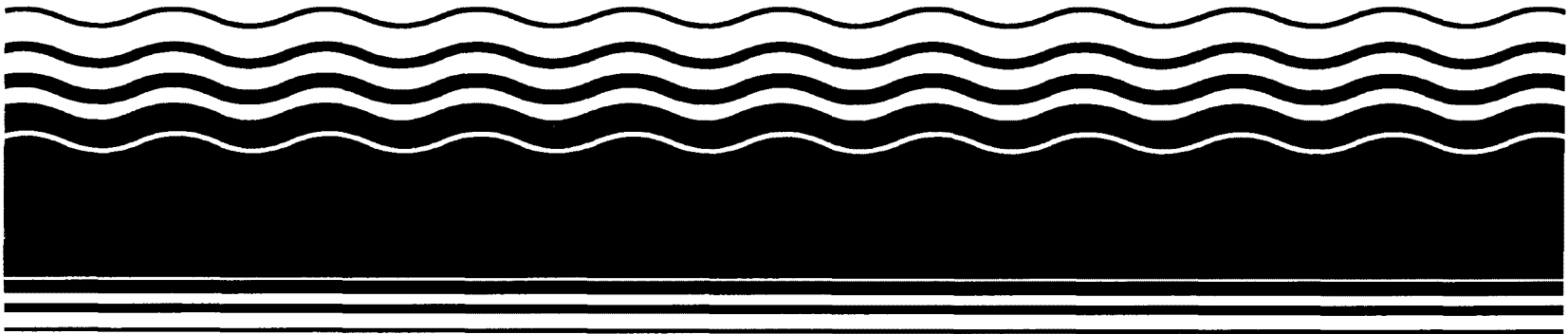


PB95-964031
EPA/ROD/R04-95/240
February 1996

EPA Superfund
Record of Decision:

Woolfolk Chemical Works Site,
Operable Unit 2, Fort Valley, GA
9/29/1995





RECORD OF DECISION
SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

WOOLFOLK CHEMICAL WORKS SITE
FORT VALLEY, PEACH COUNTY, GEORGIA
OPERABLE UNIT #2: CONTAMINATION OF SOIL ON PROPERTIES
BETWEEN MARTIN LUTHER KING DRIVE AND OAK STREET
PROPOSED FOR A REDEVELOPMENT PROJECT

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

**DECLARATION
of the
RECORD OF DECISION**

WOOLFOLK CHEMICAL WORKS SITE

***Operable Unit Two: Soil Contamination of MLK/Oak Street Properties Proposed
for a Redevelopment Project***

SITE NAME AND LOCATION

Woolfolk Chemical Works Superfund Site, Fort Valley, Peach County, Georgia

STATEMENT OF BASIS AND PURPOSE

This decision document (Record of Decision) presents a selected remedial action for Operable Unit (OU) #2 at the Woolfolk Chemical Works Site, Fort Valley, Georgia, developed 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. Section 9601 et seq., and to the extent practicable, the National Contingency Plan (NCP), 40 CFR Part 300. This decision is based on the administrative record for OU #2 at the Woolfolk Chemical Works Superfund Site ("the Site").

The State of Georgia, as represented by the Georgia Environmental Protection Division (GaEPD), has been the support agency during the Remedial Investigation and Feasibility Study process for the Site. In accordance with 40 CFR 300.430, as the support agency, GaEPD has provided input during this process. The State of Georgia has deferred to EPA on efficacy of the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from OU #2 at the Woolfolk 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 and/or the environment.

DESCRIPTION OF SELECTED REMEDY

This operable unit is the second of three planned operable units at the Woolfolk Site. OU #1 addressed the contamination of groundwater, while OU #2 will address contamination of soils in a proposed redevelopment project to be implemented on properties on Martin Luther King Drive and Oak Street in Fort Valley, GA. OU #3 will address remaining contaminated soils, surface/storm water, structures, and sediment at the Site.

Due to the past removal actions at the site, limited further action will be required on the thirteen (13) properties proposed for a redevelopment project as discussed in this Record of Decision (ROD). In order to implement this remedy, EPA will require:

- land use consistent with the proposed redevelopment plan for the new Peach County Library Building;
- land use consistent with the renovation of two existing structures located at 201 Oakland Heights and 202 Oak Street for the purpose of an office building and an adult education center, respectively; and,
- placement of institutional controls to ensure that future land use is non-residential and groundwater beneath the site cannot be used for any purpose as stipulated in this Record of Decision.

EPA has entered into a Prospective Purchaser Agreement with the Peach County Libraries Board, the Fort Valley Redevelopment Authority, and the Peach County Chamber of Commerce. The ROD is based on the assumption that proposed properties will be transferred to these entities and redeveloped for use as a

library, an office building, and an adult-education center. If this project does not proceed, it will be necessary to review this record of decision. Progress of the redevelopment project and whether or not the remedy remains protective will be periodically reviewed by EPA.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate, and is cost-effective. The remedy utilizes permanent solutions and alternative treatment technologies to the extent practicable, although it does not satisfy the preference for treatment due to the limited volume and concentration of the contamination. Finally, implementation of OU #1 actions will require groundwater to be pumped and treated if contamination is found beneath the OU #2 properties above the performance standards set in OU #1.

Because this remedy will result in hazardous substances remaining at the Site, a review will be conducted within five years after commencement of the remedial action and, thereafter, to ensure that the remedy continues to provide adequate protection of human health and the environment.


RICHARD D. GREEN
ASSOCIATE DIRECTOR
OFFICE OF SUPERFUND AND EMERGENCY RESPONSE

29 SEP 95
DATE

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***Record of Decision
Operable Unit #2
Woolfolk Chemical Works Site
Fort Valley, Georgia***

1.0 SITE LOCATION AND DESCRIPTION

The Woolfolk Chemical Works Site is located in Fort Valley, Peach County, Georgia, and includes approximately 31 acres including the former Woolfolk Chemical Works plant and surrounding areas where contamination has spread. Businesses operating on the property of the former Woolfolk plant include SurePack, Inc., Georgia Ag Chem, Inc., and the Marion Allen Insurance and Realty Company. Canadyne-Georgia Corporation (CGC) also owns a one acre parcel of Site property but does not maintain an active business at the Site. SurePack, Inc. continues to formulate, package, and warehouse various organic pesticides that are used primarily in the lawn and garden market but also by peach growers.

The Woolfolk Site is located in an area with mixed commercial and residential uses. Residences are located to the west, south, and east, with homes to the southeast adjoining a pecan orchard. Several businesses and light industries are located along the north, northwest, and east ends of the former plant, including the Norfolk Southern Railroad tracks and station.

For an area Location map and general Site map, see Figures 1.1 and 1.2, respectively.

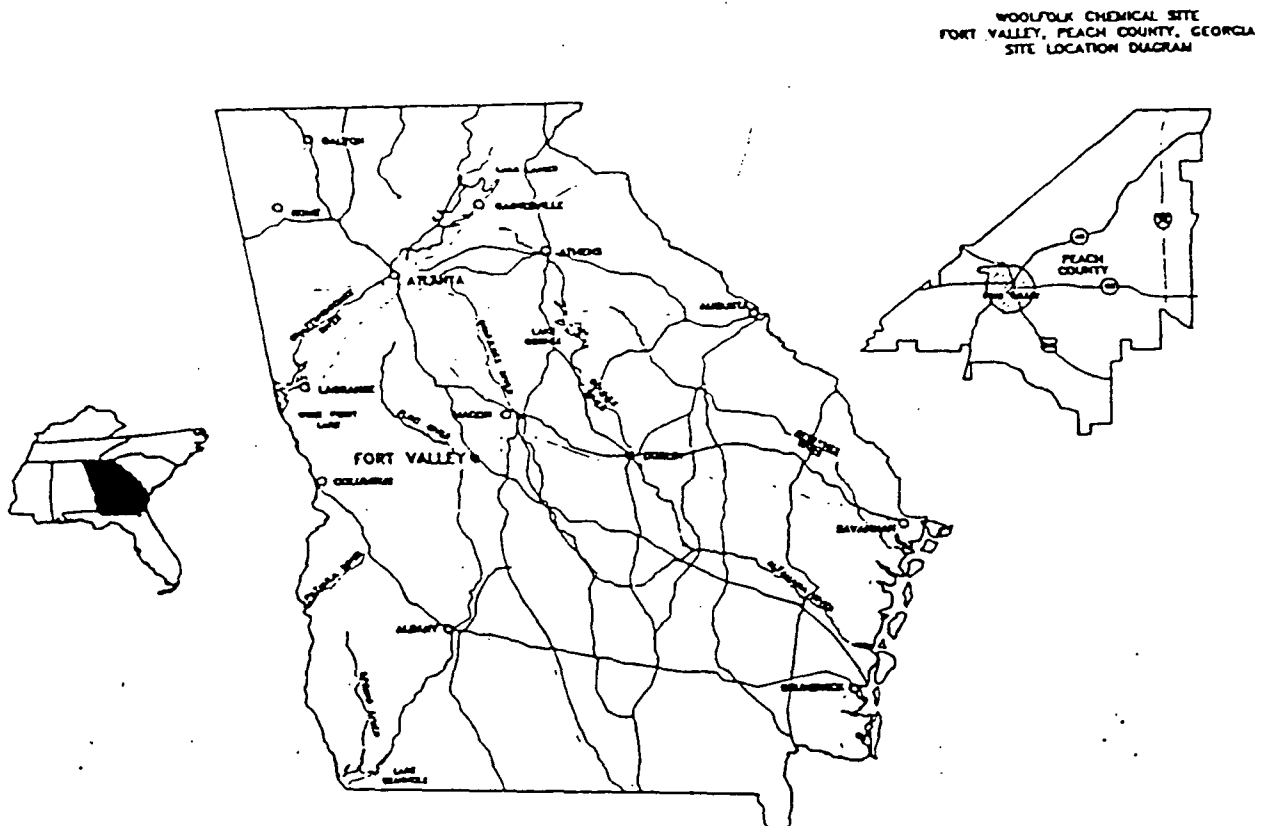
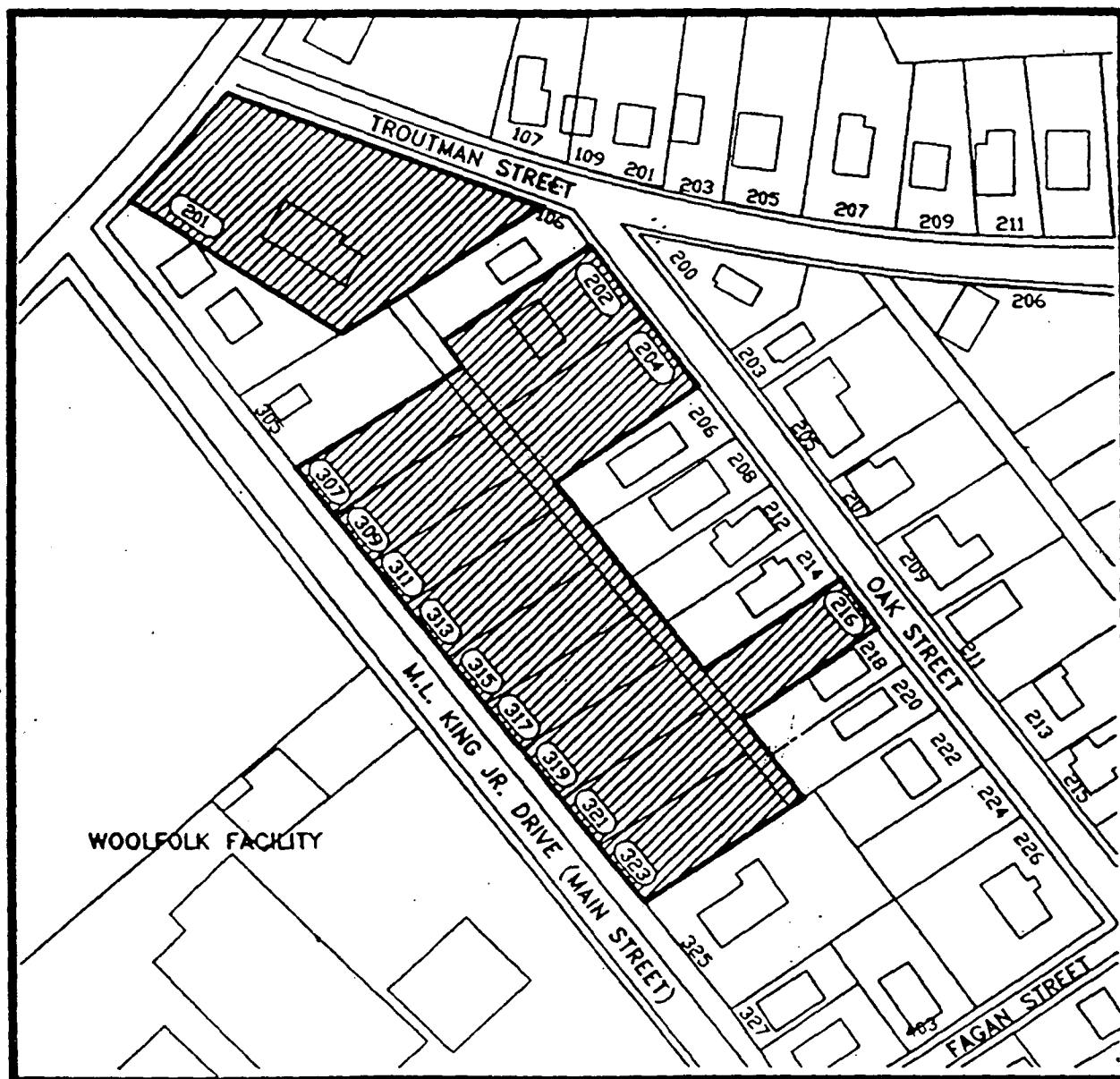


Figure 1.1: Area Map



WOOLFOLK CHEMICAL WORKS SITE

OPERABLE UNIT 2 PROPERTIES
FORT VALLEY, GEORGIA

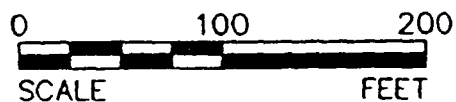


Figure 1.2: Site Map



2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

Since the 1920's, the Woolfolk facility has been used for the production and packaging of organic and inorganic insecticides (including arsenic and lead-based products), pesticides, and herbicides. During World War II an inorganic intermediate (arsenic trichloride) was reportedly produced at the facility for the War Production Board. Production was expanded during the 1950's to include the formulation of various organic pesticides, including DDT, lindane, toxaphene, and other chlorinated pesticides. These organic pesticides and other insecticides and herbicides were formulated, packaged, or warehoused at the facility.

The J. W. Woolfolk Company owned and operated the Woolfolk Facility from 1926 until 1941, when it dissolved and conveyed its assets to Woolfolk Chemical Works, Ltd. Woolfolk Chemical Works, Ltd., reorganized into the corporation Woolfolk Chemical Works, Inc., in 1972. In 1977, Reichold, Limited acquired all of the stock of Woolfolk Chemical Works, Inc. pursuant to a stock purchase agreement. The stock purchase agreement was assigned to Canadyne Corporation, a wholly owned subsidiary of Reichold, Limited. In 1984, Woolfolk Chemical Works, Inc., changed its name to Canadyne-Georgia Corporation (CGC). Also in 1984, assets of Woolfolk Chemical Works, Inc. were sold to the predecessor of Peach County Properties, Inc. (PCPI). PCPI is the current owner of most of the former Woolfolk property, and has leased most of the property to its affiliate, SurePack, Inc., which has formulated and packaged pesticides at the facility since 1984. Another portion of the property is leased to Georgia Ag. Chemicals, which operates a warehouse and distribution facility. CGC currently retains the title to a one acre parcel of the facility used as a landfill. Marion Allen Insurance and Realty Company also owns one parcel located northwest of the operating facility. (See Figure 1.2).

