeds the cleanup goals are presented in this Proposed Plan.

Costs shown in the Proposed Plan for each alternative represent the midpoint of the low and high estimates for each alternative which are provided in greater detail in the Feasibility Study.

### Alternative 1: No Action

A no action alternative is required by the NCP to be carried forward as a baseline for detailed comparison. Under this alternative no remedial actions will be conducted for groundwater and surface soil. Site monitor wells will be plugged and abandoned. The current fencing will not be actively maintained under this program. No groundwater monitoring or remediation activities will be conducted. This option does, however, include natural attenuation of groundwater and surface soil contaminants. Under this option, organic contaminants in groundwater and surface soil will biodegrade naturally. Metals will tend to persist in sediment and soils. Investigative derived waste (materials from well drilling and soil sampling) from the RI which are currently being stored on-site will be disposed and the Site will remain

in its current condition.

Mid-point of the range of costs for Alternative 1 in present worth is $5439.

Alternative 2 - Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Deed Restrictions

Alternative 2 combines an institutional control general response action for groundwater and the no action general response action for surface soil. Under this alternative, a monitoring program for groundwater, stream surface water, and stream sediment will be implemented to provide a method for identifying changes in the site conditions. Groundwater samples will be collected from six of the monitoring wells and from three surface water and sediment sampling locations from the unnamed creek); these samples will be analyzed semi-annually for the first two years and annually for three years thereafter. The results will be assessed for future monitoring requirements. Site monitoring will (1) provide early warning of unacceptable contaminant migration, and (2) allow for a better understanding of the natural attenuation rates, No remedial action will be conducted for groundwater and surface soil. This alternative does include natural attenuation and biodegradation of groundwater and surface soil contaminants. Under this alternative, organic contaminants in groundwater and surface soils will degrade naturally. Institutional controls would prevent use of the shallow groundwater and preclude use of the Site for residential construction since metals will not biodegrade and would tend to persist in soils. The investigative derived waste from the RI will be disposed and the site area will be maintained in its current condition.

Mid-point of the range of present worth estimate costs for Alternative 2 is $276,887.

Alternative 3 - Groundwater, Surface Water, and Sediment Monitoring/Grading-Drainage Control-Capping of Site and Deed Restrictions

Alternative 3 combines the institutional control general response action for groundwater and the containment general response action for surface soil. Under this alternative, a monitoring program for groundwater, stream surface water, and stream sediment will be implemented to provide a method for identifying changes in the site conditions. Groundwater samples will be collected from six of the monitoring wells and from three surface water and sediment sampling locations from the unnamed creek). Samples from those locations will be collected and analyzed semi-annually for the first two years and annually for three years thereafter. The results will then be assessed for future monitoring requirements. Site monitoring will (1) provide early warning of unacceptable contaminant migration, and (2) allow for a better understanding of the natural attenuation rates.

The "hot spot" at pipeline location P5 will be excavated and the excavated material will be placed within the fenced area. Initially a 5' by 5' grid will be sampled. The extent of contamination will determine the amount of soil to be excavated. It is believed that 2' of depth will be sufficient with an area 20' by 20' or less.

A cap designed to meet a specification of 10-9 permeability will be placed over the entire area within the fence. Alternative 3, as developed in the Feasibility Study, included a native soil/clay cap designed to meet a 10-5 permeability. Both EPA and SCDHEC concur that the cap should be designed to meet a specification of 10-9 permeability, rather than the 10-5 permeability contained in the alternative as developed in the Feasibility Study. The change was based on modeling the Site with the Sommers model, commonly used to predict effectiveness in caps to prevent leaching from soils of contaminants. EPA and SCDHEC feel the higher degree of impermeability of a cap built to 10-9 specification would insure that the RGO's would be met in the groundwater. The exact details of the construction of the cap will be determined during the Remedial Design, but to meet a design specification of 10-9 will probably require the use of synthetic materials as part of a multiple component layer cap over the Site, rather than just native soil and clay. The cap will be placed over contaminated surface soil within the fenced area to serve as a barrier to potential ecological receptors that may be exposed to the surface soils. The Site will be graded and the lagoon will be backfilled. The waste located on the east side of the lagoon will also be used to backfill the lagoon. The water currently in the lagoon will not be removed. The cap will be placed over the filled lagoon. The cap will be of appropriate gradient as to facilitate direct stormwater run-off.

The grading work at the Site will involve the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread and compact loose soil and modify the surface gradient. Grading the Site will control surface runoff and reduce erosion.

After placement of the cap, grass will grow on the Site and the Site will be maintained by cutting the grass and periodically inspecting the cap for damage.

An earthen berm, ditch or other drainage control feature will also be constructed to divert surface water away from and

around the Site. Therefore, surface water run-off will not cause excessive soil erosion and contaminant transport. Based on the gradient of the Site, drainage controls could be constructed along the southern and southeastern border of the Site.

Deed restrictions would prevent new construction on the Site Several assumptions were made during EPA/SCDHEC change in design specifications for the cap. Utilizing cost comparisons to other recent 10-9 cap designs for sites in this area capital costs are estimated to be $32,000 additional for the Site remedy. Several computer models of caps that could achieve 10-9 were run on RACER software (Remedial Action Cost Engineering and Requirements System, Dept. of Air Force, 1993). From those efforts, it is believed that the capital cost of the Modified Alternative 3 Site cap would be between $212,000 to $220,000, below the $225,000 high range of the Feasibility Study estimate of capital costs for the 10-5 cap. EPA believes that a conservative estimate of the total costs for the Selected Remedy, the modified Alternative 3 is $580,882.

Alternative 4 - Groundwater Pumping and Treatment/Grading and Drainage Control-Capping of Site and Deed Restrictions.

Alternative 4 combines the removal and treatment general response action for groundwater and the containment general response action for surface soil. Deed restrictions are also included. Under this alternative, groundwater will be pumped from monitoring wells that will be determined during the remedial design. For cost and design estimation purposes, MW4S and MW5S have been designed as the extraction wells. These wells will be pumped at a combined rate of approximately 5 gallons/minute. The contaminants of concern include benzene, chromium VI, manganese, naphthalene, 2-methylnaphthalene, and beryllium. To remove beryllium, chromium, and manganese, a dual filtration cartridge system will be used. The first cartridge will be a 3 micron filter. This cartridge will remove the larger particulate that may foul the smaller (second) filtration cartridge. A precipitation system may also be needed prior to the filtration system to remove silt or other larger particles, i.e., iron, manganese, and chromium. The second filtration cartridge will be a 0.3-micron filter. This cartridge will remove the beryllium to below 4 ug/L.

The effluent from the submicron filtration cartridge will pass through a carbon adsorption unit. The carbon adsorption unit will remove the benzene, naphthalene, and 2-methylnaphthalene. The adsorption unit will hold approximately 180 lbs. of carbon. The activated carbon system sized for the groundwater characteristics and extraction rate from MW4S and MW5S will require carbon replacement every 60 days. The removed carbon will be sent off-site for regeneration or disposal. The effluent from the carbon system will be discharged via a pipe to the unnamed creek.

The entire water treatment unit will be located on the Sites property. A concrete foundation with a protection overhead shed will be constructed to protect the units.

The duration of groundwater treatment is based on the size of the contaminated plume, pumping and treatment flow rates, and extraction efficiency (i.e., removal of contaminants from the water bearing zone). The extent of contaminants in groundwater is expected to be localized because the RI data did not indicate the existence of a significant plume. The pumping and treatment flow rates are 5 gpm. For estimation purposes, it is assumed that water treatment would continue for five years. Water samples will be collected monthly from the influent and effluent of the treatment units to periodically verify that treatment standards are being met. Samples will be analyzed for benzene, PNAs, beryllium, chromium VI, and manganese. After five years, an evaluation will be conducted to determine if further treatment is necessary. After treatment has discontinued, a groundwater, stream surface water and stream sediment monitoring program similar to Alternative 2 will be initiated. Treatment would not begin until each monitor well is sampled and groundwater samples are analyzed at least one time to confirm the presence of the contaminants of concern (COCs) and their concentrations.

The "hot spot" at pipeline location P5 will be excavated and the excavated material will be placed within the fenced area. A native soil/clay cap will be placed over contaminated surface soil within the fenced area to serve as a barrier to potential ecological and human receptors that may be exposed to the surface soils. The Site will be graded the lagoon will be backfilled and 18 inches of clay will first be compacted over the graded surface soils. The waste located on the east side of the lagoon will also be used to backfill the lagoon. The water currently in the lagoon will not be removed. The cap will be placed over the filled lagoon. Then 12 inches of native soil will be graded over the clay. The cap will have a maximum permeability of 1 x 10-5 cm/sec.

