B6055

RECORD OF DECISION

BUCKINGHAM COUNTY LANDFILL SUPERFUND SITE
BUCKINGHAM COUNTY, VIRGINIA

PREPARED BY
THE U.S. ENVIRONMENTAL PROTECTION AGENCY

SEPTEMBER 1994

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RECORD OF DECISION
BUCKINGHAM COUNTY LANDFILL SUPERFUND SITE

PART I - DECLARATION

I. SITE NAME AND LOCATION

Buckingham County Landfill Superfund Site
Buckingham County, Virginia

II. STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the final remedial action selected for the Buckingham County Landfill Superfund Site (Site), located near the town of Sprouse's Corner in Buckingham County, Virginia. This remedial action was chosen in accordance with the requirements of the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA), 42 U.S.C. §§9601 et. seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting the remedial action and is based on the Administrative Record for this Site.

The Commonwealth of Virginia has had the opportunity to comment on this remedy and their comments for the most part have been incorporated into this ROD.

III. ASSESSMENT OF THE SITE

Pursuant to duly delegated authority, I hereby determine, pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606, that actual and threatened releases of hazardous substances from this Site, as discussed in Part II, Section VI (Summary of Site Risks) of this ROD, if not addressed by implementing the remedial action selected in this ROD, may present an imminent and substantial endangerment to human health or the environment.

IV. DESCRIPTION OF THE SELECTED REMEDY

The Environmental Protection Agency (EPA), in consultation with the Virginia Department of Environmental Quality (VDEQ), has selected the following remedial action for the Buckingham County Landfill Superfund Site (Site). This remedy addresses the hazardous wastes and contaminated soils located in the four onsite trenches as well as the plume of ground water contamination.

The selected remedy includes the two following options, both of which are fully protective of human health and the environment:

Option 1 - Monitor the ground water and cap the hazardous waste disposal area. If ground water monitoring detects migration of the plume, as defined below, remove appropriate portions of the cap, implement source control measures, replace the cap, and treat the ground water.

Option 2 - Monitor the ground water, implement the source control measures, and then cap the hazardous waste disposal area. If ground water monitoring detects migration of the plume, as defined below, treat the ground water.

The selected remedy includes the following major components:

- A ground water monitoring program to include residential wells as well as bedrock and saprolite monitoring wells shall be implemented. Samples shall be collected at the points of compliance which shall be no further than 150 feet from the edge of the cap. If any analytical result from a ground water monitoring sample collected at the points of compliance exceeds the Safe Drinking Water Act Maximum Contaminant Level (MCL) or the health-based contaminant level (if an MCL has not been established) for any Site-related contaminant, a confirmatory sample from the well where the exceedance occurred shall be collected and analyzed for all Site-related contaminants. If the analytical results from the confirmatory sample also exceed the MCL or health-based level, appropriate contingency actions shall be invoked.

- A RCRA multilayer cap over the hazardous waste disposal area and the area south of the barrel trench shall be constructed. The cap shall not extend beyond the disposal trenches and previously capped area south of the barrel trench.

- Excavation and offsite incineration of the waste layer and contaminated soils in the eastern disposal trench (approximately 675 cubic yards). This source control action would be implemented as part of the contingency requirements under Option 1. Under Option 2, this action would be completed prior to cap construction. If it is determined via treatability studies that Insitu Soil Vapor Extraction (ISVE) can effectively remove contaminants from the waste layer, ISVE may be used. However, if full scale ISVE cannot meet performance standards set by EPA in this ROD, excavation and offsite incineration as described above must be implemented.

- Excavation of test pits and sampling will be conducted in the barrel trench; information gained from these activities will be used to prepare a Focused Feasibility Study (FFS). EPA will issue a subsequent decision document regarding source control measures for this trench. This action will be implemented as part of the contingency requirements under Option 1. Under Option 2, this action would be completed prior to cap construction.

- Extraction and treatment of contaminated ground water by air stripping to remove Volatile Organic Compounds (VOCs) in order to contain the ground water plume; this action would be implemented as a contingency for both Options 1 and 2.

- Deed and access restrictions.

V. STATUTORY DETERMINATIONS

This selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. If Option 2 is implemented or if the contingency requirements for Option 1 are invoked, the selected remedy will utilize permanent solutions and alternative treatment technologies to the maximum extent practicable, and will satisfy the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

Because this remedy will result in hazardous substances remaining onsite above health-based levels, a review will be conducted within five years after initiation of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Peter H. Kostmayer
Regional Administrator
Region III

9/30/94
Date

I. Site Name, Location, and Description

The Buckingham County Landfill Site is located in central Buckingham County, Virginia, near the town of Sprouse's Corner, about 1.5 miles southwest of the intersection of U.S. 60 and U.S. 15 on County Road 640 (see Figure 1). Buckingham County is located approximately 60 miles west of Richmond, 50 miles south of Charlottesville, and 40 miles northeast of Lynchburg.

The land immediately surrounding the Site is rural and mostly forested. The property on which the Site is located is owned by Buckingham County and consists of 125 wooded acres, with approximately 8 open acres that were used for disposal operations (see Figure 2). When this Site was placed on the National Priorities List (NPL) it was described as the 8-acre area surrounding the hazardous and domestic waste disposal operations. For the remainder of this document, "Site" will refer to the hazardous waste disposal area and any surrounding areas onto which hazardous substances have migrated.

Locally, the Site is drained by the Warner Branch of Cooper Creek to the south and by Cooper Creek, itself, to the north. A ditch drains the immediate vicinity of the landfill and discharges into an unnamed tributary of Warner Branch. Although there are wetlands in the Site vicinity, these wetlands are upgradient and not affected by the Site. The habitat for an endangered plant species (the Small Whorled Pogonia) which is considered a unique ecosystem, is present at the Site. Based on the results of a June 23, 1993 survey conducted by the U.S. Fish and Wildlife Service, it was determined that this plant species does not actually reside onsite.

A majority of the county's residences obtain potable water from Troublesome Creek Reservoir. Although the reservoir is topographically lower than the Site, it is in a different watershed. A ground water use survey was conducted as part of the Remedial Investigation (see RI Report Figure 3.17). According to this survey, 52 persons within a one-mile radius of the Site use private wells as their source of drinking water. The closest downgradient drinking water well is located approximately one third of a mile from the Site (2,000 feet). There are no residences onsite or directly adjacent to the Site. Several residences use an alternate source of water for drinking because of taste and odor problems which are due to naturally occurring background concentrations of certain inorganics.

The Site includes of a number of trenches and a "borrow" pit used in hazardous waste disposal operations. The trenches include an evaporation trench, two disposal trenches, and a

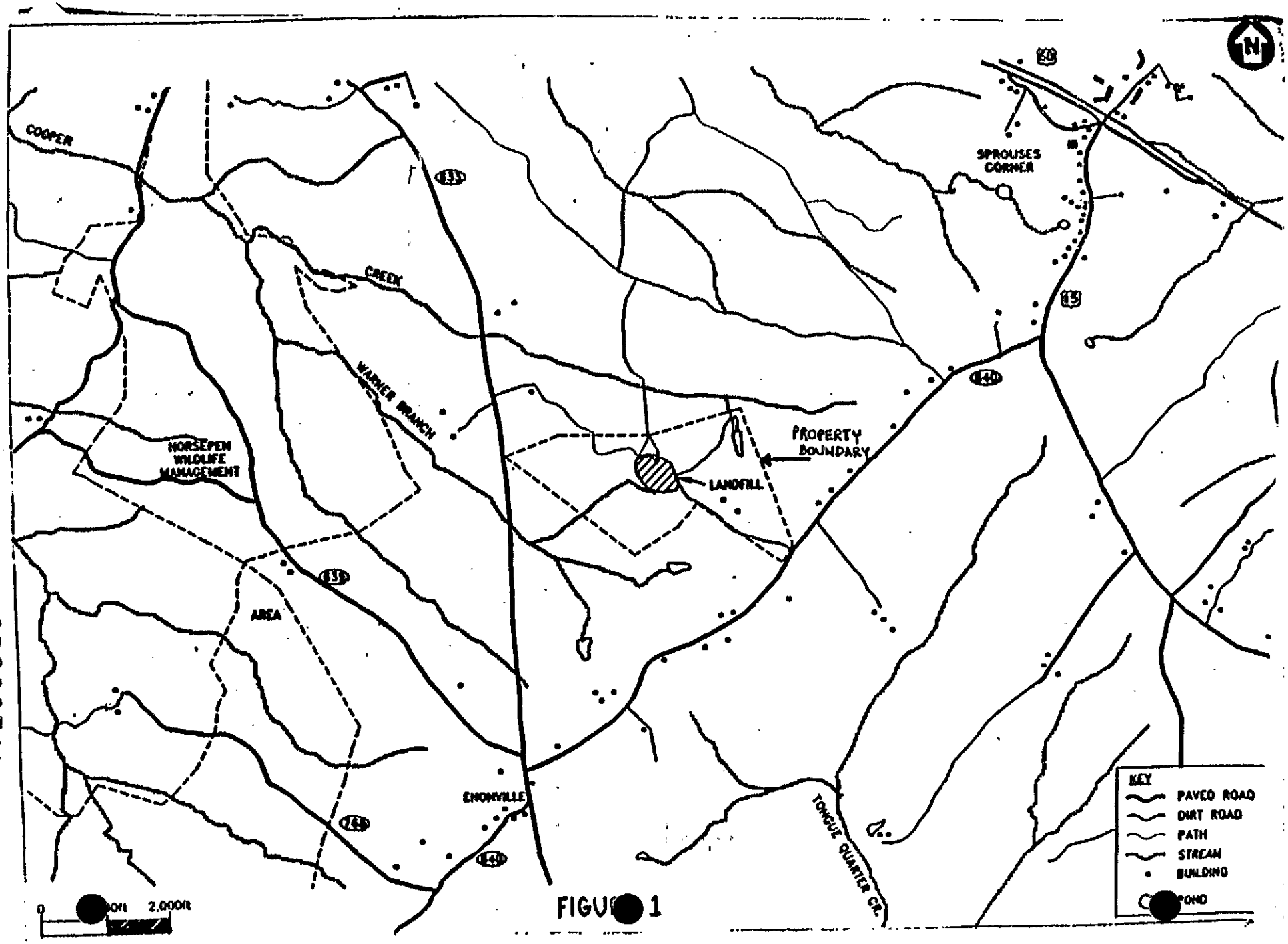

FIGURE 1

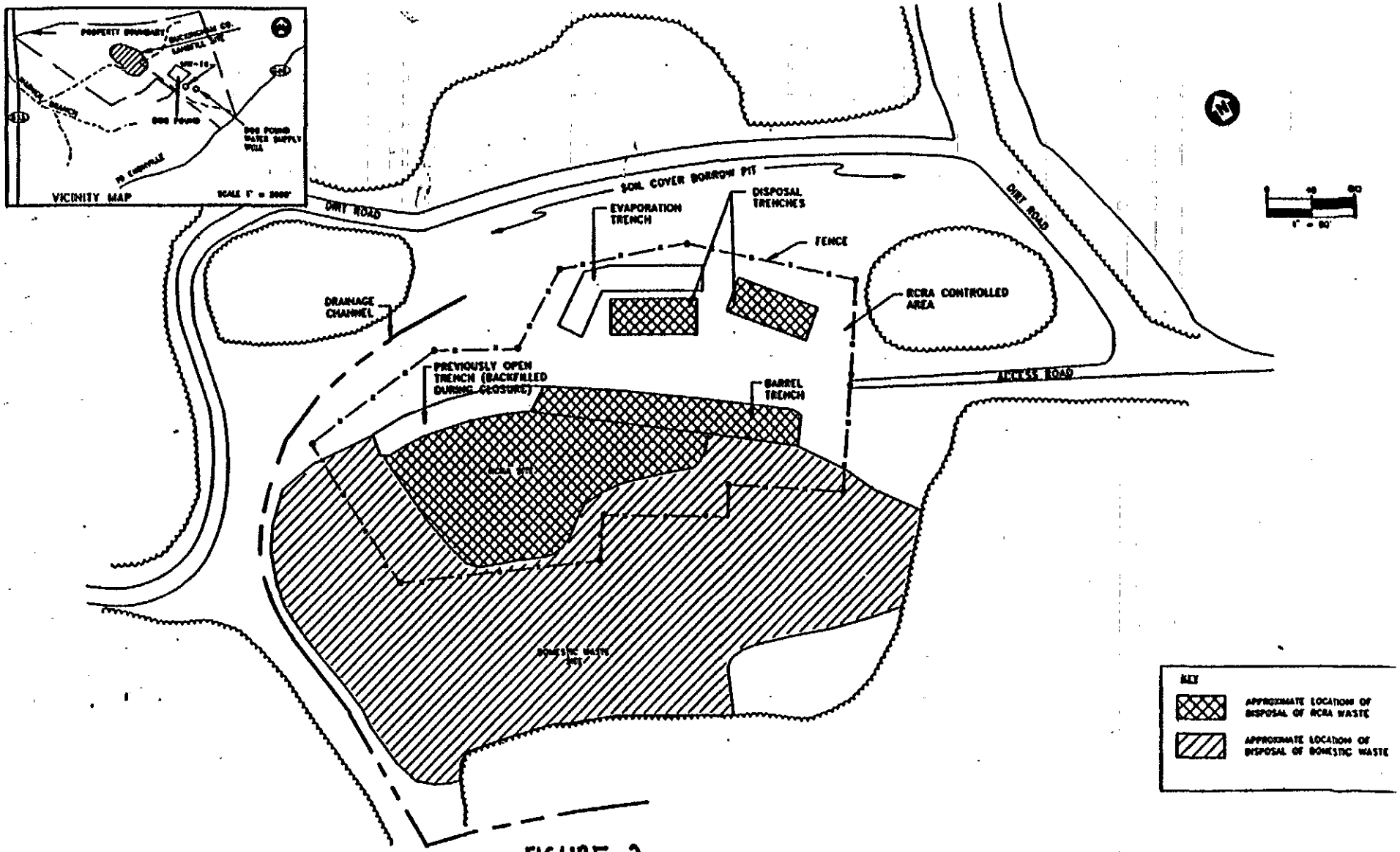

FIGURE 2

barrel trench. The area where the trenches are located is approximately one to two acres in size, surrounded by a fence, and is referred to in this document as the "hazardous waste area" (see Figure 3). The borrow pit is located to the north of the hazardous waste area. A solid waste landfill is located directly south. The Remedial Investigation/Feasibility Study (RI/FS) focused on the hazardous waste disposal area as well as the surrounding 8-acre area.

II. Site History and Enforcement Activities

The Buckingham County Landfill facility was owned and operated by Joseph Love (Love's Container Service) from 1962 until 1982. Mr. Love initially used the Site for disposal of municipal solid waste. Between 1962 and 1972, Mr. Love collected municipal solid wastes from Buckingham County and surrounding counties which were disposed of at the Site. Mr. Love was issued a Sanitary Landfill Permit (Number 83) by the Virginia State Board of Health (VSBH) in November 1972, which covered approximately 7 of the cleared acres of the property (shown in Figure 2). He sold the solid waste portion of his business in 1976, but continued his commercial waste disposal operations. The solid waste landfill was covered and closed in 1979 under the supervision of the VSBH.

In 1977, the Sanitary Landfill Permit was modified to allow for the disposal of 50 gallons per week of industrial furniture making waste. This waste allegedly consisted of lacquer paints, polyester filler, acrylic paints, and nitrocellulose dust. In 1979, the VSBH approved an increase in the quantities of "special" wastes Mr. Love could accept to 30,000 to 40,000 gallons per month. In 1980, Mr. Love sought interim status for his hazardous waste operations pursuant to Section 3005 of the Resource Conservation and Recovery Act, (RCRA). The waste was described on the Site's Notification of Hazardous Waste Activity form as ignitable hazardous waste bearing the EPA hazardous waste number D001. In 1981 and 1982, Mr. Love also received still-bottom waste at the Site from a solvent recovery process. These wastes bore the EPA hazardous waste numbers F003 and F005. The total quantity of waste received and disposed of at the Site has not been clearly established due to Mr. Love's incomplete record keeping practices.

In general, operations in the hazardous waste area involved the receipt of drummed liquid wastes, which were poured into the evaporation trench. The evaporation trench was approximately 80 to 125 feet long, 10 to 20 feet wide, and 10 to 15 feet deep. Based on information received from Mr. Love, the trench was reportedly lined with a synthetic liner. However, no written or physical evidence of this liner has been found. A tin roof supported by wooden poles was installed over the evaporation trench in 1980 to minimize dilution of the waste with rain. The trench was periodically cleared of solid residues that remained

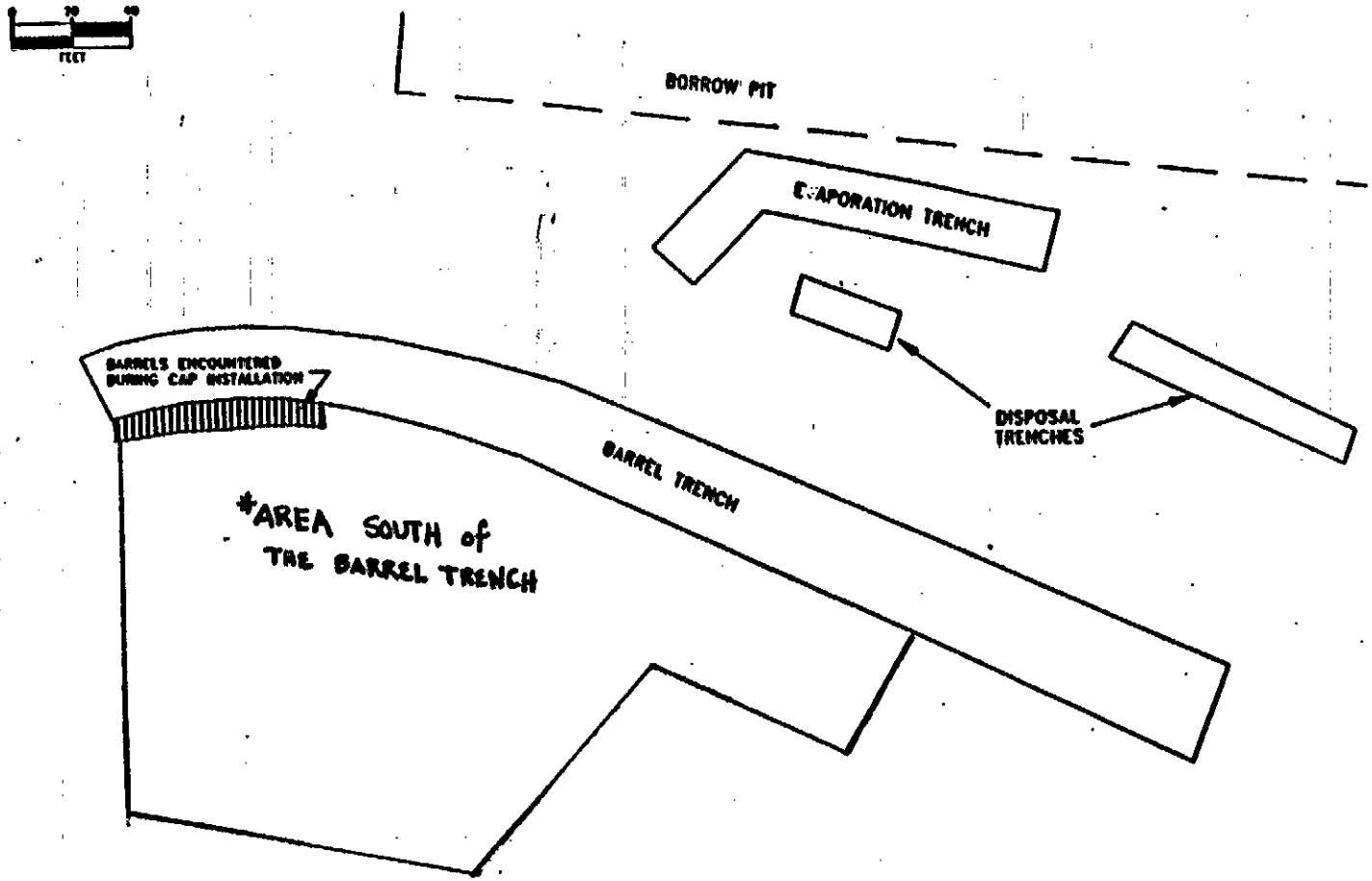

FIGURE 3

* This area was included during cap construction in 1983.

after evaporation and/or percolation. These residues were transferred to one of the two disposal trenches. The disposal trenches, which were each approximately 18 to 20 feet deep, were unlined. The borrow pit supplied cover material for the entire operation.

Based on information received from Mr. Love, the drums were supposedly emptied, crushed and placed in the barrel trench, which was 400 feet long, 20 feet wide, and 14 feet deep. The barrel trench was also unlined. This trench was never completely filled during the operational life of the Site; the west end remained open until the hazardous waste area was closed in 1983. As described below, Schnabel Engineering Associates ("Schnabel") was the firm hired to close the hazardous waste portion of the Site. During closure, portions of empty crushed drums were encountered south of the area previously believed to be the edge of the barrel trench. Schnabel dug test pits in the area in question which indicated that a combination of domestic wastes, clean fill and empty crushed drums were present in this area. Because of this discovery, the cover for the hazardous waste area was extended to include the area where additional drums were found.

Hazardous wastes were received at the Site through February 1982. In April 1982, Buckingham County purchased the property and disposal permit from Mr. Love. The County contracted Schnabel to close the Site in accordance with state regulations. The County submitted a closure/post-closure plan addressing the hazardous waste area under State law to the Commonwealth in 1982. Closure was begun in February 1983 and was completed in May 1983. The closure plan called for installation of a cover constructed of four layers: a layer of clay, a synthetic cover, a layer of fine aggregate, and a layer of topsoil. This cover was installed over what Schnabel determined to be each individual trench area. Additionally, surface water diversion trenches were constructed around the covered areas, and a fence was constructed around the area of the trenches. Several monitoring wells were also installed throughout the Site. The domestic solid waste landfill was not addressed in this closure plan.

A number of EPA-led site investigations were conducted between January 1983 and April 1989. In November 1984, the Site was scored using the EPA Hazard Ranking System (HRS) in order to determine its eligibility for inclusion on the National Priority List (NPL). The score for the Site was 40.77. Sites which score greater than 28.5 are eligible for inclusion on the NPL. The Site was listed on the NPL on October 4, 1989. See 54 Fed.Reg. 41015 (October 4, 1989).

An Administrative Order on Consent (AOC) between EPA and a number of Potentially Responsible Parties (PRPs) was signed on January 31, 1991, becoming effective on February 13, 1991. Under this AOC, the PRPs were to conduct an RI/FS at the Site. The purpose of the RI/FS is to identify the types, quantities and locations of contaminants and to develop ways of addressing the

contamination problems. Field work for the RI was conducted from March through July 1992. The RI was accepted as final by EPA on March 24, 1993. The FS was submitted on April 27, 1993 and following modifications by EPA, became final on May 3, 1993.

III. Highlights of Community Participation

The RI/FS Report and the Proposed Remedial Action Plan (PRAP) for the Buckingham County Landfill Site were released to the public for comment on May 5, 1993, in accordance with the requirements of Sections 113(k), 117(a), and 121(f) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. Sections 9613(k), 9617(a), and 9621(f). These documents were made available to the public in the Administrative Record at both an information repository maintained at the EPA Docket Room in Region III, Philadelphia and the Buckingham County Library in Dillwyn, Virginia. The notice of availability for these two documents was published in the Farmville Herald on May 5, 1993. A public comment period on the documents was held from May 6, 1993 to July 6, 1993.

In addition, a public meeting was held by EPA and the Virginia Department of Environmental Quality (VDEQ) on May 25, 1993, at the Buckingham County High School Gymnasium in Dillwyn, Virginia, in accordance with Section 117(a)(2) of CERCLA, 42 U.S.C. Section 9617(a)(2). At this meeting, representatives from EPA presented the findings of the RI/FS and answered questions about the Site and the remedial alternatives that were under consideration at that time.

Following the public meeting held on May 25, 1993 and the close of the first comment period on July 6, 1993, EPA evaluated and considered comments that were received from all interested parties. In response to concerns voiced by the community, EPA developed two new alternatives and, on November 24, 1993, issued an Addendum to the PRAP which opened a second public comment period. Following issuance of the Addendum, EPA attempted to schedule a public meeting on several different occasions starting in January and these meetings were all cancelled due to inclement weather. The second public meeting was held on April 26, 1994. The purpose of this meeting was to present the new alternatives to the community and to provide the community with an opportunity to ask questions and offer comments on the new alternatives. The second comment period closed on May 3, 1994.

Response to comments that related to the cleanup alternatives being considered, including those expressed verbally at the public meetings, are included in the Responsiveness Summary, which is part of this Record of Decision (ROD).

IV. Scope and Role of Response Action

The selected alternative will address all media impacted by

the contamination at the Site including: contaminated trench materials, contaminated soils, and the contaminated ground water. This response action, includes contingencies and a potential for subsequent actions regarding remediation of the barrel trench. EPA has determined that addressing the Site as separate operable units for individual media is not warranted.

V. Extent of Contamination

A. General

The RI field activities and analytical program were designed to define the extent of contamination in the soils, disposal trenches, ground water, surface water, sediments and leachate, as well as identify migration pathways and provide data to support a feasibility study of potential remedial actions. The following tasks were completed at the Site:

- Surface soil sampling;
- Subsurface soil boring and sampling;
- Hazardous characteristic testing;
- Geophysical surveying;
- Ground water monitoring well installation and sampling;
- Hydraulic conductivity testing;
- Leachate sampling.

A summary of the results from the RI sampling program is provided below.

B. Surface and Sub-surface Soils

The contaminants found in the most significant concentrations in the soils at the Site were Volatile Organic Compounds (VOCs). Samples with the highest VOC concentrations were collected within the hazardous waste area adjacent to or near the base of the disposal trenches.

There was a single soil boring sample in the western disposal trench. In this soil boring at approximately 10 feet toluene, ethylbenzene, and styrene were detected at levels above background. These same compounds and several others were detected at lower levels in the 14 to 20 foot depth of that same boring. Two borings were placed in the eastern disposal trench and sampled at various depths. Samples from each boring indicated extremely high levels of acetone, toluene, 2-butanone, 4-methyl-2-pentanone, ethylbenzene, styrene, and xylene. Analysis of samples from two borings in the evaporation trench indicated the presence of similar contaminants at concentrations slightly above background levels. Three borings were placed in

the area south of the barrel trench. These samples also indicated levels of VOCs slightly above background levels. However, these samples cannot be considered representative of the barrel trench because they were not taken from within the trench itself.