In 1986-87, Reichold, Limited funded an interim soil remediation at the Woolfolk facility, with Applied Engineering Sciences (AES) serving as construction manager. The major remediation activities consisted of demolishing several buildings and excavating approximately 3,700 cubic yards of soil contaminated with a combined lead and arsenic concentration above 10,000 mg/kg. All soil with contamination levels above this concentration was disposed of at a permitted hazardous waste landfill in Emelle, Alabama. Other soils and debris were disposed of underneath an on-site cap on property currently owned by CGC. CGC informed the Georgia Environmental Protection Division (EPD) of the investigations and cleanup activities. In August 1987, AES submitted a document to EPD entitled "Cleanup Report for the Former Woolfolk Chemical Works Plant Facility" which summarized remedial activities conducted at the facility.

In 1986, the U.S. Environmental Protection Agency (EPA) began an investigation of the release or potential release of hazardous substances at the facility and requested all analytical data pertaining to the facility. This investigation led to the proposal to add the Site to the National Priorities List (NPL) in June 1988. In April 1989, EPA notified potentially responsible parties (PRPs) of their potential liability under CERCLA for response costs incurred at the Site. In April 1990, EPA and CGC completed negotiations on an Administrative Order on Consent (AOC) for a Remedial Investigation/Feasibility Study (RI/FS). The AOC was signed on April 24, 1990. In August 1990, the Woolfolk facility was placed on the NPL.

The Remedial Investigation was submitted to EPA by Canadyne-Georgia in November 1992. The RI was performed to document the nature and extent of contamination for affected media, including soils, groundwater, surface/storm water, sediments and air. The objective of the RI was to gather sufficient information to develop risk management options and remedial alternatives that are appropriate for the site. The risk management options are presented in the Baseline Risk Assessment which was submitted to EPA in November 1992. In 1993, the site was divided into two Operable Units (OU); OU #1 for groundwater, and OU #2 for the remaining contaminated areas. The remedial alternatives for groundwater are presented in the Final Feasibility Study (FS) which was submitted to EPA in December 1993. A Record of Decision for OU #1, Groundwater, was issued on March 25, 1994. In April 1995, EPA further divided the site into OU #2 for redevelopment properties, and OU #3 for remaining portions of the site. CGC submitted a revised FS Addendum (FSA) in May, 1995. In conjunction with the RI/FS, bench scale treatability tests were performed for the soils and groundwater at the site. The results of these tests were used to support the findings of the FS and the FSA.

During the RI/FS, arsenic contamination was found in soils in residential yards near the Woolfolk facility. The removal of residential soil contamination, relocation of some residents, together with demolition of a

dioxin contaminated on-facility building, is being completed pursuant to an Unilateral Administrative Order for Removal Response activities issued by EPA to CGC, Reichold, Limited, and Canadyne Corporation on December 1, 1993. Only CGC has complied with the Order to date.

As mentioned, EPA issued a Record of Decision for the Operable Unit #1, Groundwater on March 25, 1994. Canadyne Corporation, Reichold Limited, and Canadyne Georgia were issued an Unilateral Administrative Order to complete the Remedial Design/Remedial Action on May 23, 1994. Only Canadyne-Georgia is complying with the Order by implementing the on-going Remedial Design activities.

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

EPA has made significant efforts to insure that interested parties have been kept informed and given an opportunity to provide input on activities at the Woolfolk Chemical Works site. EPA has been working with the community surrounding the Woolfolk Chemical Works since 1990. In September 1990, press releases informing the community about the NPL listing of the site were released. Subsequent interviews were held that Fall to develop a Community Relations Plan (CRP). The information repository was established in October 1990, at the Thomas Public Library, 213 Persons Street, Fort Valley, Georgia. The CRP, which was finalized in November 1990, has been placed in the information repository. In January 1991, EPA held a public meeting to discuss the start of the RI/FS.

In July 1993, EPA issued a press release and fact sheet on the findings of the RI study regarding soil contamination and health precautions recommended by the Agency for Toxic Substances and Disease Registry (ATSDR). On August 2-3, 1993, EPA conducted door-to door visits to the potentially affected residents to further distribute the fact sheet and extend our invitation to an availability session. The availability session, held on August 3, 1993 discussed the results of the RI study and ATSDR's recommendations for health precautions. Fifty people attended the session which was hosted by EPA, GaEPD, and ATSDR. Representatives of CGC were also present.

EPA's Emergency Response and Removal Branch has determined the extent their required actions for contamination in a drainage corridor extending south of the plant. EPA has excavated the majority of the contaminated soils from residential properties, and supervised the destruction of an on-site dioxin contaminated building (Building E). Five sampling events of soils in residents' yards have occurred to date with results subsequently explained in meetings with the public. CGC is complying with an Unilateral Administrative Order (UAO) requiring the disassociation of the affected residents from contaminated soils and destruction/removal of Building E.

EPA has issued the ROD for OU#1 after allowing for public participation through the Proposed Plan and Public Comment period. The Proposed Plan for OU#1 was issued January 18, 1994 and public comment was sought from January 18 through February 17, 1994. A public meeting was also held during this comment period on February 1, 1994. A Responsiveness Summary was prepared and published as an appendix to the OU #1 Record of Decision.

Throughout the Removal and Remedial process citizens of Fort Valley, as represented by the Technical Assistance Group (TAG), have expressed the concern of inadequate information being disseminated by EPA to the public. EPA had made available the public repository and the monies for the TAG Grant, but it was suggested that this was not adequate to get a full understanding of the Superfund process. In order to further the exchange of information between EPA and the community, EPA developed a Community Information Exchange Group. This group of 11 community-selected representatives has met in a public forum to discuss the activities of the Woolfolk Site related to OU #2 and OU #3. The series of meetings has allowed in-depth discussions of the remedial alternatives and provided information to both EPA and the community relating to activities at this site prior to the formal proposed plan process.

The Feasibility Study Addendum (FSA), the Proposed Plan, and the Administrative Record (AR) for OU #2 were released to the public on June 15, 1995. The FSA and the Proposed Plan were made available in both the AR, maintained in the EPA Region IV Docket Room, and the information repository at the site. The notice of availability of these documents and the AR was published on July 19, 1995 in various local

publications. A public comment period was held from July 19, 1995 to September 15, 1995. In addition a public meeting was held on August 29, 1995. At this meeting representatives from EPA and the State of Georgia answered questions about issues at the site and the remedial alternatives under consideration. Responses to the comments received during this comment period are presented in the responsiveness summary in Appendix A of this document.

4.0 SCOPE AND ROLE OF OPERABLE UNITS

As mentioned in Section 2.0, EPA has organized the work at this Superfund Site into three operable units (OUs). The operable units are:

- OU #1: Contamination of the groundwater;
- OU #2: Contamination of the soils on properties located on Martin Luther King Drive and Oak Street which are proposed for redevelopment; and,
- OU #3: Contamination of remaining soils, surface/storm water, sediments, house dust, and structures.

Only limited action is needed at OU #2 due to the past removal actions which have taken place on these properties, and assuming the use of the properties in a non-residential redevelopment program. The removal actions addressed contamination of the soils from past practices at the Site. The purpose of this OU is to ensure protection of human health and the environment while enabling redevelopment of the OU #2 properties consistent with the remediation efforts for the other OUs. In the event that a redevelopment project does not occur on these properties, this Record of Decision (ROD) will need to be re-evaluated. OU #1 initiated groundwater delineation, collection of data on aquifer response for remediation, and the restoration of groundwater to prevent possible future exposure to contaminated groundwater. The planned OU #3 will address the remaining sources of contamination at the Site which shall include soils, surface/storm water, sediments, house dust, and structures.

Thirteen (13) properties have been proposed for construction of a new library building and renovation of two remaining structures for an adult education center and an office building. Local contributions to the project are being reserved by CGC to supplement a State grant applied for by the Peach County Libraries Board to fund the library construction and building renovation project. Should the grant be awarded, construction of the library will begin in 1996. The Fort Valley Redevelopment Authority has also obtained funds from the Department of Transportation for renovation of the another building. A Prospective Purchaser Agreement (PPA) has been entered between EPA and the Peach County Public Libraries, Fort Valley Redevelopment Authority, and the Peach County Chamber of Commerce protecting the proposed future owners from liability for past contamination and provides for access to the site and non-residential use of the properties.

5.0 SUMMARY OF SITE CHARACTERISTICS

The major Site characteristics presented in the RI/FS Study are summarized below.

5.1 GEOLOGY/PHYSIOGRAPHY

- The Site is located in downtown Fort Valley, which has a population of approximately 9,000 people. Surrounding land use is classified as industrial, commercial, and residential. The majority of the former Woolfolk facility consists of buildings, storage tanks, and stockpiles of equipment. A pecan orchard located on the southern portion of the facility is fenced. Residential properties border this fence to the south and east.
- To the northeast of the former Woolfolk facility, eighteen (18) properties were contaminated by past activities. Under the Removal program these properties were either bought and fenced by CGC, or cleaned to a standard set by the removal program for clean-up of residential properties. Thirteen (13) of these properties have been bought and most of the buildings have been razed. These

properties have been fenced and proposed for non-residential redevelopment. The properties which had soils contaminated with arsenic above 100 ppm were cleaned by removing the soils for final disposal at an off-site landfill.

- The Woolfolk Site is located in what is physiographically known as the Fort Valley Plateau District. This district lies within the Coastal Plain Province of Georgia just south of the "fall line," which marks the boundary between the Piedmont and Coastal Plain Provinces. This district is characterized by broad, flat to very gently rolling surfaces, sloping gently to the southeast. Surface soils are moderately drained and generally consist of sandy and silty clays to clayey and silty sands.
- Several southeast flowing creeks dissect the Fort Valley Plateau District. It is bounded to the west by the Flint River and on the east by the Ocmulgee River. Although the Flint River borders this district along its western boundary, almost the entire district lies within the drainage basin of the Ocmulgee River. Surface runoff leaving the Facility is collected by the City's storm sewer system. The storm water flows generally to the east, southeast and south discharging to a series of local creeks within 1 mile from the facility. These creeks discharge to Mosy Creek approximately 7.5 miles to the east and into Big Indian Creek approximately 4 miles to the southeast.
- Topography at the Site has land surface elevations which vary from 516 feet above mean sea level (MSL) at the northern end of the Site to 510 feet above MSL to the south. The slope is generally around 1 percent. A man-made mound (cap) installed during an interim clean-up by CCG, approximately 170 feet by 300 feet, with a maximum elevation of 520 feet above MSL, has been constructed at the north central portion of the Site. The cap consists of, from top to bottom, grass, 24-inches of topsoil, a filtering geotextile, 12-inches of granular drainage material, a 30-mil High Density Polyethylene (HDPE) flexible membrane liner (FML), 24-inches of compacted clay, and geotextile fabric on the subbase to the compacted clay.

5.2 HYDROGEOLOGY

- The Site is underlain by several hundred feet of unconsolidated sediments consisting of interbedded layers of sand, silt, and clay. (See Figure 5-1 of the ROD for OU #1). For simplification purposes, EPA has divided these into four main units which are called the Surficial Aquifer, the Upper Cretaceous (UC) Water Table Aquifer, the UC Confined Aquifer, and the Tuscaloosa Aquifer. The RI, the FS approved for OU #1, and the Record of Decision for OU #1 present a more in-depth discussion of the aquifers.
- Under the EPA groundwater classification system, groundwater in the surficial aquifer and the Upper Cretaceous aquifers is considered Class IIb groundwater (a potential drinking water source), while ground water in the Tuscaloosa aquifer is considered Class IIa groundwater (a current source of drinking water).
- The direction of the groundwater flow in the surficial aquifer is generally toward the southeast. Leakage occurs through the surficial perching unit from the surficial aquifer into the Upper Cretaceous sediments below.
- The water table in the Upper Cretaceous aquifer indicates that groundwater flows generally to the north and northeast beneath most of the Site and to the east in the southeast portion of the Site.
- The hydraulic head contours in the Upper Cretaceous confined aquifer generally conform to those of the Upper Cretaceous water table aquifer, indicating that groundwater flows primarily to the northeast and east. There is also a component of the flow toward the northwest in the Upper Cretaceous confined aquifer, along the northwest side of the Site. Hydraulic heads in the Upper Cretaceous confined aquifer are typically below those of the water table, indicating vertical groundwater flow from the Upper Cretaceous water table aquifer into the Upper Cretaceous confined aquifer.

- Hydraulic head measurements in the Tuscaloosa aquifer beneath most of the Site indicate groundwater flow toward the southeast. These measurements also show a reversal in groundwater flow direction in and beyond the northwestern part of the facility. The direction of flow toward the northwest is consistent with the expected effects of pumping groundwater from the Tuscaloosa aquifer by the City of Fort Valley's wells.
- Plume delineation efforts for the properties proposed for redevelopment is currently underway in accordance with the OU #1 ROD and Remedial Design Work Plan. The flow directions are assumed to be similar to the flow directly beneath the former Woolfolk facility. Should groundwater contamination be found beneath these properties, it will be addressed as part of OU #1.
- Hydraulic and lithological data indicate the potential for groundwater flow vertically downward beneath the former Woolfolk facility. The general nature of the perched surficial unit makes it likely for the groundwater to leak downward through this unit. Downward flow is also indicated by a comparison of the hydraulic-head gradients of the Upper Cretaceous Aquifers and the Tuscaloosa Aquifer.

5.3 MEDIA CONTAMINATION

In a baseline risk assessment addendum, supplemented by EPA revised risk calculations, discussed in Section 6.0, EPA required evaluation of the risks associated with the contaminated soils on the OU #2 properties. Using the pre-removal data from these properties, EPA established that the contaminants of concern for the soils are:

Inorganics: arsenic, lead;

Semi-volatile organics: benzo(a)anthracene, benzo(a) pyrene, benzo(b and/or k)fluoranthene; and,

Pesticides: Aldrin, BHC (alpha, beta, delta, gamma), Chlordane (alpha, gamma), DDE, DDT, Dieldrin, Endosulfan (I and II), Heptachlor, Heptachlor epoxide, Methoxychlor, PCB-1254 and Toxaphene.

5.3.1 SOIL CONTAMINATION

- At the Woolfolk Site, two series of soils are identified: The Greenville series and the Grady Series. The Greenville Series soil commonly has a 4- to 8-inch surface layer of dark reddish-brown or dark brown fine sandy loam and a subsoil of dark red, friable sandy clay. The Grady Series soil has a dark gray to black fine sandy loam or sandy clay loam surface layer (5 to 10 feet) and a subsoil of firm gray clay that is sometimes mottled.
- During the RI, several pesticides (toxaphene, DDD, DDE, DDT, dieldrin, BHCs), arsenic, and lead were detected in both surface (0 to 1 foot) and subsurface (generally 1 to 8 feet) soil samples collected from locations on and off the former Woolfolk plant site. Areas with elevated concentration of one or more of these constituents include the tank farm, Area A cap, Building W, Building S, west boundary of Marion Allen Insurance and Realty company property, and the area northeast of the limehouse (See Figure 1-2 From the Remedial Investigation dated November, 1992).
- In general, the RI found that volatile and semivolatile organic compounds were not detected as frequently as arsenic, lead, or pesticides in either the surface or subsurface soil samples. In addition, the concentrations of volatile and semivolatile organic compounds were lower than the other constituents.
- The remediation for soils will, for the most part, be addressed in OU #3. Only those portions of the site which are part of the redevelopment project between Martin Luther King (MLK) and Oak Streets are addressed as part of OU #2.
- The delineation and removal of residential soil contamination is being completed pursuant to a UAO issued by EPA to CGC on December 1, 1993. Residential properties were sampled as part of the Removal Order. Soils samples were taken from 0 to 6 inches and tested for inorganics,

extractable organics, and pesticides/PCB's. These analyses were conducted to enable detection of chemicals present in on-facility surface soils which were above the 1×10^{-6} excess cancer risk level in the Baseline Risk Assessment.