The natural soil will facilitate grass growth. Grass will provide erosion control. Approximately 5,000 yd3 of clay and 3,000 yd3 of soil will be required for the construction. These materials, at the required thicknesses, will be spread and graded over the entire site. The cap will be of appropriate gradient as to facilitate direct stormwater run-off.

The grading at the Site involves the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread

and compact loose soil and modify the surface gradient. Grading the Site will control surface runoff and reduce erosion.

With the implementation of a natural soil and clay cap, grass will grow on the Site and the Site will be maintained by cutting the grass and periodically inspecting the cap for damage.

An earthen berm, ditch, or other drainage feature will be constructed to divert surface water away from and around the Site. Therefore, excessive surface water run-off will be diverted from the Site and not cause surface soil erosion and contaminant transport. Based on the gradient of the Site, drainage control could be constructed along the southern and southeastern border of the Site. Deed restrictions are also a component of Alternative 4.

Costs for Alternative 4 in present worth have a mid-point of $6,042,662.

Alternative 5 - Groundwater, Surface Water, and Sediment Monitoring/Excavation of "Hot Spots" and Off-Site Disposal and Deed Restrictions

Alternative 5 combines the institutional control general response action for groundwater and the removal and off-site disposal general response actions for surface soil. Under this alternative, a monitoring program for groundwater stream surface water, and stream sediments will be implemented to provide a method for identifying changes in the Site conditions. Groundwater samples will be collected from six of the monitoring wells. Three surface water and sediment sampled. Samples from these locations will be collected and analyzed semiannually for the first two years and annually for three years thereafter. The results will be assessed for future monitoring requirements. Site monitoring will (1) provide allow for a better understanding of the natural attenuation rates.

Within the Site, surface soil that contains COC concentrations above cleanup levels, discussed in the Feasibility Study and in the Table in this fact sheet (RGO's), will be excavated and disposed at an off-site landfill. Four surface soil samples collected during the RI had arsenic and/or nickel concentrations above soil action levels. Additional soil samples will be collected in a 20-ft grid around the sampling location. At the pipeline location P5, soil samples will be collected at the corners of a 5-ft grid. The soil samples will be analyzed for arsenic and nickel and, if a sample from this additional sampling exceeds the cleanup levels for arsenic or nickel, soil samples will be collected from a 20-ft grid around that sampling location or a 5-ft grid for the pipeline location around the exceedance location. Excavation will be completed within a boundary of soil sample locations that have nickel and arsenic concentrations below their respective preliminary remediation goals.

A range of costs was developed for this option. The lower range assumes the surface soil excavation will be limited to a volume of 20 ft by 20 ft by 2 ft around four RI sample locations (shown in Figure 3.6 of the Feasibility Study) and a volume of 5 ft by 5 ft by 2 ft at pipeline location P5. This scenario assumes all samples collected around the "hot spots" are below Remedial Goal Options (RGO's) for surface soil. The total volume of excavation for this scenario is approximately 120 yd3. The higher range costs for this Alternative assumes that all surface soils within the Site will require excavation and disposal. The total volume of excavation for this scenario is approximately 5,000 yd3. Additionally the cost of surface soil sampling and analyses will be a significant part of the total cost of this option. Soil will be excavated to a 2 ft. depth. The excavated soil will be transported to an off-site landfill for disposal. The soil may be disposed in a Subtitle D landfill if the soil is not characteristically hazardous. Based on information gained during the RI, the soil will pass TC criteria and may be accepted for disposal at an off-site solid waste landfill.

The excavated areas will be backfilled and graded. The grading work at the Site will involve the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread and compact loose soil and modify the surface gradient. Grading the Site will control surface runoff and with the excavated areas.

The extent of soil excavation will impact the number of analyses, amount of soil needing excavation, amount of backfill. Once again, deed restrictions would prevent future construction at the Site.

The present worth costs of Alternative 5 are estimated to be in the range of $243,193 to $1,370,675, with the mid-point of costs for this Alternative as $806,934.

Alternative 6 - Groundwater Pumping and Treatment/ Excavation of "Hot Spots" and Off-site Disposal and Deed Restrictions

Alternative 6 combines the removal and treatment general response action for groundwater and the removal and disposal general response action for surface soil. Under this alternative

groundwater will be pumped from monitoring wells that will be determined during the remedial design. For cost and design estimation purposes, MW4S and MW5S have been designed as the extraction wells. These wells will be pumped at a combined rate of approximately 5 gallons/minute. The contaminants of concern include benzene, chromium VI, manganese, naphthalene, 2-methylnaphthalene, and beryllium. To remove beryllium, a dual filtration cartridge system will be used. The first cartridge will be a 3-micron filter. This cartridge will remove the larger particulate that may foul the smaller (second) filtration cartridge. (A precipitation system may also be needed prior to the filtration system to remove silt or other larger particles, e.g., iron, manganese, and chromium.) The second filtration cartridge will be a 0.3-micron filter. This cartridge will remove beryllium to below 4 ug/L.

The effluent from the submicron filtration cartridge will pass through a carbon adsorption unit. The carbon adsorption unit will remove the benzene, naphthalene, and 2-methylnaphthalene. The adsorption unit will hold approximately 180 lbs. of carbon. The activated carbon system properly sized for the groundwater characteristics and extraction rate from MW4S and MW5S would require carbon replacement every 60 days. The removed carbon will be sent off-site for regeneration or disposal. The effluent from the carbon system will be discharged via a pipe to the unnamed creek.

The entire water treatment unit will be located on the site property. A concrete foundation with a protective overhead shed will be constructed to protec the units.

The duration of groundwater is based on the size of the contaminated plume, pumping and treatment flow rates, and extraction efficiency (in other words, removal of contaminants from the water bearing zone). The extent of contaminants in groundwater is expected to be localized because the RI data did not indicate the existence of a significant plume. The pumping and treatment flow rates are 5 gpm. For estimation purposes, it is assumed that water treatment would continue for five years. Water samples will be collected monthly from the influent and effluent of the treatment units to periodically verify that treatment standards are being met. Samples will be analyzed for benzene, poly nuclear aromatics (PNA's), beryllium, chromium, and manganese. After five years, an evaluation will be conducted to determine if further treatment is necessary. After treatment has discontinued, a groundwater, stream surface water, and stream sediment monitoring program similar to Alternative 2 will be initiated. Treatment will not begin until each monitoring well is sampled and analyzed at least one time to confirm the presence of the COCs and their concentrations.

Within the Site, surface soil that contains COC concentrations above cleanup levels will be excavated and disposed at an off-site landfill. Four surface soil samples collected during the RI had arsenic and/or nickel concentrations above soil action levels. Additional soil samples will be collected in a 20-ft grid around the sampling location. At the pipeline location P5, soil samples will be collected at the corners of a 5-ft grid. The soil samples will be analyzed for arsenic and nickel and, if a sample from this additional sampling exceeds the cleanup levels for arsenic or nickel, soil samples will be collected from a 20-ft grid around that sampling location or a 5-ft grid for the pipeline location around the exceedance location. Excavation will be completed within a boundary of soil sample locations that have nickel and arsenic concentrations below their respective preliminary remediation goals. A range of cost was developed for this option. The lower range will assume the surface soil excavation will be limited to a volume of 20 ft by 20 ft by 2 ft around four RI sample locations and a volume of 5 ft by 5 ft by 2 ft at pipeline location P5. This scenario assumes all samples collected around the "hot spots" are below RGOs for surface soil. The total volume of excavation for this scenario is approximately 120 yd3. The higher range units of excavation for removal of "hot spots" assumes that all surface soils within the Site will require excavation and disposal. The total volume of excavation for this scenario is approximately 5,000 yd3. Additionally the cost of surface soil sampling and analyses will be a significant part of the total cost of this option. Soil will be excavated to a 2 ft. depth. The excavated soil will be transported to an off-site landfill for disposal. The soil may be disposed in a Subtitle D landfill if the soil is not characteristically hazardous. Based on information gained during the RI, the soil will pass TC criteria and may be accepted for disposal at an off-site solid waste landfill.

The extent of soil excavation will impact the number of analyses, amount of soil needing excavation, amount of backfill required, and the amount of grading required following backfill.

Present worth cost estimates for Alternative 6 range from $3,740,838 to $8,865,058, with a mid-point cost of $6,302,948.