C. Waste characterization

Waste material is present in the eastern disposal trench from about 10 to 14 feet below grade. Elevated levels of VOCs were noted to at least 24 feet below grade in the soils underlying this waste material, indicating that the contaminants in this waste are, or were at one time, mobile. A sample of the waste material was tested and determined to exhibit the characteristic of ignitability under RCRA (see 40 C.F.R. §261.21(a)(i)and §3.6 of the VHWMR, VR §672-10-1) Moreover, the RI reports that listed hazardous wastes bearing the EPA hazardous waste numbers F001 and F005 were disposed of in the trenches (See 40 C.F.R. §261.31(a) and Appendix 3.1 to Part III of the VHWMR, VR §672-10-1).

D. Ground water

Two rounds of ground water sampling were conducted. Analytical results from both rounds indicated that several VOCs, primarily chlorinated hydrocarbons, were detected at concentrations above Safe Drinking Water Act Maximum Contaminant Levels (MCLs)[1] in a cluster of monitoring wells including MW-2B, MW-2SL, and MW-2SU. These wells are located between the western disposal trench and the barrel trench (MW-2 cluster). MCL exceedances were also detected in MW-6S. Contaminants that exceeded MCLs in the first round of ground water sampling include: 1,1-dichloroethene, trichloroethene, 1,1,1-trichloroethane, tetrachloroethene, and toluene. All of the above six compounds in addition to the following contaminants were detected at levels above the MCLs in the second round of sampling: bromoform, cis-1,2-dichloroethene, 1,2-dichloroethane, 1,2-dichloropropane, styrene, bromodichloromethane, chloroform, 1,1,2-trichloroethane, and 1,4-dichlorobenzene. Table 2 shows the levels of contaminants that were detected in ground water as well as the MCL for these contaminants. Figure 4 depicts the area where ground water is anticipated to have VOCs at levels above MCLs.

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[1] Maximum contaminant levels are contaminant specific drinking water standards applicable to certain public water suppliers established under the federal Safe Drinking Water Act. See 40 C.F.R. Part 141, Subpart B.

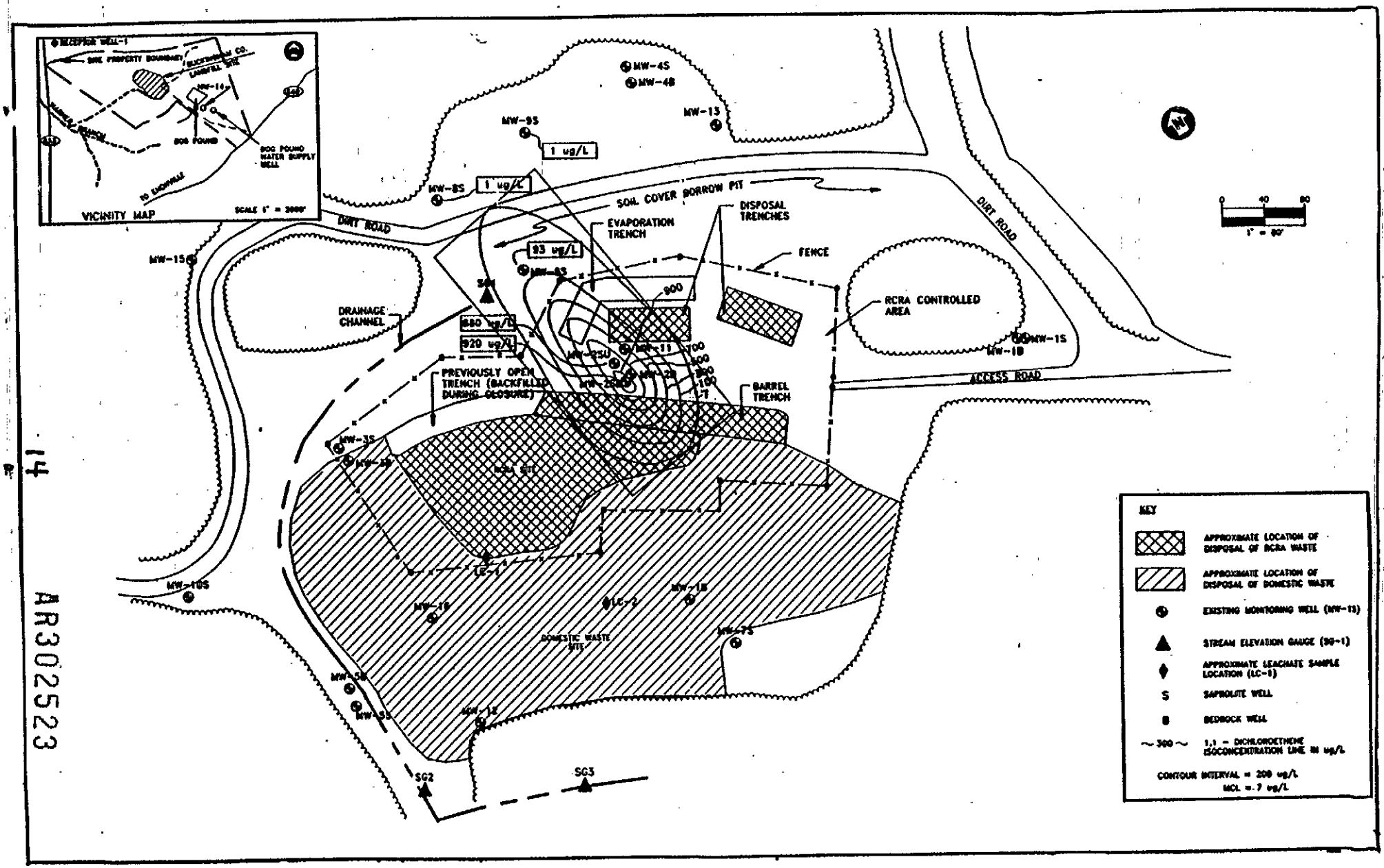
MCL EXCEEDANCES IN GROUND WATER		
CONTAMINANT:	MCL (ug/l)	GROUND WATER (ug/l)
1,1-dichloroethene	7	1400
1,1,1-trichloroethane	200	6600
trichloroethene	5	800
tetrachloroethene	5	3700
toluene	1000	5800
bromoform	100	460
cis-1,2-dichloroethene	70	210
chloroform	100	230
1,2-dichloroethane	5	450
styrene	100	200
bromodichloromethane	100	310
1,2-dichloropropane	5	300
1,1,2-trichloroethane	5	490
1,4-dichlorobenzene	75	430

TABLE 2

Because the discrepancy between filtered and unfiltered ground water results for inorganic contaminants was significant, the EPA Baseline Risk Assessment (BRA) established that filtered metal samples were the most appropriate indicator of Site related metals contamination. According to EPA guidelines, filtered data may be selected for use in risk assessments if there is an obvious discrepancy between concentrations in the filtered and unfiltered ground water samples (USEPA, Exposure Point Concentrations in Ground Water, Office of Superfund, Hazardous Waste Management EPA/504/1-89/002). Although metals were detected in monitoring wells at levels above background, no dissolved metals were detected at levels above MCLs in the filtered samples.

E. Leachate

Leachate seeps, present at the base of the hazardous waste area to the west, were found to contain elevated levels of several metals as well as trace levels of VOCs. The metal concentrations that were detected in the leachate are consistent with metal concentrations noted in the MW-2 well cluster.



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AR302523

AREA of ASSUMED GROUND. WATER CONTAMINATION

FIGURE 4

VI. Summary of Site Risks

A. Background

As part of the RI/FS process, a Baseline Risk Assessment (BRA) was prepared by EPA utilizing data from the RI. The purpose of the BRA is to characterize the current and potential threats to human health and the environment in the absence of remedial action (i.e., the "no action" alternative). These threats may be posed by contaminants migrating in ground water or surface water, released to the air, leaching through the soil, remaining in the soil, or bioaccumulating in the food chain at the Site.

Based on the BRA discussed below, actual or threatened releases of hazardous substances from this Site, 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.

B. Human Health Risks

1. Contaminants of Concern

The initial step of the BRA was to compile a list of indicator contaminants which represent a potential risk to human health. The following contaminants of concern were judged to contribute significantly to potential health risks at the Site:

1,2-dibromoethane	acetone
1,2-dibromo-3-chloropropane	methylene chloride
1,1-dichloroethylene	tetrachloroethylene
1,2-dichloropropane	trichloroethylene
cis-1,3-dichloropropylene	vinyl chloride
trans-1,3-dichloropropylene	1,1,2-trichloroethane
1,1,2,2-tetrachloroethane	1,2-dichloroethane

A description of the toxicological effects of each contaminant of concern is as follows:

acetone: Primarily, acetone acts as an irritant and as a central nervous system depressant.

1,2-dibromo-3-chloropropane: The main target of 1,2-dibromo-3-chloropropane is the testes, causing reproductive effects. This compound has also been implicated in cardiovascular disease.

1,2-dibromoethane: This contaminant is classified by EPA as a Group B2 - Probable Human Carcinogen. Additionally, 1,2-dibromoethane is a poison by ingestion, inhalation and dermal contact. It is an eye and skin irritant, and has been implicated in sterility in exposed workers. Prolonged exposure may cause liver and kidney damage.

1,2-dichloroethane: This contaminant is classified by EPA as a Group B2 - Probable Human Carcinogen. In humans, systemic effects of acute oral exposure to this compound include bronchitis, hemorrhagic gastritis and colitis, blood cellular damage, central nervous system depression and histological changes in brain tissue.

1,1-dichloroethylene: This contaminant is classified by EPA as a Group C - Possible Human Carcinogen. High levels of 1,1-dichloroethylene are reported to cause a variety of adverse health effects in animals, including liver, kidney, heart and lung damage, as well as nervous system disorders and death.

1,2-dichloropropane: This contaminant is classified by EPA as a Group B2 - Probable Human Carcinogen. Although exposure to 1,2-dichloropropane has not been shown to be fatal in humans, case studies have reported several adverse effects after inhalation exposure, including chest discomfort, cough, nose bleeds, acute liver damage and depression.

cis-1,3-dichloropropylene: This contaminant is classified by EPA as a Group B2 - Probable Human Carcinogen. Following exposure in animals, adverse impacts on the liver and kidney have been observed. In humans, inhalation of this compound has caused lung injury. Skin irritation has also been reported in exposed workers.

trans-1,3-dichloropropylene: This contaminant is classified by EPA as a Group B2 - Probable Human Carcinogen. Following exposure in animals, adverse impacts on the liver and kidney have been observed. In humans, inhalation of this compound has caused lung injury. Skin irritation has also been reported in exposed workers.

methylene chloride: This contaminant is classified by EPA as a Group B2 - Probable Human Carcinogen. Methylene chloride is readily absorbed by the lungs, and can be fatal to humans if inhaled in sufficient quantities. Additionally, acute exposure can affect vision, hearing, and motor skills.

1,1,2,2-tetrachloroethane: This contaminant is classified by EPA as a Group C - Possible Human Carcinogen. In humans, ingestion and inhalation of 1,1,2,2-tetrachloroethane is known to cause nausea, vomiting and drowsiness.

tetrachloroethylene: This contaminant is classified by EPA as a Group B2 - Probable Human Carcinogen. The primary targets of tetrachloroethylene are the central nervous system, liver, and kidney. Toxic effects include dizziness, impaired memory, confusion, tremors, hepatitis, and chronic kidney disease.

1,1,2-trichloroethane: This contaminant is classified by EPA as a Group C - Possible Human Carcinogen. In animals, 1,1,2-trichloroethane has been shown to affect the central nervous system, liver, kidney and digestive tract.

trichloroethylene: This contaminant is classified by EPA as a Group B2 - Probable Human Carcinogen. Symptoms of oral exposure to trichloroethylene in humans include muscle weakness, vomiting, and unconsciousness.

vinyl chloride: This contaminant is classified by EPA as a Group A - Human Carcinogen. Vinyl chloride has been found to cause cancer in the liver, brain, lungs, and blood system of humans. It can also cause liver damage and an enlarged spleen.

2. Exposure Assessment

The goal of the exposure assessment is to determine the type and magnitude of human exposure to the contaminants present at, and migrating from, the Site. The exposure assessment was conducted to estimate the Site risks if remedial action is not taken.

To determine if human and environmental exposure to the contaminants of concern might occur in the absence of remedial action, an exposure pathway analysis was performed. An exposure pathway has four necessary elements: 1) a source and mechanism of chemical release; 2) an environmental transport medium; 3) a human or environmental exposure point; and 4) a feasible human or environmental exposure route at the exposure point. The potential for completion of exposure pathways at the Site is described in the following sections.

a. Transport Pathways

For any particular site, there may be a variety of potential exposure routes, with either simple or complex pathways. The simple pathways are of primary significance at this Site. Such simple exposure routes for humans generally include consumption of ground water, bathing with ground water, inhalation of VOCs in ground water during showering, consumption of surface water, bathing with or playing in surface water, ingestion of soil, dermal exposure to soil, and inhalation of fugitive dust emissions. The ingestion pathways are the most important at the Site, based on Site contaminants and their distribution. Complex exposure routes are significantly less important at the Site than simple pathways because the primary contaminants have not been shown to bioaccumulate. Furthermore, sampling data indicate that only minimal migration of contaminants has occurred in any environmental media to date.

The transport pathways evaluated at the Site include ground water, soils, sediments, and leachate. Based on the results of the sampling performed as part of the RI, the four primary areas of contamination associated with the Site are as follows:

- surface soils associated with the trench areas;
- subsurface soils underlying the trench areas;

- waste materials in the trenches; and
- ground water.

Only trespassers could potentially be exposed to contaminated media. There are no residences onsite or directly adjacent to the Site. However, there are an estimated 52 persons living within one mile of the Site. The media that were sampled outside the hazardous waste area include surface water, sediment, leachate and surface soil.

With respect to ground water, there is currently no complete exposure pathway to the contaminants detected in this media because there are no onsite residents that use ground water for potable supply. Ground water in the vicinity of the Site is considered a potential drinking water supply, however, which necessitates evaluation of future residential use of the Site to support risk management decisions. Potential exposure to Site contaminants by future residents adjacent to the Site may occur via contact with ground water (if used for drinking supply), surface soils, surface water, and sediment.

Buckingham County bought the Site and contracted to have it closed in accordance with State regulations; closure was completed in 1983. The Site closure plan called for installation of four distinct layers of cover materials over each of the four individual trenches located onsite. Soil borings obtained during the RI in 1992 indicate that these trench covers currently do not meet the design specifications outlined in the closure plan. Additionally, to prevent infiltration of precipitation through the contaminated materials present in the trenches, a more effective cap design would have included the entire trench area and not simply each individual trench. For the reasons discussed above, the current cover materials on the trenches at this Site are not adequate to protect human health and the environment.

b. Exposure Scenarios

The BRA was developed for the Site utilizing EPA methodologies from the Risk Assessment Guidance for Superfund (EPA/540/1-89/002) which is included in the Administrative Record file. The BRA provides a conservative assessment of the potential risks to humans associated with residential or trespasser land use at the Site and subsequent exposure to contaminated media. The potential exposure pathways that have been evaluated are:

(1) Current use scenario: trespasser

(2) Future use scenario: residential

The current use scenario involves exposure of a trespasser to Site contamination via incidental ingestion of surface soil, dermal absorption of contaminants from surface soil, incidental ingestion of surface water, dermal absorption of contaminants

from surface water, incidental ingestion of sediments, dermal absorption of contaminants from sediment, and dermal absorption of contaminants from leachate.

The future use scenario involves exposure of a resident to Site contamination via ingestion of ground water, inhalation of VOCs from ground water, dermal absorption of contaminants from ground water, incidental ingestion of surface soil, and dermal absorption of contaminants from surface soil.

c. Exposure Point Concentrations

Reasonable Maximum Exposure (RME) concentrations have been calculated for each of the contaminants of concern in ground water, surface soil, surface water, sediments, and leachate. Table 1 presents the RME concentrations for contaminants of concern in each medium. The RME was calculated according to EPA risk assessment guidance. The 95% upper confidence limit of the arithmetic mean is considered the reasonable maximum exposure concentration. If the 95% upper confidence limit of the arithmetic mean exceeded the maximum detected concentration, then the maximum concentration was substituted as the reasonable maximum exposure concentration for the risk calculations.

3. **Toxicity Assessment**

a. Background

The purpose of the toxicity assessment is to review and evaluate available information regarding the potential for site specific contaminants to cause adverse health effects. As the level of exposure (the dose) to contaminants increases, the probability of an adverse effect (the response) also increases. In the toxicity assessment, the dose-response relationship is quantified so that site-specific exposure levels can be correlated with the likelihood of an adverse health effect.

Cancer potency factors (CPFs) have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, which are expressed in units of (milligram (mg)/kilogram (kg) per day)$^{-1}$, are multiplied by the estimate intake of a potential carcinogen, in mg/kg-day, to provide an upper-bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the CPF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Cancer potency factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors 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

TABLE 1

CONTAMINANTS OF CONCERN AND RELATED CONCENTRATIONS USED TO CALCULATE RISK

	GROUNDWATER CONC. (mg/L)	TRESPASSER SURFACE SOIL CONC. (mg/kg)	RESIDENT SURFACE SOIL CONC. (mg/kg)	SURFACE WATER CONC. (mg/L)	SEDIMENT CONC. (mg/kg)	LEACHATE CONC. (mg/L)
VOLATILE ORGANICS						
Acetone	8.47					
Chloroform	.155					
1,2-Dibromo-3-chloropropane	.309					
1,2-Dibromoethane	.182					
1,2-Dichloroethane	.182					
1,1-Dichloroethylene	.759					
1,2-Dichloropropane	.162					
cis-1,3-Dichloropropylene	.166					
trans-1,3-Dichloropropylene	.172					
Methylene Chloride	6.14					
1,1,2,2-Tetrachloroethane	.193		.0416			
Tetrachloroethylene	1.98					
Toluene	2.89					
1,1,2-Trichloroethane	.187					
Trichloroethylene	.432					
Vinyl chloride	.250 M					
SEMIVOLATILE ORGANICS						
Bis(2-ethylhexyl)phthalate			1.03		10.7	
2,4-Dimethylphenol						.044 M
PESTICIDES						
gamma-BHC				.000011 M		
4,4-DDD			.00489			
4,4-DDE			.00633	.000015 M		
4,4-DDT			.00218			
INORGANICS						
Arsenic					4.18	.0012
Barium				.0317	93.3	.223 M
Beryllium					.597	
Chromium		32.4 M	257	.0068	104	.0737 M
Nickel		3.1	15,5		8.23	.0239

M - Indicates that the upper 95% confidence limit exceeded the maximum concentration.
For vinyl chloride, the upper 95% confidence limit exceeded the maximum assumed concentration (i.e. 1/2 the highest sample quantitation limit).
In these instances, the maximum concentration was substituted as the reasonable maximum exposure.

expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals, that are expected to be without adverse health effects. Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) 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.

b. Risk Characterization

Excess lifetime cancer risks for a contaminant are determined by multiplying the intake level with the cancer potency factor. These risks are probabilities that are generally expressed in scientific notation (e.g., 1×10^{-6}, otherwise expressed as 1E-6). An excess lifetime cancer risk of 1×10^{-6} indicates that, as a plausible upper bound, over a 70-year lifetime an individual has a one in one million chance of developing cancer as a result of site-related exposure to a carcinogen under the specific exposure conditions at a site.

Potential concern for non-carcinogenic 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 contaminant's reference dose). The Hazard Index for the Site (HI) is calculated by adding the HQs for all contaminants within a medium or across all media to which a given population may reasonably be exposed. The HI provides a reference point to gauge the potential significance of multiple contaminant exposures within a single medium or across media. Any media with a cumulative HI equal to or greater than 1.0 is considered to pose a potential risk to human health. The HIs for the future land use scenario for this Site were separated into adult resident and child resident.

Unacceptable cancer and systemic health risks were identified with respect to the future residential use scenario (i.e., hypothetical future residents living adjacent to the Site and using ground water for drinking, or migration of contaminated ground water to existing residential wells). The excess lifetime cancer risk determined under the future use exposure scenario from incidental inhalation, incidental ingestion, and dermal absorption of contaminants in ground water is 2.6×10^{-1}. In other words, if no remedial action is taken, those people who are exposed to the contaminated ground water have a 26% chance of developing cancer. Most of this risk is due to the ingestion of VOCs in the contaminated ground water.

With respect to noncarcinogenic systemic risks a total HI of greater that one (1) was calculated based on a number of VOC's. The HI under a future residential exposure scenario, for an adult

is 58 and for a child the HI is 112. VOCs, even though they are not all carcinogens, could pose systemic health threats to potential adult and child residents from exposure to ground water under a future residential use scenario.

The evaluation of human health risks (both carcinogenic and noncarcinogenic) from exposure to the ground water is intended to provide a reference point for evaluating potential future ground water exposures; it does not represent present day health risks since the ground water contamination is confined to the area in the immediate vicinity of the Site and no one is currently exposed since there is no use of this portion of the aquifer as a potable supply.

The BRA did not identify any direct unacceptable health risks associated with the remaining Site media (contaminated soils/trench materials, sediments, leachate, and surface water). However, the trench materials and underlying contaminated soils represent a continuing source of contaminants to ground water.

C. Environmental Risks

EPA evaluated the environmental problems at the Site in an Ecological Risk Assessment (ERA). The possible areas of environmental exposure were identified as: streams at ground water discharge points, and leachate seeps. Observation of ecological effects have been limited to observations during RI activities. Because no tissue analyses or bioassays (either acute or chronic) were performed, the assessment uses a conservative approach with hazard indices based on statistically derived concentrations of contaminants found onsite and in the study area.

The ERA indicated that the following contaminants were found at ecologically hazardous levels in one or more of the four major media (ground water, surface water, sediment and leachate):

Aluminum	Trans-1,3-Dichloropropylene
Arsenic	Heptachlor
Beryllium	Chlordane
Copper	Butyl-benzene-phthalate
Mercury	Methoxychlor
Lead	Bis-(2ethylhexyl)Phthalate

The ERA concluded that the potential exists for impact to ecological receptors due to threatened or actual releases of hazardous substances from the Site. This assessment, based on federal Ambient Water Quality Criteria as well as calculations of hazard indices for the four major media, concludes that the Site is the source of several contaminants that could pose a risk to ecological receptors.

Actual or threatened releases of hazardous substances from this Site, 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.

VII. Description of Alternatives

In accordance with Section 300.430 of the NCP, 40 C.F.R. Section 300.430(e)(9), remedial response actions were identified and screened for effectiveness, implementability, and cost during the FS to meet remedial action objectives at the Site. The technologies that passed the screening were assembled to form remedial alternatives. The alternatives were then evaluated using the nine criteria required by 40 C.F.R. Section 300.430(e)(9). The FS evaluated a variety of technologies used in the development of alternatives for addressing the sources of contamination at the Site as well as the existing ground water plume. According to the FS and additional information received during the public comment period, the technologies and the approaches contained in the alternatives listed below were determined to be the most appropriate for this Site. The descriptions of Alternatives 1 through 8 are derived from the descriptions in the FS. Alternatives 8A, 8B, and 8C were developed after receipt of the final FS. The capital costs, the Operation and Maintenance (O&M) costs, present worth costs, and months to implement for each of the alternatives listed below are estimates based on currently available information.

Common Elements

All of the alternatives will include a periodic review pursuant to Section 121(c) of CERCLA. Except for the "No Action" alternative, the following controls are common to all of the alternatives for the Site: revegetation; installation of diversion ditches; long-term ground water monitoring; and implementation of deed and access restrictions to prohibit future residential development of the Site and areas immediately surrounding the Site.

A. Alternative 1: NO ACTION

Capital Cost:	$ -0-
Annual O&M Cost:	$ -0-
Total Present Worth:	$ -0-

Section 300.430 (e)(6) of the NCP requires that a "no action" alternative be evaluated at every NPL site in order to establish a baseline for comparison. Under this alternative, EPA would take no further remedial actions at the Site to prevent exposure to the contaminated media or to reduce risks at the Site.

B. Alternative 1A: LIMITED ACTION

Capital Cost:	$ 70,000
Annual O&M Cost:	$ 46,000
Total Present Worth:	$ 772,000

Alternative 1A would require limited additional action at the Site to prevent exposure to the contaminated media and to reduce risks at the Site. Contaminated trench materials found in all four trenches would remain in place and the existing covered areas would be graded and revegetated. Long-term monitoring of both existing and additional ground water monitoring wells would be performed to measure VOC concentrations over time. See Table 5.9 on page 5-48 of the Feasibility Study Report (FS) for the assumptions made to estimate the cost of ground water monitoring for this alternative.

C. **Alternative 2: GROUND WATER EXTRACTION AND TREATMENT**

Capital Cost:	$ 680,000
Annual O&M Cost:	$ 325,000
Total Present Worth:	$5,673,000

Under Alternative 2, contaminated trench materials found in all four trenches would remain in place and the existing covered areas would be graded and revegetated. Extraction wells would be constructed for the purpose of recovering contaminated ground water. Actual well locations and pumping rates would be determined after additional ground water studies were conducted during remedial design. Contaminated ground water would be pumped to an onsite treatment system which would consist of VOC removal via an air stripping unit. Residuals from the air stripping unit would be treated and disposed of in accordance with Applicable or Relevant and Appropriate Requirements (ARARs). Emissions from the air stripping unit would be treated via vapor phase carbon adsorption. The treated water would then be discharged to a nearby surface water body and would meet the substantive requirements of a Virginia Pollution Discharge Elimination System (VPDES) permit. All ground water wells would be sampled bi-annually for the duration of the treatment period (assumed to be 30 years). See Table 5.9 on pages 5-48 and 5-49 of the FS for the assumptions made to estimate the cost of ground water recovery and treatment for this alternative.

D. **Alternative 3: RCRA CAP AND GROUND WATER MONITORING**

Capital Cost:	$ 586,000
Annual O&M Cost:	$ 46,000
Total Present Worth:	$ 1,288,000
Time to construct:	8-12 months

Under Alternative 3, contaminated trench materials found in all four trenches would remain in place. An approximately one to two acre RCRA cap would be constructed over all four trenches, the area south of the barrel trench, and the entire area of assumed ground water contamination. Prior to cap construction the existing cover on each individual trench area would be removed. These materials would be used as fill where appropriate. The cap would meet the design requirements for hazardous waste landfill caps under VDEQ regulations as well as

RCRA. The existing wells in the area would be abandoned prior to cap installation. Surface water drainage patterns would be revised to reflect the cap configuration. The estimated implementation time for construction of the cap is 8-12 months. Long-term ground water monitoring would be implemented as described above for Alternative 1A.