- Based on the results of EPA's removal sampling activities, EPA's Emergency Response and Removal Branch defined an area of concern which would require disassociation of the residents from contaminated soil under the removal order. The area had mixed residential, commercial and industrial land use. For the properties between MLK and Oak Streets, the primary contaminant was found to be arsenic.
- CGC elected to comply with the Removal Order's requirement that residents be disassociated from contamination by purchasing and fencing the OU #2 properties currently proposed for redevelopment because arsenic contamination was found above the removal performance standard. CGC also removed the majority of the structures on these properties along with portions of the soils with arsenic contamination above 100 ppm (the preliminarily calculated health-based standard for non-residential properties). After the removal activities, the maximum concentration of arsenic remaining was found to be 74 mg/kg with an average concentration for all the properties of 40 mg/kg.
- A summary of the contaminants of concern for the surface soils (approx. 0-6 inches) of the OU #2 properties is presented in Table 6-1.

5.3.2 GROUNDWATER CONTAMINATION

- Groundwater contamination is outlined in the ROD for OU #1. The groundwater contamination levels for each of the aquifers at this Site are presented in Table 6-1 of the ROD for OU #1. The performance standards (levels required to attain groundwater remediation) are established in Table 6-9 of the OU #1 ROD. A comparison of these two tables gives a view of the contamination at the site. Groundwater activities under OU #1 are currently in the Remedial Design stage.
- The levels of contamination exceed the performance standards established in the OU #1 ROD in the surficial, Upper Cretaceous (UC) water table, and UC confined aquifers. Trace contaminants have been detected directly beneath the site in the Tuscaloosa aquifer although recent sampling has indicated no detection of chemicals. The City of Fort Valley water wells, which draw water from the Tuscaloosa aquifer, have never shown any measurable levels of contamination.
- Potential groundwater contamination beneath the redevelopment properties is currently being delineated as part of OU #1, Remedial Design. If contamination is found beneath these properties it will be addressed as part of OU #1. All actions with respect to redevelopment of these properties must be consistent with the activities under all OUs at the site, including the design of a potential extraction system should groundwater contamination be discovered beneath these properties.

5.3.3 SURFACE WATER AND SEDIMENT CONTAMINATION

- The RI sampling results indicated that surface/storm water flowing off-site contained only trace levels of DDT, benzoic acid, and pentachlorophenol. No sediment sampling was conducted on the redevelopment properties due to the limited area of the OU #2 properties and the grass cover which currently exists on these properties limiting stormwater discharge from the properties.
- The RI results of sediment sampling from the former Woolfolk facility indicated that pesticide concentrations, with the exception of toxaphene, are generally higher on the facility than downstream (intersection of Preston and Spruce streets). Toxaphene concentrations were detected at levels up to 12 mg/kg downstream and were detected in three out of four samples throughout the stormwater conveyance system. The inorganic constituent results of the sediment samples indicated that arsenic levels were generally higher on the facility than upstream or downstream. No consistent pattern was observed with the lead results.

- EPA is currently assessing the extent of the contamination downstream from the stormwater conveyance system discharge at Spruce Street. To date, arsenic contamination has been found to extend one-half mile past this discharge.
- The final remedial action for surface/storm water and sediment contamination from the facility will be addressed in a future ROD(s).

5.3.4 STRUCTURE CONTAMINATION

- Building W and Building E at the former Woolfolk facility were constructed primarily of wood and sheet metal, with wood flooring. Chemicals have been absorbed within the wood floors and have migrated through the floors to the underlying soils. Also, the wood rafters in Building W have pesticide dust on them as a result of using this building to make pesticides in powder form. Building W is located on the Georgia Ag Chem property to the west of the former Woolfolk plant. Organic pesticides were formulated and packaged in the building. Building E was located at the east end of the former Woolfolk plant. Elevated levels of arsenic, lead, pentachlorophenol, and dioxin were found in soil samples taken from the area beneath and adjacent to Building E during the Remedial Investigation.
- From 1978 to 1979, several 30- and 55-gallon drums of silvex were brought into Building E and repackaged in pint and quart containers. Some of the silvex, which contained 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) as a contaminant, was disposed on the wood floors, resulting in localized contamination of the floors and underlying soil with silvex, TCDD, 2,4-dichlorophenoxyacetic acid and 2,4,5-trichlorophenoxyacetic acid.
- Building E has been demolished by CGC under EPA's oversight pursuant to a Unilateral Administrative Order issued by EPA to CGC, Reichold, Limited, and Canadyne Corporation. Debris from this demolition remains on-site in a roll-off container, resting on a concrete slab, covered by a corrugated sheet metal roof, and surrounded by a 6-foot chain link fence. The roll-off box is located inside the fence of the existing cap. The debris could not be disposed of because there is no disposal facility permitted to accept material with elevated levels of dioxin and arsenic contamination.
- Building W and the debris from Building E will be addressed in OU #3.

5.3.5 AIR CONTAMINATION

- A total of 24 chemicals were detected in on-site air samples taken during RI sampling consisting of 6 volatile organics, 4 semi-volatile organics, 12 pesticides/herbicides, and 2 inorganics (lead and arsenic).
- Air contamination will be addressed in OU #3.

6.0 SUMMARY OF SITE RISKS

CERCLA directs EPA to conduct a baseline risk assessment to determine whether an NPL Site poses a current or potential future threat to human health and the environment in the absence of any remedial action. The baseline risk assessment provides the basis for determining whether or not remedial action is necessary and the justification for performing remedial action.

The Remedial Investigation (RI) and Baseline Risk Assessment (BRA) have determined the media contaminated by the chemicals of concern. In a previous ROD issued in March 1994, OU #1 addressed contamination of the groundwater. OU #2 will address soil contamination on a portion of the properties between MLK Drive and Oak Street which are proposed for redevelopment. OU#3 will address the remaining contaminated media.

The Final BRA of the Site was submitted by CGC in November 1992. Based on the results of the BRA and the RI, EPA conducted further sampling of residential properties under the Removal Program in 1993 and 1994. EPA determined that samples would need to be analyzed for a full scan of inorganic, semi-volatile, pesticide and PCB chemicals. EPA ordered CGC to disassociate residents from the soils exceeding action levels. CGC purchased the affected OU #2 properties, demolished most of the former structures, removed soil with arsenic concentrations above 100 ppm, and fenced the properties.

In June 1995, EPA asked CGC to develop an addendum to the BRA to determine the risks associated with current and proposed future non-residential use of the OU #2 properties. The BRA Addendum summarized the analytical reports of the pre-removal soil samples for all of the non-residential properties. In developing the ROD, EPA decided that only those proposed non-residential properties which will be redeveloped into the library project would be addressed in this ROD. Using the exposure assumptions presented in the BRA, EPA revised the data summaries, the average daily intakes, the associated risks, and the soil action levels in order to be consistent with this ROD. Table 6-1 is a review of the pre-removal analytical results, as developed by EPA, for only those properties associated with the redevelopment project.

The BRA Addendum identified the receptors and pathways for both current and proposed future scenarios. The current scenario receptors considered by EPA were on-site trespassers, off-site residents, and a maintenance worker required to maintain the fenced properties or provide work on the remaining structures. The proposed future use of the property is for the two existing structures to be renovated into an office building and an adult education center, and for a library structure and parking lot to be constructed on the vacant lots. The four receptors considered by EPA are the patrons of the proposed facilities, the maintenance worker, the construction worker, and the office workers/librarians. The pathways for each of these receptors considered by EPA were inhalation, ingestion, and dermal contact.

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

6.1 CHEMICALS OF CONCERN

The chemicals of concern (COCs) for OU2 were chosen based on three criteria: comparison with background levels, comparison with USEPA soil screening levels, and knowledge of past activities as a pesticide formulator carried out by the former Woolfolk facility. The baseline risk assessment addendum included endrin ketone as a contaminant of concern (COC) because it met one of the three criteria. However, health-based values do not exist to establish a health-based remediation level for endrin ketone. The concentration of endrin ketone on the OU #2 properties are not believed to pose an unacceptable health risk. This was determined by comparing health-based values for the parent compound, endrin, to the maximum concentration of endrin ketone on the site. Since the maximum concentration of endrin ketone was three orders of magnitude lower than the health-based values for endrin, endrin ketone was eliminated as a contaminant of concern for the OU #2 properties.

6.2 EXPOSURE ASSESSMENT

Whether a chemical is actually a concern to human health and the environment depends not only on the innate toxicity but also upon the likelihood of exposure, i.e. whether the exposure pathway is currently complete or could be complete in the future. A complete exposure pathway (a sequence of events leading to contact with a chemical) is defined by the following four elements:

- A source and mechanism of release from the source,
- A transport medium (e.g. surface water,) and mechanisms of migration through the medium,
- The presence or potential presence of a receptor at the exposure point, and

Table 6-1: Contaminants of Concern for Surface Soils of Operable Unit #2			
Chemical (All values mg/kg)	Arithmetic Mean	95% UCL	Maximum
Inorganics			
Arsenic	49.74	65.7	180
Lead	242.37	336	570
Semivolatile Organics			
Benzo(a)anthracene	0.53	0.84	4.45
Benzo(a)pyrene	0.56	0.92	4.45
Benzo(b and/or k)fluoranthene	0.63	0.79	4.45
Pesticides			
Aldrin	0.004	0.006	0.022
BHC-alpha	0.003	0.005	0.012
BHC-beta	0.028	0.046	0.33
BHC-delta	0.012	0.019	0.13
BHC-gamma	0.005	0.006	0.043
Chlordane-alpha	0.19	1.82	1.15
Chlordane-gamma	0.22	0.85	1.6
DDE	0.93	2.77	5.6
DDT	1.03	4.43	4.5
Dieldrin	0.29	1.72	1.5
Endosulfan I	0.013	0.007	0.16
Endosulfan II	0.008	0.018	0.03
Heptachlor	0.005	0.007	0.02
Heptachlor epoxide	0.12	0.31	1.0
Methoxychlor	0.03	0.05	0.12
PCB-1254	0.079	0.14	0.46
Toxaphene	0.5	0.92	3.4

- A route of exposure (ingestion, inhalation, dermal absorption).

If all four elements are present, the pathway is considered complete.

An evaluation was undertaken of all potential exposure pathways which could connect chemical sources at the Site with potential receptors. All possible pathways were first hypothesized and evaluated for completeness using EPA's criteria. The current pathways represent exposure pathways which could exist under current Site conditions. The future pathways represent exposure pathways which could exist, in the future, if the current exposure conditions change. Exposure by each of these pathways was mathematically modeled using generally conservative assumptions.

Under current site conditions, the following complete exposure pathways were identified:

- ingestion of contaminated soil by an on-site maintenance worker and on-site trespasser,

- dermal contact with contaminated soil by an on-site maintenance worker and on-site trespasser, and
- inhalation of contaminated soil by an on-site maintenance worker, on-site trespasser, and off-site resident.

The future exposure pathways are:

- ingestion of contaminated soil by a future maintenance worker, on-site patron, on-site construction worker and on-site office worker/librarian,
- dermal contact with contaminated soil by a future maintenance worker, on-site patron, on-site construction worker and on-site office worker/librarian, and
- inhalation of contaminated soil by a future maintenance worker, on-site patron, on-site construction worker and on-site office worker/librarian.

The potential for exposure to soils in the future exposure scenarios will be reduced for all receptors except the construction worker, since much of the OU #2 soils will be covered by pavement or the library building.

The exposure point concentrations for each of the chemicals of concern and the exposure assumptions for each pathway were used to estimate the chronic daily intakes for the potentially complete pathways. The chronic daily intakes were then used in conjunction with cancer potency factors and noncarcinogenic reference doses to evaluate risk.

The major assumptions for the OU #2 properties defining current exposure frequency and duration that were considered in the exposure assessment were:

- The body weights are assumed to be 70 kilograms for a maintenance worker, 40 kilograms for a child trespasser, and 15 kilograms for a child resident not located on OU #2 properties.
- Ingestion rates are estimated as 100 mg/day for a maintenance worker and child trespasser.
- The exposure frequency is 50 days per year for a maintenance worker, 75 days per year for a child trespasser, and 350 days per year for a child resident not located on OU #2 properties.
- The duration of exposure is assumed to be 25 years for a maintenance worker, 9 years for a child trespasser, and 6 years for a child resident not located on OU #2 properties.

The major assumptions for the OU #2 properties defining future exposure frequency and duration that were considered in the exposure assessment were:

- The body weights are assumed to be 70 kilograms for a maintenance worker, a construction worker, and an office worker and 40 kilograms for a child patron.
- Ingestion rates are estimated as 100 mg/day for a maintenance worker and child patron, 480 mg/day for a construction worker, and 50 mg/day for an office worker.
- The exposure frequency is 50 days/year for a maintenance worker, 75 days/year for a child patron, 60 days/year for a construction worker, and 250 days/year for an office worker.
- The duration of exposure is assumed to be 25 years for a maintenance worker and office worker, 9 years for a child patron, and 1 year for a construction worker.

Table 6-2
CRITICAL TOXICITY VALUES¹
SLOPE FACTORS (SFs) AND REFERENCE DOSES (RfDs)

Contaminants	Slope Factor (SFs) (mg/kg/day) ⁻¹		Reference Dose (RfD) (mg/kg/day)	
	Oral	Inhal.	Oral	Inhal.
Arsenic	1.5	15	3.00E-4	-
Lead	-	-	-	-
Benzo(a)anthracene	0.73	0.61	-	-
Benzo(a)pyrene	7.3	6.1	-	-
Benzo(b and/or k) fluoranthene	0.73	0.61	-	-
Aldrin	17	17	3.00E-5	-
BHC-alpha	6.3	6.3	-	-
BHC-beta	1.8	1.8	-	-
BHC-delta	6.3*	6.3*	-	-
BHC-gamma	1.3	-	3.00E-4	-
Chlordane-alpha	1.3	1.3	6.00E-5	-
Chlordane-gamma	1.3	1.3	6.00E-5	-
DDE	3.4E-01	-	-	-
DDT	3.4E-01	3.4E-01	5.00E-4	-
Dieldrin	16	16	5.00E-5	-
Endosulfan I	-	-	6.00E-3	-
Endosulfan II	-	-	6.00E-3	-
Heptachlor	4.5	4.5	5.00E-4	-
Heptachlor epoxide	9.1	9.1	1.3E-5	-
Methoxychlor	-	-	5.00E-3	-
PCB-1254	7.7	-	2.00E-5	-
Toxaphene	1.1	1.12	-	-

Notes:

- ¹ Critical toxicity values obtained from Integrated Risk Information System (IRIS) or Health Effects Assessment Summary Tables (HEAST) (USEPA, Fiscal Year 1991).
- USEPA has not derived a RfD or slope factor
- The slope factors are surrogate values based on the BHC-alpha isomer.

6.3 TOXICITY ASSESSMENT

Toxicity values are used in conjunction with the results of the exposure assessment to characterize site risk. EPA has developed critical toxicity values for carcinogens and noncarcinogens. These critical toxicity values are listed in Table 6-2. Cancer slope factors (CSFs) have been developed for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CSFs, which are expressed in units of $(\text{mg/kg/day})^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg/day , to provide a high end estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "high end" reflects the conservative estimate of the risks calculated from the CSF. Cancer slope factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation have been applied.