Alternative 7 - Groundwater, Surface Water, and Sediment Monitoring/Excavation of Site Surface Soils and Fill Area and Off/site Disposal

Alternative 7 combines the institutional control general response action for groundwater and a second combined removal and disposal general response action for surface soil. Under this alternative, a monitoring program for groundwater, stream surface water, and stream sediment will be implemented to provide a method of identifying changes in the Site

conditions. Groundwater samples will be collected from six of the seven RI monitoring wells and from three surface water and sediment sampling locations (from the unnamed creek). The routines for sampling and analyses will be the same as in of unacceptable contaminant migration, and (2) allow for a better understanding of the natural attenuation rates.

Within the Site, all surface soil and the fill material (located east of the lagoon) will be excavated, contained and disposed off-site. With this option, surface soils within the site boundaries and at pipeline location P5 (5 ft by 5 ft) will be excavated to 2 ft depth. Approximately 5,000 yd3 of surface soil would require excavation. The surface area of fill material is approximately 1,800 yd2 with the fill extending to an average of approximately 10 ft. These soils total approximately 6,000 yd3 that would require excavation. The excavated soil will be contained for disposal. The soil may be disposed in a Subtitle D landfill if the soil is not characteristically hazardous. Based on information gained during the RI, the soil will pass TC criteria and may be accepted to an off-site solid waste landfill. The excavated areas would then be backfilled with natural soil.

Under Alternative 7, the existing lagoon would be backfilled and the entire Site will be graded. The grading work at the Site will involve the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread and compact loose soil and modify the surface gradient. Grading the Site will control surface runoff and reduce erosion. Grass seeding will be used to grow grass within the Site.
The estimated present worth costs for Alternative 7 range from a low of $934,429 to a high of $2,002,775, with a mid-point of $1,468,602.

Alternative 8 - Groundwater Pumping and Treatment/Excavation of Site Surface Soils and Fill Area and Off-site Disposal

Alternative 8 combines the removal and treatment general response action for groundwater and a second combined removal and disposal general response action for surface soil. Under this alternative groundwater will be pumped from monitoring wells that will be determined during the remedial design. For cost and design estimation purposes, MW4S and MW5S have been initially chosen as the extraction wells These wells will be pumped at a combined rate of approximately 5 gallons/minute. The contaminants of concern include benzene, chromium VI, manganese, naphthalene, 2-methylnaphthalene, and beryllium. To remove beryllium, a dual filtration cartridge system will be used. The first cartridge will be a 3 micron filter. This cartridge will remove the larger particulate that may foul the smaller (second) filtration cartridge. (A precipitation system may also be needed prior the filtration system to remove silt or other larger particles, i.e., iron, manganese, and chromium.) The second will remove the beryllium to below 4 ug/L.

The effluent from the submicron filtration cartridge will pass through a carbon adsorption unit. The carbon adsorption unit will remove the benzene, naphthalene, and 2-methylnaphthalene. The adsorption unit will hold approximately 180 lbs. of carbon. The activated carbon system sized for the groundwater characteristics and extraction rate from MW4S and MW5S will require carbon replacement every 60 days. The removed carbon will be sent off-site for regeneration or disposal. The effluent from the carbon system will be discharged via a pipe to the unnamed creek.

The entire water treatment unit will be located on the site property. A concrete foundation with a protective overhead shed will be constructed to protect the units.

The duration of groundwater treatment is based on the size of the contaminated plume, pumping and treatment flow rates, and extraction efficiency. The extent of contaminants in groundwater is expected to be localized because the RI data did not indicate the existence of a significant plume. The plumping and treatment flow rates are 5 gpm. For estimation purposes, it is assumed that water treatment would continue for five years. Water samples will be collected monthly from the influent and effluent of the treatment units to periodically verify that treatment standards are being met. Samples will be analyzed for benzene, PNAs, beryllium, chromium, and manganese. After five years, an evaluation will be conducted to determine if further treatment is necessary. After treatment has discontinued, a groundwater, stream surface water, and stream sediment monitoring program similar to Alternative 5 will be initiated. Prior to treatment, each well will be sampled and analyzed at least one time to confirm the presence of the COCs and their concentrations.

Within the Site, all surface soil and the fill material (located east of the lagoon) will be excavated, contained and disposed off-site. With this option, surface soils within the site boundaries and at pipeline location P5 (5 ft by 5 ft) will be excavated to 2 ft depth. Approximately 5,000 yd3 of surface soil would require excavation. The Fill area is approximately 1,800 yd2. The fill extends to an average of approximately 10 ft. Therefore approximately 6,000 yd3 would require excavation. The excavated soil will be contained for disposal. The soil may be disposed in a Subtitle D landfill if the soil is not characteristically hazardous. Based on information gained

during the RI, the soil will pass TC criteria and will be accepted to an off-site solid waste landfill. The excavated areas would then be backfilled with natural soil.

Under this alternative the existing lagoon will be backfilled and the entire Site will be graded. The grading work at the Site will involve the use of heavy equipment (such as dozers, loaders, scrapers, and compactors) to spread and compact loose soil and modify the surface gradient. Grading the Site will control surface runoff and reduce erosion. Grass seeding will be used to grow grass within the Site.

The range of present worth costs for Alternative 8 range from a low of $4,432,074 to $9,497,158, with a mid-point of $6,964,616.

## COMPARATIVE ANALYSIS OF ALTERNATIVES

EPA has established criteria for use in comparing the advantages/disadvantages of each alternative. The alternatives are evaluated against one another by using the nine criteria on the following table. The nine evaluation criteria fall into the groups: threshold criteria, primary balancing criteria, and modifying criteria.

The following discussion compares the various alternative to the criteria.

### Overall Protection of Human Health and the Environment

Relative to groundwater concerns, the alternatives without groundwater pumping and treatment (Alternatives 1, 2, 3, 5, 7) will have decreases in the concentrations of organic contaminants through natural attenuation. While metals would tend to persist, migration of metals was not observed during the RI. Alternatives with pump and treatment of groundwater (Alternatives 4, 6) would enhance the speed of the reduction of organic contaminants. Groundwater monitoring and use restrictions of all alternatives except the no action alternative would preclude exposure to the groundwater and provide early warning of unacceptable contaminant migration.

Relative to surface soil, alternatives 1 and 2 do not reduce risks to ecological receptors. All other alternatives eliminate risk to area biota.

### Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

All non pump and treat groundwater alternatives will not immediately meet chemical-specific ARARs including MCLs, but the concentrations of organic contaminants of concern in groundwater will decrease over time (about 5 years) through natural attenuation and will be in compliance with chemical specific ARARs. While metals would tend to persist, monitoring and groundwater use restrictions would prevent exposure and provide warning of contaminant migration, as yet undetected. Groundwater pump and treat alternatives would provide compliance sooner than non-pump and treat alternatives.

Relative to action-specific ARARs, alternatives 3 through 8 comply with requirements for 1) abandonment of wells in the SC Groundwater Use Act, 2) the SC Groundwater Use Act for Well Development, and 3) the South Carolina Stormwater Regulations for soil disturbance. No location specific ARARs have been identified for the Site.

### Cost

A summary of the present worth cost which includes the capital as well as the operation and maintenance cost for each of the alternatives is presented within the explanation of the alternative. Greater detail is provided in the Feasibility Study, which is located in the Administrative Record.

### Implementability

The implementability of an alternative is based on technical feasibility, administrative feasibility and the availability of services and materials. All components of each alternative are both technically and administratively feasible. The design and construction of soil caps with synthetic materials is commonly done. Soil excavation and removal would be difficult and would require compliance with significant administrative requirements, but it is commonly done. Necessary technology, services, and materials are all readily available. Pump and treat remedies are commonly installed at Superfund Sites, although due to the long term requirements of these remedies, their effectiveness has not been fully determined at many other sites.

### Community Acceptance

The purpose of this Proposed Plan and the upcoming comment period is to encourage input from the public during the remedy selection process. Community acceptance of the preferred alternative will be evaluated after the public comment: period and will be described in the Record of Decision for the Site.

## CRITERIA FOR EVALUATING REMEDIAL ALTERNATIVES

In selecting a preferred cleanup alternative, EPA uses the following criteria to evaluate each of the alternatives developed in the Feasibility Study (FS). The first two criteria are essential and must be met before an alternative is considered further. The next five are used to further evaluate all options that meet the first two criteria. The final two criteria are used to further evaluate EPA's proposed plan after the public comment period has ended and comments from the community and the State have been received. All nine criteria are explained in more detail here.