E. **Alternative 4: RCRA CAP AND GROUND WATER EXTRACTION AND TREATMENT**

Capital Cost:	$ 1,196,000
Annual O&M Cost:	$ 322,000
Total Present Worth:	$ 6,146,000
Time to construct:	8-12 months

Under Alternative 4, contaminated trench materials found in all four trenches would remain in place. This alternative consists of the replacement of the existing cover materials with a RCRA cap as described for Alternative 3. Long-term ground water monitoring would be conducted and a ground water extraction and treatment system would be designed and implemented, as described above for Alternative 2.

F. **Alternative 5: ONSITE INCINERATION OF TRENCH MATERIALS AND GROUND WATER MONITORING**

Capital Cost:	$ 39,124,000
Annual O&M Cost:	$ 46,000
Total Present Worth:	$ 39,826,000
Time to construct:	12-18 months

Alternative 5 is a source removal/treatment/disposal alternative that includes excavating trench materials and underlying soils, onsite incineration of these materials, and backfilling the excavated areas with clean fill. Areas to be excavated would include the existing cover over the trenches, the waste materials in the evaporation, eastern disposal, western disposal and barrel trenches, as well as underlying and surrounding contaminated soils. All excavated materials (except for the existing cover) would be incinerated in a mobile incinerator that would be brought to the Site. The excavated areas would be backfilled with previous cap materials and clean fill. The estimated amount of time for excavation and onsite incineration of the contaminated materials is 12 - 18 months. The ground water would be monitored on a long-term basis as described above for Alternative 1A.

Since a RCRA cap is not included as part of this alternative, the volume of trench materials and contaminated soils to be excavated would be determined based on the soil cleanup levels presented in the PRAP issued May 5, 1993. Excavation of the trenches would continue until all waste materials, as well as surrounding and underlying soils, with contaminant concentrations above the soil cleanup levels presented in the PRAP had been removed.

The costs stated above for Alternative 5 (see Appendix A of the FS) were estimated based on the following assumptions: (1) residuals generated from incineration would be delisted and disposed of onsite; and (2) these residuals would be used as backfill making it unnecessary to obtain clean backfill material. If delisting and onsite disposal of the residuals is not possible, these residuals would have to be disposed of offsite and alternate materials for backfill would have to be obtained. Therefore, the costs for this alternative would substantially increase if offsite disposal is deemed necessary. If this were the selected remedy, costs would also be higher than those listed above because EPA would require excavation and incineration of contaminated materials/soils from the western disposal trench, which was not included as part of this alternative in the FS.

G. **Alternative 6: ONSITE INCINERATION OF TRENCH MATERIALS AND GROUND WATER EXTRACTION AND TREATMENT**

Capital Cost:	$ 39,725,000
Annual O&M Cost:	$ 325,000
Total Present Worth:	$ 43,903,000
Time to construct:	12-18 months

Alternative 6 consists of excavation and onsite incineration of trench materials and contaminated soils as described in Alternative 5. Long-term ground water monitoring would be conducted and a ground water extraction and treatment system would be designed and implemented, as described above for Alternative 2.

H. **Alternative 7: OFFSITE INCINERATION OF DRUMS AND ONSITE LOW TEMPERATURE THERMAL DESORPTION OF REMAINING TRENCH MATERIALS AND GROUND WATER MONITORING**

Capital Cost:	$ 24,661,000
Annual O&M Cost:	$ 46,000
Total Present Worth:	$ 25,363,000
Time to construct:	12-18 months

Alternative 7 consists of: (1) excavation of contaminated trench materials found in all four trenches and soils exceeding cleanup standards presented in the PRAP for VOCs; (2) offsite incineration of drums from the barrel trench; (3) onsite treatment via Low Temperature Thermal Desorption (LTTD) of the remaining contaminated trench materials and contaminated soils; and (4) long-term ground water monitoring.

This Alternative is similar to alternatives 5 and 6 in that contaminated trench materials found in all four trenches and the surrounding contaminated soils will be excavated. A mobile LTTD unit equipped for hazardous waste treatment would be brought to the Site to treat the excavated trench materials from the eastern disposal trench, western disposal trench, and the evaporation trench, as well as contaminated soils from the barrel trench. The drums from the barrel trench would be transported offsite for

incineration at a RCRA permitted incineration facility. For cost estimation purposes it was assumed that the drums would be transported to a permitted incineration facility in either Coffeyville, Kansas, or Roebuck, South Carolina. The estimated amount of time to implement this remedy is 12 - 18 months. The ground water would be monitored on a long-term basis as described for Alternative 1A.

The costs stated above for Alternative 7 (see Appendix A of the FS) were estimated based on the following assumptions: (1) residuals generated from the LTTD process would be delisted and disposed of onsite; and (2) these residuals would be used as backfill making it unnecessary to obtain clean backfill material. If delisting and onsite disposal of the residuals is not possible, these residuals would have to be disposed of offsite and alternate materials for backfill would have to be obtained. Therefore, the costs for this alternative would substantially increase if offsite disposal is deemed necessary. If this were the selected remedy, costs would also be higher than those listed above because EPA would require excavation and treatment via LTTD of contaminated materials/soils from the western disposal trench, which was not included as part of this alternative in the FS.

I. **Alternative 8: OFFSITE INCINERATION OF DRUMS, ONSITE LOW TEMPERATURE THERMAL DESORPTION OF TRENCH MATERIALS, AND EXTRACTION AND TREATMENT OF GROUND WATER**

Capital Cost:	$ 25,262,000
Annual O&M Cost:	$ 325,000
Total Present Worth:	$ 29,440,000
Time to construct:	12-18 months

Alternative 8 consists of: (1) excavation of contaminated trench materials found in all four trenches and soils exceeding cleanup standards presented in the PRAP for VOCs; (2) offsite incineration of drums from the barrel trench; (3) onsite treatment via Low Temperature Thermal Desorption (LTTD) of the remaining contaminated trench materials as well as underlying and surrounding soils; (4) ground water extraction and treatment and (5) long-term monitoring of the ground water.

Alternative 8 is similar to Alternatives 5, 6, and 7 in that contaminated trench materials found in all four trenches would be excavated and treated. Alternative 8 consists of onsite treatment via LTTD of trench materials and contaminated soils from the eastern disposal trench, western disposal trench and the evaporation trench, as well as offsite incineration of drums from the barrel trench, as described in Alternative 7.

Long-term ground water monitoring would be conducted and a ground water extraction and treatment system would be designed and implemented, as described above for Alternative 2.

J. **Alternative 8A: OFFSITE INCINERATION OF MATERIALS FROM THE EASTERN DISPOSAL TRENCH, OFFSITE DISPOSAL OF THE MATERIALS FROM THE BARREL TRENCH, RCRA CAPPING OF TRENCH AREAS AND RECOVERY AND TREATMENT OF GROUNDWATER**

Capital Cost:	$ 18,962,697
Annual O&M Cost:	$ 62,700
Total Present Worth:	$ 20,216,697
Time to construct:	14-24 months

Alternative 8A is a source removal/treatment/disposal alternative that includes excavating and treating those trench materials that are posing a principal threat[2] and backfilling these excavated areas with clean fill. Alternative 8A consists of: (1) excavation of approximately 2,531 yd^3 of waste and contaminated soils from the eastern disposal trench and incineration at an offsite RCRA-permitted facility; (2) excavation of drums and associated material from the barrel trench (approximately 6,858 yd^3 in volume) with offsite treatment and/or disposal of hazardous substances at a RCRA-permitted facility and onsite or offsite disposal of non-hazardous substances; (3) removal of the existing cover material from each individual trench and construction of a RCRA cap over the entire area of the trenches and the area south of the barrel trench; (4) extraction and treatment of the contaminated ground water with the goal of restoration of the aquifer to beneficial use; and (5) long-term monitoring of the ground water.

Volumes to be excavated from the eastern disposal and barrel trenches were calculated based on historical and soil boring data. Dust control, air monitoring, and VOC emissions control would be performed while contaminated trench materials were being excavated. The excavated materials would be handled in accordance with any applicable and relevant or appropriate RCRA requirements.

For this Alternative, a RCRA cap would be constructed over the entire trench area where the hazardous waste disposal operations occurred, as well as the area south of the barrel trench (see figure 3). Unlike Alternative 3, Alternative 8A does not require the area of expected ground water contamination to be capped. The cap would meet the design requirements for hazardous waste landfill caps under VDEQ regulations as well as RCRA requirements.

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[2] Principal threat wastes are defined as those source materials considered to be highly toxic or highly mobile that would present a significant risk to human health or the environment should exposure occur. The National Oil and Hazardous Substances Pollution Contingency Plan 300.430(a)(1)(iii)(A) indicates that principal threats should be treated whenever practical.

Alternative 8A includes installation of a ground water extraction and treatment system similar to the one described for Alternative 2. The groundwater extraction and treatment system would remain in operation until the aquifer is restored to its beneficial use. For cost estimation purposes this time period is assumed to be 30 years. The cost estimate for Alternative 8A can be found in the Administrative Record.

K. Alternative 8B: LIMITED EXCAVATION ALTERNATIVE AND GROUND WATER MONITORING

Capital Cost:	$ 5,399,000
O&M Cost (present worth):	$ 2,815,000
Total Present Worth:	$ 9,293,800
Time to construct:	14-24 months

Alternative 8B consists of: (1) excavation of an estimated 675 yd^3 of concentrated waste from the eastern disposal trench and offsite incineration of waste materials at a RCRA-permitted facility; (2) test pits would be excavated in the barrel trench with disposal of non-empty drums and associated hazardous material from this trench; (3) construction of a RCRA cap over the entire hazardous waste disposal area as well as the area south of the barrel trench; and (4) installation of a long-term ground water monitoring network using "trigger wells" with a contingency requirement to extract and treat ground water.

The goal of excavation for Alternative 8B in both the eastern disposal trench and the barrel trench is to remove the concentrated waste sources which are considered to be a principal threat at the Site. The volume of hazardous material to be excavated from these trenches would be reduced from that of Alternative 8A without decreasing the effectiveness of the remedy.

A distinct layer of waste is present in the eastern disposal trench from approximately 10 to 14 feet below grade (RI p.4-70). This layer is approximately 4 feet thick. In addition to the waste layer, one foot of soil both above and below the layer would be removed. The total thickness of the excavated materials is estimated at 6 feet. The dimensions of this trench are 75 feet by 30 feet. The total depth of the excavation would be approximately 15 feet. The estimated volume of waste to be excavated from the eastern disposal trench is 675 yd^3.

The waste materials found in the eastern disposal trench are grossly contaminated. Table 3 identifies the contaminants found in the eastern disposal trench and their concentrations. The excavated materials from the eastern disposal trench will be treated at an offsite, RCRA permitted, hazardous waste incineration facility.

TABLE 3- CONTAMINANT LEVELS IN THE EASTERN DISPOSAL TRENCH	
CONTAMINANT:	**LEVEL (ug/kg)**
acetone	14,000
2-butanone	140,000
benzene	28,000
4-methyl-2-pentanone	340,000
toluene	330,000
ethylbenzene	30,000
styrene	80,000
xylene	86,000

The barrel trench is a suspected source of ground water contamination. Since there were no samples obtained from within this trench during the RI, there is no conclusive data available to indicate otherwise. Therefore, as part of Alternative 8B, a representative number of test pits would be excavated in the barrel trench in accordance with a work plan that would be subject to approval by EPA in consultation with VDEQ. The purpose of the test pits will be to provide a representative evaluation of the condition of drums buried throughout the barrel trench, to determine if the buried drums are empty, and to determine the levels of contaminants in the waste materials and soils in this trench. The materials from this trench would be sampled and analyzed. Remediation of the barrel trench would include excavation of drums with offsite treatment and or disposal of hazardous materials (e.g., drums, drum contents, incidental soils or debris) and onsite or offsite disposal, as necessary, of non-hazardous materials. The barrel trench was approximately 400 feet long, 20 feet wide, and 14 feet deep. Estimated excavation depth is 15 feet. The estimated volume of waste to be excavated from the barrel trench is 6,000 yd^3.

For cost estimation purposes, assuming that excavation of the entire barrel trench is necessary, it is anticipated that less than 50% of this material will need to be incinerated or disposed of at a RCRA Subtitle C hazardous waste landfill facility. The remaining non-hazardous materials from the barrel trench will either be decontaminated and allowed to remain onsite (beneath the RCRA cap) or transported offsite to a RCRA Subtitle D facility.

A RCRA cap would be constructed over the entire area of the trenches and the area south of the barrel trench, as described under Alternative 8A.

The long-term ground water monitoring program included in this alternative is more extensive than the program described for Alternative 1A. In order to design an effective ground water monitoring system that can verify that the existing ground water contamination is not migrating offsite, additional study of the ground water during remedial design will be necessary. The goals of this additional study will be to further characterize the horizontal and vertical extent of the plume of ground water contamination, the rate and direction of migration, and specific contaminant concentrations.

The monitoring program is intended to verify that the existing contaminated ground water has not migrated beyond the points of compliance, which have been defined as no further than 150 feet beyond the edge of the RCRA cap. The "trigger wells" will be placed at the most ideal locations no further than 150 feet beyond the edge of the cap. Placement of these wells will be based on information obtained during design and will be subject to EPA approval. In the event that migration of the ground water plume to the points of compliance is detected by the "trigger wells", a ground water extraction and treatment system, as described for Alternative 8A, would be implemented. The goal of this system would be to contain the plume within the designated points of compliance and to comply with cleanup requirements in the area of attainment beyond the points of compliance.

The ground water monitoring wells included in the monitoring program would be sampled and analyzed for VOCs and metals. Sampling on a quarterly basis for a minimum of three years would be required. If, twelve (12) consecutive rounds of sampling demonstrate that Site-related contaminants are not present above MCLs, or risk-based contaminant levels[3] if MCLs have not been established, at the points of compliance, EPA may determine that sampling frequency can be reduced to bi-annually. The downgradient residential wells closest to the Site, would be sampled as frequently as the monitoring wells. The monitoring will include, but not be limited to, the requirements of Sections 10.5 and 10.6 of the Virginia Hazardous Waste Management Regulations [VHWMR], (VR §672-10-1). The ground water monitoring will be performed for at least thirty years, in accordance with the VHWMR.

The cost estimate listed above for Alternative 8B does not include the cost for the ground water containment system. Table 4 provides a cost estimate summary for Alternative 8B and Table 5 provides the total cost of Alternative 8B along with the costs associated with the ground water contingency requirement. Documentation for these cost estimates is in the Administrative Record.

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[3] In cases where the risk-based contaminant level is lower than the detection limit, the detection limit would be used as the standard.

TABLE 4- COST ESTIMATE SUMMARY FOR ALTERNATIVE 8B				
ITEM:	QUANTITY	UNIT	UNIT COST	COST ($)
Mobilization	1	LS	N/A	161,000
Eastern Trench	675	yd^3	3,360	2,268,000
Barrel Trench	6000	yd^3	310	1,860,000
RCRA Cap	2	acre	N/A	578,000
Install GW Monitor System	1	LS	N/A	330,000
Decon	1	LS	N/A	95,000
Demobilization	1	LS	N/A	107,000
Capital Costs			TOTAL:	5,399,000
Contingencies (20%)				1,079,800
O&M Present Worth				2,815,000
TOTAL COST				**$ 9,293,800**

TABLE 5- ALTERNATIVE 8B PLUS CONTINGENCY COST	
INSTALL GW EXTRACTION AND TREATMENT	$ 430,000
CONTINGENCIES (20%)	$ 86,000
TOTAL CAPITAL COST	$ 516,000
INCREASE IN O&M (PRESENT WORTH)	$ 1,900,000
ALTERNATIVE 8B - NO CONTINGENCY	$ 9,293,800
TOTAL POTENTIAL COST	**$ 11,709,000**

L. Alternative 8C: INSITU VAPOR EXTRACTION (ISVE) AND GROUND WATER MONITORING

Capital Cost: $ 3,731,000
Cap/Monitor O&M Cost: $ 2,815,000
ISVE O&M (18 months): $ 700,000
Total Present Worth: $ 7,992,200
Time to Construct: 32-42 months

Alternative 8C includes treatment of the waste materials in the eastern disposal trench via In Situ Vapor Extraction (ISVE)

using horizontal wells. The ISVE process involves the removal of VOCs from soils and wastes, in-place. Therefore, no excavation or offsite transportation of wastes is necessary. The ISVE system would involve the installation of a horizontal well into the contaminated waste layer in the eastern disposal trench. A vacuum pump is attached to the well to withdraw air from the contaminated area. This air is then transported through the well to the surface. The contaminants in the extracted air are then subjected to onsite treatment. The method of treatment (e.g. activated carbon, catalytic oxidation, etc.) will be determined during remedial design.

A pilot scale treatability would be performed for ISVE in the eastern disposal trench during the remedial design to determine if ISVE can effectively remove contaminants from the waste layer. The treatability study would need to demonstrate the following:

1) adequate air flow can be achieved throughout the waste layer;
2) ISVE can meet the performance standards described below;
3) an effective method for measuring performance of the system can be developed and implemented.

If EPA determines that the treatability study successfully meets the above criteria then full scale ISVE may be implemented. ISVE will continue until contamination levels in the waste layer and surrounding soils are no longer a source of contamination to underlying ground water which results in ground water contamination above MCLs, or health-based contaminant levels[4] if MCLs have not been established. The cleanup criteria will be determined during the remedial design by considering the characteristics of the waste layer and contaminated soils and associated contaminants and then deriving specific levels of contaminants in the waste layer and surrounding soils that would not be expected to exert a significant impact on underlying ground water.

If EPA determines that the treatability study does not successfully meet the criteria listed above or if full scale ISVE in the eastern disposal trench can not meet the performance standards described above, excavation and off-site incineration would be implemented for the eastern disposal trench as described for Alternative 8B.

If ISVE is deemed feasible and implemented full scale, the emissions from the ISVE unit would be treated and monitored to ensure that unacceptable levels of contaminants would not be released to the atmosphere. Residuals from the treatment process

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[4] In cases where the risk-based contaminant levels are lower than the detection limits, the detection limits would be used as the standard.

(e.g. spent carbon, etc.) would be handled in accordance with substantive requirements of federal and state hazardous waste regulations or treated/disposed of offsite at a RCRA-permitted hazardous waste disposal facility. The ISVE unit would be operated in accordance with applicable and relevant and appropriate requirements of federal and state hazardous waste management regulations and Virginia Air Pollution Control regulations.

Test pits would be dug in the barrel trench and hazardous materials, if present, would be removed and treated as described for Alternative 8B. If no hazardous wastes are present in this trench, then the test pits would be filled in and the trench would be capped along with the rest of the Site. A RCRA cap would be constructed over the entire area of the trenches and the area south of the barrel trench, as described under Alternative 8A.

The long-term ground water monitoring using "trigger wells" is included in this alternative and is the same as described for Alternative 8B. This monitoring program is intended to verify that the existing contaminated ground water is not migrating and, if migration is detected, the ground water contingency action will be implemented to contain the plume as described for Alternative 8B.

The cost estimate listed above for Alternative 8C does not include the contingency costs for excavation and incineration of waste materials in the eastern disposal trench or the ground water containment system. Table 6 provides a cost estimate summary for Alternative 8C and Table 7 provides the total cost of Alternative 8C along with the costs associated with the contingency requirements for this alternative. Documentation for these cost estimates is in the Administrative Record.

TABLE 6- COST ESTIMATE SUMMARY FOR ALTERNATIVE 8C				
ITEM:	QUANTITY	UNIT	UNIT COST	COST ($)
Mobilization	1	LS	N/A	161,000
Eastern Trench	1	LS	N/A	600,000[5]
Barrel Trench	1	LS	N/A	1,860,000
RCRA Cap	2	acre	N/A	578,000
Install GW Monitor System	1	LS	N/A	330,000
Decon	1	LS	N/A	95,000
Demobilization	1	LS	N/A	107,000
Capital Costs			TOTAL:	3,731,000
Contingencies (20%)				746,200
Operation & Maintenance:				
ISVE Cap and Monitor	1 1	LS LS	N/A N/A	700,000[6] 2,815,000
TOTAL COST				$ 7,992,200

[5] This figure for the cost of ISVE was supplied by the PRPs. This cost estimate is for full scale ISVE and assumes that the treatability study for ISVE proves that this technology is feasible. Treatability study costs are not included in this estimate.

TABLE 7 - ALTERNATIVE 8C PLUS CONTINGENCY COST	
EXCAVATION/TREATMENT OF EASTERN TRENCH	$ 2,268,000
INSTALL GW EXTRACTION AND TREATMENT	$ 430,000
INCREASE IN MOB/DECON/DEMOB	$ 100,000
SUBTOTAL	$ 2,798,000
CONTINGENCIES (20%)	$ 559,600
TOTAL CAPITAL COST	$ 3,357,600
INCREASE IN O&M (PRESENT WORTH)	$ 1,900,000
ALTERNATIVE 8C - NO CONTINGENCIES	$ 7,992,200
TOTAL POTENTIAL COST	**$ 13,249,800**

Alternatives 1 through 8C were retained for detailed analysis. Alternatives 9 and 10 described in the FS, were screened from further consideration because at this time there are no offsite incineration facilities available that have the capacity to treat the large volume of materials involved with these alternatives and relative costs of these alternatives were significantly higher than other alternatives of comparable effectiveness. Alternatives 8B and 8C were developed based on comments from the community and information gained from interested parties during the first public comment period (May 5, 1993 - July 6, 1993).

VIII. Summary of Comparative Analysis of Alternatives

The twelve remedial action alternatives described above were assessed in accordance with the nine evaluation criteria as set forth in the NCP at 40 C.F.R. Section 300.430(e)(9). These nine criteria are categorized below into three groups: threshold criteria, primary balancing criteria, and modifying criteria.

THRESHOLD CRITERIA

1. Overall protection of human health and the environment; and
2. Compliance with applicable or relevant and appropriate requirements (ARARs).

PRIMARY BALANCING CRITERIA

3. Long-term effectiveness and permanence;
4. Reduction of toxicity, mobility, or volume through treatment;
5. Short-term effectiveness;
6. Implementability; and
7. Cost.

MODIFYING CRITERIA

8. State acceptance; and
9. Community acceptance.

These evaluation criteria relate directly to requirements in Section 121 of CERCLA, 42 U.S.C. Section 9621, which determine the overall feasibility and acceptability of the remedy.

Threshold criteria must be satisfied in order for a remedy to be eligible for selection. Primary balancing criteria are used to weigh major trade-offs between remedies. State and community acceptance are modifying criteria formally taken into account after public comment is received on the Proposed Plan. A summary of the relative performance of the alternatives with respect to each of the nine criteria follows. This summary provides the basis for determining which alternative provides the "best balance" of tradeoffs with respect to the nine evaluation criteria.

A. Overall Protection of Human Health and the Environment

A primary requirement of CERCLA is that the selected remedial action be protective of human health and the environment. A remedy is protective if it reduces current and potential risks to acceptable levels within the established risk range posed by each exposure pathway at the Site.

Alternatives 6 and 8 are fully protective of human health and the environment. These alternatives achieve this protection through excavation, treatment, and proper disposal of the contaminated trench materials found in all four trenches as well as extraction and treatment of contaminated ground water. These alternatives eliminate all sources of contamination at the Site and, therefore, eliminate the potential for further degradation of ground water quality. Protection from exposure to contaminated ground water would be achieved through a ground water extraction and treatment system.

Alternatives 8A, 8B, and 8C are fully protective remedies. Protection of human health and the environment is provided by these remedies in a variety of ways. All of these alternatives include treatment of the primary source of contamination at the Site (the eastern disposal trench and the barrel trench)) and, therefore, eliminate the potential for this source to further degrade ground water quality. Additionally, the RCRA cap for all three of these alternatives will decrease the infiltration of precipitation through the remaining areas of low level contamination at the Site and thereby curtail continuing degradation of the aquifer. For each of these alternatives, protection from exposure to contaminated ground water will be provided through a ground water monitoring network, as well as deed and access restrictions. To provide additional protection, Alternative 8A includes implementation of a ground water extraction and treatment system. Alternatives 8B and 8C include ground water extraction and treatment in the event that the plume

migrates to the points of compliance.

Alternatives 2 and 4 provide protection of human health and the environment. For both of these alternatives, the source of the ground water contamination would be allowed to remain onsite. Protection from exposure to such contaminated ground water would be provided through implementation of a ground water extraction and treatment system, as well as, deed and access restrictions. For Alternative 4, the RCRA cap will decrease the infiltration of precipitation through the contaminated waste materials in the trenches and thereby curtail continuing degradation of the aquifer.

Alternatives 3, 5, and 7 may not provide protection of human health and the environment due to the fact that extraction and treatment of the ground water is not included in these remedies. Monitoring of the ground water in all three of these alternatives will allow EPA to detect movement of the contaminated ground water, however, additional actions would be required to prevent exposure to the plume. As long as the contaminated ground water plume does not migrate beyond the points of compliance, Alternatives 5 and 7 will provide protection by eliminating all potential sources of ground water contamination and the Alternative 3 will provide protection by decreasing the infiltration of precipitation through the contaminated waste materials in the trenches.

Alternatives 1 and 1A are not protective of human health and the environment. Under Alternative 1, contaminated trench materials found in all four trenches would remain in place and no actions would be taken to address the potential threats posed by either the contaminated trench materials or contaminated ground water. Alternative 1A includes long-term ground water monitoring, as well as, deed and access restrictions, however, should the plume migrate further offsite, this alternative does not provide a mechanism for treating or containing contaminated ground water. Also under Alternative 1A, all contaminated trench materials found in all four trenches and contaminated soils would remain onsite. For the reasons discussed above, both Alternatives 1 and 1A are not protective of human health and the environment and thus, can not be evaluated further.

B. **Compliance with ARARs**

This criterion addresses whether a remedy will meet all of the Applicable or Relevant and Appropriate Requirements (ARARs) of other environmental statutes and/or provide grounds for invoking a waiver under the NCP at 40 C.F.R. 300.430(f)(1)(ii)(C).

All alternatives that are protective of human health and the environment would be in compliance with existing Federal and State ARARs.

C. Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to the expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once the cleanup levels have been met. This criterion includes the consideration of residual risk and the adequacy and reliability of controls.

Alternatives 6 and 8 afford the highest degree of long-term effectiveness because all contaminated soils and waste materials would be excavated, treated and properly disposed of either on- or off-site and the contaminated ground water would be extracted and treated. Alternatives 5 and 7 are effective in the long term because all contaminated soils and waste materials would also be addressed as described above, however, these alternatives do not provide for extraction and treatment of the ground water.