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to chemicals exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg/day , are chemical-specific estimates of lifetime daily exposure levels for humans, including sensitive individuals, which are not expected to cause harm. Estimated intakes of chemicals from environmental media can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans). These uncertainty factors help ensure that the RfDs will not underestimate the potential for adverse noncarcinogenic effects to occur.

6.4 RISK CHARACTERIZATION

Human health risks are characterized for potential carcinogenic and noncarcinogenic effects by combining exposure and toxicity information. Excessive lifetime cancer risks are determined by multiplying the estimated daily intake level with the cancer slope factor. These risks are probabilities that are generally expressed in scientific notation (e.g., 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-6} indicates that, as a plausible upper limit, an individual has a one in one million additional (above their normal risk) chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the assumed specific exposure conditions at a site.

EPA considers individual excess cancer risks in the range of 1×10^{-4} to 1×10^{-6} as protective; however the 1×10^{-6} risk level is generally used as the point of departure for setting cleanup levels at Superfund sites. The point of departure risk level of 1×10^{-6} expresses EPA's preference for remedial actions that result in risks at the more protective end of the risk range.

Potential concern for noncarcinogenic effects of a single contaminant in a single medium is expressed as the hazard quotient (HQ) (or the ratio of the estimated intake derived from the contaminant concentration in a given medium to the contaminants' reference dose). A HQ which exceeds one (1) indicates that the daily intake from a scenario exceeds the chemical's reference dose. By adding the HQs for all contaminants within a medium or across all media and appropriate pathways to which a given population may reasonably be exposed, the Hazard Index (HI) can be generated. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. An HI which exceeds unity indicates that there may be a concern for potential health effects resulting from the cumulative exposure to multiple contaminants within a single medium or across media for an individual receptor. Summaries of risk characterization are presented in Tables 6-3 and 6-4.

The risk characterization values are overestimated due to the subsequent removal actions taken on the OU#2 properties. The BRA addendum and revised risk calculations used contaminant concentrations based on the pre-removal soil data. Certain properties have had soils removed and disposed of in an off-site landfill. These removal actions were not taken into consideration by EPA while deriving the risk characterization values shown in the table.

Throughout the risk assessment process, uncertainties associated with evaluation of chemical toxicity and potential exposures arise. For example uncertainties arise in derivation of toxicity values for reference doses (RfDs) and carcinogenic slope factors (CSFs), estimation of exposure point concentrations, fate and transport modeling, exposure assumptions and ecological toxicity data. Risk assessment uncertainties may

lead to an under- or over-estimation of the actual risk by the risk calculations presented in this section. However, because of the overall conservative nature of the risk assessment process, risk estimated in this assessment are likely to overestimate the true risk associated with potential exposure at OU #2 of the Woolfolk Chemical Site. Major uncertainties for the OU #2 at the Woolfolk Chemical Site are enumerated in Table 6-5.

TABLE 6-3
Risk Characterization Summary for Current Use Scenarios

Receptors	Hazard Index	Additional Lifetime Cancer Risk
Maintenance Worker	0.09	1.4 E-05
Child Trespasser	0.21	1.2 E-05
Off-site Child Resident	ND*	5.2 E-09
* ND= not determined: Hazard Index could not be calculated for the off-site child resident scenario due to lack of an arsenic reference dose for the inhalation pathway.		

TABLE 6-4
Risk Characterization Summary for Future Use Scenarios

Receptors	Hazard Index	Additional Lifetime Cancer Risk
Maintenance Worker	0.06	9.9 E-06
Child Patron	0.14	7.5 E-06
Construction Worker	0.46	3.1 E-06
Office Worker/Librarian	0.14	2.1 E-05

TABLE 6-5
SUMMARY OF UNCERTAINTIES ASSOCIATED WITH RISK ASSESSMENT

Assumption	Estimated Magnitude of Effect on Risk	Direction of Effect on Risk Estimate
Environmental Sampling and Analysis		
Errors in chemical analysis	Low	Over or underestimate risk
The majority of soil samples were taken in the region of the suspected contamination	Low-Moderate	Overestimate risk
Toxicological Data		
Hazard indices (HIs) were developed assuming all toxic effects were additive	Low-Moderate	Overestimate risk
Exposure Parameters		
Conservative values were used for exposure duration, frequency, and intake levels.	Low-Moderate	Overestimate risk

6.5 ECOLOGICAL RISK/HISTORICAL SITES

An ecological risk assessment evaluates potential hazardous effects on non-human species at Superfund sites. It may be a qualitative or quantitative appraisal of the actual and potential effects on the environment of a Superfund site. Not all sites provide a suitable ecological habitat. Many sites in industrial areas have little or no wildlife. The appropriate level of effort for assessing ecological risk is determined on a site-by-site basis.

The Woolfolk facility is located adjacent to the central business district of Fort Valley, Georgia, and the surrounding community consists of residential homes and small businesses. A qualitative assessment of the potential ecological effects of the Woolfolk Chemical Works facility determined that the site poses no significant ecological impacts. The properties being considered under this operable unit are unlikely to pose ecological concerns due to their location. It is unlikely that the Woolfolk facility and the OU #2 properties affect any designated wetlands due to the fact that the closest wetland is more than three miles from the Facility and is not hydraulically connected. The Woolfolk facility is not located within either the 100-year or 500-year floodplain. However, a drainage corridor heading south of the facility is currently under evaluation and will be addressed under OU #3.

It is unlikely that OU #2 affects either of the three identified endangered species (i.e., the Red-Cockaded Woodpecker, Kirtland's Warbler, or the Bald Eagle) that reside in the geographical area for the following reasons: 1) There are no records or reported sightings of any of these species in Peach County, and 2) the Facility and surrounding area do not provide the critical types of habitat needed for these endangered or threatened species.

There are two historical sites listed in Peach County, Georgia. These sites include the Peach County Courthouse located on West Church Street, and Strother's Farm located near the Peach/ Macon County line. It is unlikely that the Facility adversely affects the use of these historical sites nor their cultural value because they are located at least 1/2 mile from the Facility.

There are no wild and scenic rivers nor designated wilderness areas in Peach County. The Facility does not affect any coastal zones or coastal barriers.

6.6 PERFORMANCE STANDARDS

The establishment of health-based performance standards serves as an important means of guiding remedial activities. A health-based approach is warranted when performance standards promulgated by state or federal agencies are not available for contaminants in soil, as well as for certain groundwater contaminants. The approach to developing health-based standards is derived from the risk assessment process. The risk assessment is essentially a process by which the magnitude of potential cancer risks and other health effects at a site can be evaluated quantitatively. A performance standard is established by back-calculating a health protective contaminant concentration, given a target cancer risk or hazard quotient which is deemed acceptable and realistic. The concept of the performance standard inherently incorporates the concept of exposure reduction which allows remedial alternatives to be flexible.

The soils on the OU #2 properties at the Woolfolk Chemical site currently contain concentrations of Site-related contaminants at levels which would pose an unacceptable risk to human health if the properties are used for residential use. Actual or threatened releases of hazardous substances from this OU, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

The performance standards for this OU are contained in Table 6-6. The standards assume non-residential use. The performance standards are established at the lower of: (1) the 1×10^{-5} risk level, (2) the hazard quotient of 1, or (3) the groundwater protection standard. The 1×10^{-5} risk level is protective and will only be achieved in light of the planned future use of the OU#2 properties, the institutional controls that are planned for this operable unit, and all of the RODs for the Woolfolk Site. Setting the performance standards for each soil contaminant at the 1×10^{-5} risk level or a HQ of 1.0 is considered protective because

the future receptor with the greatest calculated cumulative risk (the future institutional worker) is 2×10^{-5} . This cumulative risk level is within EPA's protective risk range of 1×10^{-4} to 1×10^{-6} .

TABLE 6-6: SOIL PERFORMANCE (CLEANUP) STANDARDS (ALL UNITS IN MG/KG OR PPM)			
Contaminants	Standard	Contaminant	Standard
Metals			
arsenic	113(G)	lead	625(G)
Pesticides			
aldrin	2.23(R)	Dieldrin	2.37(R)
BHC-alpha, -delta	6.02(R)	Endosulfan I	3,070(R)
BHC-beta	0.5(G)	Endosulfan II	3,070(R)
BHC-gamma (lindane)	0.066(G)	Heptachlor	8.42(R)
Chlordane-alpha	29.2(R)	Heptachlor epoxide	4.16(R)
Chlordane-gamma	29.2(R)	Methoxychlor	2,560(R)
DDE	9.8(G)	PCB 1254	4.92(R)
DDT	8.1(G)	Toxaphene	34.5(R)
Semivolatile Organic Compounds			
Benzo(a)anthracene	51.9(R)	Benzo(a)pyrene	5.19(R)
Benzo(b/k)fluoranthene	51.9(R)		
Footnote: (G) Based on EPA's Site-Specific Protection of Groundwater Action Levels (R) Based on Site-Specific Risk Assessment			

The performance standards for the protection of groundwater are based on EPA vadose zone modeling. For certain OU #2 Chemicals of Concern (COC) which did not have a standard set under OU #1, a health-based performance standard for groundwater protection was calculated by setting the risk level in the groundwater at 1×10^{-6} , consistent with OU #1, groundwater. A model was used to establish the time required to reach peak leachate concentration and the equivalent soil performance standard. A range of values was established by varying the degradation rate and the depth of concentration of the maximum soil concentration found on the properties.

USEPA considers arsenic to be both a carcinogen and a systemic toxicant. Arsenic exposure via drinking water has been linked to increased incidences of skin cancer. The possible carcinogenic effects to human health from ingestion of arsenic laden soil are not being considered here as the health endpoint for the performance standards. Rather, a noncancer endpoint, or a soil concentration of arsenic that is protective of groundwater, is felt to be a more appropriate basis for deriving values protective of human health. The groundwater protective basis for the arsenic performance standard is within EPA's acceptable risk range for the carcinogenic endpoint and the non-cancer HQ of 1.0.

7.0 DESCRIPTION OF ALTERNATIVES

The following is a description of remedial alternatives evaluated to provide a range of cleanup options for Operable Unit #2 at the Woolfolk Site. The alternatives for the remediation of contaminated soil in OU #2 at the Woolfolk Chemical Works Site were evaluated in the Feasibility Study Addendum (FSA) and presented in the Proposed Plan for the Site. During the comment period, EPA re-evaluated the Proposed Plan alternatives based on revised risk calculations, which were presented in the previous chapter, but did not require a revision of the FSA. The revised alternatives included only those properties which are being proposed for a redevelopment project, however, the basic concepts presented in the FSA remained valid. Based on public comment received during the public comment period, EPA revised the performance standards a second time. EPA documented the first changes to the performance standards and the preferred alternative in the Proposed Plan in a memorandum dated August 25, 1995, filed in the Administrative Record. The second revisions are presented in this ROD and documented in a second memorandum from Elmer Akin to Tim Woolheater dated September 28, 1995. The alternatives presented in the Table 7-1 represent the revised alternatives considered by EPA in developing this Record of Decision. The changes to these alternatives are discussed in Chapter 11.0 of this ROD.

Table 7-1: Operable Unit #2 Alternatives			
Alternative Number	Medium	Remedial Action	Capital Cost (thousands)
1	Soil	No Action	\$ 0
2	Soil	Place institutional controls on the proposed redevelopment properties to ensure non-residential land-use including no groundwater use and monitor progress on the redevelopment project to ensure engineering controls are implemented and remain protective of human health and the environment.	\$ 15
3	Soil	Excavation of soils on residential properties with disposal on the Woolfolk facility.	\$ 160
4	Soil	Excavation of soils on residential properties with disposal at a permitted facility off-site.	\$ 300
5	Soil	Excavation of soils exceeding the 1×10^{-5} risk level with disposal at a permitted facility off-site. Place institutional controls on the proposed redevelopment properties to ensure non-residential land-use including no groundwater use and monitor progress on the redevelopment project to ensure implementation and protectiveness.	\$ 55

The assembled site-specific alternatives represent a range of distinct waste-management strategies addressing the human health and environmental concerns posed by Operable Unit #2. Although the selected remedial alternative may be further refined during the predesign and design phases, the analysis presented below reflects the fundamental components of the various alternatives considered feasible for this Site.

7.1 ALTERNATIVE 1: NO ACTION

The no action alternative is carried through the screening process as required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This alternative is used as a baseline for comparison with other alternatives that are developed. Under this alternative, EPA would take no further action to minimize the soil contamination threat posed by the properties between Martin Luther King Drive and Oak Streets. No institutional controls or remedial actions are implemented under the no-action alternative. Under this alternative, there are no impediments to the future residential use of these properties. There is no cost associated with this alternative since no additional activities would be conducted.

7.2 ALTERNATIVE 2: INSTITUTIONAL/ENGINEERING CONTROLS

Institutional controls under this alternative include placing restrictive covenants on the properties to preclude residential use, groundwater use, or other uses with similar exposure potential. Although these institutional controls help reduce risks associated with contact with contaminated soils, they do not reduce the contamination. Covenants would be recorded with the Peach County Clerk of Superior Court. Such restrictions would be imposed on the land and be binding on the owner's successors and assignees. Copies would be provided to the zoning or land use planning authority with jurisdiction over the property.

Engineering controls will require either paving, buildings, or landscaping (minimum of 6 inches of top soil) on approximately 85% of the proposed library project property. The assumptions used to evaluate the future risks in this ROD were based on the assumptions that engineering controls will be placed. Implementation of the construction activities for the library project will be required to achieve protectiveness under this ROD. Further review of protectiveness will be conducted through EPA's periodic reviews of OU #2.

7.3 ALTERNATIVE 3: EXCAVATION WITH ON-SITE DISPOSAL (AS PART OF OPERABLE UNIT 3)

Alternative 3 includes soil excavation on two (202 & 204) Oak Street properties that are zoned for residential use and do not meet interim residential levels contained in the Removal Action Unilateral Administrative Order (UAO). Soil excavated from these two properties would be disposed of in a landfill proposed for the Woolfolk property in OU #3. Soil excavation to action levels established by the Removal Action UAO on these two properties would involve excavation of about 360 cubic yards of soils. One property (216 Oak St.) has been remediated to residential levels in the Removal Action Unilateral Order. The other OU #2 properties are zoned for non-residential use and, therefore, would not be excavated under this scenario.

Operable Unit 3 will establish final remedial action levels for residential land use and determine any further excavation that may be necessary to meet with these remedial standards. If standards are established under the OU #3 ROD which are consistent with Removal Action UAO, no further excavation would be required on the 216 Oak St. property.

7.4 ALTERNATIVE 4: EXCAVATION WITH OFF-SITE DISPOSAL

This alternative is similar to Alternative 3, except off-site disposal is used as was utilized for excavated soils under the Removal Action UAO.

7.5 ALTERNATIVE 5: INSTITUTIONAL CONTROLS/EXCAVATION WITH OFF-SITE DISPOSAL

This alternative would implement institutional controls similar to Alternative #2 to ensure that future land use of the properties would be non-residential. Permanent restrictive covenants would be placed on properties to preclude residential use or other uses with similar potential exposure. The covenants would be recorded with the Peach County Clerk of Superior Court. Such restrictions would be imposed on the land and be binding on the owner's successors and assignees. Copies would be provided to the zoning or land use planning authority with jurisdiction over the property.

In the August 25, 1995 memorandum updating the Proposed Plan, one property, 204 Oak St., currently zoned for residential use was not believed to meet a 1×10^{-5} risk level for dieldrin. Soil excavation to non-residential action levels at, or below, 1×10^{-5} risk level was believed to involve excavation of 100 cubic yards of material and the disposal would be in an off-site landfill determined in OU #3.