- Overall Protection of Human Health and the Environment - Assesses degree to which alternative eliminates, reduces, or controls health and environmental threats through treatment, engineering methods, or institutional controls.
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) - Assesses compliance with Federal/State requirements.
- Cost - Weighing of benefits of a remedy against the cost of implementation.
- Implementability - Refers to the technical feasibility and administrative case of a remedy.
- Short-Term Effectiveness - Length of time, for remedy to achieve protection and potential impact of construction and implementation of the remedy.
- Long-Term Effectiveness and Performance - Degree to which a remedy can maintain protection of health and environment once cleanup goals have been met.
- Reduction of Toxicity, Mobility, or Volume Through Treatment - Refers to expected performance of the treatment technologies to lessen harmful nature, movement, or amount of contaminants.
- State Acceptance - Consideration of State's opinion of the preferred alternatives.
- Community Acceptance -- Consideration of public comments on the Proposed Plan.

**Short Term Effectiveness**

During the implementation of all the alternatives, both on-site workers and people surrounding the Site will be protected from possible impacts caused by construction activities. Risks from cap installation or soil excavation and removal would be addressed in health and safety plans. There is no risk to the environmental receptors from implementation of any remedy, although habitats would be disrupted during installation activities. Community risks from construction truck traffic would be short term and safety could be insured by additional signage and traffic control. Installation of a cap would be immediately effective in reducing leaching from soils into the groundwater.

**Long-Term Effectiveness and Permanence**

All of the alternatives under consideration by EPA in this Proposed Plan were evaluated for this criteria under each of its components consisting of 1) permanence, 2) magnitude of residual risk, 3) adequacy and reliability of controls, 4) need for periodic review, and 5) certainty of success. Relative to permanence and magnitude of residual risk, Alternatives 1, 2, 3, 5, and 7 only reduce risk in groundwater after natural attenuation processes are complete. Pump and treat Alternatives 4, 6, and 8 will reduce risks from groundwater more quickly. Alternatives 1 and 2 do not reduce ecological risks while all other alternatives do. Adequacy and reliability of controls for all alternatives are generally good if institutional controls (such as Alternative 2) are enforced. All alternatives involving regular monitoring will require periodic review as will alternatives involving capping the Site. Alternatives involving excavation and soil replacement will not require periodic review. All alternatives have approximately the same certainty of success with the pump and treat alternatives having the ability to meet Remedial Action Objectives more quickly.

**Reduction of Toxicity, Mobility, and Volume**

This criteria was evaluated for each of its components consisting of 1) treatment used, 2) reduction of toxicity, mobility, or volume, 3) type and quantity of residuals remaining after treatment, and 4) irreversibility of treatment. Only pump and treat alternatives involve treatment and are considered irreversible. Such treatment will generate residuals which will require off-site disposal Alternatives involving soil excavation and removal will reduce the toxicity, mobility, and volume by removal of the

contaminated soils.  Capping alternatives will reduce the mobility of the contaminants, while soil excavation remedies are considered irreversible.

**State Acceptance**

The State of South Carolina's Department of Health and Environmental Control was consulted during the drafting of this Proposed Plan.  They are in support of the Alternative selected in this Proposed Plan.

## EPA's PREFERRED ALTERNATIVE

In summary, based on the information available at this time, EPA is proposing Alternative 3: Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Grading-Drainage Control-10-9 Site Cap and Deed Restrictions, as the proposed remedy for the Beaunit Site. The only modification to Alternative 3 as described earlier in this fact sheet and in the Feasibility Study is the design specifications and construction materials for the Cap. Both EPA and SCDHEC concur that the cap should be designed to meet a specification of 10-9 permeability, rather than the 10-5 permeability contained in the alternative as developed in the Feasibility Study. The change was based on modeling the Site with the Sommers model, commonly used to predict effectiveness in caps to prevent leaching from contaminated soils. EPA and SCDHEC feel the higher degree of impermeability of a cap built to 10-9 specification would insure that the RGO's would be met in the groundwater. The exact details of the construction of the cap will be determined during the Remedial Design.

Several assumptions were made during EPA/SCDHEC change in design specifications for the cap. Utilizing cost comparisons to other recent 10-9 cap designs for sites in this area capital costs are estimated to be $32,000 additional for the site remedy. Several modeling runs of caps were performed on RACER software (Remedial Action Cost Engineering and Requirements System, Dept. of Air Force, 1993). From those efforts, it is believed that the capital cost of the Modified Alternative 3 Site Cap would be between $212,000 to $220,000, below the $225,000 high range of the Feasibility Study estimate of capital costs for the 10-5 cap. EPA believes that a conservative estimate of the total costs for the Selected Remedy, the modified Alternative 3, $580,882.

This alternative represents the best balance among the criteria used to evaluate remedies. The modified Alternative 3 is believed to be protective of human health and the environment, would attain ARARs, would be cost effective, and would utilize permanent solutions and alternative treatment technologies or resource technologies to the maximum extent practicable.

Based on comments received from the public during the upcoming comment period, EPA, in consultation with SCDHEC, may later further modify the preferred alternative or select another remedial alternative presented in this Proposed Plan.

## TECHNICAL ASSISTANCE GRANTS ARE AVAILABLE

who are interested in a TAG may contact Ms. Cynthia Peurifoy at 1-800-435-9233.

## GLOSSARY

Administrative Record: An official compilation of information that is considered important to the status of Superfund decisions. The record is placed in the information repository to allow public access to the material.

Applicable or Relevant and Appropriate Requirements (ARARs): Requirements which must be met by a response action selected by EPA as a site remedy. "Applicable" requirements are those mandated under one or more Federal or State laws. "Relevant and appropriate" requirements are those which, while not necessarily required, EPA judges to be appropriate for use in that particular case.

Baseline Risk Assessment: An assessment which provides an evaluation of the potential risk to human health and the environment in the absence of remedial action.

Biota: The animal and plant life of a given region.

Comprehensive, Environmental, Response, Compensation and Liability Act (CERCLA): A Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA), known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites.
waste sites.

Contaminants of Concern (COC's): Contaminants, identified during site investigations and risk assessments, that pose a potential risk to human health and the environment because of their toxicity and potential routes of exposure.

Exposure Route: Path for contaminants to reach people either working or residing near a site.

Groundwater: Water found beneath the earth's surface that fills the pores between materials such as sand, soil, or gravel.

Hazard Ranking System (HRS): A scoring system used by EPA and the states to evaluate relative risks to public health and the environment from releases or threatened releases of hazardous substances. An HRS score is calculated based on actual or potential release of hazardous substances through the air, soils, surface water or groundwater. This score is a primary factor used to decide if a hazardous waste site should be placed on the National Priorities List.

Information Repository: A library or other location where information related to a Superfund Site is placed for public access.

To assist communities in interpreting the technical finding at Superfund Sites, communities may apply for Technical Assistance Grants of up to $50,000.  Congress and EPA have established requirements for the use of this grant.  Citizens

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<IMG SRC 0495254U>

Permeability:  The rate at which liquids pass through soil or other materials in a specified direction.

Polynuclear Aromatics (PNA's) - also know as Polynuclear Aromatic Hydrocarbons (PAH's):  A class of organic compounds whose structure consists of joined rings of carbon atoms.  PNAs/PAHs are often associated with wood-treating operations such as creosote treatment.

Record of Decision (ROD):  A public document describing EPA's rationale for selection of a Superfund cleanup alternative.

Remedial Investigation/Feasibility Study (RI/FS):  A two part study of hazardous waste site that supports the selection of a remedial action for the site.  The first part, or the RI, identifying that type and extent of contamination.  The second part, or the FS, identifies and evaluates alternatives for addressing site contamination, based on the results of the RI.

**APPENDIX D**

**PUBLIC NOTICE OF COMMENT PERIOD**

Published November 6, 1994, Greenville News
Published November 9, 1994, Golden Strip Times/Tribune Times

<IMG SRC 0495254V>

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION IV
INVITES PUBLIC COMMENT ON THE PROPOSED CLEANUP PLAN FOR THE
BEAUNIT CIRCULAR KNIT A DYEING SUPERFUND SITE,
FOUNTAIN INN, GREENVILLE COUNTY, SOUTH CAROLINA

The U.S. Environmental Protection Agency is inviting public comment on the Proposed Plan for cleanup of the Beaunit Circular Knit & Dyeing Superfund Site. The Remedial Investigation and Feasibility Study for the site have been completed. The Remedial Investigation determined the nature and extent of contamination at the site. The Feasibility Study evaluated alternatives for addressing surface soil and groundwater contamination at the site, the principal threats posed by the site.