Alternatives 8A, 8B, and 8C are effective in the long term because these alternatives use treatment to eliminate principal threats posed by waste materials present in onsite trenches. Potential risk from concentrated waste sources present in the eastern disposal trench and barrel trench would be eliminated after implementation of these alternatives and their contingencies. The long-term risk of contaminants leaching from areas of low level contamination at the Site would be reduced via capping. Implementation of ground water extraction and treatment, either immediately as in Alternative 8A or as a contingency as in Alternatives 8B and 8C, further increases the long-term effectiveness of these alternatives. Proper maintenance of the cap, along with institutional controls would be necessary to ensure the overall long term effectiveness of these alternatives.

Alternative 4 provides a moderate degree of long-term effectiveness. This alternative allows all contaminated wastes to remain at the Site and relies solely on a cap to reduce the long-term risk of contaminants leaching from both areas posing a principal threat and areas posing low level threats at the Site. This alternative also has cap maintenance requirements which are highly critical to the effectiveness of the remedy since all of the wastes would remain under the cap without prior treatment. However, the ground water extraction and treatment measures included in this alternative increases its long-term effectiveness

Alternative 2 provides a low degree of long-term effectiveness. Ground water extraction and treatment measures included in this alternative provide for long-term effectiveness, however, no treatment or containment of the contaminated wastes onsite would be provided under this alternative.

Alternative 3 provides the lowest degree of long-tern effectiveness. Although the cap included in this alternative would reduce the long-term risk of contaminants leaching from the waste materials in the trenches into the ground water, this

alternative lacks ground water extraction and treatment measures which decreases its long-term effectiveness.

D. Reduction of Toxicity, Mobility, or Volume through Treatment

This evaluation criterion addresses the degree to which a technology or remedial alternative reduces the toxicity, mobility, or volume of a hazardous substance. Although Section 121 (b) of CERCLA, 42 U.S.C. Section 9621(b), establishes a preference for remedial actions that permanently and significantly reduce the toxicity, mobility, or volume of hazardous substances, EPA expects to use a combination of treatment and engineering controls, such as containment measures, to achieve protection of human health and the environment, as set forth in the NCP at 40 C.F.R. Section 300.430(a)(iii).

Alternatives 6 and 8, would provide the most significant reduction of toxicity, mobility, and volume through treatment because all of the contaminated waste materials in the potential source areas would be excavated and treated. For Alternative 6, this reduction would be achieved via onsite incineration of all of the excavated trench materials and underlying soils. For Alternative 8, this reduction would be achieved via offsite incineration of the drums from the barrel trench and via onsite LTTD of the remaining contaminated waste material and soils. The treatment processes discussed above would significantly reduce toxicity, mobility, and volume of the potential sources at the Site and leave relatively little residual risk. Additionally, both Alternatives 6 and 8 include extraction and treatment of the contaminated ground water which further reduces toxicity, mobility, and volume of contamination through treatment.

Alternatives 8A, 8B, and 8C would provide reduction of toxicity, mobility, and volume through treatment, but to a lesser degree that Alternatives 6 and 8. For Alternatives 8A through 8C, treatment measures are focused on the eastern disposal trench which appears to represent the primary source of contamination at the Site. For Alternatives 8A and 8B, reduction of toxicity, mobility, and volume would be achieved in the eastern disposal trench through offsite incineration. For Alternative 8C, reduction of toxicity and mobility would be achieved in the eastern disposal trench through ISVE using horizontal wells. In addition to the treatment measures described above, Alternatives 8A, 8B, and 8C also utilize a RCRA cap to contain the waste and soil contamination which reduces the mobility of the remaining low level threats.

Under Alternative 8A, the barrel trench, which is also a potential source area would be excavated and, if drums containing wastes are found, then these drums would be incinerated offsite thereby, further reducing toxicity, mobility, and volume of contaminants via treatment. For Alternatives 8B and 8C, test pits would be excavated in the barrel trench to determine if hazardous wastes are present. If found, the remaining portions of the barrel trench would be excavated and offsite treatment

and/or disposal of hazardous wastes would follow, thereby further achieving reduction of toxicity, mobility and volume. Also, under Alternative 8A and as a contingency for Alternatives 8B and 8C, the contaminated ground water would be extracted and treated, thereby further achieving reduction of toxicity, mobility and volume of contaminants through treatment.

Alternatives 5 and 7, would provide reduction of toxicity, mobility, and volume through treatment because all of the contaminated waste materials in the potential source areas would be excavated and treated. For Alternative 5, this reduction would be achieved via onsite incineration of all of the excavated trench materials and underlying soils. For Alternative 7, this reduction would be achieved via offsite incineration of the drums from the barrel trench and via onsite LTTD of the remaining contaminated waste material and soils. The treatment processes discussed above will significantly reduce toxicity, mobility, and volume of the potential sources at the Site and leave relatively little residual risk. However, neither Alternatives 5 nor Alternative 7 include extraction and treatment of the contaminated ground water.

Alternatives 2 and 4 do not propose any waste or soil treatment and would therefore not reduce the toxicity, mobility, or volume of these media through treatment. However, Alternative 4 includes a cap which would be used to contain the waste and soil contamination to reduce mobility and both Alternatives 2 and 4 include extraction and treatment of the ground water which reduces the toxicity, mobility, and volume of contamination in the ground water.

Alternative 3 does not include any form of treatment for the source areas at the Site, instead a RCRA cap would be used to contain the waste and soil contamination, therefore reducing mobility.

E. Short-Term Effectiveness

This evaluation criterion addresses the period of time needed to achieve protection of human health and the environment, and any adverse impacts that may be posed during the construction and implementation period of a remedy, until cleanup goals are achieved. The time for completion of the remedial actions for each of the alternatives listed below does not include the time for long-term monitoring, which will be required for all of the alternatives. All of the timeframes listed below are estimates.

The primary short-term effects associated with each of the source control alternatives are possible exposure to air borne contaminants generated during excavation and exposure to physical safety hazards that exist around heavy equipment. Air-borne dust containing VOCs could be generated during soil waste excavation required for Alternatives 5 - 8C. The extent of soil/waste excavation is highest under Alternatives 5 - 8 and lowest under Alternatives 8B and 8C. Additional dust could be generated during soil/waste handling and operation of treatment units

onsite, particularly under Alternatives 5 - 8.

Release of air-borne contaminants would be expected to be minimal under Alternatives 3 and 4, because land disturbing activities would involve surface soils which may contain low levels of contamination and buried waste materials would not disturbed. Measures would be taken to control dust during implementation of not only Alternatives 3 and 4, but also Alternatives 5 - 8C. These measures would be detailed in the Remedial Action Work Plan and the associated Health and Safety Plan which must be prepared and approved by EPA prior to initiation of construction. These measures would include, but not be limited to, (1) dust suppression during excavation, handling, and treatment activities, (2) air monitoring before and during remedial activity, and (3) the use of specialized equipment, engineering controls, and experienced and trained personnel.

Because transportation of materials offsite is involved for Alternatives 7, 8, and 8A, as well as 8B and 8C (if hazardous wastes were found in the barrel trench), there would be an increase in truck traffic in the vicinity of the Site and along the transportation route during implementation of the remedy. Increased truck traffic may result in a greater potential for accidents along the transportation route, although it is unlikely that any accident would pose a serious health threat to residents along that route. To minimize the potential for accidents, truck traffic would be strategically spaced throughout the remedial action and all Virginia Department of Transportation (VDOT) regulations regarding the transportation of hazardous wastes would be adhered to.

Implementation of Alternatives 3 and 4 would take the least amount of time. Although Alternative 2 would take less that six months to construct, implementation of this ground water treatment remedy would be ongoing for at least 30 years. Alternatives 5 through 8 are expected to take approximately one to two years to construct, however, implementation of the ground water treatment components for Alternatives 6 and 8 would be ongoing for at least 30 years.

Some of the activities associated with the Alternatives 8A and 8B will occur sequentially as opposed to simultaneously. It is expected to take approximately 6 months to construct the ground water monitoring system and to excavate and transport materials from both the eastern disposal trench and the barrel trench for Alternatives 8A and 8B, followed by up to 12 months for cap construction.

Alternative 8C is expected to take approximately 6 months for construction of the ISVE system, however, the ISVE system must be in operation until the goals of the system are met and it is not known exactly how long this will take. Other activities (i.e., completion of ground water monitoring network) will occur simultaneously with ISVE system design and operation.

Alternative 8B would most likely take less total time to construct than Alternatives 8A and 8C. However, implementation of ground water extraction and treatment will be ongoing for at least 30 years under Alternative 8A and, if contingency actions are required, under Alternatives 8B and 8C as well.

F. **Implementability**

This evaluation criterion addresses the technical and administrative feasibility of each remedy, including the availability of materials and services needed to implement the chosen remedy.

The ground water extraction and treatment system included in Alternatives 2, 4, 6, 8, and 8A and as a contingency for Alternatives 8B and 8C is routinely implemented at many Superfund Sites. The treatment would rely on proven technologies (air stripping and carbon adsorption) and could be implemented relatively easily. The air stripper system contemplated under these alternatives would require treatability tests to assure that stream effluent limits set by the Virginia State Water Control Board would be met prior to discharge. Long-term maintenance of the ground water treatment system and long-term ground water monitoring would be required to assure the effectiveness of all alternatives that include ground water extraction and treatment. Although ground water extraction and treatment systems are readily implementable, restoration of the aquifer, which is the goal of these systems under Alternatives 2, 4, 6, 8, and 8A, may not be achievable.

The RCRA cap included in Alternatives 3, 4, 8A, 8B, and 8C could be readily implemented. The cap is straight forward to construct. Long-term maintenance and repairs of the cap would be required to assure the integrity of these alternatives. The required labor, equipment, and materials are readily available to construct and maintain the cap.

The excavation and offsite treatment/disposal of waste materials and contaminated soils from the eastern disposal trench and the barrel trench in Alternatives 8A, 8B and potentially 8C could be readily implemented. Excavation is relatively straight forward and the availability of treatment/disposal facilities is adequate. Alternatives 8A and 8B would be easier to implement than Alternatives 5 through 8 because acquisition and operation of a mobile incinerator or LTTD unit would not be necessary and excavation of a lesser amount of waste materials would be required.

Operation of either the incinerator under Alternatives 5 and 6 or the LTTD system under Alternatives 7 and 8 would be more difficult to implement than the offsite treatment alternatives. Treatability tests would have to be completed and the systems' operating parameters would have to be established. Onsite incinerators and LTTD units are available for use. The remediation schedule would need to be coordinated with the availability of the needed mobile units and the availability of

experienced contractors. The ability of LTTD to meet the soil cleanup goals for VOCs needs to be confirmed in treatability tests. Incineration is a highly reliable technology for organics treatment; trial burns would, however, be undertaken to ensure compliance with air emission requirements. The handling, treatment, and disposal of the large volume of contaminated wastes and soils would require a design plan sequencing remedial activities to facilitate efficient removal. Varying volumes or concentrations of contaminants in soils could be handled easily.

Implementation of the ISVE system under Alternative 8C may prove to be difficult. There are many factors involved that will determine the success or failure of this system. These factors include, but are not limited to, the following: soil and waste permeability in the eastern disposal trench and the ability of the system to meet the performance standards.

G. Cost Effectiveness

Section 121 of CERCLA, 42 U.S.C. Section 9621, requires selection of a cost-effective remedy that protects human health and the environment and meets the other requirements of the statute. The alternatives are compared with respect to present worth cost, which includes all capital costs and the operation and maintenance cost incurred over the life of the project. Capital costs include those expenditures necessary to implement a remedial action, including construction costs. All of the costs indicated below are estimates.

Alternatives 3 and 8C have the lowest total present worth costs at $1.3 million, and $ 7.9 million respectively. However, Alternative 3 is clearly the least effective of all alternatives considered. Alternative 8C has the potential to be highly cost-effective, however, if the contingencies for the eastern disposal trench and the ground water have to be invoked to ensure the remedy's effectiveness, then this alternative could cost up to $ 13.2 million. The overall cost-effectiveness of Alternative 8C would decrease if the contingencies were invoked.

Alternatives 5 - 8A range in cost from $20.2 million to $43.9 million. Although Alternatives 5 - 8A offer a high degree of effectiveness, the relative costs of these alternatives are significantly higher than other alternatives which offer an acceptable level of effectiveness.

The remaining alternatives, 2, 4, and 8B range in cost between $5.6 million and $ 9.2 million. Alternatives 2 and 4, although reasonably priced, do not provide an adequate degree of effectiveness. Alternative 8B, at $ 9.2 million, is the most cost-effective of the alternatives considered. Contingencies included with this alternative could increase the cost to $ 11.7 million.

H. State Acceptance

VDEQ has had the opportunity to review and comment on all the documents in the Administrative Record and has actively participated in selecting a remedy for this Site. VDEQ has had the opportunity to comment on the draft ROD and, to the extent possible, the State's comments have been incorporated into the ROD.

I. Community Acceptance

On May 25, 1993 and April 26, 1994, public meetings were held at the Buckingham County High School Gymnasium, in Dillwyn, Virginia to discuss EPA's preferred alternatives. The first preferred alternative (8A) was presented in the Proposed Remedial Action Plan (Proposed Plan) issued on May 5, 1993 and the second preferred alternative (8C) was presented in the Addendum to the Proposed Plan (Addendum) issued on November 24, 1993. There was a public comment period following the issuance of both the Proposed Plan and the Addendum.

Both of the public meetings were well attended by the community (800 - 1,000 people). An overwhelming majority of the community expressed a strong desire for: (1) EPA to select the "cap and monitor" remedy (Alternative 3); (2) a remedy that did not include excavation and offsite incineration; and (3) an inexpensive remedy. The desires of the community were closely aligned with those of the PRPs. Many of the citizens who commented on the PRAP and the Addendum were employed by Armstrong Furniture, a PRP for the Site. The citizens expressed concern that their jobs would be in jeopardy if an expensive remedy were selected. Many residents of Buckingham County also commented and expressed concern that their local taxes would increase significantly if an expensive remedy was selected because the County is also a PRP. The Administrative Record for this Site contains hundreds of letters that express the sentiments discussed above. The nearest residents downgradient of the Site expressed a strong preference for EPA to select Alternative 8A.

IX. Selected Remedy

A. Remedial Options

EPA carefully considered the concerns expressed by the PRPs and the public during the two public comment periods. The primary area of disagreement centered on the need for source control. EPA has maintained that the highly toxic concentrated waste present at the Site should be removed prior to capping to reduce the potential for continued migration of contaminants in the groundwater. The PRPs and the public have maintained that source control is not warranted and that capping will be sufficient to prevent further migration of the contaminants. EPA believes that allowing the highly toxic concentrated waste to remain beneath the cap will (1) increase the likelihood of contaminant migration; and (2) increase the required duration of extraction and treatment of the ground water. The Agency's

position is based in part on its experience in tracking ground water movement. However, the Agency concedes that the existing Site data is open to interpretation on the issue of potential offsite ground water migration. As a result, EPA has structured the selected remedy for this Site to allow for two options, both of which are fully protective of human health and the environment:

Option 1 - Monitor the ground water and cap the hazardous waste disposal area. If ground water monitoring detects migration of the plume, as defined below, remove appropriate portions of the cap, implement source control measures (as described below), replace the cap, and treat the ground water.

Option 2 - Monitor the ground water, implement the source control measures (as described below), and then cap the hazardous waste disposal area. If ground water monitoring detects migration of the plume, as defined below, treat the ground water.

B. Contingency Trigger

If any analytical result from a ground water monitoring sample collected at the points of compliance exceeds an MCL or the health-based contaminant level[6] if an MCL has not been established, for any Site-related contaminant, a confirmatory sample from the well where the exceedance occurred shall be collected and analyzed for all Site-related contaminants. If the analytical results from the confirmatory sample also exceeds the appropriate MCL or health-based level, the contingency actions for the option of the selected remedy that is being implemented (i.e., Option 1 or Option 2) shall be triggered.

The points of compliance shall be no more than 150 feet from the edge of the cap. This cap, which will be constructed as part of both Option 1 and Option 2, shall not extend beyond the disposal trenches and previously-capped area south of the barrel trench.

C. Remedy Description and Performance Standards

The selected remedy for the Site is comprised of specific combinations of components from Alternatives 8B and 8C and a modification regarding barrel trench remediation based on public comment. The components include ground water monitoring, capping, source control, ground water treatment, and institutional controls. As discussed above, implementation of the ground water treatment component shall be contingent upon detection of contaminant migration through the ground water monitoring system. Implementation of source control components

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[6] In cases where the risk-based contaminant level is lower than the detection limit, the detection limit would be used as the standard.

shall also be contingent upon detection of contaminant migration, if Option 1 is chosen for implementation. Source control measures are mandatory components of Option 2.

1. **Ground Water Monitoring Performance Standards**

- A ground water monitoring system shall be installed to detect migration of Site-related contaminants beyond the hazardous waste disposal area in accordance with 40 C.F.R. Part 264, Subpart F and §10.5.H of VHWMR, VR §672-10-1; 40 C.F.R. Part 141, Subparts C and E. The system shall include, at a minimum: (1) existing wells and new wells located no more than 150 feet from the edge of the cap, and (2) the two nearest downgradient residential wells. Monitoring wells shall be located in both the saprolite and bedrock aquifers. Monitoring wells located no more than 150 from the edge of the cap shall be the points of compliance for containment of the plume.

- The ground water monitoring system wells shall be sampled in accordance with 40 C.F.R. Part 264, Subpart F and §§10.5 and 10.6 of VHWMR, VR §672-10-1; 40 C.F.R. Part 141, Subparts C and E on a quarterly basis. Samples shall be analyzed for all EPA Contract Laboratory Program Target Compound List VOCs and Target Analyte List Metals. If no Site-related contaminants are detected at the points of compliance during consecutive quarterly samples for a period of three years, the ground water sampling may be reduced to bi-annual collection.

- Ground water monitoring will be conducted in accordance with 40 C.F.R. Part 264, Subparts F and G and § 10.5 and 10.6.H. of [VHWMR] (VR §672-10-1).

2. **Cap Performance Standards**

- A multilayer cap shall be installed over the hazardous waste disposal area in accordance with RCRA Subtitle C requirements, 40 C.F.R. Part 264, Subpart G and N and VHWMR §10.13.K. to reduce infiltration of surface water and migration of contaminants into the ground water. The cap shall cover the trench areas and the previously capped area south of the barrel trench and will be approximately two acres in size. The cap shall not extend beyond the disposal trenches and previously capped area south of the barrel trench.

- Maintenance of the cap shall be performed in accordance with 40 C.F.R. Part 264, Subpart G and N and VHWMR §10.6.H. and §10.13.K. to prevent degradation of the cap and to ensure long-term effectiveness.

- A fence shall be constructed and maintained around the perimeter of the cap to restrict access.

3. **Source Control - Eastern Disposal Trench**

One of the following options shall be completed as the source control measure for the eastern disposal trench:

a. ISVE Performance Standard

- A pilot scale treatability study would be performed for ISVE in the eastern disposal trench during the remedial design to determine if ISVE can effectively remove contaminants from the waste layer. The treatability study would need to demonstrate the following:

  1) adequate air flow can be achieved throughout the waste layer;
  2) ISVE can meet the performance standards described below;
  3) an effective method for measuring performance of the system can be developed and implemented.

- If EPA determines that the treatability study successfully meets the above criteria then full scale ISVE may be implemented in the eastern disposal trench.

- ISVE will continue until contamination levels in the waste layer and surrounding soils are no longer a source of contamination to underlying ground water which results in ground water contamination above MCLs, or health-based contaminant levels[7] if MCLs have not been established. The cleanup criteria will be determined during the remedial design by considering the characteristics of the waste layer and surrounding contaminated soils and associated contaminants and then deriving specific levels of contaminants in the waste layer and surrounding soils that would not be expected to exert a significant impact on underlying ground water.

- If EPA determines that the treatability study does not successfully meet the criteria listed above or if full scale ISVE in the eastern disposal trench can not meet the performance standards described above, excavation and off-site incineration would be implemented for the eastern disposal trench as described below.

b. Excavation and Off-site Incineration Performance Standard

- The layer of concentrated waste located in the eastern disposal trench and contaminated soil one foot above and below the layer shall be excavated to eliminate the continued migration of contaminants from this source into soil and ground water. The waste layer is encountered at a

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[7] In cases where the risk-based contaminant level is lower than the detection limit, the detection limit would be used as the standard.

depth of approximately ten feet below the ground surface and extends to an approximate depth of fourteen feet. The volume of waste material and contaminated soil has been estimated to be 675 cubic yards. Soil excavated from the surface of the eastern disposal trench to the depth of one foot above the waste layer shall be considered overburden material.

- Excavated waste material, contaminated soil, and overburden soil shall be temporarily staged on-site in accordance with 40 C.F.R. Part 264, Subpart L, and §10.11 of VHWMR, VR §672-10-1 if material can be staged in an area that will subsequently be capped. If waste material and soil cannot be staged in an area that will subsequently be capped, the waste material and soil shall be temporarily staged in containers in accordance with RCRA regulations contained in 40 C.F.R. Part 268, Subpart E and §15.3 of VHWMR, VR §672-10-1; containers used for staging shall be in compliance with 40 C.F.R. Part 264, Subpart I and §10.8 of the VHWMR, VR §672-10-1.

- Excavated waste material and contaminated soil shall be transported from the Site in accordance with Part VII of the VHWMR, VR §672-10-1, VR §672-30-1, and VR §672-20-1; 40 C.F.R. Parts 262 and 263 and §268.7; 49 C.F.R. Part 107 and 49 C.F.R. Subchapter C.

- Excavated waste material and incidental soil shall be incinerated at an off-site permitted RCRA Subtitle C facility operating in accordance with 40 C.F.R. Part 264, Subpart O.

- The eastern disposal trench shall be backfilled with the overburden soil and additional clean soil, as necessary, to achieve an appropriate surface grade for capping.

4. <u>Source Control - Barrel Trench Performance Standards</u>

- A representative number of test pits shall be excavated and samples shall be obtained from the barrel trench to provide a representative evaluation of the condition of drums buried in the barrel trench, to determine if the buried drums are empty, and to determine the levels of all contaminants present in this trench. Samples obtained from the test pits shall be analyzed for all priority pollutants set forth in 40 C.F.R Part 423, Appendix A.

- The information gained from visual observations during test pitting and analytical results from sampling shall be compiled and remedial action alternatives shall be evaluated in a Focused Feasibility Study (FFS).

- The appropriate source control measures for the barrel trench shall be selected in a subsequent EPA decision document, based on the FFS.

5. **Ground Water Treatment Performance Standards**

- The ground water treatment system shall be designed at the same time that the ground water monitoring and capping components of the remedy are designed.

- A network of ground water extraction wells shall be installed. These wells shall be specifically located in order to facilitate achievement of MCLs, or risk-based levels in the absence of MCLs, for Site-related contaminants in the area of attainment in accordance with 40 C.F.R. Part 141, Subpart B and Part 264 Subpart F as well as VR §355-18-004.08. The area of attainment has been defined as the area beyond the points of compliance. The points of compliance shall be the ground water monitoring wells located no further than 150 feet from the edge of the cap as described both in Section IX.C.1. above and in "Guidance for Remedial Actions for Contaminated Ground Water at Superfund Sites," December 1988, OSWER Directive 9283.1-02.

- Ground water shall be treated to meet the discharge limits established by the VDEQ Water Division in accordance with Virginia State Water Control Law, Code of Virginia §§ 62.1-44.2 et seq., Virginia State Water Control Board Regulations VR §§680-21-00 and 680-14-00 as well as 40 C.F.R. Parts 122, 129, and 131. Treatment shall take place in an on-site facility that includes air stripping and, if necessary, a process to remove metals. Treated ground water shall be discharged to the surface water body adjacent to the Site.

- Emissions from the air stripping unit shall not exceed health-based levels established for on-site workers or downwind residents. Air emissions shall be in compliance with National Ambient Air Quality Standards (NAAQS) set forth in 40 C.F.R. Part 50, National Emissions Standards for Hazardous Air Pollutants (NESHAPs) set forth in 40 C.F.R. Part 61, and described in "Control of Air Emissions from Superfund Air Strippers at Superfund Ground Water Sites," June 15, 1989, OSWER Directive 9355.0-28.

- Chemical and biological monitoring shall be performed to evaluate the performance of the ground water treatment system and detect any impacts to the surface water body receiving the treated ground water. The monitoring requirements shall be developed during the remedial design in accordance with Virginia State Water Control Law, Code of Virginia §§ 62.1-44.2 et seq., Virginia State Water Control Board Regulations (VR 680-21-00), and 40 C.F.R. Part 141 Subparts C and E and Part 264, Subpart F, G, and N. These monitoring requirements shall be subject to EPA approval.

6. **Institutional Controls**

- A deed restriction shall be place on the property within the points of compliance prohibiting residential development or use of the ground water as a potable source.

EPA may modify or refine the selected or contingent remedies during remedial design and construction. Such modifications or refinements, if any, would generally reflect results of the engineering design process. The estimated present worth cost of the selected remedy without the contingency requirements is $4.3 million for Option 1 (see Table 8) and $7.3 million for Option 2 (see Table 10). The estimate for Option 1 is comprised of a capital cost of $1.2 million and $2.8 million for 30 years of operation and maintenance. The estimate for Option 2 is comprised of a capital cost of $3.7 million and $2.8 million for 30 years of operation and maintenance.

The costs for both options of this remedy could increase if migration of the contaminated ground water is detected and, therefore, contingency requirements are invoked. The estimated cost of Option 1 plus contingencies is $10.7 million (see Table 9) and the estimated cost of Option 2 plus contingencies is $9.7 million (see Table 11). Documentation for these costs is in the Administrative Record.