Based on the revised risk assessment calculations, EPA determined that the soils on 204 Oak Street did not exceed the 1×10^{-5} risk level for dieldrin. This alternative, therefore, was not selected.

8.0 SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

This section of the ROD provides the basis for determining which alternative provides the best balance of the criteria in Section 121 of CERCLA and in Section 300.430 of the NCP. The major objective of the FS Addendum was to develop, screen, and evaluate alternatives for remediation of OU #2.

EPA evaluated each alternative by the standard criteria shown in Table 8-1 to determine which provided the best overall balance. To be considered as a remedy, the alternative must be protective of human health and the environment, and comply with applicable or relevant and appropriate requirements (ARARs). ARARs for the Site are discussed in Section 8.2 and Appendix B.

The selected alternative must meet the threshold criteria of overall protection of human health and the environment and compliance with all ARARs (or be granted a waiver for compliance with ARARs). Any alternative that does not satisfy both of these requirements is not eligible for selection. The Primary Balancing Criteria are the technical criteria upon which the detailed analysis is primarily based. The final two criteria, known as Modifying Criteria, assess the public's and the state agency's acceptance of the alternative. Based on these final two criteria, EPA may modify aspects of a specific alternative.

Table 8-1: Breakdown of Evaluation Criteria		
THRESHOLD CRITERIA	PRIMARY BALANCING CRITERIA	MODIFYING CRITERIA
-Overall protection of human health and the environment	-Long-term effectiveness	-State acceptance
-Compliance with ARARs (or invoking a waiver)	-Reduction of toxicity, mobility, or volume through treatment	-Community acceptance
	-Short-term effectiveness	
	-Implementability	
	-Cost	

The following analysis is a summary of the evaluation of the OU #2 alternatives for remediating the soils remaining on the properties under each of the criteria. A comparison is made between each of the alternatives for achievement of a specific criterion.

Threshold Criteria

8.1 OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The assessment of this criterion describes how each alternative, as a whole, achieves and maintains protection of human health and the environment. This criterion provides the final check to determine which of the alternatives best provides for adequate protection of human health and the environment.

This criterion draws on the assessments conducted under other criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs.

Present contamination levels are not protective for residential use or any use similar to residential use. Alternatives #1, #3 and #4 provide no protection from the future use of the OU #2 properties for residential purposes. Though the majority of the properties are zoned for commercial use the potential exists for conversion of the property to residential use. Alternatives #2 and #5 provide for restrictive covenants against the use of the properties for residential purposes and provide the best overall protection of human health and the environment. Based on comments received during the public comment period, Alternative #5 was deemed unnecessary due to all contaminants having risks below 1×10^{-5} . Therefore, Alternative #2 provides the best overall protection.

Alternative #1 is also not protective because of the lack of engineering controls. Alternative #2, #3, #4, and #5 rely on the construction of a protective cover (i.e building, paving, or topsoil) to limit exposure to potential future receptors. Alternatives #3, #4, and #5 further reduce the potential for future exposure by excavation of contaminated soils, although each presents higher short-term risks due to the construction activities. Alternatives #4 and #5 are less preferred due to off-site disposal. Alternatives #3 and #4 actions would need to be consistent with the ROD for OU #3 which will set residential performance standards. Both Alternatives #3 and #4 are not protective in the long-term due to the potential for residential land use.

8.2 COMPLIANCE WITH ARARs

The evaluation of the ability of the alternatives to comply with ARARs includes a review of chemical-specific, action-specific, and location-specific ARARs. Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant or contaminant, location, or other circumstances at a CERCLA site. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that are not directly applicable to a hazardous substance, pollutant or contaminant, location, or other circumstances at a CERCLA site but address problems or situations sufficiently similar to those encountered at the CERCLA site, and whose use is well suited to the particular site. The judgement of the relevance and appropriateness of a requirement to a remedial action depends on the substances in question, the physical nature of the site, or other circumstances at the site.

In order to comply with CERCLA requirements, selected remedial actions must attain ARARs unless a waiver is invoked. Performance standards for a remedial action will generally be based on chemical-specific and location-specific ARARs or health-based levels.

In the event that an ARAR does not exist, other pertinent guidelines and standards should be considered. These are commonly referred to as To-Be-Considered (TBC). Risk-specific doses (RSDs), reference doses (RFDs), health advisories (HAs) and state and federal guidelines and criteria, etc. are example of TBCs.

All of the alternatives will meet ARARs, except for Alternative #3 which would require a waiver for the siting requirements for an on-site landfill. Alternatives #1, #3 and #4 do not meet some of the "to-be-considered" guidelines due to the lack of institutional controls required to prevent the potential for the property to be used in the future for residential purposes. The performance standards established forth in this ROD are based on the use of the property for non-residential purposes. The standards would change if residential use was assumed because there would be a need to protect the child on the residential property. Alternative #2 and #5 will meet all identified ARARs and "to-be-considered" guidelines, since residential use is precluded by restrictive covenants. All identified ARARs and "to-be-considered" guidelines for Alternative #2 are presented in Appendix B.

Primary Balancing Criteria

8.3 LONG-TERM EFFECTIVENESS AND PERMANENCE

This criterion evaluates the long-term effectiveness of the alternatives in maintaining protection of human health and the environment after the remedial objectives have been met. The evaluation compares the risk remaining for each of the alternatives after meeting the objectives. The primary focus of this evaluation is the extent and effectiveness of the controls that may be required to manage the risk posed by untreated wastes. It ensures that the magnitude of the residual risk and adequacy/reliability of the controls of the remedial action are addressed.

Alternatives #2 and #5 have permanent restrictive covenants to prevent the use of the OU #2 properties for residential use and, therefore, are the most protective of the alternatives in the long-term. Alternatives #1, #3, and #4 are less protective due to the potential for future conversion of the properties for residential use, though, three properties are excavated to residential levels. Alternative #5 is more permanent, and slightly more protective, than Alternative #2 because excavation of contaminated dieldrin soils on one property are removed rather than being paved to prevent future exposure.

8.4 REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT

This criterion compares the alternatives' specific treatment technologies' anticipated performance. It addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of the hazardous substances as their principal element.

Due to the low levels of contamination and small volume of contaminated soils on the OU #2 properties it is not practical to require treatment to reduce the toxicity, mobility, or volume. None of the alternatives involve treatment, therefore, this criterion does not distinguish among the five alternatives.

8.5 SHORT-TERM EFFECTIVENESS

The assessment of this criterion examines the comparative effectiveness of each of the alternatives in protecting human health and the environment during the construction and implementation of a remedy until the response objectives have been met. Factors to consider are: protection of the community, protection of the workers, environmental impacts, and the time until the remedial objectives are met.

Alternatives #1 and #2 are more effective in the short-term because the actions will not require further disruption of the community nor create additional risk due to remediation construction activities. Environmental impacts are less likely for these alternatives and the time is relatively short. This is not the case for alternatives #3, #4, and #5, as excavation activities will disrupt the community and create additional risks due to construction traffic and contamination transport. Alternative #3 would require the longest time to implement due to the need to dispose of the site material on-site.

8.6 IMPLEMENTABILITY

This criterion evaluates the technical and administrative feasibility of the alternatives and the availability of the required goods and services. The following factors are considered: Construction and operation, reliability of the technology, ease of undertaking additional remedial action, monitoring conditions, coordination with other offices and agencies, availability of disposal services, availability of services, equipment, and materials.

Alternative #1 would require no action to implement. Technological expertise, services, equipment and materials are adequately available for the implementation of Alternative #2 through #5. Alternative #3 must be implemented as part of Operable Unit #3 since it requires an on-site landfill. Alternatives #3 and #4 would need to be consistent with the residential performance standards and require disposal services. All of

alternatives would require periodic review by EPA. Institutional controls would be placed for Alternatives #2 and #5 prior to transferring the property to the future owner. The Prospective Purchaser Agreement with the future owner will allow EPA the ability to enforce these institutional controls.

8.7 COST

This criterion evaluates the capital, operation, and maintenance costs of the alternatives. Capital costs are direct (construction) and indirect (non-construction and overhead) costs. Operation and Maintenance costs are post-construction costs necessary to ensure the continued effectiveness of the remedial action.

There are no anticipated costs for the operation and maintenance of any of the alternatives. The capital costs for each of the alternatives is: Alternative 1, \$0; Alternative #2, \$15,000; Alternative #3, \$75,000; Alternative 4, \$141,000, and Alternative #5, \$55,000.

Modifying Criteria

8.8 STATE ACCEPTANCE

This section provides the support agency's preference for the alternatives presented. The State of Georgia, as represented by the Georgia Environmental Protection Division (GaEPD), has been the support agency during the Remedial Investigation and Feasibility Study process for the Woolfolk Chemical Works site. In accordance with 40 CFR 300.430, as the support agency, GaEPD has provided input during this process. The State of Georgia deferred to EPA on the efficacy of the selected remedy in a letter dated September 29, 1995. The letter of deferral is in Appendix C.

8.9 COMMUNITY ACCEPTANCE

EPA has considered comments received during the public comment process associated with the Proposed Plan. EPA has included a Responsiveness Summary in Appendix A of this ROD, which addresses those comments. Comments received were both in support and in opposition to the preferred alternative, which is chosen as the selected remedy.

The entire Woolfolk Site has generated great interest and concern in this community. There is support for the redevelopment of these properties but not at the expense of human health and the environment. EPA has made attempts to explain that the remedy is protective but certain members of the community are skeptical of EPA's explanation. Community concerns address site risks, rather than any of the specific alternatives considered. EPA has documented the concerns raised during the comment period and addressed them in the Responsiveness Summary of Appendix A.

9.0 SUMMARY OF SELECTED REMEDY

Based upon consideration of the requirements of CERCLA, the NCP, public and state comments, EPA has selected Alternative #2 as a remedy for OU #2 at the Site. Due to the past removal actions at the site, limited further action will be required on the thirteen (13) properties proposed for a redevelopment project as discussed in this Record of Decision (ROD). In order to implement this remedy, EPA will require:

- land use consistent with the proposed redevelopment plan for the new Peach County Library Building;
- land use consistent with the renovation of two existing structures located at 201 Oakland Heights and 202 Oak Street for the purpose of an office building and an adult education center, respectively; and,
- placement of institutional controls to ensure that future land use is non-residential and groundwater beneath the site cannot be used for any purpose as stipulated in this Record of Decision.

EPA has entered into a Prospective Purchaser Agreement with the Peach County Libraries Board, the Fort Valley Redevelopment Authority, and the Peach County Chamber of Commerce. The ROD is based on the assumption that proposed properties will be transferred to these entities and redeveloped for use as a library, an office building, and an adult-education center. If this project does not proceed, it will be necessary to review this record of decision. Progress of the redevelopment project and whether or not the remedy remains protective will be periodically reviewed by EPA.

The area of concern at this Site for OU #2 is defined as the properties between MLK Drive, Oak Street, Oakland Heights Parkway, and Peachtree Street which are proposed for a redevelopment project. The street addresses include 307-323 MLK Drive, 201 Oakland Heights Parkway (also known as the Troutman House), and 202, 204, and 216 Oak Street. For an OU #2 site map, see Figure 1.2.

At the completion of this remedy, the risk associated with this Site has been calculated to be at, or below, EPA's excess cancer risk range of 1×10^{-6} to 1×10^{-4} and below a Hazard Index of 1, which is determined to be protective of human health and the environment. The total present cost of the selected remedy, Alternative #2, is estimated at \$15,000 for capital costs. There are no operation and maintenance costs associated with the remedy. The timeframe for implementation of the engineering controls is approximately three years.

A. SOURCE CONTROL

Source control remediation will address the contaminated soils on the OU#2 properties. EPA evaluated the properties based on the current and potential future use of the OU#2 properties. The use of these properties must be consistent with the plans that EPA has reviewed in determining the risk associated with this use.

A.1 Land use consistent with the redevelopment plan on MLK/Oak Street

The proposed library will be centered on 311 MLK to 319 MLK. The remaining properties will be used for parking and driveways to the library and the adult-education center. In evaluating the risk for future users of the library, EPA estimated that 85% of the property will be covered by either the library building, paving, or landscaping with a minimum of six (6) inches of topsoil. EPA will periodically review the redevelopment project to ensure that the project is continuing on a timely schedule.

A.2 Land use consistent with the proposed office structure on Oakland Heights:

A similar redevelopment initiative is planned for the properties on 201 Oakland Heights and 202 Oak Street. The 201 Oakland Heights property is planned for use as an office building for the Peach County Chamber of Commerce and the Fort Valley Redevelopment Authority. The 202 Oak Street property is planned to be used for an Adult Education Center operated by the Peach County Library Board. The existing building on 201 Oakland heights is planned to be renovated and only limited paving will be added, although six (6) inches of topsoil is planned for the front yard and west-back yard. The existing building on 202 Oak Street is also planned for renovation and paving will be placed in the rear of the property.

A.3 Placement of Institutional Controls:

The risk evaluation was based on the assumptions that the property will be used for non-residential purposes and that no groundwater from beneath the properties is used. Residential use of these properties is not protective of human health. Permanent restrictive covenants must be placed on each of the properties to prevent current and future owners from using the properties, and the groundwater beneath these properties, in a manner inconsistent with this ROD, or other EPA RODs. The covenants shall be recorded with the Peach County Superior Court and transfer with the land to be binding on current and successive owners and assignees. Copies of the covenants will be provided to the authorities with jurisdiction. The covenants must be in effect before the transfer of the property may take place.

At a minimum, restrictive covenants must comply with terms set out in Exhibit B of the Prospective Purchaser Agreement (PPA) between EPA and three local entities. EPA will enforce these restrictions through the PPA. Periodic review of protectiveness as it relates to this remedy will be conducted by EPA no less than every five years.

B. Performance Standards

Soils shall meet the performance standards set forth in Table 9-1.

C. Other Standards

In addition, the selected remedy shall comply with those ARARs identified in Section 10.2 (Attainment of ARARs) and in Appendix B of this ROD.

D. Compliance Monitoring

The redevelopment project will be reviewed by EPA on a periodic basis, at least once every five years.

TABLE 9-1: SOIL PERFORMANCE (CLEANUP) STANDARDS (ALL UNITS IN MG/KG OR PPM)			
Contaminants	Standard	Contaminant	Standard
Metals			
arsenic	113(G)	lead	625(G)
Pesticides			
aldrin	2.23(R)	Dieldrin	2.37(R)
BHC-alpha, -delta	6.02(R)	Endosulfan I	3,070(R)
BHC-beta	0.5(G)	Endosulfan II	3,070(R)
BHC-gamma (lindane)	0.066(G)	Heptachlor	8.42(R)
Chlordane-alpha	29.2(R)	Heptachlor epoxide	4.16(R)
Chlordane-gamma	29.2(R)	Methoxychlor	2,560(R)
DDE	9.8(G)	PCB 1254	4.92(R)
DDT	8.1(G)	Toxaphene	34.5(R)
Semivolatile Organic Compounds			
Benzo(a)anthracene	51.9(R)	Benzo(a)pyrene	5.19(R)
Benzo(b/k)fluoranthene	51.9(R)		
Footnote:			
(G) Based on EPA's Site-Specific Protection of Groundwater Action Levels			
(R) Based on Site-Specific Risk Assessment			

10.0 STATUTORY DETERMINATION

Under its legal authority, EPA's primary responsibility at Superfund Sites is to undertake remedial actions that achieve adequate protection of human health and the environment and attain all ARARs. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences. These specify that, when complete, the selected remedy must also be cost effective and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity, or mobility of hazardous substances as their principal element. The following sections discuss how the selected remedy meets these statutory requirements.