EPA evaluated eight alternatives that were considered in the Feasibility Study. The costs shown in parentheses below represent the midpoint of the low and high present worth cost estimates for each alternative. The following alternatives were considered:

| | |
|---|---|
| Alternative 1: | No Action ($5439) |
| Alternative 2: | Groundwater, Surface Water, and Sediment Monitoring/Groundwater Use Restrictions/Deed Restrictions ($276,887) |
| Alternative 3: | Groundwater, Surface Water, and Sediment Monitoring/Grading-Drainage Control-Capping of Site and Deed Restrictions ($580,822) |
| Alternative 4: | Groundwater Pumping and Treatment/Grading & Drainage Control-Capping of Site and Deed Restrictions ($6,042,662) |
| Alternative 5: | Groundwater, Surface Water, and Sediment Monitoring/Excavation of "Hot Spots"/ Off-site Disposal and Deed Restrictions ($806,934) |
| Alternative 6: | Groundwater Pumping and Treatment/Excavation of "Hot Spots", Off-Site Disposal and Deed Restrictions ($6,302,948) |
| Alternative 7: | Groundwater, Surface Water and Sediment Monitoring/Excavation of Site Surface Soils and Fill Area and Offsite Disposal ($1,468,602) |
| Alternative 8: | Groundwater Pumping and Treatment/Excavation of Site Surface Soils and Fill Area and Off-site Disposal ($6,964,616) |

EPA is proposing Implementation of Alternative 3: Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Grading and Drainage Control-Capping of Site and Deed Restrictions. Under the alternative, a monitoring program for groundwater, stream surface water, and stream sediment will be implemented to provide a method for identifying changes in the Site conditions. The "hot spot" at pipeline location P5 will be excavated and the excavated material will be placed within the fenced area. A cap will be placed over the entire area within the fence. EPA is proposes a change to the design specifications for Alternative 3, as written in the Feasibility Study. EPA and SCDHEC propose that the cap should be designed to meet a specification of 10-9 permeability, rather than the 10-5 permeability as contained in the alternative as developed in the Feasibility Study. The design of a 10-9 cap will probably require synthetic materials in addition to soil and clay. EPA and SCDHEC believe that the higher degree of impermeability would insure that Remedial Goal Options for groundwater would be met. EPA believes that the proposed remedy will be protective of human health and the environment, meet applicable or relevant and appropriate requirements, be effective in the long-term, reduce contaminant, mobility, be easy to implement, and will be cost effective.

The Agency is holding a 30 day comment period, which begins on Monday, November 7, 1994, and ends on Wednesday, December 7, 1994. Upon receipt of a timely request, the comment period can be extended for an additional 30 days. Written comments, which must be postmarked no later than December 7, 1994, should be sent to:

Mr. Steven Sandler, Remedial Project Manager
of Cynthia Peurifoy, Community Relations Coordinator
North Superfund Remedial Branch
U.S. Environmental Protection Agency, Region IV
345 Courtland Street, N.E., Atlanta, GA 30365

EPA has scheduled a public meeting to present the proposed plan and to answer questions regarding the Remedial Investigation, Feasibility Study and other documentation contained in the Administrative Record. The meeting also provides the public an opportunity to submit oral and written comments on the proposed cleanup plan and the other alternatives considered. The meeting will be:

| | |
|---|---|
| Date: | Monday, November 14, 1994 |
| Time: | 7:00 p.m. |
| Place: | FOUNTAIN INN ACTIVITY CENTER<br>200 N. Main Street, Fountain Inn, South Carolina |

Copies of the proposed plan, as well as the administrative record for the site, are available for review at the site information repository, which is in the Fountain Inn Branch Library, 400 North Main Street Fountain Inn, SC, 803-862-2576. These documents are also available for review at the EPA Records Center, 345 Courtland Street, N.E., Atlanta, GA 30365, 404-347-0506.

For additional information, or to be added to EPA's mailing list for the site, contact Cynthia B. Peurifoy, Community Relations Coordinator, at 1-800-435-9233, or 404/347-7791, x4102.

Published November 27, 1994, Greenville News
Published November 30, 1994, Golden Strip Times/Tribune Times

<IMG SRC 0495254W>

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION IV
INVITES PUBLIC COMMENT ON THE PROPOSED CLEANUP PLAN FOR THE
BEAUNIT CIRCULAR KNIT A DYEING SUPERFUND SITE,
FOUNTAIN INN, GREENVILLE COUNTY, SOUTH CAROLINA

The U.S. Environmental Protection Agency has extended the public comment period for the Proposed Plan for the Beaunit Circular Knit and Dyeing Superfund Site. The comment period which opened on November 7, and was scheduled to close on December 7, will close on January 13, 1995. EPA continues to inviting public comment on the Proposed Plan for cleanup of the Beaunit Circular Knit & Dyeing Superfund Site. EPA held a public meeting on November 14, 1994 to present the proposed plan and to receive public input.

EPA and the South Carolina Department of Health and Environmental Control, evaluated eight alternatives that were considered in the Feasibility Study conducted for the site. The costs shown in parentheses below represent the midpoint of the low and high present worth cost estimates for each alternative. The following alternatives were considered:

| | |
|---|---|
| Alternative 1: | No Action ($5439) |
| Alternative 2: | Groundwater, Surface Water, and Sediment Monitoring/Groundwater Use Restrictions/Deed Restrictions ($276,887) |
| Alternative 3: | Groundwater, Surface Water, and Sediment Monitoring/Grading-Drainage Control-Capping of Site and Deed Restrictions ($580,822) |
| Alternative 4: | Groundwater Pumping and Treatment/Grading & Drainage Control-Capping of Site and Deed Restrictions ($6,042,662) |
| Alternative 5: | Groundwater, Surface Water, and Sediment Monitoring/Excavation of "Hot Spots"/Off-site Disposal and Deed Restrictions ($806,934) |
| Alternative 6: | Groundwater Pumping and Treatment/Excavation of "Hot Spots", Off-Site Disposal and Deed Restrictions ($6,302,948) |
| Alternative 7: | Groundwater, Surface Water and Sediment Monitoring/Excavation of Site Surface Soils and Fill Area and Offsite Disposal ($1,468,602) |
| Alternative 8: | Groundwater Pumping and Treatment/Excavation of Site Surface Soils and Fill Area and Off-site Disposal ($6,964,616) |

EPA is proposing Implementation of Alternative 3: Groundwater, Surface Water, and Sediment Monitoring and Groundwater Use Restrictions/Grading and Drainage Control-Capping of Site and Deed Restrictions. Under this alternative, a monitoring program for groundwater, stream surface water, and stream sediment will be implemented to provide a method for identifying changes in the Site conditions. The "hot spot" at pipeline location P5 will be excavated and the excavated material will be placed within the fenced area. A cap will be placed over the entire area within the fence. EPA is proposes a change to the design specifications for Alternative 3, as written in the Feasibility Study. EPA and SCDHEC propose that the cap should be designed to meet a specification of 10-9 permeability, rather than the 10-6 permeability as contained in the alternative as developed in the Feasibility Study. The design of a 10-9 cap will probably require synthetic materials in addition to soil and clay. EPA and SCDHEC believe that the higher degree of impermeability would insure that Remedial Goal Options for groundwater would be met. EPA believes that the proposed remedy will be protective of human health and the environment, meet applicable or relevant and appropriate requirements, be effective in the long-term, reduce contaminant, mobility, be easy to implement, and will be cost effective.

Written comments, which must be postmarked no later than January 13, 1995, should be sent to:

Mr. Steven Sandler, Remedial Project Manager
of Cynthia Peurifoy, Community Relations Coordinator
North Superfund Remedial Branch
U.S. Environmental Protection Agency, Region IV
345 Courtland Street, N.E., Atlanta, GA 30365

Copies of the proposed plan, as well as the administrative record for the site, are available for review at the site information repository, which is in the Fountain Inn Branch Library, 400 North Main Street Fountain Inn, SC, 803-862-2576. These documents are also available for review at the EPA Records Center, 345 Courtland Street, N.E., Atlanta, GA 30365, 404-347-0506.

For additional information, or to be added to EPA's mailing list for the site, contact Cynthia B. Peurifoy, Community Relations Coordinator, at 1-800-435-9233, or 404/347-7791, x4102.

**APPENDIX E**

**TRANSCRIPT OF THE PROPOSED PLAN PUBLIC MEETING**

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION IV

ATLANTA, GEORGIA

PUBLIC HEARING

NOVEMBER 14, 1994 @ 7:00 P.M.