TABLE 8 - SELECTED REMEDY COST ESTIMATE SUMMARY - OPTION 1

ITEM:	QUANTITY	UNIT	UNIT COST	COST ($)
Mobilization	1	LS	N/A	161,000
RCRA Cap	2	acre	N/A	578,000
Install GW Monitor System	1	LS	N/A	330,000
Decon	1	LS	N/A	95,000
Demobilization	1	LS	N/A	107,000
Capital Costs			TOTAL:	1,271,000
Contingencies (20%)				254,200
O&M Present Worth				2,815,000
TOTAL COST				**$ 4,340,200**

TABLE 9 - SELECTED REMEDY OPTION 1 + CONTINGENCY COSTS	
REMOVE PORTIONS OF THE CAP	$ 100,000
EXCAVATION/TREATMENT OF EASTERN TRENCH	$ 2,268,000
BARREL TRENCH - TEST PIT/SAMPLE/FFS	$ 250,000
INSTALL GW EXTRACTION AND TREATMENT	$ 430,000
RE-CAP	$ 578,000
INCREASE IN MOB/DECON/DEMOB	$ 100,000
SUBTOTAL	$ 3,726,000
CONTINGENCIES (20%)	$ 745,200
TOTAL CAPITAL COST	$ 4,471,200
INCREASE IN O&M (PRESENT WORTH)	$ 1,900,000
OPTION 1 - NO CONTINGENCIES	$ 4,340,200
TOTAL POTENTIAL COST	**$ 10,711,400**

TABLE 10 - SELECTED REMEDY COST ESTIMATE SUMMARY - OPTION 2				
ITEM:	QUANTITY	UNIT	UNIT COST	COST ($)
Mobilization	1	LS	N/A	161,000
Eastern Trench	675	yd^3	3,360	2,268,000
Barrel Trench	1	LS	N/A	250,000
RCRA Cap	2	acre	N/A	578,000
Install GW Monitor System	1	LS	N/A	330,000
Decon	1	LS	N/A	95,000
Demobilization	1	LS	N/A	107,000
Capital Costs			TOTAL:	3,789,000
Contingencies (20%)				757,800
O&M Present Worth				2,815,000
TOTAL COST				**$ 7,361,800**

TABLE 11 - SELECTED REMEDY OPTION 2 + CONTINGENCY COSTS	
INSTALL GW EXTRACTION AND TREATMENT	$ 430,000
CONTINGENCIES (20%)	$ 86,000
TOTAL CAPITAL COST	$ 516,000
INCREASE IN O&M (PRESENT WORTH)	$ 1,900,000
OPTION 2 - NO CONTINGENCY	$ 7,361,800
TOTAL POTENTIAL COST	**$ 9,777,800**

X. Statutory Determinations

EPA's primary responsibility at Superfund sites is to select remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA, 42 U.S.C. Section 9621, establishes several other statutory requirements and preferences. These requirements/preferences specify that, when complete, the selected remedial action for a site must comply with applicable or relevant and appropriate requirements established under Federal and State environmental laws, unless a statutory waiver is justified. The selected remedy must also be cost-effective and utilize permanent treatment technologies or resource recovery technologies to the maximum extent practicable. The statute also contains a preference for remedies that employ treatment as a principal element. Site-specific conditions have influenced the Agency to select an alternative that may not, if Option 1 is implemented, utilize permanent treatment technologies or resource recovery technologies to the maximum extent practicable or employ treatment as a principal element, unless the contingency requirements are invoked. These site-specific conditions include: (1) the fact that this Site poses no current risk to public health; and (2) the options that make up the selected remedy are more cost-effective, without decreasing overall protection of human health and the environment, than the alternatives that more completely utilize permanent treatment technologies.

A. Protection of Human Health and the Environment

The BRA for the Buckingham County Landfill Site determined that the Site potentially presents an unacceptable risk to future residents in the vicinity of the Site who would use ground water for drinking. Specifically, the risk assessment indicates that the cumulative risk posed by ingestion and inhalation of VOCs in ground water is unacceptable. Furthermore, many of these contaminants exceed MCLs. Over a lifetime, the total excess cancer risk associated with exposure to contaminated ground water at the Site is 2.6×10^{-1} for future residents (i.e. those people who are exposed to the contaminated ground water have a 26%

chance of developing cancer).

For both Options 1 and 2, a RCRA cap would provide protection of human health and the environment by decreasing the infiltration of precipitation through the trench areas at the Site and thereby curtailing continuing degradation of ground water. Under both options, protection from exposure to the contaminated ground water will be provided through a ground water monitoring network as well as deed and access restrictions.

If Option 1 were implemented, the sources of contamination that are posing a principal threat would be allowed to remain onsite beneath the cap. EPA maintains that allowing the highly toxic concentrated waste to remain beneath the cap will (1) increase the likelihood of contaminant migration; and (2) increase the required duration of extraction and treatment of the ground water. If Option 2 were implemented, the sources of contamination that are posing a principal threat would be removed prior to capping to reduce the potential for continued migration of contaminants in the groundwater.

Under both options, if at any time following issuance of this ROD, EPA determines that the ground water contamination has migrated to a point of compliance, extraction and treatment of the ground water shall be implemented to ensure that the contaminated ground water remains within the points of compliance therefore providing additional protection.

The short-term threats associated with both options of the selected remedy and their contingency requirements can and will be readily controlled and no adverse cross-media impacts are expected as a result of implementation this remedy. Both Options are equally protective of human health and the environment.

B. Compliance with Applicable or Relevant and Appropriate Requirements

Under Section 121(d) of CERCLA, 42 U.S.C. § 9621(d), and EPA guidance, remedial actions at Superfund sites must attain legally applicable or relevant and appropriate Federal and state environmental standards, requirements, criteria, and limitations (collectively referred to as ARARs). Applicable requirements are those substantive environmental protection requirements, criteria, or limitations promulgated under Federal or state law that specifically address hazardous material found at the site, the remedial action to be implemented at the site, the location of the site, or other circumstances at the site. Relevant and appropriate requirements are those which, while not applicable to the site, nevertheless address problems or situations sufficiently similar to those encountered at the site that their use is well suited to that site.

The selected remedy will comply with all Applicable or Relevant and Appropriate Requirements (ARARs). The ARARs are presented below.

1. **Chemical Specific ARARs**

- Treatment of the ground water to ensure the area of attainment will comply with the requirements of the Safe Drinking Water Act 40 C.F.R. Part 141, Subpart B and VR §355-18-004.08, pertaining to maximum contaminant levels.

- Offsite treatment, storage and disposal of materials to be excavated from the eastern disposal trench will comply with RCRA regulations and standards for owners and operators of hazardous waste treatment, storage and disposal facilities, 40 C.F.R. Part 264 and the Virginia Hazardous Waste Management Regulations (VHWMR), VR § 672-10-1 and Virginia Solid Waste Management Regulations (VSWMR), VR §672-20-10.

- Offsite treatment/disposal of materials to be excavated from the eastern disposal trench and residues from ground water treatment will comply with the RCRA requirements for treatment before disposal to meet RCRA's Land Disposal Regulations, 40 C.F.R. Part 268, Subpart C and D and §§15.3 and 15.4 of VHWMR, VR §672-10-1.

- Emissions from the air stripping unit, specifically the VOCs identified as the contaminants of concern in the baseline risk assessment for the Site, will be monitored and, if required, a vapor phase carbon adsorption unit can be installed to ensure compliance with the Clean Air Act National Emission Standard for Hazardous Air Pollutants (NESHAPs), 40 C.F.R. Part 61, National Ambient Air Quality Standards (NAAQS), 40 C.F.R. Part 50 and VR §§120-03-02, 120-03-06, and 120-04-07.

2. **Action-Specific ARARs**

- The ground water monitoring component of the selected remedy will comply with the requirements of 40 C.F.R Part 264 Subpart F, G, and N as well as §10.5.H. of the VHWMR, VR §672-10-1. The ground water monitoring will be performed for at least thirty years.

- Capping of the trench areas with a RCRA Subtitle C cap will comply with the requirements set forth at 40 C.F.R. Part 264, Subparts G and N and §§ 10.6 and 10.13 of the VHWMR, VR § 672-10-1.

- Any land-disturbing activities associated with the selected remedy will comply with the Virginia Erosion and Sediment Control Law, Code of Virginia §§ 10.1-560 et seq., and Virginia Erosion and Sediment Control Regulations, VR §625-02-00 to prevent erosion and transport of sediments in surface water runoff during earth moving activities.

- During all Site work, Occupational Safety and Health Administration (OSHA) Standards set forth at 29 C.F.R. Parts 1904, 1910, and 1926 governing worker safety during hazardous waste operations, shall be met.

- Any offsite disposal of hazardous materials will comply with CERCLA §121(d)(3) which prohibits the disposal of Superfund Site waste at a facility not in compliance with §§3004 and 3005 of RCRA, 40 C.F.R. §300.440.

- Transportation of excavated wastes, soils and ground water treatment residues to a RCRA-permitted treatment/disposal facility would comply with RCRA regulations at 40 C.F.R. Parts 262, 263, and §268.7; as well as the Department of Transportation (DOT) regulations set forth in 49 C.F.R. Part 107 and 49 C.F.R Subchapter C and Part VII of the VHWMR, §672-10-01.

- The excavation associated with the selected remedy will cause no violation of NAAQS due to fugitive dust generated during construction activities as set forth in 40 C.F.R. §50.6 and 40 CFR §52.21(j) and VR §120-04-0104.

- The treatment of contaminated ground water by air stripping and contaminated waste/soils by ISVE must comply with 40 C.F.R Part 262, and Part VI of the VHWMR, § VR 672-10-1.

- If materials can be staged onsite in an area that will subsequently be capped, temporary staging of excavated materials (in tanks or drums) will comply with 40 C.F.R. Part 264, Subpart L, and §10.11 of the VHWMR, VR §672-10-1.

- If materials can not be staged onsite in an area that will subsequently be capped, temporary staging of materials (in tanks or drums) will comply with 40 C.F.R. Part 268, Subpart E, and §15.3 of the VHWMR, VR §672-10-1.

- Containers used for temporary staging shall be in compliance with 40 C.F.R. Part 264, Subpart I and VHWMR §10.8, VR §672-10-1.

- The federal National Pollutant Discharge Elimination System (NPDES) under the Clean Water Act 33 U.S.C. §§1251 et seq., and the Virginia Pollution Discharge Elimination System (VPDES) under the Virginia Water Control law, Code of VA §62.1-44.2 et seq., establishes discharge limitations for point source discharges to surface water based on designated use of the receiving stream. Since the treated ground water will be discharged to a nearby surface water body, NPDES requirements set forth in 40 C.F.R. Part 122, 129, and 131 and VPDES requirements set forth in VR §§680-14-00 and 680-21-00 will be met.

- Operation of the air stripping unit must comply with the requirements of 40 C.F.R Part 264, Subpart AA and §10.15 of the VHWMR, VR §672-10-1.

2. **Location-Specific ARARs**

- The Endangered Species Act of 1973 (16 U.S.C. §1651 et. seq.), the Virginia Board of Game and Inland Fisheries (Code of Virginia §§ 29.1-100 et seq.), and Virginia Endangered Species Act, Code of Virginia §§ 29.1-563, provide a means for conserving various species of fish, wildlife, and plants that are threatened with extinction. These ARARs will be applicable if a determination is made that endangered species are present or will be affected by the remedial alternative.

C. Cost-Effectiveness

Section 300.430(f)(1)(ii)(D) of the NCP requires EPA to evaluate cost-effectiveness by first determining if the alternative satisfies the threshold criteria: protection of human health and the environment and compliance with ARARs. The effectiveness of the alternative is then determined by evaluating the following three of the five balancing criteria: long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, and short-term effectiveness. Both options of the selected remedy meet these criteria to varying degrees. Both options of the selected remedy are cost-effective because the costs are proportional to their overall effectiveness. The estimated present worth cost for Option 1 the selected remedy is $ 4,340,200 with the potential to cost $10,741,400 if contingencies are invoked and the estimated present worth cost of Option 2 of the selected remedy is $7,361,800 with the potential to cost $9,777,800 if the contingencies are invoked.

D. Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable (MEP)

Section 121(b) of CERCLA, 42 U.S.C. § 9621(b), establishes a preference for remedial actions that permanently and significantly reduce toxicity, mobility or volume of hazardous substances over remedial actions which will not.

If Option 2 of the selected remedy is implemented or if the contingency requirements for Option 1 of the selected remedy are invoked, permanent solutions and alternate treatment technologies will be utilized to the maximum extent practicable in a cost effective manner to control contamination at this Site. EPA issued two different proposed plans (5/5/93 and 11/24/94). Each proposed plan also presented preferred alternatives that represented different ways in which permanent solutions and treatment technologies could be utilized to the maximum extent practicable in a cost effective manner to control contamination at this Site. However, site-specific conditions have influenced the Agency to select an alternative that may not initially utilize permanent treatment measures. The site-specific

conditions mentioned above include: (1) the fact that this Site poses no current risk to public health; and (2) the options that make up the selected remedy are more cost-effective, without decreasing overall protection of human health and the environment, than the alternatives that more completely utilize permanent treatment technologies.

E. Preference for Treatment as a Principal Element

If Option 2 of the selected remedy is implemented or if the contingency requirements for Option 1 of the selected remedy are invoked, the selected remedy will satisfy the statutory preference for treatment as a principal element. The waste sludge and the surrounding contaminated soils in the eastern disposal trench, which are considered to be a principal threat will be excavated and incinerated offsite. Additionally, if the contingency requirements are invoked, for both Option 1 and Option 2 of the selected remedy, ground water treatment will be implemented.

XI. Documentation of Significant Changes

The Proposed Remedial Action Plan (PRAP) for the Buckingham County Landfill was first issued on May 5, 1993. The preferred alternative (8A) included excavation and offsite incineration of wastes/soils from the eastern disposal trench, excavation and offsite treatment/disposal of miscellaneous hazardous substances from the barrel trench, construction of a RCRA Subtitle C cap over the trench areas, and extraction and treatment of the ground water. The cost of this remedy was estimated at $20 million. During the public comment period following issuance of this plan, the PRPs adamantly opposed this remedy and the community followed suit.

The major comments regarding the Alternative 8A were as follows: (1) the cost of the remedy was too high; (2) any excavation or offsite transportation of hazardous wastes was perceived to be a significant health threat and, therefore, was opposed by the community; and (3) treatment via air stripping of the ground water was thought to be an "ineffective" technology. EPA also received comments from the responsible parties which indicated that Insitu Soil Vapor Extraction (ISVE) would be an effective technology for treatment of the eastern disposal trench as well as an acceptable alternative to the community.

EPA took all of the comments that were received into consideration and issued an Addendum to the Proposed Plan which identified Alternative 8C as the preferred alternative. Alternative 8C included the following components: (1) ISVE in the eastern disposal trench with an offsite incineration contingency if ISVE was not successful; (2) sampling in the barrel trench with an offsite treatment/disposal contingency; (3) construction of a RCRA Subtitle C cap over the trench areas; and (4) ground water monitoring with a ground water extraction and treatment as

a contingency.

The selected remedy is neither Alternative 8A nor Alternative 8C. The selected remedy is comprised of specific combinations of components from Alternatives 8B and 8C and a modification regarding barrel trench remediation based on public comment. The significant changes between the last preferred alternative (8C) and the selected remedy are as follows: (1) permanent treatment measures may not be initially implemented; (2) Option 1 of the selected remedy, without contingencies, consists of a RCRA cap and ground water monitoring; (3) ISVE will only be used in the eastern disposal trench if treatability studies are performed during remedial design that indicate implementation of ISVE will be successful; (4) source control measures for the barrel trench will be determined based on additional investigation followed by an FFS; EPA will issue a subsequent decision document which will specifically address remediation of the barrel trench; and (5) all of the contingency requirements, if they have not already been implemented as part of Option 2, will be triggered by migration of the ground water plume to the points of compliance.

EPA continues to maintain the position that the source control measures should be initially implemented to prevent further migration of the contamination. However, other interested parties maintain that the ground water will never migrate to the boundary of the property and therefore, excavation and treatment of the source areas is not necessary. EPA has therefore, allowed for two options under the selected remedy. Both options ensure protection of human health and the environment in the long-term.

PART III - RESPONSIVENESS SUMMARY
BUCKINGHAM COUNTY LANDFILL

This Responsiveness Summary documents public concerns and comments expressed during both the comment period following issuance of the Proposed Remedial Action Plan (PRAP) on May 5, 1993 and the comment period following issuance of the Proposed Plan Addendum (Addendum) on November 24, 1994. The summary also provides EPA's responses to those comments. The information is organized as follows:

I. Overview

II. Summary of significant comments from the May 25, 1993, public meeting and EPA responses

III. Summary of significant comments from citizens received during the first public comment period and EPA responses

IV. Summary of significant comments from the Potentially Responsible Parties (PRP) received during the first public comment period and EPA responses

V. Summary of significant comments from the April 26, 1994, public meeting and EPA responses

VI. Summary of significant comments from citizens received during the second public comment period and EPA responses

VII. Summary of significant comments from the PRPs received during the second public comment period and EPA responses

VIII. Summary of comments received from Congressman Payne regarding the Addendum to the Proposed Plan and EPA responses

IX. Summary of comments received from the Virginia Department of Environmental Quality (VDEQ) on the Draft Record of Decision and EPA responses

I. OVERVIEW

There has been two public comment periods associated with remedy selection for the Buckingham County Landfill Site (Site). The first comment period followed issuance of the PRAP and began on May 5, 1993. This comment period was initially scheduled to end on June 4, 1993, however, it was extended until July 6, 1993, as requested by the County of Buckingham. The first EPA public meeting was held on May 25, 1993, in the Buckingham County High School gymnasium in Dillwyn, Virginia.

At that meeting, EPA discussed the Remedial Investigation (RI), the Baseline Risk Assessment (BRA), and the Feasibility Study (FS) reports prepared for this Site. EPA also presented the PRAP for eliminating and/or mitigating the public health and environmental threats posed by the contamination detected in the environmental media at the Site. At that time, EPA explained that the preferred alternative included the following components: excavation and offsite incineration of materials from the eastern disposal trench; excavation and treatment/offsite disposal of the materials from the barrel trench; construction of a RCRA cap over the hazardous waste disposal area; recovery and treatment of ground water; ground water monitoring; and institutional controls.

The EPA public meeting held on May 25, 1993, provided the first opportunity for the public to ask questions and express opinions and concerns. Residents questioned the need for such a comprehensive remedy considering that the risk for the Site is based on future ground water use. The perceived economic impact that the preferred alternative would have on the PRPs, including the County of Buckingham, was a concern voiced by many citizens. And the overall cost of the preferred alternative was then, and is still, the concern expressed most vehemently and most often by the concerned community.

Following the public meeting held on May 25, 1993 and the close of the first comment period, July 6, 1993, EPA evaluated and considered comments that were received from all interested parties. In response to concerns voiced by the community, EPA developed two new alternatives and issued an Addendum to the PRAP on November 24, 1993, which opened a second public comment period. Following issuance of the Addendum, EPA attempted to schedule a public meeting on several different occasions starting in January 1994 and each meeting had to be cancelled due to inclement weather. The public meeting was held on April 26, 1994. The purpose of this meeting was to present two new alternatives to the community and to provide the community with an opportunity to ask questions and offer comments on these new alternatives. The second comment period closed on May 3, 1994. After considering all of the input received during the comment period, EPA issued a Record of Decision (ROD) on September 30, 1994, documenting the Agency's final decision regarding cleanup of this Site.

II. SUMMARY OF SIGNIFICANT COMMENTS FROM THE MAY 25, 1993 PUBLIC MEETING AND EPA RESPONSES

Significant questions and comments presented at the May 25, 1993, public meeting are listed and/or summarized briefly in this section. The EPA response, if appropriate, follows each of the questions or comments presented.

A. The following written comments were submitted to EPA at the public meeting:

1. The County of Campbell and the County of Appomattox submitted comments in the form of resolutions adopted by their respective Boards of Supervisors. These resolutions voiced opposition to the preferred alternative presented in the EPA PRAP and support for Alternative 3.

EPA Response: EPA believes that excavation of the concentrated waste areas, in conjunction with a cap (and possibly extraction and treatment of the ground water), will be necessary to ensure that the contaminated ground water does not migrate offsite. However, EPA's selected remedy allows the implementing party to choose a cap and monitor option, provided the party agrees to perform excavation and extraction/treatment of the ground water if migration of the ground water plume is detected at the points of compliance. Also see Section IX. of the ROD, Selected Remedy and Performance Standards, for an explanation regarding why Alternative 3 is not the selected remedy.

2. A written statement was received from Gordon G. Ragland, Jr., Chairman, Buckingham County Planning Commission. The major issues in his statement are as follows:

(a) The planning commission is opposed to the EPA plan and supports the plan proposed by Engineering-Science, Inc.

EPA Response: See response to Comment 1.

(b) For Buckingham County to fully fund Alternative 8A there would have to be an increase in the County tax rate of 1850%. When using a cost/benefit analysis approach to decision making, the costs of Alternative 8A are out of proportion with the benefits.

EPA Response: There are a variety of mechanisms to ensure that no PRP, regardless of whether it is a governmental or private entity, will incur the severe financial hardship anticipated by this commenter in order to fulfill its obligations under CERCLA. EPA has never imposed such severe financial burdens on any County or Municipality in the 14 years since CERCLA was enacted. EPA has offered to meet with the County to equitably resolve the County's CERCLA responsibilities for this Site. The Agency has also advised the County regarding the various settlement options available to it which would allow the County to fulfill its CERCLA responsibilities without imposing undue financial hardships on the taxpayers. These negotiations are ongoing at this time.

(c) The Site was operated in compliance with the laws at the time and Buckingham County bought the Site with the intent to properly close it.

EPA Response: CERCLA imposes strict liability for cleanup (i.e., liability without regard to fault) on site owners and operators, as well as those who generated and transported hazardous

substances that were disposed at a site. The intent of the law is to have those most closely associated with the problem bear the cost of cleanup rather than the public at large. In many cases, environmental laws governing disposal of hazardous substances did not exist or were of limited scope at the time when disposal at most Superfund sites occurred. Nevertheless, under CERCLA persons who owned or operated a site at the time of such disposal (or who currently own or operate the site) are liable for cleanup of the Site.

B. A presentation was given as a verbal comment on behalf of the PRPs by Susan Fullerton of Engineering-Science, Inc. at the May 25th public meeting. Significant comments made in this presentation are summarized below, followed by the EPA response.

3. The statement was made that the Site is located on a 120 acre property and the 2 acre landfill is located on an 8 acre cleared area. The ground water contamination has only moved about 50 feet outside the 2 acre area and therefore, has not moved offsite.

EPA Response: If by Site, Ms. Fullerton means the 8-acre cleared area surrounding the area where hazardous waste disposal operations took place, then EPA agrees that the ground water contamination has not moved "offsite". However, regardless of what the Site definition is, the ground water contamination has migrated beyond the area where disposal took place and EPA believes it will continue to do so. For the record, it should be noted that Section 101(a) of CERCLA, 42 U.S.C., §9601, defines a facility as, inter alia,"...any site or area where hazardous substances has been deposited, stored, disposed of, placed, or otherwise come to be located," (emphasis added). Therefore, as the hazardous substances released from the Site expand, the boundaries of the Superfund Site also expand.

4. The statement was made that the cancer risk, which was quoted to be 2.6×10^{-1} during the EPA presentation, was misleading. It is the opinion of the PRPs that this risk would apply only if a well was drilled within the area of the plume.

EPA Response: The above stated risk translates to: 26% of the people exposed to the contaminated ground water under the exposure scenario described in the ROD would develop cancer. This is an accurate description of the risk associated with this Site. EPA agrees that it is unlikely that anyone would build a home or drill a well directly on the disposal area at the Site, because such development would be prohibited under current Virginia law and the institutional controls described in the ROD. Because the properties in the general vicinity of the Site are primarily residential and are expected to remain so, EPA considered future residential land use near the Site to be appropriate. At Superfund sites with ground water contamination, the area of consideration in performing the risk assessment includes areas where contamination would likely migrate given

groundwater movement at the site, hence the 2.6×10^{-1} cancer risk. Baseline risk assessments at all Superfund Sites are performed to determine the risks to human health and the environment that would occur if no further actions were taken.

5. The statement was made that the soils at the Site are relatively impermeable and, although not as impermeable as clay, these soils (saprolite) tend to hold the ground water in place. The conclusion was that although the ground water is moving it is moving at a very slow pace.

EPA Response: EPA does not consider soils with a permeability factor of 1.1×10^{-3} to be "relatively impermeable". Although EPA believes that the contaminated ground water is migrating, experts at the EPA Robert S. Kerr Environmental Research Laboratory have determined that more data regarding the geology (fractured bedrock) and the ground water at the Site needs to be gathered before final conclusions regarding the rate or direction of the ground water flow can be made. The first priority for implementation of the selected remedy will be to gather this information and design and install the ground water monitoring network.

6. The statement was made that the existing caps on each of the individual trenches are limiting the movement of the contaminated ground water.

EPA Response: Any cap, including the existing caps or even a RCRA multilayer cap, can only prevent contaminants from leaching **downward** under the influence of infiltration. Ground water moves in all directions including upward and laterally. The ground water is already contaminated. EPA does not believe that the RCRA cap included in the selected remedy will effect the movement of the contaminants that are already in solution in the ground water.

7. The area of the barrel trench has been questioned. It has been stated by the PRPs that the entire barrel trench was not represented in the proposed remedy.

EPA Response: During operations at the Site, the barrel trench was located at the southern portion of the Site and, as described on page 1-8 of the RI, was approximately 400 feet long, 20 feet wide, and 14 feet deep. This area was specifically used for disposal of supposedly empty, crushed drums. This trench was never completely filled; The west end remained open until the Site was closed in 1983. During installation of the cap in 1983, portions of empty crushed drums were found mixed in with the solid waste landfill south of the barrel trench. Fourteen test pits were dug in this area to determine if drums were disposed of throughout this area. Five test pits uncovered portions of empty drums and two pits uncovered cloth laden with solvents. There were no reports of finding drums containing hazardous wastes. EPA does not consider the area where the test pits were dug to be

part of the barrel trench.

8. The statement was made that the EPA cost estimate for the preferred remedy is low. The PRPs estimated that the preferred remedy would actually cost $30-40 million as opposed to the $20 million estimate prepared by EPA because (1) EPA's volume estimate for the barrel trench is incorrect and (2) in order to meet the soil cleanup goals presented in the proposed plan more of both the barrel trench and the eastern disposal trench would have to be excavated.

EPA Response: Engineering-Science (ES) announced to the residents at the May 25th public meeting that EPA's remedy (Alternative 8A) would cost $30-40 million. However, no backup cost documentation has ever been provided to substantiate this claim.

Due to unknown factors, assumptions must be made when costs are estimated for Site cleanups. There are some fundamental differences between ES's and EPA's assumptions that were made during cost estimation which account for the differences in the cost estimates. ES assumed that EPA would require a much larger volume to be excavated from the barrel trench. The area of the barrel trench is addressed in the response to Comment 7. However, aside from the test pits, no excavation of the barrel trench would be required under the selected remedy until additional information has been obtained, a Focused Feasibility Study (FFS) is performed, and EPA has set excavation performance standards in a subsequent decision document.

Regarding the assumption that, in order to meet the soil cleanup goals more of the barrel trench, as well as more of the eastern disposal trench, would need to be excavated, EPA acknowledges that the cleanup goals specified in the PRAP would only have to be met for the excavation as described for Alternatives 5-8, because these alternatives do not include a RCRA cap. It should also be noted that the volume targeted for excavation under Alternative 8A from the eastern disposal trench has been reduced in the selected remedy, without decreasing the effectiveness of the remedy. As noted above, a decision regarding performance standards for barrel trench excavation is being postponed until EPA has more data regarding the contaminants in the barrel trench.