10.1 PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The selected remedy protects human health and the environment through minimizing exposure to the contaminated soil. The selected remedy, through the use of institutional/engineering controls, provides protection of human health and the environment by controlling risk through restrictive covenants, paving, landscaping, and construction of buildings. EPA will periodically review the site, no less than once every five years, to ensure that it remains protective of human health and the environment.

10.2 ATTAINMENT OF THE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Remedial actions performed under CERCLA must comply with all applicable or relevant and appropriate requirements (ARARs) unless a waiver is invoked. All alternatives considered for the Site were evaluated on the basis of the degree to which they complied with these requirements. The selected remedy was found to meet or exceed all ARARs that have been identified in Appendix B attached to this ROD.

10.3 COST EFFECTIVENESS

The estimated cost of EPA's selected remedy is \$15,000. Cost effectiveness is determined by comparing the cost of all alternatives being considered with their overall effectiveness to determine whether the costs are proportional to the effectiveness achieved. EPA evaluates the incremental cost of each alternative as compared to the increased effectiveness of the remedy. The selected remedy does cost more than the no action alternative; however, effectiveness achieved by the remedy justifies the higher cost. The remedy is considered cost effective.

10.4 UTILIZATION OF PERMANENT SOLUTIONS TO THE MAXIMUM EXTENT PRACTICABLE

EPA believes the selected remedy is the most appropriate cleanup solution for Operable Unit #2 at the Woolfolk Chemical Works Site and provides the best balance among the evaluation criteria for the remedial alternatives evaluated. This remedy provides effective protection in both the short-term and long-term to potential human and environmental receptors, is implementable, and is cost-effective.

10.5 PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

Due to the low levels and volume of the contamination on the OU #2 properties, it is not practical to require treatment to reduce the toxicity, mobility, or volume. Therefore, this selected remedy does not meet the preference for treatment as a principal element.

10.6 STATUTORY DETERMINATION

The remedy for OU #2 at the Woolfolk Chemical site is consistent with the requirements of Section 121 of CERCLA and the NCP. The selected alternative is protective of human health and the environment, will attain all Federal and State applicable or relevant and appropriate requirements, is cost-effective, and utilizes permanent solutions to the maximum extent practicable. The remedy will not reduce the mobility, toxicity

and volume of contaminated soil through treatment at the Site due to the impracticability of treating low levels and volumes of contaminated soils. The remedy for OU #2 is consistent with previous and projected remedial actions at the Site. Based on the information available at this time, the selected remedy represents the best alternative when balanced against the criteria used to evaluate remedies, especially in light of the ongoing removal action.

11.0 DOCUMENTATION OF SIGNIFICANT CHANGES

Upon further review of the proposed performance standards subsequent to the issuance of the Proposed Plan, EPA determined that certain adjustments to the performance standards were warranted. An error was determined to have occurred in addressing the standards for the protection of groundwater. EPA also obtained further clarification of the criteria to meet State concerns. EPA revised the performance standards in a memorandum to the Administrative Record on August 25, 1995. This memorandum established the revised performance standards and slightly revised the preferred alternative selected in the Proposed Plan. The revised alternative no longer considered the contingency since existing lindane concentrations were found to be protective.

EPA also modified the alternatives presented in the Proposed Plan due to the revised performance standards. The Proposed Plan discussed the need to further characterize one property (313 MLK) in order to confirm the presence of lindane. This was assumed to be needed due to the pre-removal lindane concentration which was above the performance standards presented in the Proposed Plan. This performance standard, however, did not consider the effects of degradation of the contaminant. Therefore, EPA revised the performance standard to consider degradation effects and found the pre-removal concentration was below the revised standard for lindane and was, therefore, already protective.

This revision affected Alternatives #2, #3, #4, and #5. Alternative #2 was found to no longer need a contingency for the removal of material from 313 MLK. The contingency, though not directly part of Alternative #2, was presented as part of the preferred alternative. The number of properties to be excavated in Alternatives #3 and #4 were also revised due to the revision of standards. This decreased the cost and increased the short-term effectiveness of these alternatives but did not alter the preferred alternative. Finally, alternative #5 no longer needed the excavation of 313 MLK but was found to need the excavation of another property discussed below.

Initially, the upperbound risk level for dieldrin on 204 Oak Street was calculated by EPA to be 1.4×10^{-5} , which is within the protectiveness range established by EPA at 1×10^{-6} to 1×10^{-4} . The initial revised performance standard for dieldrin was established at a risk level of 1.5×10^{-5} (1.6 ppm). Alternative #5 was, therefore revised from excavation of 313 MLK to excavation of 204 Oak St. in order to consider the option of excavating to a risk level at or below 1×10^{-5} for all contaminants. This change to the revised performance standard did not change the preferred alternative of the proposed plan.

Based on public comment received during the public comment period, EPA revised the performance standards a second time. The initial revised standards confused dermal absorption factors in calculating values presented in the August 25 memorandum tables. The second revision of the performance standards did not affect the selected remedy but eliminated Alternative #5 from further consideration since dieldrin was found to be below the established risk level of 1×10^{-5} . Chapter 6 presents the corrected risk values for all scenarios and the corresponding corrected performance standards.

APPENDIX A:
RESPONSIVENESS SUMMARY

WOOLFOLK CHEMICAL WORKS SITE
RECORD OF DECISION, OPERABLE UNIT #2:
FORT VALLEY, PEACH COUNTY, GEORGIA

**RESPONSIVENESS SUMMARY
WOOLFOLK CHEMICAL WORKS SITE
OPERABLE UNIT #2: SOIL CONTAMINATION
FORT VALLEY, PEACH COUNTY, GEORGIA**

The U.S. Environmental Protection Agency (EPA) held a public comment period from July 19, 1995 through September 15, 1995 for interested parties to give input on EPA's Proposed Plan for Remedial Action at the Woolfolk Chemical Superfund Site in Fort Valley, Peach County, Georgia. A public meeting was conducted by EPA on August 29, 1995, at the Peach County Courthouse in Fort Valley. At the meeting EPA presented the Proposed Plan for the Woolfolk Chemical Works Site, Operable Unit #2, which was based on the results of the Remedial Investigation and Feasibility Study (RI/FS).

A responsiveness summary is required to document how EPA addressed citizen comments and concerns about the Site, as raised during the public comment period. All comments summarized in this document have been factored into the final decision of the remedial action for the Woolfolk Site.

This responsiveness summary for the Woolfolk Site is divided into the following sections.

- I. Overview - This section discusses the recommended alternative for remedial action and the public reaction to this alternative.
- II. Background on Community Involvement and Concerns: This section provides a brief history of community interest and concerns regarding the Woolfolk Site.
- III. Summary of Major Questions and Comments Received During the Public Comment Period and EPA's Responses: This section presents comments submitted during the public comment period and provides the responses to these comments.
- IV. Concerns to be Addressed in the Future: This section discusses community concerns of which EPA should be aware during future actions.

I. Overview

The preferred remedial alternative was presented to the public in a Proposed Plan released on July 18, 1995. A public meeting was held August 29, 1995 with about 100 people attending. Due to the past removal actions at the site, limited further action will be required on the thirteen (13) properties proposed for a redevelopment project as discussed in this Record of Decision (ROD). In order to implement this remedy, EPA will require:

- land use consistent with the proposed redevelopment plan for the new Peach County Library Building;
- land use consistent with the renovation of two existing structures located at 201 Oakland Heights and 202 Oak Street for the purpose of an office building and an adult education center, respectively; and,
- placement of institutional controls to ensure that future land use is non-residential and groundwater beneath the site cannot be used for any purpose as stipulated in this Record of Decision.

EPA has entered into a Prospective Purchaser Agreement with the Peach County Libraries Board, the Fort Valley Redevelopment Authority, and the Peach County Chamber of Commerce. The ROD is based on the assumption that proposed properties will be transferred to these entities and redeveloped for use as a library, an office building, and an adult-education center. If this project does not proceed,

it will be necessary to re-evaluate this record of decision. EPA will continue to review the progress of the redevelopment project and whether or not the remedy remains protective.

There is significant support in the community for the concept of reusing this property. Support for redevelopment of this property is varied including those who do not wish to see this property redeveloped. Some members of the community opposed the redevelopment plan and requested that the OU #2 properties be cleaned up to residential standards. Concern was raised regarding the protection of human health and EPA believes this remedy is protective.

II. Background on Community Involvement and Concerns

EPA has made significant efforts to insure that interested parties have been kept informed and given an opportunity to provide input on activities at the Woolfolk Chemical Works site. EPA has been working with the community surrounding the Woolfolk Chemical Works since 1990. In September 1990, press releases informing the community about the NPL listing of the site were released. Subsequent interviews were held that Fall to develop a Community Relations Plan (CRP). The information repository was established in October 1990, at the Thomas Public library, 213 Persons Street, Fort Valley, Georgia. The CRP, which was finalized in November 1990, has been placed in the information repository. In January 1991, EPA held a public meeting to discuss the start of the RI/FS.

In July 1993, EPA issued a press release and fact sheet on the findings of the RI study regarding soil contamination and health precautions recommended by the Agency for Toxic Substances and Disease Registry (ATSDR). On August 2-3, 1993, EPA conducted door-to-door visits to the potentially affected residents to further distribute the fact sheet and extend our invitation to an availability session. The availability session, held on August 3, 1993 discussed the results of the RI study and ATSDR's recommendations for health precautions. Fifty people attended the session which was hosted by EPA, the Georgia Environmental Protection Division (GaEPD), and ATSDR. Representatives of Canadyne-Georgia Corporation (CGC) were also present.

EPA's Emergency Response and Removal Branch has determined the extent of off-site contamination which needs immediate response, has excavated contaminated soils from the majority of residential properties, and completed the destruction of an on-site, dioxin-contaminated building (Building E). EPA has met numerous times with the residents individually and held public meetings throughout this process. CGC is complying with an Unilateral Administrative Order (UAO) requiring the disassociation of the affected residents from contaminated soils and destruction/removal of Building E.

The Feasibility Study, the Proposed Plan, and the Administrative Record (AR) for OU#1 were released to the public on January 18, 1994. These two documents were made available in both the AR, maintained in the EPA Region IV Docket Room, and the information repository at the site. The notice of availability of these documents and the AR was published on January 18, 1994 in various local publications. A public comment period was held from January 18, 1994 to February 17, 1994. In addition a public meeting was held on February 1, 1994. At this meeting representatives from EPA, ATSDR, and the State of Georgia answered questions about problems at the site and the remedial alternatives under consideration.

EPA also hosted a series of five meeting with a group of eleven community members representing different views throughout the community. The group formed under the already existing TAG group and was called the Community Information Exchange Group (CEIG). The purpose of the group was to allow EPA to explain to a greater degree the activities at the site while receiving input from the community on issues of concern to them. The CIEG met from March through June 1995 and concentrated on issues related to OU #2 and future actions at the Site.

A Feasibility Study Addendum, a Proposed Plan, and an Administrative Record for OU #2 were prepared and made available to the public on July 18, 1995. These two documents were made

available in both the AR, maintained in the EPA Region IV Docket Room, and the information repository at the site. The notice of availability of these documents and the AR was published on July 18, 1995 in various local publications. A public comment period was held from July 18, 1995 to September 15, 1995. In addition a public meeting was held on August 29, 1995. At this meeting representatives from EPA and the State of Georgia answered questions about problems at the site and the remedial alternatives under consideration. Responses to the comments received during this comment period are presented in the responsiveness summary in Appendix A of this document.

III. Summary of Major Questions and Comments Received During the Public Comment Period and EPA's responses

Concern 1: There were many comments raised regarding the proposed redevelopment project. The issues involved the risks associated with the proposed future use, zoning requirements, the Troutman House, etc...

EPA Response: The basic concept behind redevelopment is based on the evaluation of the risks associated with the future use of the property. The OU #2 properties have been purchased by CGC and have been offered to three local entities in order that they may redevelop these properties for productive use. The proposed future use is non-residential. EPA has evaluated the risk associated with non-residential use of these properties and found it to be acceptable. The properties are not protective if they are used for residential purposes. A portion of the associated costs for cleaning to residential standards have been set aside as local funding for a state grant to construct a new library on a portion of the OU #2 properties. Other savings were used to purchase the property and prepare it for the potential construction project.

EPA believes that the proposed future use of the property is protective of human health. There are other aspects of the project which will need to be addressed before transfer of the property is considered. To ensure that the proposed use remains residential, EPA will require that restrictive covenants be placed on each of the properties to ensure that future use remains non-residential. CGC and the Peach County Libraries are continuing their negotiations regarding the transfer of property. If there is a breakdown in the process toward redeveloping these properties EPA will re-evaluate this ROD.

Certain properties are currently zoned for residential use. It is EPA's understanding that the proposed use of these properties is non-residential. Though added protection from reverting these properties may be provided by zoning changes, these zoning changes are not required for the proposed project. Each of these properties will have restrictive covenants placed on them and will be enforced by EPA through a Prospective Purchaser Agreement (PPA) with the future owners. EPA will also periodically review this ROD to ensure that it remains protective of human health and the environment.

There was a comment related to the Prospective Purchaser Agreement (PPA) and the need and use of the agreement. People are often reluctant to use property associated with a Superfund site. One of the reasons for this is the potential to be held liable for Superfund contamination. In an effort to relieve future developers from the liability of past contamination, EPA can promise, through the PPA, that it won't hold the future owner liable for past contamination. EPA must believe that the future use of the property is protective and the future owner was not responsible for the past contamination practices. EPA has entered into a PPA with three entities proposing to redevelop these properties. This agreement, however, does not prevent other parties from bringing legal action against these entities.

A major issue raised at the public meeting was concerning the risk to children who might come to visit the library and may live in the neighborhood. EPA evaluated the risks associated with both of these individuals and found the future use protective. The properties were also evaluated on their potential use as residential properties. This use is considered unacceptable to EPA at the current

contamination levels and, therefore, EPA is requiring the placement of restrictive covenants which will prevent the future use of these properties for residential purposes.

Throughout the evolution of the redevelopment project the concept behind redevelopment has remained the same. Some feel they have been deceived on the extent of the redevelopment proposal. EPA made efforts to clarify the ever changing property limits being considered for redevelopment in OU #2. EPA would also like to encourage those in the community who want to learn more about the project to contact the local entities which have proposed the project.

There was also a number of questions regarding the need for the Troutman House project to be approved and not to be affected by the proposed library project. EPA considered this comment but believes that to separate these two projects at this point would be counter-productive. EPA believe both projects are protective and through this ROD establishes the standards for both projects to proceed concurrently.

The role of City government was also an issue. EPA considers City government requests in balancing the nine criteria used to select a remedy as part of community input. There have been a number of City Resolutions regarding the overall remediation at this site. The latest resolution provided to EPA asked for remediation of soils to background levels for all of the properties which would then be considered for redevelopment. EPA, however, rarely remediates to background levels when it is possible to establish performance standards based on a site-specific risk assessment. The most protective standards, residential use standards, are not consistent with the concept of redevelopment as the proposed use for the properties is non-residential. This inconsistency would add a measure of protectiveness since non-residential use properties would be remediated to residential standards. However, this extra measure of protectiveness is not required. If these properties are not redeveloped in a timely manner, EPA will revisit this decision to ensure protectiveness.

EPA believes that there is a need for further discussion on the local level regarding the redevelopment project. As the project is proposed, it is protective. At the public meeting, there was considerable debate over the future use of the OU #2 properties. Some of the residents, including many on Oak Street, were skeptical of the project while others felt the need to begin to revitalize the City. All were concerned about protecting human health. EPA wishes to state, once again, that the non-residential use of these properties, as proposed, will be protective.