BEAUNIT CIRCULAR KNIT & DYEING SUPERFUND SITE

FOUNTAIN INN, SOUTH CAROLINA

Deborah Garrison
Court Reporter
245-D East Broad Street
Greenville, S.C. 29601
(803) 244-0973

BY CYNTHIA PEURIFOY:

Good evening. My name is Cynthia Peurifoy and I'm the Community Relations Coordinator with the South Carolina section of the Superfund Program of EPA out of Atlanta, Georgia.

I welcome you here tonight to hear the proposed plan concerning the Beaunit Circular Knit & Dyeing Superfund Site.

Before we get started, I want to make some introductions to you.

First of all, I would like to introduce to you Steven Sandler. He is the Remedial Project Manager of the site for EPA.

I would also like to introduce Jan Rogers, who is managing coordinator for EPA, South Carolina section.

We have some colleagues of ours from the South Carolina Department of Health and Environmental Control with us tonight. They are Craig Marriner and Jim Bowman.

Before we get started, I would also like to cover a little bit with you about the Superfund's Community Relations Program. I know that some of you are familiar with the community interviews that we did in preparation for our work on the site. We do have

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a community relations plan outlined that we felt we should do in order to communicate with the community and keep you informed. And I know that a lot of you got the Fact Sheet that we mailed out that announced our Proposed Plan.

I also want to make sure that you have the information that is at the Fountain Inn Library here in Fountain Inn.

We are in the public comment period on this proposed plan. That comment period ends on December 7th.

There is a provision for a thirty-day extension of that comment period, if you so desire.

I would also like to point your attention to our court reporter tonight, who is Deborah Garrison. I would like to ask that at any time you would like to make a statement or ask a question that you identify yourself and make sure that she can hear you clearly, whatever statement that you would make.

Finally, I would like to just ask that if at any time we can do anything for you, or answer any questions for you, that you can reach us at our 800-Number, which is on the Fact Sheet. Let us know of anything that we can do to answer questions or to answer any concerns that you have.

At this time, I would like to turn the meeting over

to Steven Sandler, our Remedial Project Manager.

BY MR. SANDLER:

Thank you very much, Cynthia. And thank you, too, everyone who came out tonight to listen to what we are going to be proposing for the cleanup of the Beaunit Circular Knit & Dyeing Site.

I have a few photographs that I am going to put out on the table, which some of you may wish to take a look at after I make the presentation; because many people may not be familiar with the site, because it is not on a main road and it is not quite on the road.

The Site is located off of Valley View Road. I have a picture here and you can see some tire tracks, and that shows where the entrance to the Site is.

I also have some other photographs that show the interior of the site, (placing on table for public viewing).

Briefly, I will go through a little bit of the history of the Site, the regulatory history of the Site; some of the Site features; what we did during the investigation of the Site; and the development of the alternatives to clean up the Site; and what the Agency selected, in conjunction without counterparts at the South Carolina Department of Health

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& Environmental Control; and give you an indication of some of the upcoming events in the cleanup of this Site.

Last, and certainly not least, we will have plenty of time for questions and answers at the conclusion of the presentation.

Just briefly, the site history:

In 1951, there was a wastewater treatment plant in the woods off of Valley View Road, some four hundred yards from what is now the Wilson Sporting Goods plant.

In 1952, the wastewater treatment plant was put into operation. It had a capacity then of 300,000 gallons per day.

In 1953, the capacity was increased.

In 1977, the plant was shut down and the operation of the wastewater treatment plant, which included a wastewater lagoon, ended.

And sometime in between 1977 and 1988, all discharge to the lagoon from the plant stopped. Even though the lagoon was not used for sewage treatment operations, there was a pipeline that connected the current Wilson Sporting Goods plant to the lagoon and there were some materials that were discharged into the lagoon.

In between 1979 and 1980 the wastewater treatment plant, the structures above the ground, were destroyed and for the most part were bulldozed into the lagoon. There was some concern then that the lagoon represented an unsafe condition. As it was explained to the parties who were involved at this time when the lagoon was filled in, it was so that it would not pose so much of a hazard.

A number of governmental agencies have been involved in this site for a period of time. And like any history, there are some certain variations in the years. I have seen one report saying that as early as the early '60s that some citizens had complained about an odor problem. But there were some complaints in the early 70's about stream discoloration. I should add that the lagoon has a pipeline that connects it with the plant and it also had a discharge pipe where, after the sewage had been treated, it would be discharged to an unnamed stream that eventually went into another stream called Howard's Branch.

In 1973, the state agency DHEC had a public hearing on the violations.

And in 1985, they did a site investigation and sampled the site. I should add that there were very,

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very few samples that were taken in 1985. But the site was still ranked according to a Hazardous Ranking score and proposed for listing on the National Priorities List, which is the list of sites which enable facilities to be studied under the CERCLA law.

I will apologize, as I do in every single meeting, for inadvertently using many acronyms and abbreviations. "CERCLA" is the formal name for what we all call "Superfund". The law has a fund of money which provides for the study and cleanup of sites if no potentially responsible parties (RPRs) are found. Or if they are found, it will attempt to seek cost recovery in negotiation with potentially responsible parties to get the site cleaned up.

We have five companies that at various points in time either directly owned or operated the plant and the wastewater treatment lagoon, or later bought a company that operated the plant and the wastewater lagoon. Those five PRP's, as we call them, are El Paso Natural Gas, Kaiser Corporation, Pepsi Inc., Wilson Sporting Goods and Continental Assurance.

I am getting a little bit ahead of myself, but as you can see, in 1990 the site was listed on the National Priorities List as a Superfund site.

And by 1992 all the PRP's and EPA successfully negotiated and signed an AOC, which stands for an Administrative Order Under Consent. That is a contractual agreement between the PRP's and EPA which outlines, in this case, an agreement where the PRP's agree to study the site and propose solutions to clean it up with EPA and DHEC oversight.
(Displaying Figure 1.1 map via overhead projector/indicating), this is where the Wilson Sporting Goods plant is. And this little square is where the site is. You can see the center of Fountain Inn is over here (indicating lower right of Figure 1.1).
Just to mention some of the characteristics of the site, it is 1.3 acres. This is the former wastewater plant and lagoon area.
This is what it looks like right now, with the lagoon partially filled in. As I said, I brought some photographs so that you can take a look at it.
There is a large amount of manufacturing debris from the manufacturer of tennis balls, which is non-hazardous but is nevertheless piled up in the area.
You see a lot of pieces of a synthetic material, like Swiss cheese, so to speak, with circular cut-out's taken out of it, which are the parts that are used in the manufacture of tennis balls.

Because the area was used as a sewage treatment lagoon, some of the exact site features and the location of things are a bit uncertain as far as the exact dimensions. But we generally know where they are. As I said earlier, We will show you a blow-up of the site to illustrate that.
The site had a pipeline going in from the factory and it also had a pipeline going out.
The area is currently fenced, locked, and it is posted as a Superfund site.
The nearest residence is the Valley View Apartments and they are some one hundred yards northeast.
There is runoff on the site, generally to the northwest, on the surface and also in the groundwater.
The entire area served by municipal water and sewage.
We had conducted, as part of the remedial investigation, a feasibility study by a survey of the area which does not show any signs of animal life. But within the fenced area are aquatic life and are adjacent to the lagoon. We did not have individual stations there for a long period of time. This is a habitat for a number of species and that fact played a part in our decision as to what to do in cleaning up the site.