9. ES believes that Alternative 3 provides overall protection of human health and the environment, which is an EPA threshold criteria.

EPA Response: EPA has carefully considered this position. The ROD states that Alternative 3 may provide protection of human health and the environment. However, this protection is only provided if the ground water contamination does not migrate to the points of compliance at which time extraction and treatment of the ground water would be necessary to provide adequate protection. The PRP's alternative is no longer screened out

because of not meeting this criteria.

10. It was stated that 700 dump trucks would be needed to transport the excavated materials from the Site to offsite facilities creating a "significant threat" to the community. The possibility of accidental spills along the route was mentioned as well as the liability of such a spill. Specifically it was stated that, "...you (the local community) are still involved in this Site, you're still paying for long-term liability".

EPA Response: The estimate of 700 dump trucks has never been substantiated by ES. This was not an EPA estimate and EPA maintains that the actual number of trucks for Alternative 8A would have been much less than 700. If Option 2 of the selected remedy is implemented or if the contingency actions for Option 1 of the selected remedy are deemed necessary, EPA estimates that no more than 35 trucks would be needed for disposal of materials from the eastern disposal trench.

The Agency is aware of the concern the community has regarding the transportation of hazardous materials. Transportation of hazardous materials does not pose a "significant threat" to human health as stated by ES. To minimize the potential risk, all Virginia Department of Transportation (VDOT) regulations regarding the transportation of hazardous wastes would be adhered to and truck traffic would be strategically spaced throughout the remedial action to avoid high traffic volumes at any one time.

The statement that "you" (the community) are liable for actions taken at the Site is inaccurate. The PRPs for the Site are responsible for the cleanup costs and potential extended liability, not the community.

11. The statement was made that ground water pump and treat is not an effective technology. Additionally, the extracted ground water would not be treated to the point that it is free of contaminants, therefore, previously clean streams will be contaminated by the discharge.

EPA Response: EPA agrees that the extraction and treatment of ground water may not, in all situations, be 100% effective in reducing the concentration of contaminants below health based standards throughout the plume. However, this ineffectiveness, in most cases, is due to the presence of Non-aqueous Phase Liquids (NAPLS) in the contamination plume which serve as a continuing source of contamination for long periods of time. The possible presence of NAPLS at this Site was not explored by ES but will be investigated during design of the ground water monitoring system as part of the selected remedy. Extraction and treatment systems have consistently been proven effective when the goal of the treatment is to contain the plume, and not to restore the aquifer to its' beneficial use. At this time, the ROD requires ground water monitoring with a contingency

requirement for extraction and treatment of the ground water.The goal of the extraction and treatment system will be to contain the plume within the points of compliance. Ground water underneath the waste disposal areas is not part of the area of attainment and hence does not have to meet ground water protection levels applicable to the points of compliance.

A concern about discharging treated ground water into clean streams was also raised. Although it is true that the treated ground water may contain trace levels of contamination, these levels would have to meet the Virginia Pollution Discharge Elimination System requirements which are established to protect both human health and the ecological integrity of streams.

C. The following significant issues were raised by citizens during the May 25, 1993, public meeting:

12. One citizen was concerned that samples were not taken from other areas of the county to determine if the levels of heavy metals found at the Site were comparable to natural background levels.

EPA Response: Background samples were collected from offsite areas, as required by EPA guidelines, to determine if the levels of contaminants found onsite are comparable to background levels. EPA is not required to sample other areas of the county.

13. One citizen wanted to know if it had been determined when the actual ground water contamination occurred. Specifically, the commenter was curious as to whether the contamination had occurred before or after the trenches were capped. The EPA Response to that question was that it is not known when the actual contamination occurred. This citizen then went on to ask, if we didn't know when the contamination occurred, why would EPA not consider a "more conservative financial approach to monitor the situation with a new cap without going to something as drastic as pumping and removing the material".

EPA Response: Knowing when the actual contamination occurred would not change the fact that the ground water contamination exists today. Alternative 8A included a RCRA cap. EPA does not disagree that a cap is warranted at this Site. Although capping the Site will limit the amount of infiltration through the waste materials to the ground water, EPA does not believe the cap will ultimately impede the contaminated ground water from migrating at its natural pace. EPA has consistently maintained that removing the most contaminated waste materials from the Site initially would ensure that these waste materials could no longer contribute to the already existing ground water contamination. If the Site is capped prior to removal of the source areas then these source areas will continue to contribute to the contamination already present in the ground water, conceivably making it necessary to extract and treat the ground water indefinitely. Also, see response to Comment 6.

The Agency has selected a remedy in this ROD that includes two options for remediation. Option 1 is to cap and monitor the Site until the migration of the ground water contamination beyond the points of compliance is documented. Once the ground water contamination has migrated beyond the points of compliance, then the source control measures will be required. Option 2 requires implementation of source control measures prior to capping. The implementing party will be given the opportunity to either address the source areas up front or install a cap while reserving source control as a contingency requirement. Given the currently documented movement of the plume, EPA believes it is likely that the contingency requirements will be invoked, making Option 2 much more cost-effective that Option 1.

14. One citizen also commented about the ineffectiveness of "pump and treat" technologies and specifically referenced an article in the June 1993 Readers' Digest by John Cherry.

EPA Response: See response for Comment 11.

D. The following comments were made during the comment segment of the public meeting:

15. Mr Watkins Abbitt, member of the Virginia State House of Delegates, made the following comments:

(a) He objected to the structure of the public meeting, stating that people who had come to comment had to leave because of job or family constraints due to the late hour and did not get the chance to comment.

EPA Response: The typical format for a public meeting on a Proposed Remedial Action Plan (PRAP) includes presentation of the PRAP by EPA, an opportunity for questions and answers, and then an opportunity for anyone wishing to provide oral comments to do so. EPA followed this format at the May 25, 1993, public meeting. EPA typically tries to answer all the questions individuals have before moving on to accepting comments. With an attendance of an estimated 800 to 1000 people at the meeting, the question-and-answer period was understandably lengthy. Many comments were actually given by individuals during the question-and-answer segment of the meeting. EPA has a complete transcript of the meeting and has included all significant comments provided at the meeting in this Responsiveness Summary. EPA did not close the meeting until all comments has been made. EPA also encouraged those present to take the opportunity to provide written comments because the public comment period would be continuing through July 6, 1993. Hundreds of people did, in fact, provide letters to EPA. All significant comments contained in these letters are also included in this Responsiveness Summary.

(b) Mr. Abbitt questioned the assertion that the hazardous compounds at the Site are "highly mobile", as stated in the EPA

presentation.

EPA Response: Volatile Organic Compounds (VOCs) are present at significantly elevated levels in the waste materials and the ground water at this Site. Of all the contaminants that are considered to be hazardous, VOCs are most likely to migrate because of their tendency to volatilize. In other words, these compounds are highly mobile as stated in the presentation. The fact that contaminants that were present in the waste materials in the trenches have migrated into the ground water indicates that these compounds are highly mobile. Additionally, residual waste material is present in the eastern disposal trench from about 10 feet to 14 feet below grade. Elevated levels of VOCs were noted to at least 24 feet below grade in the soils underlying this waste material, as well as in the ground water also indicating that the contaminants in this waste are highly mobile.

(c) Mr. Abbitt then went on to stress that the ground water contamination has only moved forty feet.

EPA Response: EPA's conclusion after analyzing the monitoring data is that the ground water contamination has moved further than this distance. As of July 1992, the plume of ground water contamination at this Site has expanded up to 140 feet from the most highly contaminated cluster of monitoring wells. This cluster of wells is located between the western disposal trench and the barrel trench. In 1992, it was estimated by the potentially responsible parties that the plume may actually extend up to 60 feet beyond monitoring well 6S (see Figure 4 of the ROD), leaving approximately 60 feet to the boundary of the 8-acre Site, defined as the points of compliance.

(d) Mr. Abbitt then commented on the three in ten cancer risk and stated that it only applied to a well drilled right through the trenches.

EPA Response: See response to Comment 4.

(e) Mr. Abbitt then commented on the proposed pump and treat system and how he was opposed to discharging the treated ground water into a nearby stream.

EPA Response: See response to Comment 11.

16. Mr. Wayne Wright, a citizen of Buckingham County and an employee of one of the PRPs, brought up the possible economical ramifications of implementing Alternative 8A. He stated that he cannot afford higher taxes and he believes that layoffs, cutbacks and bankruptcy may be the result of implementation of Alternative 8A.

EPA Response: Many Buckingham County residents believe that they may have to pay for a substantial portion of the cleanup through

higher taxes. However, as is stated in the response to comment 2(b), EPA has the authority to settle with the County to ensure that the County does not incur an undue financial hardship in assisting with the remediation of this Site.

The remedy selection process, as defined by law, is not based on whether or not the PRPs can pay for the cleanup. EPA is responsible for protecting human health and the environment. There are many site cleanups that are paid for by the Superfund, if either PRPs don't exist or are not financially viable. If there are legitimate reasons to believe that any PRP cannot afford to pay for a particular remedy, EPA investigates the parties in question and prepares complete financial analyses to determine if they are capable of paying for the selected remedy.

III. SUMMARY OF SIGNIFICANT COMMENTS FROM CITIZENS RECEIVED DURING THE FIRST PUBLIC COMMENT PERIOD AND EPA RESPONSES

A. Over one thousand postcards were received by EPA which stated the following:

17. "I strongly support the plan to cap and monitor Love's Landfill, but otherwise leave it alone. I believe this plan fully protects Buckingham County and its citizens.

I oppose the EPA plan. It gives no more protection, creates risks, and could result in job losses. The EPA plan makes no sense for Buckingham County."

EPA Response: EPA believes that excavation of the concentrated waste areas, in conjunction with a cap (and possibly extraction and treatment of the ground water), will be necessary to ensure that the contaminated ground water does not migrate offsite. However, EPA's selected remedy allows the implementing party to choose a cap and monitor option, provided that the party must perform excavation and extraction/treatment of the ground water if migration of the ground water plume is detected at the points of compliance. Also see Section IX. of the ROD, Selected Remedy and Performance Standards, for an explanation regarding why Alternative 3 is not the selected remedy.

B. Over eight hundred letters were received by EPA during the comment period. Many of the concerns expressed in these letters were also voiced at the May 25, 1993 public meeting and therefore, have been addressed previously in this responsiveness summary. The following additional comments/concerns about the proposed plan, which are significant and relevant to this Site, were raised in the letters from citizens:

18. Many citizens are concerned in general with the cost of the preferred alternative (8A) in the proposed plan.

EPA Response: The cost estimate for this remedy was $20,216,697. When developing the preferred alternative in the PRAP (8A), EPA carefully considered which areas of the Site pose a principal threat. Alternative 8A specifically identified areas where excavation would be required and the estimated cost was a conservative figure which assumed greater levels of excavation and treatment than were actually anticipated. However, EPA has made specific changes to the remedy presented in the PRAP to address these citizens' concerns by reducing the scope of the remedy without decreasing its effectiveness and thereby, reducing the overall cost. The cost estimate for Option 1 of the remedy selected in the ROD is $4,340,000 with the potential for costing $10,711,400. Option 2 is estimated to cost $7,361,800 with the potential for costing $9,777,800.

19. Many citizens were generally concerned about the liability of Thomasville furniture and the other PRPs. There seemed to be an overall lack of understanding regarding the PRPs liability (why the PRPs have to pay for the cleanup).

EPA Response: CERCLA imposes liability for cleanup on site owners and operators, as well as those who arranged for disposal of hazardous substances at a Site. Thomasville Furniture disposed of hazardous wastes at the Site and Buckingham County owns the Site. The intent of the law is to have those most closely associated with the problem bear the cost of cleanup rather than the public at large. Where, as in this case, the management practices at a Site have given rise to releases of contamination, entities associated with the facility are required under the law to bear the responsibility of remediating the contamination.

20. Many citizens are concerned with the possibility of employee layoffs when the PRPs are required to pay for the selected remedy.

EPA Response: As mentioned in response to comment 18 above, EPA has made many changes to the preferred alternative presented in the PRAP that significantly lowers the cost of the Site remediation work specified in the ROD. EPA can negotiate settlements based on "ability to pay"in cases where a party would suffer severe economic hardships in attempting to comply with its CERCLA obligations regarding Site cleanup. Nonetheless, decisions regarding the optimum number of employees working for a company is ultimately under that company's discretion. Moreover, that decision is based on a variety of factors in addition to the company's environmental obligations. Also, see EPA response to Comment 16.

21. Many citizens are concerned with the possibility of higher taxes because Buckingham County is one of the PRPs required to pay for the selected remedy.

EPA Response: See EPA response to Comments 2(b), 16, and 18.

22. The citizens are concerned that implementation of the selected remedy will be creating safety and health risks to the citizens of Buckingham County.

EPA Response: If Option 2 or the contingencies for Option 1 are implemented, the selected remedy, could pose some risks to workers in the immediate area of the excavation. However, these workers will be protected by personal protective equipment, will be required to have the 40-hour health and safety training course and will be required to adhere to all Federal health and safety regulations, including ambient air monitoring.

Risks associated with transportation of wastes from this Site will be minimized by adhering to health and safety regulations relating to transportation of hazardous materials and truck traffic would be strategically spaced throughout the remedial action to avoid high traffic volumes at any one time. Transportation of hazardous materials occurs safely in this country everyday. The Agency believes that the incidental risk due to excavation and transportation of wastes currently onsite to a treatment or disposal facility is more than offset by the fact that excavation and appropriate treatment of the waste materials at this Site would eliminate any risk that these materials could pose to residents in the future.

23. Many citizens voiced the opinion that Alternative 3 would provide just as much protection of human health and the environment as the preferred alternative in the PRAP (8A) and would cost much less.

EPA Response: Although Alternative 3 is a less expensive alternative, the Agency does not agree that Alternative 3 is equally as protective of human health and the environment as Alternative 8A for the reasons stated in Section IX. of the ROD.

24. Many citizens voiced the opinion that there is no current risk and therefore, there is no need for cleanup.

EPA Response: The fact that there is no current risk at the Site does not mean that the Site is safe. When making decisions regarding Superfund sites, EPA must consider the long term effects of contamination at a Site and not just the present conditions. Currently, the properties in the general vicinity of the Site are primarily residential and are expected to remain so. Therefore, future residential use of the ground water (future risk) must be considered when making any decisions regarding this Site.

25. Many citizens are concerned with the hazards posed by hauling the wastes through their county. They feel that it does not make sense to burn or bury the waste somewhere else.

EPA Response: As discussed above in the response to Comment 22, risks associated with transportation of wastes from this Site can

be minimized by adhering to health and safety regulations associated with transportation of hazardous materials. Additionally, the volume of waste materials that will be transported offsite under Option 2 or the contingency options for Option 1 of the selected remedy, is significantly less than that of the preferred remedy presented in the PRAP. Because the volume of materials to be transported has been reduced, the risks of this transportation are also reduced. EPA does not deny that, when transporting hazardous materials, there is the risk of accidents and therefore, the risk of spills. However, the possibility of this occurring is remote.

The wastes that are currently present onsite were just dumped into open trenches. There is no evidence of a liner between any of the wastes and the ground water and there is no system in place for the collection and/or treatment of leachate. If Option 2 or the contingency options for Option 1 of the selected remedy are implemented, the waste material from the eastern disposal trench will be incinerated at a RCRA permitted incineration facility. The incineration treatment process actually destroys the contaminants, in this case VOCs. EPA believes that despite the marginal risks, excavation and offsite incineration of the wastes at a RCRA-permitted facility will be more environmentally sound than allowing the wastes, which represent a continual source of ground water contamination, to remain at the Buckingham Site untreated. It should be noted that Insitu Soil Vapor Extraction (ISVE) is also an option for treating the waste materials in the eastern disposal trench.

26. Many citizens believe that ES's plan (Alternative 3), if implemented, will "ensure that the landfill remains safe".

EPA Response: As previously explained, the fact that there is no current risk at the Site does not mean that the Site is "safe". The cap and monitor plan (Alternative 3) is not a permanent remedy, does not provide for measures that actively address the concentrated waste sources at the Site, provides no contingency for treatment of contaminated ground water should the plume migrate to the points of compliance, and therefore, this remedy may not be able to guarantee effectiveness in the long term. EPA, therefore, does not agree with the statement that Alternative 3 will "ensure that the landfill remains safe". Although Option 1 of the selected remedy is essentially the "cap and monitor" remedy, this option also provides for source control measures and extraction and treatment of the ground water if the ground water contamination migrates beyond the points of compliance. See also Section VIII. of the ROD for further analysis of Alternative 3.

27. Some citizens expressed the concern that Buckingham County alone would be spending $30 million on this remedy. Fear that the county will go bankrupt has stemmed from this belief.

EPA Response: The cost estimate for the preferred alternative (8A) presented in the PRAP was $20,216,697, not $30 million. In addition, the selected remedy has been modified with a corresponding reduction in the cost without decreasing the effectiveness of the cleanup. The cost estimate for Option 1 of the remedy selected in the ROD is $4,340,000 with the potential for costing $11,711,400. Option 2 is estimated to cost $7,361,800 with the potential for costing $9,777,800. Also, see response to comment 2(b).

28. Some citizens brought up the fact that public sentiment is against the alternative presented in the PRAP (Alternative 8A). Some citizens stated that this needs to be a major factor in EPA's decision.

EPA Response: Alternative 8A has been modified in such a manner that total anticipated costs are approximately half as expensive as the cost estimate for Alternative 8A presented in the PRAP. In addition, EPA has provided the PRPs with the option of essentially implementing Alternative 3, provided that they are willing to take the risk of also implementing more costly contingency requirements should the ground water contamination migrate to the points of compliance.

29. A few citizens were concerned that the existing ground water contamination actually occurred before the trenches were capped. One citizen stated that there was evidence to that effect.

EPA Response: There is no evidence that the contamination occurred before the trenches were capped. Also, see response to Comment 13.

30. Many citizens do not feel that the PRPs should be responsible because at the time of disposal no laws were broken.

EPA Response: See response to Comment 2(c).

31. Many citizens voiced the concern that they did not want "partly cleaned ground water" discharged into local streams.

EPA Response: See response to Comment 11.

32. A majority of the letters from local citizens indicated that they were against the EPA plan and in favor of the plan proposed by ES.

EPA Response: See response to Comment 1.

33. Some citizens are concerned that the facilities where the waste is sent may become Superfund sites and the PRPs would then also be PRPs for those sites.

EPA Response: There is a very remote possibility that this will occur. Environmental laws are much more strict today than they

were at the time of disposal at the Buckingham Site. Many more precautions are required such as double liners and leachate collection systems. Therefore, it is highly unlikely that the PRPs will be responsible for cleanup of another Superfund Site due to disposal of materials from this Site.

34. A couple of citizens questioned why the costs of cleanup would not be paid for by the "Superfund".

EPA Response: The "Superfund" is only used at sites where the PRPs are unknown or not financially viable. The PRPs for this Site have been identified and, at least as a group, appear to be capable of paying for the cleanup. Also, see responses to comments 2(b), 16, and 20.

35. Many citizens were concerned with the fact that (for Alternative 8A) EPA only proposed to remove approximately one third of the waste from the Site and not all of the waste.

EPA Response: CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) specify a preference for using treatment technologies to treat principal threats at sites whenever practical. At this Site, EPA has determined that the wastes in the eastern disposal trench and the barrel trench pose a principal threat. The only actual "waste" material (sludge) onsite is located in the eastern disposal trench. Additionally, there are drums with an unknown amount of waste materials located in the barrel trench. The remaining areas of the site (the evaporation trench and western disposal trench) have been found to have relatively low levels of contamination and are therefore considered to be low level threats. CERCLA and the NCP indicate that it is acceptable to cap such low level threats. Therefore, under Option 2 or the contingency requirements for Option 1, EPA will be systematically removing those waste materials that represent a principal threat at the Site.

36. A few citizens voiced the concern that EPA's proposed remedy did not include long term monitoring of the ground water.

EPA Response: EPA agrees that the inclusion of long term monitoring of the ground water as set forth in the preferred remedy presented in the PRAP was not evident. However, long term ground water monitoring is an inherent part of the ground water extraction and treatment system described in the PRAP. In order to determine if any extraction and treatment system is working effectively, routine samples must be obtained and analyzed on a regular basis. Both Options 1 and 2 of the selected remedy in the ROD include long term monitoring of the ground water using a network of "trigger" wells.

37. A few citizens were concerned about the release of hazardous substances into the atmosphere during the excavation of the hazardous materials.

EPA Response: The only individuals who could potentially be affected by any volatilization of the hazardous materials would be the onsite workers. As previously mentioned, these workers will be protected by personal safety equipment and the levels of contaminants in the air will be monitored to insure that these workers are not exposed to unacceptable levels of contaminants. Once the contaminants reach the atmosphere, not only will they volatilize, but they will also dissipate. Any amount of contaminants leaving the Site through the air will not exist in high enough concentrations to be harmful by the time they would reach any residential areas.

38. More than one citizen stated that the landfill was approved by EPA. They in turn believe that EPA should be a PRP.

EPA Response: The landfill was not approved by EPA. The hazardous waste disposal operations run by Mr. Love had received RCRA Interim Status. This only means that EPA identified it as a Site where disposal operations involving hazardous wastes were occurring and could continue if performed in accordance with certain legal standards pending the issuance of a RCRA permit for the Site. EPA's acknowledgement of the facility's interim status under RCRA § 3005(e) had and has no impact on liability for cleanup imposed by CERCLA, a separate and distinct statute. Mr. Love was required to obtain a RCRA Part B permit which would actually regulate the operations at the Site. This was never done. Also, see response to comment 129.

39. One citizen expressed the opinion that providing a public water line would eliminate the risk by eliminating the use of ground water as a potable source.

EPA Response: Section 121 of CERCLA 42 U.S.C. § 9601 contains a statutory preference for treatment of the source of contamination at a site. The remedial alternative selected by this ROD provides a compromise between permanent treatment measures and cost effectiveness. The installation of a water line would not in any way address the source of contamination at the Site.

40. One citizen made the statement, "as of May 19, 1993, EPA announced it would limit the use of incineration to dispose of hazardous wastes".

EPA Response: Although EPA has cut back on the use of incineration to dispose of hazardous wastes, there are some materials that are still most effectively addressed by incineration. Offsite treatment via incineration of the waste from the eastern disposal trench is still, in the Agency's opinion, the best option for that material. Moreover, the volume of materials to be incinerated is relatively small (675 yd^3).

41. One citizen questioned why the Site was put on the National Priority List (NPL) when it poses no risk.

EPA Response: The Site poses a future risk to human health via the existing plume of ground water contamination. These risks have been discussed in detail in the response to Comment 4. All sites are evaluated for placement on the NPL using a systematic mathematical model (the hazard ranking system). Each site is assigned a numerical ranking based on this system. If this numerical ranking is above the cutoff point of 28.5, the site is eligible for placement on the NPL. The score for the Buckingham County Landfill was 40.77, making it eligible for the NPL.

42. One citizen voiced the opinion that replacement of the existing cap (Alternative 3) would "accomplish the purpose of reducing the mobility of the ground water and soil contamination".

EPA Response: Replacement of the existing cap would only decrease the infiltration of contaminants through the trench materials to the ground water. A cap does not tend to impede the natural movement of ground water and will therefore probably not impede the movement of contaminants already in solution in the ground water. Also, see response to comment 1.

43. Virginia State Senator Houck provided the following additional comments to the ones already listed above:

(a) The Senator points out the following : (1) any cost the County is required to contribute will be in addition to the approximately $500,000 it has already spent in acquiring, closing, monitoring, and conducting studies at the Site; (2) the County's motive in acquiring the Site was to prevent its further use as a hazardous waste disposal facility; and (3) these actions were taken in the best interest of the community and ought not be used against Buckingham County by serving as the basis for an assessment of liability.

EPA Response: EPA is aware that the County has expended a substantial amount of money on the Site in construction of a ground cover that has helped impede the leaching of the source contaminants into the ground water. Such actions by the County are appropriate for consideration during any settlement negotiations that might ensue between the County and EPA concerning this Site. However, the County was also aware at the time of purchase of the Site that the purchase alone would make it a responsible party for any future CERCLA Site remediation.

(b) The Senator states that "EPA's analysis of cleanup alternatives fails to take into account the risks to which county residents would be subjected by diverting to landfill cleanup the huge share of resources that would be required by 8A. Such a diversion of revenue could strip the locality of the money it needs to provide its citizens with police and fire protection, education, and other vital services."

EPA Response: Whenever an entity spends money on a given activity or project it cannot spend the same money on some other activity or project. When Congress enacted CERCLA and placed the burden for environmental cleanup on the parties responsible for creating the problem, it understood that these parties - be they counties, municipalities, or private parties - would have fewer funds available for other activities. By enacting CERCLA without any special limitations for counties and municipalities, Congress determined that environmental remediation took precedence over alternate fiscal decisions available to the responsible counties and municipalities. Nonetheless, should site remediation pose a severe economic hardship to the County, EPA would consider entering into settlement with the County based on its ability to pay. Also, see response to comments 2(b) and 16.

44. One citizen suggested EPA take the following steps to resolve controversy over the Site that: (1) The EPA and the PRPs should first attempt to define reasonable achievable remediation objectives; (2) EPA should then review the site remediation plan which is proposed by the PRPs and assess its capability of achieving the stated objectives. As part of this assessment, risk analysis would be performed; (3) An implementation plan and schedule would be agreed upon and the project completed; (4) the Site would be monitored for a reasonable period of time to ensure the effectiveness of the solution; and (5) if unsuccessful, a corrective action plan would be prepared and implemented.

EPA Response: This citizen is essentially describing the Superfund process and most of these steps have either already been taken or will be taken in the future. Remedial Action Objectives (RAOs) were identified in the FS. The PRPs site remediation plan (Alternative 3) along with all the other alternatives presented in the FS, were evaluated in the FS and subjected to detailed analysis during the ROD process. Both a human health and ecological risk assessment were conducted in conjunction with the RI, prior to evaluation of the alternatives. Implementation of the remedy selected in the ROD, including a schedule for work to be performed, will be negotiated between the PRPs and EPA and, if an agreement is reached, a Consent Decree, which is a legal document specifying actions to be taken, will be signed by the PRPs and EPA. As part of both options in the selected remedy, monitoring of the ground water will be conducted to ensure the effectiveness of the remedy. If migration of the ground water plume is detected, then corrective measures will be taken to address this migration.

45. One citizen indicated that his well was contaminated with chromium and beryllium as a result of the hazardous waste practices at this Site.