Concern #2: There is a concern that contamination from the OU #2 properties may have been affected by the flooding over the past few years since the testing of these properties. Will OU #2 properties contaminate other properties in the future.

EPA Response: The OU #2 properties are located in an area which is elevated from other areas with higher site related contamination. The MLK properties are sloped toward MLK street while the Oak Street properties drain to both MLK properties and Oak street. Flow of contamination from the Woolfolk plant (OU #3) property to redevelopment (OU#2) properties is highly unlikely and, therefore, no further testing is required. The pre-removal data used to evaluate the risk is actually a conservative estimate of the risks due to the removal actions (removal of a portion of soils on the site with high arsenic concentration) taken on the OU #2 properties.

Due to the slope of the properties, the relative low levels of contamination, and the future engineering controls which will be enforced through the Prospective Purchaser Agreement, EPA believes that there will be no contamination flowing from OU #2 properties to other areas. Migration off OU #2 areas prior to placement of engineering controls is not expected to be problematic due to the relatively limited slope of the properties and the low concentration of the contaminants.

Concern #3: There was considerable concern raised in regard to the sampling of residential properties and interior house dust sampling.

EPA Response: EPA's Emergency Response and Removal Branch has completed the sampling of the areas of concern with regard to the residential soil and interior house dust. As part of the long term aspect of the project, the EPA's Remedial (long-term clean up) Branch will evaluate the actions taken by the Removal team to determine if further action is warranted with respect to residential soils and house dust.

There are eight homes which were found with levels of arsenic contamination in the living areas which the removal program plans for clean up in Fall/Winter of 1995, assuming that budget cuts do not effect the Removal program operations. EPA continues to evaluate attic dust and living space house dust issues for long-term exposure, which will be addressed as part of OU #3. EPA, in consultation with the State of Georgia, will determine the need for further residential soil sampling during the same period.

Concern #4: What federal regulation allows a public entity to conduct negotiations that are not accessible to the general public?

EPA Response: EPA generally seeks to have potentially responsible parties (PRPs) perform Superfund cleanups where PRPs can be identified and they are capable of doing the work. This conserves Superfund resources. When EPA identifies a PRP and seeks to require the PRP to perform a cleanup, EPA will initially seek to negotiate a Consent Order for cleanup, and if one cannot be negotiated, EPA may either perform the cleanup itself, or issue a Unilateral Order to the PRP to perform the cleanup.

The terms of Consent Orders for implementing a cleanup are the subject of negotiations which do not include the general public. It would not be possible to effectively negotiate such an order with participation of the general public, and there is no legal requirement that the public be invited to such negotiations. Similarly, when a Consent Order is negotiated, there is usually a provision governing the resolution of disputes between EPA and the PRP that arise during implementation of the cleanup. The dispute resolution provision of the Consent Order between CGC and EPA for the Remedial Investigation, for example, calls for negotiations to resolve disputes over implementation of the Order. Such negotiations do not include the general public. If the cleanup is being conducted pursuant to a Unilateral Order rather than a Consent Order, disputes often arise between EPA and PRPs over implementation issues that are resolved through negotiations between EPA and the PRPs. It would not be feasible to include the public in each implementation issue which becomes the subject of discussion between EPA and PRPs and there is no requirement to do so.

The Superfund law does require that the public be involved in and have an opportunity to comment on the selection of remedial actions. EPA must consider community input in the remedy selection process. EPA has made extensive efforts to involve the community in the remedy selection process at the Woolfolk Site and has considered community input in making remedial decisions.

Concern #5: Why was there no alternative which requires cleanup of OU #2 properties prior to placement of the library?

EPA Response: Alternatives #3 and #4 both consider the remediation to residential standards of the residentially zoned properties. MLK Drive properties are considered commercial and are being cleaned to commercial standards. The Oak Street properties are proposed for institutional use which is protective of human health and the environment. Since the proposed use of these properties is non-residential, there is no need for further cleanup.

Concern #6: Why does EPA continue to select remedies, including alternative use, without input from surrounding property owners and business owners next to the purchased property.

EPA Response: EPA has made considerable effort to receive input from the community. A number of public meetings have been held regarding OU #2, including the public meeting of August 29, 1995 and five meeting with the CIEG. The purpose of these meetings was to receive input from the community surrounding the site. In arriving at a selected remedy, EPA must balance all of the comments received in order to make an informed decision.

Concern #7: What was EPA's involvement in the property purchase program?

EPA Response: EPA was not involved in the property purchase program. All property purchases were made pursuant to negotiations between the private parties.

Concern #8: The semivolatile target analyte dibenzofuran was detected in two samples collected at the subject site in amounts of 51 and 81 ug/Kg (ppb). The comment was made that this analyte was detected in the samples that were "analyzed with reasonable resolution" and that the other samples are valueless in examining for low ppb level of dibenzofuran.

EPA Response: The reported amounts of dibenzofuran are both below the contract required quantitation limit (CRQL) of 330 ug/Kg. However, it should be noted that the mass spectrometer/gas chromatograph (GC/MS) methodology employed by the laboratory has the capability to accurately detect target analytes in amounts well below the CRQL. Moreover, the contract laboratory is required to report all compounds meeting the qualitative identification criteria. The USEPA CLP Statement of Work for Organic Analyses, Exhibit D/SVOA, paragraph 11.1.1.4, states "When target compounds are below CRQL but the spectrum meets the identification criteria, report the concentration with a "J". The J qualifier indicates an estimated value. Under Region IV validation criteria, analytes with concentrations below 0.1 of the CRQL are not reported. The J data qualifier flag is reported when the analyte amount is below the CRQL.

Examination of the reported data show that the laboratory achieved a CRQL of between 340 and 360 ug/Kg for 22 of the 24 samples. The variation in the CRQL (detection limit) was apparently caused by moisture in the samples. Two of the samples had higher CRQLs of 450 and 8900 ug/Kg; it is not known what caused the elevated CRQLs of these two samples. Since the methodology has the capability of accurately detecting the target analytes in amounts as low as 0.1 of the CRQL, the reported data from 22 of the 24 samples would have revealed the presence of dibenzofuran if this target analyte had in fact been present in the samples.

Concern #9: The comment was made to assume, "for the sake of parsimony", that the dibenzofurans in samples collected at the subject site were chlorinated.

EPA Response: The target analyte dibenzofuran, CAS Number 132-64-9, does not contain chlorine. The empirical formula for this target analyte is $C_{12}H_8O$. The methodology employed by the laboratory for analysis of samples collected at the subject site uses a mass spectrometer for the identification of gas chromatograph peaks. The presence of chlorine would significantly alter the spectra of the suspect peak. Rigorous qualitative identification criteria are specified in the analytical methodology. The laboratory would, therefore, not identify the suspect peak as dibenzofuran; the suspect peak would be identified and reported as a tentatively identified compound by the laboratory.

Concern #10: One comment believed that the scope of OU #2 should be expanded to include additional, non-residential off-site properties. The properties included the former flour mill, several lots north of Railroad street, 305, 306, 325, 327, 328, 330, and 400 Martin Luther King, Jr. (MLK) Drive. The commentor remarked that these properties were evaluated along with OU #2 properties, that the contaminants of concern are similar, the land use is similar, and the proposed performance standards are likely to be met.

EPA Response: EPA separated the OU#2 properties on the basis that they were proposed for use in a redevelopment project and EPA believed that enforcing the future use of these properties is reasonably possible. Though EPA believes that the off-site properties proposed for inclusion have similar contaminants, it is not certain that these properties will be used for similar purposes as those in the redevelopment project. Prior to the removal action, 305, 327, 328, 330, and 400 MLK were used for residential purposes. Since the potential exists, as indicated by past and present use, for these properties to be used for residential purposes, EPA believes that these properties are not similar in land use to the redevelopment properties. This doubt, and the need to expedite the redevelopment properties, forms the basis for not including these properties in OU #2.

Another aspect which facilitated the use of only redevelopment properties in OU #2 was the ease with which institutional controls could be placed on these properties and the potential to enforce these controls in the future. There was the potential for the land owners of the former flour mill, the vacant lots north of railroad street, 306 and 325 MLK not to accept the restrictive covenants which are going to be placed on the redevelopment properties. The potential would have remained to convert these properties to residential use. As per the guidance entitled *Land Use in CERCLA Remedy Selection Process (May 25, 1995)*, EPA should determine: " ... the existence of the authority to implement the institutional control, and the appropriate entity's resolve and ability to implement the institutional control." Sufficient support could not be shown in the feasibility study to conclude that effective implementation of institutional controls could be expected for these properties, so EPA did not include them in OU #2.

Concern #11: EPA has not provided sufficient basis for revising the performance standard for dieldrin.

EPA Response: Based on this comment, EPA reviewed the performance standards proposed in the Proposed Plan and its update. EPA found an erroneous dermal adsorption factor had been used to calculate the pesticide and semi-volatile organics performance standards. EPA corrected this error and has established the correct performance standards in Table 9-1 of this ROD.

Concern #12: Further soil excavation is not required at 204 Oak Street to protect human health and the environment.

EPA Response: EPA will not require further excavation of 204 Oak Street if the actions in this ROD are implemented and the proposed use of the property is not changed.

Concern #13: What is the atmospheric duration period for the contaminants of concern and are they similar to insecticides used in the yard which have a tendency to stay in the air.

EPA Response: Very few of the chemicals of concern at the site are considered to be volatile based on a Henry's Law constant greater than $10E-5$. The ones that met this criteria were found in surface soil very infrequently or at low (mg/kg) concentrations. Therefore, no build up in ambient air of vapor concentrations to levels of any health concern would be considered likely. Many of the chemicals of concern would be expected to bond to soil particles and would become airborne with dust due to wind action. Again, the soil level are at low concentrations and air concentrations of particle bound

substances would be expected to be extremely low and of no health concern. As an additional precaution, EPA will require dust suppression measures to be applied during the construction activities.

Concern #14: There was one comment which confused the 48 contaminants of potential concern in the Baseline Risk Assessment with the Contaminants of Concern for OU #2. The commentor was concerned that we weren't considering all of the contaminants.

EPA Response: EPA has sampling results from the OU #2 properties which were analyzed for a full scan of metals, semi-volatile organics, and pesticides/PCBs. These scans are able to detect approximately 150 different contaminants that may be present in a particular sample tested. The chemicals detected in OU #2 sampling in surface soils were eliminated from further consideration only if: 1) chemicals were detected in less than 5% of the samples analyzed or; 2) the detected concentration of the chemical in the soil is similar to background concentrations.

The chemicals of concern (COCs) are those contaminants which show an unacceptable risk once the risk assessment is complete. The 48 chemicals of potential concern (COPCs) in the Operable Unit #1 ROD were screened based on the sampling results from the groundwater. Performance standards are set for 17 of those which were of concern (COCs) after the risk assessment. There were 24 COPCs which were carried through the risk assessment for the OU #2 properties. Of these, 22 are of concern for OU #2 and have performance standards set by this ROD. Each time an evaluation of risks is performed in a risk assessment, there is a process used to develop performance standards for those chemicals which are of concern.

Concern #15: There was a comment which expressed concern over the consideration of a toxic waste landfill on the former Woolfolk property.

EPA Response: EPA is considering the placement of a landfill on the former Woolfolk property. Alternative #3 evaluated the potential to dispose of OU #2 contamination in the on-site landfill. This has not been chosen as the remedy for OU #2. This issue will be revisited and evaluated in future Operable Units.

Concern #16: Many concerns were raised by the public regarding their health.

EPA Response: EPA is not qualified to discuss health aspects. However, EPA has referred these individuals with particular health concerns to the Agency for Toxic Substances and Disease Registry (ATSDR). ATSDR provides assistance to EPA on health-related issues at Superfund sites.

Concern #17: There was a question on how EPA could issue a record of decision before other portions of the site were complete.

EPA Response: EPA has the ability to divide the site into different portions (e.g. area, different media) in order to facilitate remediation of portions of the site. Actions for all of the portions must, however, be consistent. For example, EPA does not have to pick a remedy for the groundwater at the same time as is chosen for the soils. However, the soils must be cleaned to a level which would not recontaminate the groundwater. At the Woolfolk site, there are currently three portions, or Operable Units, to the remediation: the groundwater, the soils on the proposed redevelopment properties, and the remaining sources of contamination at the site.

Concern #18: What is the basis for different action levels between Woolfolk Chemical and other EPA sites across the nation.

EPA Response: The baseline risk assessment and remedial actions at Superfund NPL sites are site specific. Neither of these documents are precedent setting for decisions at other sites since many factors are involved in the final decision. The aspect that must be consistent is that Agency action must be protective of human health and the environment.

Concern #19: It appears that the level chosen as the remediation level at Woolfolk was based on something other than true local background (uninfluenced by the site) if you compare the sampling results of the backfill to the screening levels used by CGC in the risk assessment.

EPA Response: The sampling results of the backfill are not a true representation of background at the site. Backfill was chosen specifically to ensure that no further cleanup would be required on these properties and, therefore, does not give an adequate reflection of true background. The action level chosen for the arsenic removal action in residential areas near the site was based on protective levels in children for the systemic toxicity effects of arsenic. This level was also within the Superfund lifetime protective level for skin cancer that may be associated with oral ingestion of contaminated soils.

Concern #20: Does OU #2 meet with the ARAR, Georgia's Hazardous Site Response Act.

EPA Response: The HSRA was considered in developing action levels for this operable unit, but it was not considered an ARAR. However, EPA believes that the OU #2 performance standards are consistent with HSRA and GaEPD has deferred to EPA on the efficacy of the ROD.

Concern #21: Lead arsenate: Why is lead and arsenic not added as per HSRA? Lead arsenate is stable and insoluble until placed in a low pH environment. This makes it available in the soil or house dust environment where the receptor may be the human stomach.

EPA Response: There is no toxicological or programmatic basis for adding together the lead and arsenic levels in soil samples relative to obtaining a single intake level. Lead and arsenic are believed to have independent adverse effects. In addition, there is no combined lead/arsenic reference dose to compare such a value for obtaining a common hazard index.

Concern #22: Lead: The continued failure of EPA to force consideration of the impacts of lead on the hazard index at Woolfolk has become unacceptable. What is the risk action level for lead? The 1993 Risk Assessment indicates that up to 4.2% of the children exposed to off-site soils would be expected to have blood lead levels above 10ug/dL of blood. This assumption ignores that the homes may be much more contaminated with lead than the soil.

EPA Response: Lead risk cannot be evaluated through the calculation of a Hazard Index since the EPA has not established a reference dose for lead. EPA has evaluated the soil lead level in the residential area using a pharmacokinetic model consistent with OSWER guidance. This model integrates lead exposure from all major sources including house dust and yields a protective default soil lead level of 400 mg/kg. The model is not appropriate for the evaluation of lead risk for children in non-residential exposure scenarios or for adults in any exposure scenario. EPA currently has no guidance on a methodology for determining protective levels for these receptors. Traditionally the Superfund program has considered surface soil lead levels in the range of 500 to 1000 mg/kg as protective. This position was based on earlier work by the Centers of Disease Control and Prevention

that indicated blood lead levels do not increase from exposure to contaminated soil until the soil lead level exceeds this range. The clean up goal based on ground water protection is 625 mg/kg compared to a maximum detected level of 570 mg/kg and a mean of 193 mg/kg in surface soils samples collected in the OU #2 area. These levels are believed to be protective for all receptors evaluated in the Baseline Risk Assessment (BRA) Addendum and revised risk calculations. It should also be stated here that there is concern that additional sources of lead may exist in the residential area, i.e. chips from lead-based paint used in the homes. EPA initiated an effort to have children living in the area tested for blood lead levels. No evidence of elevated blood lead levels was shown in the test results.