(Displaying Figure 1.2 map on overhead projector).
This is a copy of a map which was done for both remedial investigation and then the feasibility study. To re-emphasize what Cynthia had indicated, in the Public Library you will find a vast number of documents regarding the work that has gone on on this site, including an Administrative Index or an Administrative Record which has all of the documents which were used to formulate the decision on how to clean up the site. That includes all correspondence to myself from people doing the study, any comments that I received from other EPA and State parties, and a review of the documents. So all of the items that help make the decision are available for public scrutiny.
Back to the site itself, the lagoon is only a fragment of the size that it once was. You see that when the lagoon was entirely filled in that it was approximately this size (indicating broken lines forming square on map.) Now it is much smaller (indicating present size on map.)
This is the pipe exit of the lagoon area and there were a number of sewage treatment plant operations. There was a clarifier (indicating), an aero accelator (indicating) and there were some valves. Then

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this was foam (sic) material -- or rather the sludge drying beds. Excuse me. It's hard to read when you're staring at the light.
To explain, you may see on the sign-in list some names of entities or when you go and look at the Administrative Record you will see names of the consulting firms that you should be aware of.
When the PRP's signed the EPA Administrative Order Under Consent they, in turn, retained a consulting firm by the name of Parsons Engineering Science. They did the remedial investigation and the feasibility study, according to an approved workplan that EPA reviewed and negotiated with the PRP's.
EPA retains the -- we retain certain responsibilities when a remedial investigation and feasibility study are done. One of those responsibilities is community relations, which is why some of you saw Cynthia and I as we came to certain individuals' homes and we did interviews. We went through the neighborhoods around the plant. We also met with a number of people in the Fountain Inn government. All of those things came into play in our decision.
We also retain responsibility for doing a very important part of the study, and that is called the

Baseline Risk Assessment. EPA retained and later seeks reimbursement for the cost of doing that. That document was prepared by Roy F. Weston and, lastly, -- we have a number of sites and it is difficult to do all of the oversight to make sure that the samples have been collected properly. I can't do all of that work myself, nor would it be cost-effective to do it. So we retained another consulting firm, EPA, which was in this case was Camp Dresser & McKee (CDM) to do the oversight for us. They also reviewed documents. So when you review the documents you may see many names with Engineering Science or Weston or McKee on it and I just wanted to point that out. All of these individuals were very active in doing the studies.

What was done with the study? (Changing overhead slides). First of all, with most Superfund sites, you end up finding out that groundwater may or may not be contaminated. And you also have soil that also may or may not be contaminated. We refer to these things as "media". There are surface soils, there's subsurface soils, there's sediment along the banks of the lagoon and the banks of area streams. And there is also the air which is sometimes monitored, if that is suggested as being a concern.

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In the case of this site, there were seven monitoring wells installed. There were three upgradient, or above, or in the opposite direction of the groundwater flow. Those can give you an indication of what the background conditions are. Quite often you find out that the background conditions show some contamination; so there is an contamination in the area which may not be from the site itself. It also gives you a basis on which to judge how significant the contamination might be.

We also installed four downgradient wells. Wells were also installed -- and some of these wells were at different depths, because this site, as many sites, has an upper and lower aquifer and you want to see if any contamination has potentially reached the lower aquifer.

As you can read for yourself, as far as surface soil samples, we collected at twenty-four locations with three background locations.

As I said, there was an incoming pipeline going into the lagoon and an effluent pipeline. It was sampled along the pipelines, both going in and coming out. There were also soil samples, subsurface soil samples, taken in that sludge drying bed. This was used for wastewater -- a byproduct of wastewater

treatment is the production of sludge. The residue that settles out of the sewage, it has to be disposed of. Quite often in the past, and in the present, at a number of sewage treatment plants, you put it out in areas to dry. It is compressed. Like anything, once you get the water out of it, it is far less bulkier, easier to handle and to properly dispose of.

Within the fenced in area, there were also other areas -- because there was a minor breach in the wall of the lagoon and there were some leakage of materials in the past. The lagoon wall had been fixed in the past and there was some indication of leakage of materials. So that had been sampled.

The next thing on the overhead, which is very important and which we want to emphasize to the public, is the fact that although EPA and PRP's do an awful lot of work, how would we know that the results are valid? That is the point that I put on this slide, collection and analysis, quality control.

We have site samples, split samples and they test part and we test part to make sure that the results match. We also require an extensive amount of documentation from laboratories that they use, as well as we have the responsibility to approve the laboratories that they use and to make sure that the results are valid and that there is something we can make a decision on.

The next item that was done under the RI was surveying and mapping, so that we had accurate maps so that we would know where samples were taken. As I have already mentioned, we did our own survey and then they did it. It was fed into the risk assessment for about a half a mile radius around the Site.

The area around the site was a number of different habitats: fields, wooded areas. There was a potential for a wide variety of animal life in the area, which we were concerned with. As I said, Engineering Science worked with the PRP's and, with oversight conducted by EPA and DHEC, and also Camp Dresser & McKee, our oversight contractor.

On this map we have -- this is reproduced in the copy of the Proposed Plan, and we have extra copies of the proposed plan.

Just to point out some of the monitoring well locations. As I said, the direction of the flow tends to be to the northwest, and here is the lagoon area here (indicating). We had a shallow monitoring well right here and a deep monitoring well here. We had a shallow monitoring well here. We had another

swallow monitoring well right over here (indicating). And we had a number of ones downgradient. These are some of the upgradient ones, (indicating). And we had one over here. We had one over here and over here (indicating). I believe that's it. Some of the ones that I indicated had both shallow and -- there were seven wells, I think, here.

And what did we find out from all of this? We found out a number of things. When you start a project, you form a conceptual model of what you think the site is like and we found out a number of things were not what we thought that they would be. One, we thought that the bedrock would be lot closer to the surface and that ended up not being the case. We thought that the bedrock might only be twenty or twenty-five, thirty feet down. But as it turns out, we got a phone call the first day that drilling was going on out on the site and they were down a hundred feet and hadn't hit anything. Bedrock generally is sixty to hundred feet. What difference does this make? Quite often if you have bedrock closer to the surface that has been fractured, you can have contaminants that reach and travel across the rock to another location, or you could also have fractures which may make it very difficult.

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Another thing that we found out about -- as I said, this site was put on the National Priorities List based on a very, very few samples that were collected. It was thought that of all the organic components that we find at a lot of sites wouldn't be a concern at this site. If you look at point number four on page three of the Proposed Plan it talks about contaminants. And I don't want to alarm anyone but these go into a very laborious detailed process for anything that might be a problem because you have a detection of it or we think that it may be detected it is also retained as a contaminant. It is also retained because they are more significant things that cause problems.

If you found -- the key word that I want you to keep in mind is "potential." There were a number of things that were potential that were found not to be problems at this site.

As you can see, lead and cadmium was detected earlier by DHEC, as well as PCBs, but were not found to. be significant enough to be a concern.

One contaminant, Beryllium, was detected in one groundwater sample at 4.5 milligrams per liter. We have a standard, which is called the maximum standard level, of just 4, so it was only slightly above

the MC level.
And we also had Manganese which also was detected in the sampling from three wells, one of which was a background well. As I have already indicated to you, we sampled the background wells to see if there were already some contaminants in the area. No other metals were found that exceeded the federal drinking water standards.
Manganese is mainly a problem in actually washing of clothes because of staining fabrics and plumbing fixtures. And it causes -- it is regarded as generally a secondary standard of the Drinking Water Act.
One of the other key findings is that even if you have contamination it is going to -- and this may be a rather complicated notion to follow through, but there are two ways that things can potentially get off the site. That would be surface runoff and infiltration or leachate migration through the soils. There are ways to control these things.
The remedy that we selected -- (pause).
To go back a second. The RPRs have developed a feasibility study that goes through the formulation of some remedial goals, which are numeric numbers that you want to see achieved after a cleanup. They

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develop a variety of ways of reaching those remedial goals.
This slide depicts the eight alternatives that were developed by the PRP's for this Site. It is EPA's responsibility, in conjunction with the State and citizen input to select an alternative that will be most protective of the human health and the environment. We have some other criteria that we have to match also in selecting an alternative.
Here are the eight alternatives:
Alternative 1, the first one, is "No Action." Which is a requirement of the law, is that everyone tries to do nothing. We actually require them to cost out and show the effects of doing nothing.
The other alternatives -- and I won't go into each individual one, but there are combinations of the different -- different components for treating and dealing with the groundwater, and different components for treating and dealing with the soil contamination.
The different type of alternatives that we have developed for the groundwater include doing nothing, nothing or no action, to doing monitoring of groundwater for a period of time, and ultimately leading up to Alternative 8, pumping and treating the

groundwater. That is a treatment that has been unfortunately required at a number of other sites. It is very costly, very time-consuming. Admittedly, there is some technical debate as to how effective will it turn out to be.

The different types of remedies for dealing with the contamination of the soil involve capping the site so that rain water and surface runoff after the rain will not allow contaminants that do exist in the soil to get into the groundwater. That is what you can see in Alternative 3, the soil cap.

Then in Alternative 2 -- the excavation of the material, which is in Alternative 5 and 6.

Alternative 7 would be an off-site disposal.

Alternatives 5, 6, 7 and 8 would be an off-site disposal of the material.

After a number of meetings in which EPA and DHEC reviewed the feasibility study, we decided on Alternative 3 as meeting all the criteria required for a Superfund remedy.

As you can see on the slide, we did make a modification from the alternative as it was contained in the feasibility study. In the feasibility study what does this alternative consist of? It consists of a couple of different things.