EPA Response: Chromium and beryllium were not detected in significant levels in the wastes, soils or ground water samples obtained from the Site. At this time, it is not clear what the source of this contamination is. It is possible that the

chromium and beryllium in this residential well is naturally occurring.

46. One citizen indicated that borings dug by a geologist he hired revealed no evidence of a liner in the evaporation trench.

EPA Response: EPA agrees that this liner does not appear to exist.

47. One citizen expressed the opinion that the western disposal trench and the evaporation trench should also be excavated and treated as a source of contamination along with the eastern disposal trench and the barrel trench.

EPA Response: Samples obtained from the western disposal trench and the evaporation trench during the RI indicated that there were no significant levels of contamination in these trenches. Unlike the eastern disposal trench and possibly the barrel trench. The western disposal trench and the evaporation trench do not constitute concentrated waste sources. Therefore, it is appropriate to cap these particular areas as opposed to excavating them. It should be noted that any excavation decision for the barrel trench will be postponed until after additional information on this trench has been gathered. Any subsequent excavation decision will be subject to public comment prior to that decision becoming final.

48. One citizen stated that the following statement in the PRAP, "Troublesome Creek Reservoir is upgradient of the Site", is an incorrect statement.

EPA Response: Although the reservoir is topographically lower than the site, it is in a different watershed. The RI did not indicate that this reservoir was affected by Site-related contamination.

49. One citizen stated the opinion that the selected remedy must include active measures for cleaning up the ground water.

EPA Response: EPA's selected remedy for the ground water includes monitoring alone with a network of "trigger wells" until such a time that the plume is shown to be migrating. In the event that the plume migrates to the points of compliance, extraction and treatment of the ground water will be implemented. However, the purpose of the extraction and treatment would be to contain the plume rather than to restore the ground water underneath the waste management areas to the protection levels specified for the points of compliance.

50. One citizen voiced the opinion that the soil cleanup goals are too high, not protective enough.

EPA Response: The soil cleanup goals identified in the PRAP will not be used. Under Option 2 and the contingencies for Option 1

of the selected remedy the goal of excavation will be to remove the concentrated waste sources. In the eastern disposal trench the layer of waste present between 10 and 14 feet below ground surface comprises the concentrated waste source. Performance standards for excavation in the barrel will be set by a subsequent EPA decision document. The remaining contaminated soils would remain onsite beneath the multilayer RCRA cap.

51. One citizen stated that the RI/FS should not have been limited to the hazardous waste disposal area. This citizen felt that all waste management areas on the property should have been investigated.

EPA Response: The remaining areas of the Site include a borrow pit and a solid waste landfill. The borrow pit was used for excavation of clean soils to be used as cover material for the wastes during disposal operations. There is no evidence that hazardous wastes were disposed of in the borrow pit or the solid waste landfill.

52. One citizen stated that the current ground water monitoring network is inadequate.

EPA Response: EPA agrees with this statement and during design of the selected remedy a new system of monitoring wells will be developed using both saprolite and bedrock wells. Additionally, the two closest downgradient residential wells will be sampled regularly. This monitoring well system will be subject to EPA approval.

IV. SUMMARY OF SIGNIFICANT COMMENTS FROM THE POTENTIALLY RESPONSIBLE PARTIES RECEIVED DURING THE FIRST PUBLIC COMMENT PERIOD AND EPA RESPONSES

During the comment period, EPA received formal comments from the PRPs or their respective representatives. Many of the comments in the letters listed below were also voiced at the public meeting and in letters from the community and have been addressed previously in this responsiveness summary and therefore, are not addressed below. The following additional comments/concerns about the PRAP, which are significant and relevant to this Site, were raised in the letters from PRPs:

Buckingham County Board of Supervisors

- Letter to Melissa Whittington from David Moorman, County Administrator, dated July 6, 1993.

53. It was stated that the VOCs in the existing plume would be eliminated through the natural attenuation processes of biodegradation, adsorption, and dilution.

EPA Response: EPA Region III received technical assistance from experts at the EPA Robert S. Kerr Environmental Research Laboratory (RSKERL) regarding many Site related issues including

natural attenuation of the ground water. Experts from RSKERL have determined that there is insufficient data to determine if natural attenuation of the plume will occur at all, let alone eliminate the existing contaminants. Actual degradation rates would be dependant on a myriad of environmental, physical and chemical factors. RSKERL experts indicated that the following additional data would have to be gathered in order to adequately evaluate the effectiveness of natural attenuation (for more detailed information on this subject see Memo from Don Draper (RSKERL) to Melissa Whittington dated August 4, 1993 in the Administrative Record):

- The concentration of all electron acceptors associated with the Site would have to be known.
- Tests to determine Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) would have to be obtained from ground water samples. Total Organic Carbon (TOC) and Dissolved Organic Carbon (DOC) would also be useful in the evaluation.
- A microcosm test would need to be performed mimicking as closely as possible ambient aquifer conditions.
- Analysis of intermediate and final end products of Contaminants of Interest (COI) degradation.

54. "The discharge of partially treated ground water into surface waters presents significant potential for the build up of contaminants over time so as to render currently clean surface waters additional clean-up sites."

EPA Response: See response to Comment 11.

55. It is stated that "both the community and the Commonwealth adamantly oppose the PRAP".

EPA Response: EPA does not dispute the fact that a majority (not all) of the community is opposed to the preferred remedy presented in the PRAP. However, the statement that the Commonwealth "adamantly opposes" the plan is inaccurate. The Commonwealth has raised certain questions and issues on the PRAP which EPA has tried to address in this ROD. Also, see response to comment 17.

Sara Lee Knit Products (SLKP)

- Letter to Melissa Whittington from Steve Draper, dated July 1, 1993.

56. It is stated that Alternative 8A as presented in the Proposed Plan "violates at least four major concerns associated with selecting a protective remedy". CERCLA §121(b)(1)(A)-(G) is referenced. SLKP recommends EPA adopt Alternative 3.

EPA Response: The concerns outlined in the referenced section of CERCLA above are not criteria for remedy selection. The above referenced section of CERCLA states, "In assessing alternative remedial actions, the President shall, at a minimum, take into account: (A) the long-term uncertainties associated with land disposal; (B) the goals, objectives, and requirements of the Solid Waste Disposal Act; (C) the persistence, toxicity, mobility, and propensity to bioaccumulate of such hazardous substances and their constituents; (D) short and long-term potential for adverse health effects from human exposure; (E) long-term maintenance costs; (F) the potential for future remedial action costs if the alternative remedial action in question were to fail; and (G) the potential threat to human health and the environment associated with excavation, transportation, and redisposal or containment." EPA did take all of these concerns into account when selecting the remedy. In addition to the above criteria, CERCLA also requires that, "the President shall select a remedial action that is protective of human health and the environment, that is cost-effective, and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable". In this respect, the modified Alternative 8A selected in the ROD ranks well above Alternative 3, which is the alternative selected by the PRPs.

57. SLKP poses the question," While Alternative 8A would reduce the volume of some source materials, to what extent would excavation of those materials reduce the inherent hazards posed by principal threats at the Site"?

EPA Response: The PRAP, as well as the ROD, makes a clear distinction between source materials that are posing a principal threat and source materials that are posing a low level threat. The sole purpose of excavation at this Site is to remove the principal threats in order to eliminate the possibility of further degradation of the aquifer. The eastern disposal trench is currently considered an area that poses a principal threat and will be excavated if Option 2 of the selected remedy is implemented or the contingencies for Option 1 are invoked. The barrel trench might also be an area posing a principal threat and will be further investigated to determine it this is the case. The remaining areas of the Site are considered to be low level threats. It is appropriate under CERCLA to cap low level threats.

58. SLKP has implied that the preferred remedy in the PRAP is significantly less implementable than the PRP's preferred alternative (3).

EPA Response: Evaluating the implementability of alternatives does not mean that the simplest, least complex remedy should be selected to clean up Superfund Sites. In order to effectively clean up Sites, more complex remedies are often justified. Although capping and monitoring alone may be easier to implement

than some of the other options included in the selected remedy, that does not necessarily mean that the selected remedy poses implementation difficulties.

SLKP particularly emphasized the "unknowns with designing and testing a ground water extraction and treatment system or ensuring massive amounts of soil are properly excavated, analyzed, transported and ultimately incinerated or land disposed in accordance with RCRA". EPA agrees that designing a ground water extraction and treatment system, considering the complex geology at this Site, may be a difficult task. However, if contaminated ground water is migrating toward residential wells, extraction and treatment, regardless of complexity, is certainly warranted. At this time, both options in the selected remedy in the ROD do not include extraction and treatment of the ground water. Extraction and treatment of the ground water will be implemented if and when the ground water contamination migrates beyond the points of compliance.

Excavation and transportation of materials is not a complex activity, as implied by SLKP. These activities are commonplace among site cleanups and for experienced contractors are relatively simple tasks. The incineration will occur at an existing permitted facility that has been designed specifically for this purpose. In order to incinerate materials from this Site, aside from transportation, no additional effort will have to be expended.

59. SLKP discusses a statutory bias against the offsite transportation and disposal of hazardous substances without treatment, specifically emphasizing "wastes to be land disposed".

EPA Response: Excavation will only be part of the selected remedy if Option 2 is implemented or if the contingency requirements for Option 1 are invoked. The only known waste (sludge) material present onsite is found in the eastern disposal trench. This material will either be treated offsite via incineration or treated onsite via ISVE. No materials from the eastern disposal trench are intended to be land disposed. The remaining materials to be potentially excavated include drums and associated contaminated materials from the barrel trench as well as the surrounding incidental soils. EPA will issue a subsequent decision document regarding excavation of the barrel trench which will be made available for public comment.

60. SLKP has questioned the cost-effectiveness of the selected remedy.

EPA Response: The cost-effectiveness criteria does not dictate that the least expensive remedy be selected. The purpose of this criteria is to weigh the effectiveness of the remedy as well as the cost. By removing the waste materials located in the eastern disposal trench (and potentially the barrel trench if warranted), EPA is eliminating the possibility of further degradation of the

already-contaminated ground water by this source. In addition both options of EPA's selected remedy will also cap the Site and monitor the ground water as recommended by the PRPs. EPA has made many modifications to the preferred remedy presented in the PRAP and as a result of these changes the estimated cost of the cleanup has been reduced. The cost estimate for Option 1 of the remedy selected in the ROD is $4,340,000 with the potential for costing $10,711,400. Option 2 is estimated to cost $7,361,800 with the potential for costing $9,777,800. Both options of the selected remedy are cost-effective.

Womble Carlyle Sandridge and Rice (WCSR)

- Letter (including enclosures) to Melissa Whittington from Karen Carey, dated July 1, 1993.
- Two letters (including enclosures/attachments) to Melissa Whittington from Karen Carey, dated July 6, 1993.

61. The July 1, 1993 letter and one of the letters dated July 6, 1993, from Ms. Carey enclosed a variety of newspaper articles, editorials, announcements, letters, resolutions, a petition, a press release, and a videotape of television news coverage of the Site. Ms. Carey requested that EPA respond to these items in the Responsiveness Summary.

EPA Response: The issues raised in the letters to Stan Laskowski, Acting Regional Administrator of EPA, and issues raised in the County Resolutions have been addressed previously in this Responsiveness Summary. The remaining items are not comments and were not submitted by the respective authors to EPA for comment. Therefore, those remaining items are not addressed in this Responsiveness Summary.

62. WCSR states that "the Remedial Investigation (RI) showed that the only medium of concern at the Site is ground water under the center of the Site which contains volatile organic compounds above federal drinking water maximum contaminant levels". Page 9 of the PRAP is referenced.

EPA Response: The Baseline Risk assessment, not the RI, is the document that identifies media, as well as contaminants, of concern for Superfund Sites. The above-mentioned risk assessment for this Site states that the plume of contamination poses an excess cancer risk of 2.6×10^{-1}, if exposure to the plume should occur. The plume is not only present at the center of the Site but it has expanded at least 140 feet from the center of the Site referenced above.

63. WCSR states that EPA's plan will not meet ARARs at the center of the Site due to the demonstrated ineffectiveness of pump and treat technology.

EPA Response: See response to comment 11 regarding the perceived ineffectiveness of extraction and treatment of the ground water. WCSR appears to misunderstand the ARARs for potential ground

water extraction and treatment remedies. EPA presumes that the ARAR WCSR is referring to is that of attaining MCLs in the ground water as set forth in 40 C.F.R. Part 141, Subpart B. As is clear from EPA guidance, whenever the source of the contamination is removed during a remedial cleanup, MCLs must be met throughout the contaminated plume. However, when waste is left onsite the ground water underneath the waste management area is excluded from the definition of "area of attainment" for MCL purposes (see Section 5.2, "Guidance for Remedial Actions for Contaminated ground Water at Superfund Sites", December 1988, OSWER Directive 9238.1-02). Therefore, even though MCLs might not be met underneath the cap, EPA's selected remedy still meets the ARAR MCL requirement because the monitoring network surrounding the cap will ensure that MCLs are achieved in the ground water outside the management area.

64. In WCSR's evaluation of alternatives 8A and 3 using the nine criteria, it is stated that Alternative 3 "reduces toxicity and volume through the processes of natural attenuation of the volatile organic compounds in the ground water; it reduces mobility through capping the entire area to prevent ground water movement and reduces the likelihood of future ground water contamination."

EPA Response: The criteria that WCSR appears to be evaluating is the reduction of toxicity, mobility, and volume of contamination through **TREATMENT**. Natural attenuation and capping are not treatment methods and therefore, do not constitute achievement of this criteria. Moreover, EPA does not have sufficient information indicating that the contaminants in the ground water will naturally attenuate. Even if this were to happen, it might take dozens or even hundreds of years thereby posing threats to future generations during the process. Also, see response to comment 53.

65. WCSR goes on to state that the RCRA cap included in EPA's plan would not cover the entire area.

EPA Response: This statement is inaccurate. The RCRA cap identified as a component of both options of the selected remedy outlined in the ROD, will cover the entire 2 acre hazardous waste disposal area, which is the only area for which capping is required.

66. WCSR states the following, "The PRAP, in the section on Short-term Effectiveness, treats restoring the aquifer to beneficial use as a requirement of a remedial plan."

EPA Response: The Short-term Effectiveness section of the PRAP does not state that EPA requires that the affected aquifer be treated to its beneficial use. However, for ground water extraction and treatment systems at most Superfund sites the goal is restoration of the aquifer to its beneficial use. Based on the guidance the Region has received from RSKERL on this matter,

should extraction and treatment of the ground water be deemed necessary at this Site based on ground water monitoring results, the most realistic goal would be containment of the ground water plume.

67. WCSR indicates that the conclusions drawn in EPA's ecological risk assessment are "flawed" and should not be given any consideration in developing a remedial plan for the Site.

EPA Response: EPA has already supplied correspondence to ES that states the driving force behind remedy selection at this Site is human health risk and not ecological risk. It is important to point out, however, that many of the assumptions made in the ecological risk assessment are conservative due to the fact that the ecological characterization in the RI (conducted by ES) was not complete.

68. WCSR states that EPA has violated the NCP by not including certain key documents in the Administrative Record that reflect the Commonwealth's involvement in EPA's decisions, specifically (1) no comments from the Commonwealth on the draft or final Remedial Investigation Report; (2) no comments from the Commonwealth on the draft or final Feasibility Study; (3) no comments from the Commonwealth on the draft or final ecological risk assessment; (4) no comments from the Commonwealth on the draft or final baseline risk assessment; and (5) no ARARs from the Commonwealth.

EPA Response: There were representatives from the Commonwealth on the panel at the public meeting. All of the draft documents mentioned above were reviewed and commented on by the Commonwealth. Additionally, the final documents were reviewed to ensure that the Commonwealth's comments were adequately incorporated into the final documents. EPA is not required to include review comments on any draft documents in the Administrative Record because these review comments are not "documents that form the basis for the selection of a response action". Preliminary ARARs were supplied by the Commonwealth along with its review comments for the RI. Because these ARARs were only preliminary in nature, they were not included in the Administrative Record. In Addition, the Commonwealth supplied EPA with comments on the draft ROD. These comments are in the Administrative Record. Most of the Commonwealth's comments have been incorporated into the ROD and are addressed in Section IX. of this Responsiveness Summary.

69. WCSR states that because the transcript of the public meeting was not placed in the Administrative Record prior to the close of the public comment period this constitutes a "blatant disregard for the community involvement requirements of the NCP". WCSR additionally states that this "failure, in and of itself, could make any remedial decision issued by EPA with respect to the Site, arbitrary and capricious". Reference is made to 40 CFR §300.430(f)(3)(E).

EPA Response: 40 CFR §300.430(f)(3)(E) states: "Keep a transcript of the public meeting held during the public comment period pursuant to CERCLA section 117(a) and make it available to the public". There is no time restriction associated with providing this information, therefore, EPA has not violated the NCP. The transcript of both public meetings are available in the Administrative Record.

Engineering-Science, Inc.

- Letter (including attachments) to Melissa Whittington from Susan Fullerton, dated June 25, 1993.
- Letter (including attachments) to Melissa Whittington from Susan Fullerton, dated July 2, 1993.

70. In discussing the emphasis that EPA placed on restoring the aquifer to its beneficial use in the PRAP, ES quotes the following from the NCP: "when restoration of the ground water to beneficial use is not practicable, EPA expects to prevent further migration of the plume, prevent exposure to the contaminated ground water, and evaluate further risk reduction." ES then states that Alternative 3 meets these expectations.

EPA Response: Alternative 3 would not necessarily prevent exposure to the contaminated ground water. Although Alternative 3 includes monitoring of the ground water and deed and access restrictions, this alternative would not prevent exposure to the contaminated ground water should this ground water migrate to residential areas. Alternative 3 would probably not prevent further migration of the plume anyway. Although a cap may reduce the infiltration of precipitation through the contaminated trench areas to the ground water, a cap will probably not affect the migration of contaminants already in solution in the ground water. The area surrounding this Site is a recharge area. Precipitation will probably not be prevented from infiltrating through these surrounding areas which will account for the natural movement of ground water. In addition, Alternative 3 as presented in the FS did not include any further evaluation of risk reduction.

71. ES stated that "the ground water extraction and treatment system would be run 24 hours a day without attendance. Breakdowns and/or operating problems could result in emissions of volatile chemicals to the local environment." ES concluded by stating that these concerns were not adequately addressed in the PRAP.

EPA Response: Both options of the selected remedy in the ROD include provisions for long-term ground water monitoring using trigger wells. Extraction and treatment of the ground water will only be implemented if the ground water contamination migrates beyond the points of compliance. If extraction and treatment of the ground water must be implemented, breakdowns and operating problems would not be considered a substantial risk because the treatment units are equipped with alarm systems that would alert

the appropriate personnel if problems were to occur. These systems would additionally receive routine maintenance to prevent such breakdowns.

72. ES states that the cost estimates given in the PRAP do not reflect the descriptions of the alternatives provided in the PRAP. ES uses Alternative 2 as an example by stating that the costs include long-term ground water monitoring but the description does not. ES goes on to state that EPA's cost estimate for Alternative 8A was on a completely different basis than the ES alternatives and it is their opinion that EPA's costs are low.

EPA Response: As previously discussed in this Responsiveness Summary, EPA agrees that the PRAP was not completely clear when discussing all of the components of the remedies that included ground water extraction and treatment. Although not expressly stated, all of the ground water extraction and treatment remedies presented in the PRAP do include long-term monitoring. An extraction and treatment system cannot run effectively unless its progress is monitored through sampling. This sampling was inherently included as a component of all extraction and treatment systems in the PRAP.

The reason that EPA's cost estimate for Alternative 8A is on a different basis from the ES estimates is because EPA did not agree with the methodology used by ES in its cost estimates. ES cost estimates, especially for the alternatives that included excavation, appeared to be biased high. Specifically, the percentages used for contingencies were not realistic. In the draft FS, ES included as much 70% markups to the estimated capital cost of the remedy. The contingency percentages were revised in the final FS, in response to EPA and VDEQ comments, but were still higher than necessary (50%). EPA contends that a thorough cost estimate for a remedy, such as 8A, that utilizes known technologies with limited uncertainty do not need to be marked up any more that 20%, which was used in EPA's cost estimate for Alternative 8A and EPA's cost estimate for the selected remedy. In addition, the cost estimate for the selected remedy in the ROD was prepared by the Estimates and Technical Services branch of the Bureau of Reclamation (BUREC) in Denver, with the assistance of EPA Region III. Complete detailed cost documentation is provided in the Administrative Record.

73. ES points out that excavation of the western disposal trench was not included in the description of Alternatives 5 through 8 in the feasibility study yet were included in the PRAP without an adjustment of cost.

EPA Response: For excavation alternatives that did not also include RCRA capping, both EPA and VDEQ determined that the remedies would not be complete unless excavation of the western disposal trench was included. In order for EPA to select any of those alternatives the western disposal trench either had to be

included as part of the excavation or capped. It was an oversight on the part of EPA to not adjust the cost estimates accordingly. The ROD states that these alternatives, if selected, would cost more than the estimates provided due to inclusion of the western disposal trench in the excavation.

74. ES contends that the following statement from the PRAP, which refers to Alternative 8A, is inaccurate, "...these alternatives would eliminate the source of contamination at the Site...". ES implies that EPA would only be removing a portion of the contamination source.

EPA Response: The contamination referred to in the above statement is the plume of ground water contamination, which is the media which presents the unacceptable risks at this Site. The RI states on page 7-5 that, "the easternmost disposal trench was shown to be the primary source of contamination". In addition, due to the direction of the ground water flow, the location of the existing plume, and the fact that contaminants were found in the ground water that were not found in the eastern disposal trench, EPA contends that the barrel trench may also be a primary source of the ground water contamination. ES goes on to state on page 7-6 of the RI that, "Samples from the evaporation trench, the western disposal trench and from the south boundary of the barrel trench (as defined by ES) had low levels of several organics and metals but not significant levels". Accordingly, EPA does not consider these areas significant sources of the ground water contamination. Therefore, the original statement is not inaccurate.

75. ES has outlined specific comments stating its opinion regarding errors in the EPA cost estimate. In addition, ES contends that because different methods of cost estimation were used by ES and EPA that the costs for the alternatives presented in the FS can not be compared with the costs for Alternative 8A. ES also commented that the EPA cost estimate was not reviewed by a licensed engineer.

EPA Response: EPA cost estimate for Alternative 8A was prepared using the Cost of Remedial Action (CORA) program. The CORA model uses Site assumptions that are inserted into the program via data input and the model does not provide comprehensive backup documentation. The complete detailed package for documentation of the cost estimate for the selected remedy in the ROD was prepared by BUREC and is in the Administrative Record.

Volumes estimated for excavation are directly related to the cost estimates. The difference between ES's volume estimates for the eastern disposal trench and the barrel trench and EPA's volume estimates used for these same trenches have been clearly explained in both the ROD and previously in this Responsiveness Summary (see response to comments 7 and 8). Concerns about the cost estimate for 8A in the PRAP not being reviewed by a licensed engineer are not relevant because there is no such requirement.

The statement that a comparison can not be made between the cost estimates provided for Alternatives 1 through 8 in the FS and the cost estimate for 8A is a moot point. Comparison of costs is a requirement of the law. As previously stated, EPA does not agree with the methodology used by ES to estimate costs and therefore, will not be adopting this methodology for the sake of comparison. However, even if different methodologies have been used for various alternatives, this information still gives the Agency sufficient information to make rough cost comparisons between the various alternatives.

76. ES had concerns over the preliminary remediation goals (PRGs) listed in the PRAP.

EPA Response: The selected remedy in the ROD does not utilize the PRGs presented in the PRAP. Because the entire Site will be covered by a RCRA cap, preferably after the principal threat wastes have been treated or removed (under Option 2), it is not necessary to set soil cleanup goals for the selected remedy.

EPA has adopted the position that due to specific Site-related circumstances it is appropriate to monitor the ground water using "trigger wells", until such a time that migration of the ground water plume beyond the points of compliance is detected. At that time, ground water extraction and treatment with the goal of containing the plume within the points of compliance will be implemented. When ground water extraction and treatment is implemented, the cleanup goals for the area of attainment will be the MCLs or heath based levels, if no MCL exists.

77. ES states, "in light of USEPA's preference for treatment as part of the remedial plan, ES and the PRP's propose that the agency incorporate into Alternative 3, as a contingency, vapor extraction at the eastern disposal trench". ES goes on to explain that Alternative 3 would be implemented and in the event that migration of contamination was detected by the "trigger wells", the vapor extraction contingency would automatically be implemented.

EPA Response: Treatment of the principal threat wastes at this Site was not incorporated into the preferred remedy presented in the PRAP solely because of the Agency's preference for treatment. Alternative 8A was presented as the preferred alternative in the PRAP because it represented the best balance among all the evaluation criteria for achieving long term environmental protection in a cost-effective manner.

EPA is aware of the PRPs desire to use ISVE in the eastern disposal trench. However, EPA is not convinced that this technology can effectively treat the waste material in this trench. ISVE was included as part of the preferred remedy in the Addendum to the Proposed Plan (Addendum) issued on November 24, 1993, however in the event that ISVE proved to be unsuccessful

then excavation and offsite incineration would be have been implemented under the preferred alternative in the Addendum (Alternative 8C). In the ROD, both options 1 and 2 of the selected remedy give the implementing party the opportunity to do a pilot study for ISVE in the eastern disposal during design of the cap and ground water monitoring system for Option 1 or at any time during design of Option 2. If this pilot study indicates that ISVE may be feasible based on specific criteria outlined in the ROD, then full scale ISVE may be implemented. If either the pilot study indicates that ISVE is not feasible in the eastern disposal trench or full scale ISVE cannot meet the performance standards mentioned above, then excavation and offsite incineration of the waste materials in the eastern disposal trench will be implemented.

V. SUMMARY OF SIGNIFICANT COMMENTS FROM THE APRIL 26, 1994 PUBLIC MEETING COMMENTS AND EPA RESPONSES

Questions and comments presented at the April 26, 1994, public meeting are listed and/or summarized briefly in this section and are grouped according to subject. Many of the concerns and issues raised at this meeting have been covered previously in this responsiveness summary and therefore will not be addressed in this section. The EPA response follows each new significant question or comment.

A. The following written comments were submitted to EPA at the public meeting:

78. In addition to reading a statement at the April 26th public meeting, Representative L.F. Payne provided written comments. Significant comments, not previously addressed are summarized below followed by EPA responses.

(a) Rep. Payne states in his written comments that, "the relocation of wastes does nothing to reduce the long-term liability of the PRPs. Moving contaminated waste materials from place to place does not eliminate environmental pollution."