Concern #23: Arsenic: The slope factor...Taiwanese studies... arsenic performance standard based on groundwater protection. In the ROD OU#1 the slope factor for arsenic was 1.8 mg/kg/day, why was this change for OU #2 to 1.5 mg/kg/day.

EPA Response: EPA considers arsenic a substance that can cause cancer and systemic toxicity in humans. Its human carcinogenicity is most strongly supported from studies in smelter workers with lung cancer. The evidence for arsenic as a skin carcinogen from oral ingestion of contaminated drinking water is less well supported and is based primarily on studies of an exposed population in Taiwan. Other studies of populations exposed to arsenic contaminated drinking water have not shown an association with elevated cancer rates. Very little data exist on cancer or any other toxic effects from exposure to arsenic contaminated soil. Arsenic is a natural constituent of the earth's crust and it can be safely assumed that mankind has always had some exposure to this substance. There are published scientific studies that indicate that the body can readily detoxify daily arsenic intake levels up to 200 micrograms. There is also suggestive evidence that traces of arsenic in the diet may be essential for good health. Therefore, the level of arsenic in soil that poses an adverse health effect is not obvious.

EPA has chosen to base the action level for arsenic in soil at this site on a protective level for a child against systemic toxicity effect when compared to a conservative reference level. This level is also protective for a person exposed to the site for 30 years against cancer effects at the Agency's upperbound risk level of between 1 additional chance in 10,000 to 1 additional chance in 1,000,000. The upper bound cancer risk is calculated by using the cancer slope factor value of 1.5 (mg/kg/day)¹ that was recently placed in EPA's IRIS database.

Concern #24: It appears that the valence state of the metals and pH of the medium have been ignored throughout the entire cleanup and each of its phases. The example given was arsenic.

EPA Response: The metal cation is considered as the toxic component of heavy metal compounds. The IRIS database contains toxicity information on the metals per se. The metal species and form present at the site tend to have importance relative to bioavailability. In consideration of the risk determination of the primary toxic metal at this site, arsenic, bioavailability was considered to be 80%. This assumption compares with published levels typically in the 30 to 50% range.

Concern #25: Final Appendix A: What happened to the future off-site child? It also appears that the current off-site child will still be the off-site child under future conditions, probably the child trespasser, and the future child patron. This would appear to be the most sensitive receptor about whom we should be concerned. What about the off-site child receptor during construction?

EPA Response: The risk levels have been calculated for the current off-site child resident, the current off-site child trespasser onto the site, and the future child patron of the library. No risk levels were found to be at unacceptable levels. Future exposure to off-site child residents during library construction is not expected to increase due to the requirement for dust suppression measures during

the construction period. The future off-site child resident was believed to have less exposure than the current off-site resident due to the proposed use of the property (i.e. coverage of soil by buildings, paving, or 6" of topsoil).

Concern #26: We respectfully request that EPA undertake extraction tests (e.g. TCLP) to simulate bioavailabilities of lead and arsenic on the site.

EPA Response: EPA believes it has applied conservative assumptions to its evaluation of lead and arsenic risk and does not anticipate conducting further bioavailability tests. Solubility tests do not equate to bioavailability tests. To truly conduct meaningful site specific bioavailability tests for lead and arsenic, in vivo feeding studies in an appropriate animal species would be required. Such studies would be expensive, time consuming, and often do not produce definitive results.

Concern #27: Can EPA ignore state and community issues, such as in-community landfill, permanent storage of dioxin, or leaving the current arsenic and lead landfill in place?

EPA Response: EPA must consider all of the comments it receives before selecting a remedy. If an alternative did not meet with state and local concerns, EPA would first attempt to resolve those concerns. However, if no acceptable alternative were available, EPA might have no other option than to chose a remedy without state and/or community acceptance. EPA might, however, be able to modify an unacceptable alternative to address specific community concerns. The specific concerns in this comment are issues that EPA will seek community input to in all future operable units.

Concern #28: What will happen with the remaining residentially zoned properties?

EPA Response: EPA will address the remaining contaminated residential properties in future operable units and in the removal action.

Concern #29: Where are the plans showing 85% coverage at the library site by impervious surfaces? When will these sites actually be redeveloped? Will this big blank actually be redeveloped?

EPA Response: EPA has used preliminary drawings of the proposed library, adult education center, and Fort Valley Redevelopment Authority projects to estimate the 80% coverage. These drawings are available from the local entities or copies can be obtained from EPA. The time-frame for redevelopment of these properties is approximately three years after signing of this record of Decision. EPA believes that the redevelopment project will proceed as planned; however, if it does not, EPA can re-evaluate this ROD in the future.

Concern #30: What is the paving percentage on the other sites? Is EPA funding the redevelopment project?

EPA Response: The paving percentage for the site as a whole is 80%, not on individual properties. Funding for redevelopment is explained in concern #1. EPA funding is not being used for the redevelopment project.

Concern #31: Why has zinc been ignored in the Final Baseline Risk Assessment (BRA) considering its known wildlife effects?

EPA Response: There are no ecological chemicals of concern for OU#2 since the planned development of the property will not provide an ecological habitat. However, clean up levels for COCs protective of human receptors are believed to be protective for terrestrial species.

Concern #32: A statement made in the BRA addendum on page 3-3, in the last paragraph, was not found in the reference provided. The number given was 10 times higher than that used by CDC and EPA in other documents.

EPA Response: The statement referred to in the BRA Addendum is not the basis for any site decision on lead. The lead soil screening level and the IEUBK (Integrated Exposure Uptake Biokinetic) model default for soil lead is 400 ppm. Decisions on acceptable lead levels at a Superfund site are based on site-specific application of the IEUBK model for protection of children or ground water protection modeled values.

Concern #33: The soil to dust default value of 0.70 is not supported, since testing of dust in many homes shows levels of arsenic and lead greatly exceeding the property soil levels. There is also an assumption that coverage of the soil with paving will reduce the fraction of soil ingested. This is then corrected by 0.70 to account for the amount of dust contributed by the outdoor soil to house dust. It would appear that the multiplication of both factors may be underestimating the effect since outdoor dust in the library would probably still be generated mainly by the unpaved areas. The commentor, also didn't think that anyone has demonstrated that cutting the immediate area of contaminated soil exposed to air by 50% will result in a concentration drop in indoor dust of 50%.

EPA Response: The 0.70 soil dust default value is presented in the "Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children" as appropriate for neighborhoods or residences in which loose particles of surface soil are readily transported into a house. EPA believes an appropriate assumption for indoor dust is 70% comprised of soil from immediately outside a building in areas where no other significant sources of the contaminants exist, e.g. lead-based paint chips in a building. For OU #2, EPA further believes that half of this value, i.e. 35%, is an appropriate assumption for the portion of local soil that would comprise the soil exposure in buildings associated with the redevelopment plan. This is based on the assumption that 85% of the redeveloped area will be covered by buildings, paving, or 6" of topsoil. Therefore, indoor dust is comprised of considerably less soil from OU #2 areas.

Concern #34: In 1977, Dutkiewicz showed extensive delayed uptake of arsenic by mice, with skin binding occurring as much as 24 hours before appearance of arsenic in blood, liver, etc. This suggests caution in projecting no dermal effect if the arsenic/skin contact is under moist conditions. Children playing in muddy bare yards or ditches may be absorbing arsenic at some significant rate.

EPA Response: The BRA Addendum considered risk to the COCs from ingestion, inhalation and dermal uptake. The exposure assumptions are shown in the document and are believed to be appropriate.

Concern #35: The key assumptions for the child trespasser appear distorted. The child is assumed to weigh 40 kg and to respire only 5 m³ of air. More reasonable numbers for the average trespasser would be 30 kg and 20 m³ since these children would be metabolically active. This significantly changes the relationship of body weight and inhalation by a factor of $1.33 \times 4 = 5.32$. Similarly if soil is moved by air to the off-site child, as assumed, it will also contaminate surfaces in its environment. No soil via ingestion or skin was assumed. The value used for the child trespasser or some significant fraction thereof should be used. Child patron parameters are biased to produce a lower mg/kg/day value. The commentator would suggest a balance for the child of 30 kg weight, 200 mg soil/day, and 20 m³ of air ventilated/day since children of this age have high metabolic rates.

EPA Response: The air intake assumption presented in the BRA Addendum was unclear and EPA believes has been misunderstood by the commentor. The 5 m³/d value shown does not represent the daily ventilation rate but rather the amount of air intake for the assumed period of time on site (a few hours) for both the current child trespasser and the future child patron. The assumed weight (40 kg, which is the 90th percentile for 10 year old child) an older child trespasser or patron is appropriate for determining the exposure and risk for this receptor group. EPA also considers 100 mg daily soil ingestion a conservative assumption for this age group.

Concern #36: The baseline risk assessment did not consider or evaluate the past exposure of off-site residents or on-site workers. Aren't such exposures important?

EPA Response: The purpose of the baseline risk assessment is to evaluate the risk to current and future receptors to environmental media for the contaminants at the site at the current concentration level. It is not the objective of the BRA to calculate risk from past exposure and would likely be impossible since historical media concentrations and, therefore, exposure levels are not known.

Concern #37: It appears a "hot spot analysis" would have been more appropriate and why wasn't this chosen?

EPA Response: Exposure determinations for receptors are based on media concentrations of the contaminants of concern within an exposure unit. An exposure unit is that environment that the receptor will contact generally in a random fashion throughout the exposure frequency assumed in the baseline risk assessment. Hot spots of contamination may be sufficiently large to comprise an exposure unit and if so the risk to the hot spot will be determined. For the OU #2 assessment, the entire area was assumed to be the exposure unit. The upper confidence limit on the average or the maximum concentration was used to obtain the exposure point concentration. This was a very conservative assumption for the child trespasser and the patron considering the likely soil exposure patterns.

Concern #38: The risk assessment authors reduced the TCDD (dioxin) slope factor by 15 fold. Does EPA agree with this?

EPA Response: Dioxin contamination is not an issue for OU #2. However, for informational purposes, EPA has not changed the cancer slope factor (potency assumption) for dioxin. A rigorous reassessment of the carcinogenicity and toxicity of dioxins and furans is currently underway by EPA.

Concern #39: Was the cumulative risk to all the site contaminants taken into consideration by EPA.

EPA Response: The BRA Addendum and the subsequent risk calculations evaluated the cumulative risk for six assumed current and future receptors across all COCs and the ingestion, inhalation, and dermal routes of exposure. The greatest calculated cumulative excess cancer risk was for the future institutional worker at the level of 2×10^{-5} , well within EPA's protective risk range of 1×10^{-4} to 1×10^{-6} . All six receptors had cumulative non-cancer risk levels below EPA's protective level of a calculated hazard index of 1.0.

IV. Concerns to be Addressed in the Future

The Prospective Purchaser Agreement will enable EPA to follow and enforce the redevelopment activities and ensure that the remedy is implemented. EPA will address house-dust concerns as part of future operable units and in the removal action. CGC has submitted a response to EPA comments on the feasibility study for OU #3. Review of these responses are scheduled for October, 1995. EPA will continue to work with the Fort Valley community to get input on future remediation decisions.

APPENDIX B
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARAR)
AND
"TO-BE-CONSIDERED" GUIDANCE

WOOLFOLK CHEMICAL WORKS SITE,
RECORD OF DECISION, OPERABLE UNIT #2

Appendix B

Record of Decision, Operable Unit #2, Woolfolk Chemical Works

ARARs AND "TO BE CONSIDERED"

Item	Type	Prerequisites	Description	Citation
SDWA MCLs and MCLGs	Chemical-Specific Relevant and Appropriate	Property meets soil concentrations that will protect the groundwater aquifers from exceeding these values based on leaching.	Groundwater protection criteria are established that will protect the groundwater resources.	40 CFR 141
Georgia requirements regarding the closure of abandoned wells	Action-Specific Applicable	Wells requiring abandonment may be encountered.	State requirements for closure of abandoned wells.	Water Well Standards Act of 1991, OCGA 12-5-120 et seq.
Georgia rules for air quality control	Action-Specific Applicable	Excavation and Construction.	State requirements for air quality control	GA Rule 391-3-1
OSHA-Worker Protection	Action-Specific Applicable	Excavation and construction.	Worker protection requirements.	29 CFR 1910 29 CFR 1926
National Archaeological and Historical Preservation Act	Location-Specific- Potentially Applicable	Should scientific, prehistorical, historical artifacts be found at the site, this could be applicable. This could apply to historical building.	If actions were to cause irreparable harm, loss, or destruction of significant artifacts, then recover or preservation of the artifacts would be required.	36 CFR 65
Integrated Risk Information System (IRIS) Tables	Chemical-Specific To Be Considered	Property meets standards which ensure risk levels identified in IRIS are not exceeded.	IRIS provides health risk information for specific chemicals.	1994, Online. EPA Office of Health and Environmental Assessment

Item	Type	Prerequisites	Description	Citation
Health Effects Assessment Summary Tables (HEAST)	Chemical-Specific To Be Considered	Property meets standards which ensure risk levels identified in HEAST are not exceeded.	HEAST provides health effects information for specific chemicals.	1993. EPA Office of Solid Waste and Emergency Response
Risk Assessment Guidance for Superfund, Volume 1, "Standard Default Exposure Factors"	Chemical-Specific To Be Considered	Property meets standards which ensure exposure levels identified in guidance are not exceeded.	Exposure factors are provided for use in developing risk assessments.	March 25, 1991 EPA guidance document PB91-921314
Georgia Rules for Hazardous Site Response, Chapter 391-3-19-.07 (Risk Reduction Standards)	Chemical- and Action-Specific To Be Considered		The Risk Reduction Standards for Hazardous Site Cleanups under state law.	Chapter 391-3-19, Rules of the Georgia Department of Natural Resources
Georgia Rules for Hazardous Response, Chapter 391-3-19-.08 (Property Notices)	Action-Specific To be Considered		The Property Notice requirements for Hazardous Site Cleanups under state law.	Chapter 391-3-19, Rules of the Georgia Department of Natural Resources

APPENDIX C:

STATE LETTER

Georgia Department of Natural Resources

205 Butler Street, S.E., Suite 1154, Atlanta, Georgia 30334

Lonice C. Barrett, Commissioner
Environmental Protection Division

Harold F. Rehels, Director
404/656-7802

September 29, 1995

Mr. Timothy Woolheater
Remedial Project Manager
South Superfund Remedial Branch
USEPA Region IV
345 Courtland Street, NE
Atlanta, Georgia 30365

Re: Woolfolk Chemical Works NPL Site

Dear Mr. Woolheater:

Thank you for your letter dated September 28, 1995, regarding the draft Record of Decision (ROD) for Operable Unit #2 (OU2). In the letter you requested EPD concurrence with the ROD.

We have reviewed the technical data and plans associated with the draft ROD; also, we have reviewed ATSDR's Health Consultation dated September 28, 1995. Given the very significant level of federal expertise involved in development of the draft ROD, EPD is deferring to EPA's judgment regarding the efficacy of the ROD for OU2.

Please telephone me at 656-7802 if you have questions.

Sincerely,



Jennifer R. Kaduck
Chief

Hazardous Waste Management Branch

JRK/dm

c: Bill Mundy
Harold Rehels

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Post-It™ Fax Note	7671	Date	9-29-95	# of pages	1
To	Timothy Woolheater	From	Jennifer Kaduck		
Co/Dept.	South Superfund Rem.	Co.	GA EPD		
Phone #		Phone #	656-7802		
Fax #	347-3058	Fax #	651-9425		