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For the groundwater, the surface water and the sediment, it proposes monitoring in the future to make sure that what we found today remains to be the case.

What was proposed was six groundwater samplings, two per year for the first two years and then annually after that. Three surface water samples and three sediment samples. Samples from these locations will be collected and analyzed semi-annually for the first two years and annually for three years thereafter. So it sets up a continuous program of monitoring the groundwater, the surface water and the sediments.

We also proposed capping the site, grading the site and filling in the lagoon, establishing drainage control and capping the site with the necessary materials. This is where the change is, to ensure a ten to minus nine permeability.

I, myself, am not an engineer. Ten to the minus five is the permeability that the PRP's proposed for Alternative 3 in the feasibility study.

The ten to the minus nine permeability means that you have coverage that is more impervious and it would be more difficult for the contaminants in the soil to reach the groundwater.

To do a cap of the site of a ten to the minus five permeability, you could achieve that with a cover over the site that was composed of soil and clay. That is what was proposed in the feasibility study. To achieve a ten to the minus nine impermeability or something that is more impervious would require a use of synthetic material in the covering of the site.

A couple of other features of the Alternative is that there is one small area next to the location of the pipeline between the plant and the lagoon, which we call P5, that had some soil contamination. We were proposing excavating that area and putting a soil inside the fenced area and then covering it.

As you can see, filling of the lagoon.

And future deed restrictions.

And institutional controls so that the site is not used for residential development or will allow potential exposure to humans.

Now, the feasibility study, as you saw from the previous slide had a range of costs, both a high and a low cost for each of the alternatives. We made the decision that, just to give the public the basis of comparison, we would choose the midpoint within each range. Because I was concerned that somebody

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might pick up the document and say, 'Well, the high cost for Alternative 4 was less than the low cost for Alternative' -- so we just wanted to simplify the numbers so that we could compare the costs of the various alternatives.

Similarly, when I estimated the costs for the modifications to Alternative 3, I utilized two other things to help me determine the midpoint. Those were some recent cost information for other caps that were proposed in South Carolina at other locations. And, number two, a computer software package that estimated the cost of doing different types of remedies. It was not just generic software but a very specific package that has specific costs for numerous locations in South Carolina. In other words, different costs for doing work in Greenville than other places. And the costs have been updated several times during the year, so our cost estimate is probably as good as you can get.

Ultimately whenever any of these design costs are decided after they are built, after they are drawn up and after they are -- after plans and specs are let out and they are bid upon and the things are fully finished. It reflects any construction activity, all those costs.

So the Agency has proposed modification of Alternative 3 for the cleanup of the Beaunit Knitting & Dyeing Site, which is a monitoring program for the groundwater, the sediments and the surface waters and the capping of the Site.
One of the things that I mentioned a few moments ago is how do we decide which one to pick. Obviously the key factor in all of our decision making is the overall protection of human health and the environment.
The second thing which is most important is that we have nine criteria. They are all contained in the Proposed Plan. They are located in a block that goes through them all, which is located on page eleven in the left-hand column.
The nine criteria are divided into three groupings. The two most important things which are on this are the overall protection of human health and environment and the second thing is called compliance with what we call ARARs, applicable and appropriate requirements.
When you are talking about drinking water, the Federal Government and the State Government have numerical numbers for various contaminants which they cannot exceed. They are the MCLs. It is easy to

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see if something does meet those requirements.
There are no numeric numbers in any regulation that would tell you how clean the soil would be. One thing is that in typical soil contamination, you have to -- we use two different ideals.
One is that some things that we are trying to regulate have applicable regulations. We have a number -- and some things have what we call "relevant and appropriate" of a State law. There are some things that you can see if it is cleaned up, to a certain point that it would reduce the risk level to an acceptable level. That is the appropriate and relevant requirement.
The second criteria that we have to use to select alternatives is compliance with ARARs, as we call them.
There is another five criteria and, as you can see, they are all written there (page eleven of Proposed Plan).
The effects long-term? Is it permanent?
Does it reduce the toxicity, mobility or volume through treatment?
Does it have a short-term effectiveness?
And whether it meets State acceptance.
And what is the risk to the individuals doing the

remedy? You don't want to harm the people who are out in the field at the Site working.
And is it implementable?
And what does it cost?
Is it innovative?
Does it have a proven track record?
Last, and certainly not least, does a modified criteria have State acceptance and community acceptance?
All of these factors come into our decision making process when choosing an alternative.
The question that remains now is where do we go from there, or what happens next?
At Region IV, we like to issue a Proposed Plan of Action for the public, so that the public can understand. And we did that several weeks ago. We generally try to have a public meeting after people have had an opportunity to look at the document for a period of time. Such a meeting as we are at tonight.
We have a comment period on this which will run until December 7th.
It is also a practice of Region IV that if anyone wants a longer period of time that we will automatically grant an extension to the comment period.

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You might ask what happens to your comments? Do they go into a file? All comments and any questions that you might ask -- that's why we have a stenographer here -- have to be responded to, in writing. They are responded to and then attached to the document that EPA will produce. Everyone's comments have an equal value. We have some PRP's in the audience tonight and they tend to comment quite a bit on what we propose. So -- and obviously they have a financial interest in it. We take their comments, we take your comments and attach them to the record of decision. We attach your questions and comments, and we attach our respond. That an attachment to the decision.
EPA proposes something, we take comments on it and now 'this is what we think should happen.' Quite often there may be further modification on the Proposed Plan after public input.
The record of decision will be probably a sixty to a hundred and ten page document wherein we will go through this entire process in greater detail, a summarization of all alternatives. More detailed information on the risk assessment, the selection of an alternative and the responsiveness summary. That will also include a transcript of tonight's meeting.

Then there will a recommendation with the Agency publicly saying 'this is how we feel that the Site should be cleaned up.' And if anybody is going to clean up the Site -- well, let me correct that. Not "if" but when the Site is cleaned up, that's how it is going to be done. So the question becomes, 'Well, who is going to do it?' Hopefully we will get an agreement with the PRP's for cleaning up the Site and they will negotiate with EPA and sign a Consent Agreement, which is the contractual obligation to remediate the Site. We used a different -- the Administration Order Under Consent, which I talked about earlier. We use a Consent Agreement, which is a very lengthy document which is entered into by the parties, given to a Judge and the Judge asks for comments and then it becomes final. If somebody doesn't live up to it -- everyone knows how lengthy legal processes can be. You don't have to go through all that with a Consent Order or Consent Agreement. There are penalties in there, onerous penalties, sometimes very severe penalties of several thousand dollars a day for not doing things that were agreed to be done.
So the Consent Agreement is the agreement where the PRP's indicate to perform a remedy.

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There will be a design hearing with a design specification of the cap to meet the performance standards of the ten to the minus nine permeability. They will -- or EPA, if we cannot reach agreement with the PRP's, we will use Superfund money to pursue the remedy and seek costs from the PRP's for the remedy.
Then once the remediation is successful, at some point in the future the Site can be delisted.
with that, I will ask if there are any questions?
(No response from attendees)
BY MR. SANDLER:
No questions?
(No response from attendees)
BY MR. SANDLER:
Well, you may be thinking of something -- (pause).
I invite you'all to look at these photographs (indicaring photographs put on public table). Some of you probably don't know what the Site looks like, unless you've been trespassing.
No questions?
(No response from attendees)
BY MR. SANDLER:
Well, if you think of anything our 800-Number is on the Proposed plan, and our address. If you're not

on our mailing list, there is a mailing list coupon on the back page, the last page. We will continue to give you information on the Site as the process continues.

I want to thank everyone for coming tonight.

If you have any questions, we will certainly be here for a period to talk with you.

Thank you.

Hearing no questions, we are adjourned.

(CONCLUDED)

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State of South Carolina )
County of Greenville )

This is to certify that the within Public Hearing was conducted before duly authorized agents of the U.S. Environmental Protection Agency, Region IV, out of Atlanta, Georgia on the 14th day of November, 1994, commencing at 7:10 p.m. in the Fountain Inn Activity Center, Fairview Road, Fountain Inn, South Carolina;

That the within presentation was duly presented to a public body and that the foregoing is an accurate transcription of the said presentation;

That no exhibits were entered herein or made a part of this record;

That the undersigned court reporter, a Notary Public for the State of South Carolina, is not an employee or relative of any of the parties, counsel or witness and is not in any manner interested in the outcome of this action;

IN WITNESS WHEREOF, I have hereunto set my Hand and Seal at Greenville, South Carolina this 15th day of November, 1994.

<IMG SRC 0495254X>

Commission expires: 1-10-2001