EPA Response: The purpose of selecting a remedy to cleanup a Superfund Site is to protect human health and the environment, not to reduce PRP liability. When hazardous wastes are disposed of in uncontrolled situations with no liner or leachate collection systems to protect the environment from releases of contamination, then there is value in relocation of the waste materials to a facility that employs such environmental safeguards. In addition, under either Option 2 of the selected remedy, or if the contingencies are triggered under Option 1, the concentrated hazardous wastes will be excavated and incinerated offsite at an already existing permitted hazardous waste incineration facility. This facility would not just cover up the waste but would actually destroy the waste materials so that their associated contaminants would not be available to migrate into the environment. EPA will issue a subsequent decision

document addressing excavation in the barrel trench based on additional studies of that area.

(b) Rep. Payne discusses EPA's change in cleanup standards for the eastern disposal trench when the preferred remedy changed from excavation to insitu soil vapor extraction (ISVE).

EPA Response: In the PRAP, preliminary soil cleanup goals were developed by EPA using the Summers Method for protection of ground water. The preferred alternative in the PRAP included excavation of concentrated waste material and soil in the eastern disposal trench and the barrel trench with incineration and disposal of these wastes. In both cases, the trenches would be opened, and visibly contaminated material (such as drums in the barrel trench and the waste layer in the eastern disposal trench) could be observed and removed. Thus, the preliminary soil cleanup goals were provided for post-waste-removal soil sampling to ensure that significant contamination in soil below and surrounding the visibly contaminated waste material would also be removed. EPA's selected remedy requires additional study of the barrel trench and a subsequent decision document, including performance standards for excavation of this trench, will be issued when the studies are complete.

If the preferred remedy involved any technology other than excavation, EPA did not envision using these preliminary soil cleanup goals presented in the PRAP. If implementing party can prove that ISVE is feasible in this trench, then ISVE may be implemented full scale. The performance standard for ISVE set in this ROD is as follows:

> ISVE will continue until contamination levels in the waste layer and surrounding soils are no longer a source of contamination to underlying ground water which results in ground water contamination above ground water cleanup requirements set in this ROD. The cleanup criteria will be determined during the remedial design by considering the characteristics of the waste layer and surrounding soils and associated contaminants and then deriving specific levels of contaminants in the waste layer and surrounding soils that would not be expected to exert a significant impact on underlying ground water.

79. Two written comments were submitted at the public meeting which simply stated, "I support cap and monitor".

EPA Response: See response to Comment 17.

80. The County of Appomattox submitted comments in the form of a resolution adopted by its Board of Supervisors. This resolution voiced opposition to the EPA PRAP Addendum and support for Alternative 3.

EPA Response: See response to Comment 1.

B. At the April 26th public meeting, prior to presentations by EPA staff, statements were read by Representative L.F. Payne, Chief of Staff from Senator Charles Robb's office, Tom Lehner, and William Woodfin, former Deputy Director for Operations for the Virginia Department of Environmental Quality. Significant comments not previously addressed are summarized below followed by EPA responses.

81. Tom Lehner made the following comments, not already addressed in this responsiveness summary, on behalf of Senator Charles Robb:

(a) Mr. Lehner specifically stated that Senator Robb was troubled by EPA's "abandonment of the Summers Model".

EPA Response: This statement is the same as the one made by Representative Payne in his written comments regarding the change in the cleanup standards. See response to Comment 79 (b).

(b) Mr. Lehner stated that Senator Robb was troubled that EPA had billed over $500,000 to the County without providing specific justification for the costs.

EPA Response: At that time and to date, EPA has not billed the County or any of the other PRPs for the RI/FS oversight costs. However, the PRPs agreed to pay any and all oversight costs associated with the RI/FS when they signed the Administrative Order by Consent with EPA. When a bill is sent, it will be sent to the PRPs' project coordinator with a package, detailing the costs, accompanying the bill. The actual figure is $229,345,71, not $500,000. This figure may be adjusted for annual allocation costs from EPA contractors.

C. At the April 26th public meeting, prior to the start of the question and answer segment, a presentation was given by Susan Fullerton of Engineering-Science, Inc.(ES). Any significant comments made during this presentation, which are different from those already addressed above, are summarized below, followed by the EPA response.

82. As at the first public meeting, ES indicated that the cost of EPA's preferred alternative in the Addendum would actually cost much more than the $9 million dollar cost estimate provided by EPA, assuming all the contingencies would have to be implemented.

EPA Response: ES announced to the residents at the April 26th public meeting that if all the contingencies had to be implemented, EPA's remedy (Alternative 8C) would cost $30-40 million. However, again no backup cost documentation was provided to substantiate this claim.

83. ES stated that, "EPA came to the PRPs, and told us that we needed to come up with some other ideas for the eastern disposal trench, or excavation and incineration would remain in the plan."

EPA Response: EPA never asked the PRPs to come up with other ideas for the eastern disposal trench. On the contrary, EPA indicated to the PRPs that it was highly unlikely that the ROD would call for capping and monitoring of the Site alone, and that the source areas at the Site would have to be addressed via treatment, as opposed to containment. In response, the PRPs proposed using soil vapor extraction with horizontal wells at the eastern disposal trench.

84. ES stated that, "the new standards are significantly lower and harder to meet". ES went on to say that the new model had not been used to their knowledge at any other sites.

EPA Response: There were no new standards set in the Addendum. What was presented in the Addendum was a methodology that EPA had considered using, to set standards for the performance of the ISVE system that was proposed. The methodology had recently been used at a site in Region VII that had named ISVE as the selected remedy. EPA included this proposed methodology to allow the PRPs, as well as other interested parties, to comment on it so that EPA could take their comments into consideration when the cleanup standards were actually set for ISVE in the ROD. Also, see response to comment 78(b) for an explanation regarding the inappropriateness of using the Summers Method to set standards for ISVE.

85. ES stated that, "EPA has set a time limit on how long the system would be allowed to operate, and if we don't meet those stringent cleanup limits within the time period, or show substantial gains toward meeting them, then the contingency kicks in for excavation and offsite incineration."

EPA Response: EPA did not develop the timeframe mentioned by ES. When ES came to EPA with its proposal for ISVE, it indicated to us that it could meet the preliminary soil cleanup standards that were identified in the PRAP within 18 months. However, as explained in response to comment 78(b), the preliminary soil cleanup standards presented in the PRAP are not appropriate for evaluating ISVE. In the Addendum, the 18 month time frame was identified as an evaluation point. EPA did not state that the ISVE system would be abandoned if the standards were not met within the 18 months.

86. ES states that the Addendum makes broad statements regarding the excavation of the barrel trench. And in addition, if the barrel trench is sampled and contamination is found above the levels that were set for ISVE at the eastern disposal trench, then EPA would implement excavation in the barrel trench.

EPA Response: As stated above in the response to comment 84, cleanup standards were not set for ISVE in the eastern disposal trench. Under Option 2 of the selected remedy or Option 1 in the contingency requirements are invoked, a representative number of test pits will be excavated in the barrel trench and samples from

these pits will be analyzed. The information gained from visual observations during test pitting and analytical results from sampling shall be compiled and remedial action alternatives shall be evaluated in a Focused feasibility Study (FFS). The appropriate source control measures for the barrel trench will then be selected in a subsequent EPA decision document.

87. ES states that, "EPA would require test pits or some type of large hole to be dug through the existing cap in order to sample the contents of the barrel trench. That would ruin the existing cap that's there and allow rainfall to enter this closed, dry system."

EPA Response: Yes, EPA will require test pits to be dug through the existing cap in order to sample/observe the contents of the barrel trench, if Option 2 of the selected remedy is implemented or if the contingency requirements for Option 1 are invoked. However, this piercing of the existing cap will not pose a risk to the community. At the end of each working day and during the time that samples are being analyzed, the test pits will be appropriately covered to prevent precipitation from entering the pits.

88. ES states that EPA's cost estimate includes only 1/5 of the volume of the barrel trench.

EPA Response: See response to Comment 7 regarding the volume estimate for the barrel trench. Also, additional studies in the barrel trench required by this ROD will provide sufficient information for an accurate volume estimate should excavation prove to be necessary.

89. ES states, "In one of EPA's recent newsletters that you-all have received, they stated that although test pits conducted in the 1980's showed empty crushed drums throughout the entire trench, EPA does not consider this to be part of the barrel trench. Why? They don't explain why."

EPA Response: The test pits dug in the 80's did not show that empty crushed drums were present throughout the entire capped area of the barrel trench. On the contrary, less than half of the test pits showed empty crushed drums. Although the newsletter referred to above does explain why EPA does not consider the area south of the barrel trench to be part of the "barrel trench", for the sake of clarity it is re-explained below. EPA is not opposed to the cap and monitor theory. However, in the Agency's opinion, in order for a cap and monitor remedy to be successful in the long-term, the concentrated waste sources that are present onsite must first be removed. The concentrated waste source in the eastern disposal trench is defined as the layer of "taffy-like" waste present in this trench. For the barrel trench the designation of "concentrated waste source" is more difficult. Because of this EPA has determined that additional information is needed regarding the

barrel trench and once this information is available, EPA will issue a subsequent decision document which will select an appropriate remedial action for the barrel trench.

However, it should be noted that there were contaminants found in the ground water that were not detected in the eastern disposal trench and the direction of flow of the ground water in conjunction with the current known location of the plume indicates that the barrel trench is a probable source of the ground water contamination. Since the area south of the "historical barrel trench" was not found to contain any drums or significantly elevated levels of contamination during the RI, this area is not included in previous volume estimates for excavation of the barrel trench. Also, see response to Comment 7.

90. In the same newsletter referenced above, EPA stated that, "Records describing the hazardous waste operation at the Site are almost non-existent." According to ES, this statement is not true for the following reasons: (1) EPA used Mr. Love's past records to identify PRPs for the Site; (2) Mr. Love still lives in the County; and (3) old landfill operators still live in the County.

EPA Response: There are no clear written records, in the form of manifests, or something comparable to manifests, that can document the types of wastes or the exact volumes of these wastes that were disposed of at the Site.

91. ES discusses a specific error regarding the cost of operation and maintenance for the ground water pump and treat system.

EPA Response: EPA's cost estimates for ground water monitoring and ground water extraction and treatment were re-calculated by the Engineering Services Group of the Bureau of Reclamation (BUREC). Documentation of the cost estimate details are in the Administrative Record.

D. The following significant issues were raised by residents during the April 26, 1994, public meeting:

92. One citizen asked if EPA is willing to settle with the County for an amount significantly less than 100% cost of the Site remediation and if the County had pursued this option.

EPA Response: EPA has had discussions with the County regarding this particular issue. EPA is willing to consider a settlement with the County that would be based on the County's ability to pay and has suggested to the County that negotiations for a settlement be initiated. At this time, EPA is waiting for the County to respond to the Agency on this matter.

93. One citizen was concerned about the fact that the PRPs had not received a bill for RI/FS oversight.

EPA Response: It is not uncommon for there to be a delay in the actual billing. The bill for RI/FS oversight costs is currently being prepared and will be sent to the PRPs project coordinator as soon as it is completed.

94. One citizen asked if the EPA had considered the economic impact to Central Virginia, including the potential loss of jobs, and if this information was documented anywhere.

EPA Response: What EPA is required to do under the formal Superfund process is to look at the cost of each alternative relative to one another and evaluate the cost effectiveness along with the other eight criteria outlined in CERCLA and the NCP. A cost-benefit type analysis for the community is not something that EPA is required to do when selecting a remedy for a Superfund Site. The remedy selection process is purposefully not based on the PRPs ability to pay. However, EPA may consider entering into "ability to pay" settlement when the cost of implementing a remedy would impose a significant economic hardship on one or more PRPs. Also, see response to comment 2(b), 16, and 20.

95. One citizen, who lives downgradient of the Site, made the following comments:

(a) It doesn't matter what is costs, just clean it up.

EPA Response: Although CERCLA has a statutory preference for removal or permanent treatment of the Site contamination, CERCLA also requires EPA to take cost-effectiveness into account in its selection of remedies. EPA believes that the most cost-effective remedy that eliminates risks to human health and the environment has been selected.

(b) It is hard to believe a company with $2.5 billion in sales during 1992 alone would go bankrupt from funding their share of this remedy.

EPA Response: This commenter appears to be referring to Thomasville Furniture. EPA has not received any documents from Thomasville, or any of the other PRPs, to indicate that implementing the proposed remedy for the Site would cause an undue economic hardship for any of these companies.

96. One resident, who claimed to be the closest resident to the Site, made the following comments:

(a) If Armstrong has the money to put out for all the advertising for cap and monitor that they have been doing, they certainly should have enough money for their share of the cleanup.

EPA Response: EPA takes no position on this assertion.

(b) Let's not leave it (the waste) there for future generations

to have to deal with later. Let's do something now and get it over with.

EPA Response: This is part of the statutory intent of CERCLA.

97. Susan Fullerton of Engineering-Science made the following comments during the comment section of the meeting:

(a) Ms. Fullerton made the statement that in EPA's March 30th newsletter 5 compounds were listed as being found in the eastern disposal trench but that 2 of those five compounds were not actually detected in the soil/waste samples in the RI.

EPA Response: Technically, that statement is correct. But, what is not explained is that the samples that were obtained from the eastern disposal trench were so grossly contaminated that the laboratory had to dilute them. This means that the detection limits for certain compounds increased substantially. Specifically, for 1,1,1-Trichloroethane and tetrachloroethane, the samples had to be diluted to such an extent that, for each compound, as much as 28,000 parts per billion of the contaminant could be present and the sample results would still indicate non-detect. This cannot be overlooked by EPA and in most cases when such high detection limits are used the compounds are assumed to be present. Additionally, in the newsletter these compounds were used as examples and there were many compounds that were actually detected. In addition to toluene and xylene that were mentioned in the newsletter, the following compounds were actually detected in samples from the eastern disposal trench: 2-Butanone, 4-Methyl-2-Pentanone, styrene and ethylbenzene.

(b) Ms. Fullerton stated that in the February 1994 EPA newsletter the Agency stated that the ground water has moved outward from the Site. She claims that this is not the case.

EPA Response: See response to Comment 3.

(c) Ms. Fullerton again discussed a statement from the April 13th newsletter that indicated records describing hazardous waste activities are nonexistent. She claims that this is not the case.

EPA Response: See response to Comment 91.

(d) Ms. Fullerton made the statement that in one of EPA's newsletters the statement was made that, if crushed empty drums are found in the barrel trench then the trench could be capped without excavation. She then questioned how EPA could find out about the drums without excavation.

EPA Response: EPA has proposed test pitting in the barrel trench to find out what is actually present in this trench. Further investigation of this kind is necessary in order appropriately remediate this trench. EPA agrees that test pitting is a form of

excavation and the newsletter should possibly have been more specific.

(e) Ms. Fullerton stated that the "area of the barrel trench is in dispute".

EPA Response: EPA does not believe that the area of the barrel trench is "in dispute". The area of the barrel was clearly identified in the RI. The barrel trench was located at the southern portion of the Site and, as described on page 1-8 of the RI, was approximately 400 feet long, 20 feet wide, and 14 feet deep. This area was specifically used for disposal of supposedly empty, crushed drums and is referred to as the barrel trench. Also, see response to comments 7 and 8.

(f) Ms. Fullerton stated that none of the compounds that were found in the eastern disposal trench are known carcinogenic.

EPA Response: This statement is technically correct. However, many compounds that are carcinogenic (i.e., tetrachloroethene) could be present at levels up to 28,000 (ug/kg) and still not be detected due to the significant increase in detection limits as a result of dilution of samples in the laboratory [see response to comment 97(a)]. Moreover, the waste material in the eastern disposal trench is characteristically ignitible and is therefore, a hazardous substance. There were extremely high levels of many other contaminants in this trench and excavation and treatment of the waste materials in this trench is warranted, as set forth in Sections V. and VI. of the ROD and the Baseline Risk Assessment. More importantly, many compounds found in the ground water are carcinogenic. One possible source for these ground water contaminants in the eastern disposal trench, if the carcinogens in the ground water did not originate in the eastern disposal trench then EPA believes they must have originated in the barrel trench.

98. One citizen made the following comment, "I don't care how much it costs to fix something that future generations can use. And I think that if we don't do something now, in 20, 50 years the cost will be 1000 times what we are talking about today." This commenter closed with the statement, "I think the cap and monitor is a band-aid for a cancer".

EPA Response: Cost-effectiveness is one of the nine criteria EPA uses to evaluate each of the alternatives. EPA has revised the preferred alternatives presented in the PRAP and the Addendum to reduce the cost without decreasing the effectiveness of the selected remedy. EPA agrees that preserving areas for future generations is not only important but is mandated by CERCLA. Also, see response to comment 97(a).

99. One citizen made the following comment, "Since the material has not moved, let us monitor and deal with it when and if the

problem arises".

EPA Response: The "material" has moved. Contaminants have migrated from the trenches into the ground water and the ground water contamination has migrated approximately 140 feet from the center of the trench area. However, some believe that this migration occurred prior to closure of the Site in 1983, when the individual trenches were capped. As a result, the selected remedy includes the option the cap and monitor the Site initially with the requirement of implementing source control measures only if the ground water contamination migrates beyond the points of compliance. If the implementing party chooses to implement this option of the selected remedy (Option 1), that party runs the risk of having to remove the cap to implement the source control measures and then replacing the cap. Also, leaving the source materials onsite increases the risk that the implementing party may have to implement ground water extraction and treatment measures indefinitely, if the cap proves to be ineffective in preventing source contamination from leaching into the ground water.

100. Marie Hill, a member of the Buckingham County Board of Supervisors, made the following comments and requests:

(a) Ms. Hill requested that a transcript of the briefing EPA gave to the Buckingham County Board of Supervisors on February 24, 1994, be made part of the public record.

EPA Response: EPA is not required to have transcripts made of briefings for the local elected officials. Due to the fact that a stenographer was not present at that briefing, no transcript is available.

(b) Ms. Hill also made the following request, "I am requesting an itemized accounting of EPA's expenses on Love Landfill. I am sure EPA would not accept this report which EPA gave Senator Warner's office showing the expenses to be $530,000. "

EPA Response: An itemized accounting of the RI/FS oversight costs incurred by EPA will accompany the oversight bill which will be sent to the PRPs' project coordinator in the near future. The "report" referred by Ms. Hill is a document given to Senator Warner's office by EPA. This document was not a report but the summary sheet showing the categorized costs incurred by EPA at this Site. This summary sheet is the first page of the EPA report that itemizes and accounts for all costs incurred by EPA at this Site for oversight of the RI/FS that was conducted by Engineering-Science, Inc., the PRP's contractor.

(c) Ms. Hill commented that EPA did not include the Buckingham Board of Supervisors in any of the four mailings sent to the Buckingham citizens. The Board of Supervisors finally received copies of these four mailings on April 20, 1994.

EPA Response: The master mailing list was originally made up of citizens who signed up to be on such a mailing list at the beginning of the RI/FS process. EPA did not intentionally exclude the Board of Supervisors from that mailing list. When it was discovered that the County Administrator, Dave Moorman, was not on the master mailing list, EPA went back and sent all four of the mailings to each of the board members to make sure that they had received them before the public meeting which was held on April 26, 1994.

(d) Ms. Hill Made the comment that EPA never officially notified Buckingham County of this public meeting and she questioned this failure to notify the Board.

EPA Response: Buckingham County Administrator, Dave Moorman, was closely involved with rescheduling the second public meeting. EPA spoke to Mr. Moorman on a number of occasions in an attempt to specify a date that was suitable to all parties. It should be noted, however, that coordination with local officials when scheduling public meetings is not required by law, but is done at the discretion of EPA. The only requirement in this regard is that EPA run an ad in the local newspapers announcing the date, time and location of the public meeting and this was done for this particular meeting.

VI. SUMMARY OF SIGNIFICANT COMMENTS FROM CITIZENS RECEIVED DURING THE SECOND PUBLIC COMMENT PERIOD AND EPA RESPONSES

Between two and three hundred letters were received by EPA during the second public comment period. Many of the concerns voiced in these letters have been addressed previously in this responsiveness summary. The following additional comments regarding the Addendum to the Proposed Plan, which are significant and relevant to this Site, were raised in the letters from citizens:

101. One citizen commented that cap and monitor was not the solution to the problem but would only turn the problem over to future generations.

EPA Response: See response to comment 98.

102. One citizen commented that to ensure that no releases of hazardous substances from the Site occur which could threaten human health or the environment, "active measures" need to be taken.

EPA Response: EPA agrees that active measures need to be taken which is why the selected remedy includes active source control measures initially for Option 2 and as a contingency for Option 1. These active measures include the following: (1) ISVE in the eastern disposal trench if this technology is proven to be feasible; (2) excavation and offsite incineration of wastes and

contaminated soils from the eastern disposal trench if ISVE is not proven to be a feasible; (3) potential excavation and offsite disposal of hazardous substances from the barrel trench if this is warranted based on additional studies; and (4) extraction and treatment of the contaminant ground water if migration of the plume is detected. Although Option 1 does not initially include source control measures, such measures will be required if migration of the contaminated ground water plume is detected.

103. One citizen stated that the position taken by the PRPs that the ground water contamination is not moving can not be substantiated.

EPA Response: EPA agrees with this statement. Also, see response to comments 13 and 15(c).

104. One citizen stated that limiting assessment of metals contamination to filtered samples was erroneous.

EPA Response: EPA risk assessment guidance indicates that when there is a large discrepancy between the filtered and unfiltered sample results, then the filtered sample results should be used in the risk assessment. However, EPA has similar concerns regarding heavy metals in the ground water and the long term ground water monitoring program will include analysis of heavy metals.

105. One citizen made the statement that, "EPA has previously attributed beryllium and chromium to the Site". Letters from EPA were attached.

EPA Response: Although EPA indicated that beryllium and chromium were present in the residential well in question, neither of the letters provided indicated that this contamination was Site-related.

106. One citizen made the statement that the current ground water monitoring network was inadequate.

EPA Response: EPA agrees with this statement and both options of the selected remedy require design and construction of a new ground water monitoring network. This network may, however, utilize some of the monitoring wells that currently exist.

107. One citizen indicated that the RI/FS should not have been limited to the hazardous waste disposal area but should have also included the domestic waste landfill.

EPA Response: See response to comment 51.

108. One citizen stated that "cap and monitor" does not meet the threshold criteria and that ground water treatment was necessary.

EPA Response: The threshold criteria include the following (1) overall protection of human health and the environment; and (2) compliance with Applicable and Relevant and Appropriate Requirements (ARARs). The cap and monitor option of the selected remedy will meet both of these criteria (as does the source control option). For the cap and monitor option, ground water extraction and treatment as well as source control measures will be implemented when and if the ground water contamination migrates beyond the points of compliance.

109. One citizen stated that additional study should be done in the evaporation trench and the western disposal trench.

EPA Response: To make decisions regarding Superfund cleanups, it would be ideal for EPA to have complete sampling data for every area of each Site. However, due to time and financial constraints, and given the existing information available to EPA on these two areas, EPA decided to make the decision regarding the selected remedy for this Site without additional studies of these two areas. In this situation, we have sampling data that indicates there are only slightly elevated levels of contaminants in the evaporation trench and the western disposal trench. As a result, EPA has determined that the selected remedy will include capping of these particular areas.

110. One citizen discusses a 5 x 5 x 8 foot pit that was used to dispose of waste from Thomasville Furniture.

EPA Response: It is not clear where this particular trench is located onsite. All of the trenches in the hazardous waste disposal area were investigated as part of the RI.

111. One citizen discussed how the State was aware that disposal of liquid hazardous wastes at this Site would lead to ground water contamination.

EPA Response: EPA can not respond on behalf of the Commonwealth regarding this comment. Also, see response to comment 38.

112. One citizen made the statement that the evaporation trench was actually an injection trench and that this trench should be considered a source and treated accordingly.

EPA Response: See response to comment 109.

113. One citizen has made the comment that there appears to be conflicts of interest between the State, Engineering-Science (ES), and the County. Additionally, there appears to be a connection between Armstrong Furniture and the Buckingham County Board of Supervisors.

EPA Response: EPA does not have any information to substantiate this citizen's claim that there is a conflict of interest between these entities.

114. One citizen questioned whether the Troublesome Creek Reservoir was actually upgradient.

EPA Response: As stated in the ROD, although the Troublesome Creek Reservoir is topographically lower than the Site, it is in a different watershed. The RI did not indicate that this reservoir was affected by Site-related contaminants.

115. One citizen asked that EPA postpone the making a final decision about the remedy long enough for the following: (1) the community to obtain a Technical Assistance Grant (TAG); (2) to hold a public meeting; and (3) then allow 30 days of comment after the public meeting.

EPA Response: A TAG grant can be obtained at any time during the Superfund process. It would not be advantageous to either the citizens or EPA to postpone the ROD issuance until a TAG grant could be obtained, since these grants can take up to 6 months or more to procure by interested parties.

116. One citizen expressed concerns about the feasibility of using ISVE at this Site and wanted to know what EPA considered the probability to be of ISVE's success.

EPA Response: EPA also has concerns regarding the feasibility of ISVE in the eastern disposal trench at this Site. For this reason, the contingency requirements for excavation and offsite incineration of the waste materials in the eastern disposal trench were built into the Addendum to the PRAP. Currently, the selected remedy in the ROD gives the implementing party the opportunity to conduct ISVE treatability studies. If these studies prove that ISVE could be a feasible technology for treatment of the waste in the eastern disposal trench, then the implementing party may implement this technology in full scale. However, if the full scale ISVE can not meet the performance standards set by EPA after the necessary additional information is gained in the treatability study, then excavation and offsite incineration will be implemented. EPA believes the most prudent approach would be to utilize already proven technologies and implement excavation and offsite incineration up front.

117. One citizen commented that they were in favor of "vapor extraction only" without any of the contingency options.

EPA Response: In order for EPA to ensure protection of human health and the environment it is necessary to include contingency options just in case ISVE fails. One other problem with not including the contingency options deals with the timeframe of cleanup. Significant delays could be experienced if no alternate cleanup methods were included in the ROD now.

118. A few citizens have indicated that if the Superfund Law were to be reauthorized prior to issuance of the Buckingham ROD, that "cap and monitor" would be the most appropriate remedy for the

Site.

EPA Response: Comments about the impact that reauthorization of Superfund might have on proposed remedies at existing Superfund sites are too speculative to require response in this Responsive Summary. However, EPA Headquarters has advised the Regions to move forward with Superfund site remediations without waiting to see when, and under what conditions, Superfund is reauthorized.

119. One citizen indicated that our "treatment" under Alternative 8C would not be a permanent remedy which will restore the Site to any usefulness.

EPA Response: EPA has never intended to "restore the Site to any usefulness" in the sense that the property would not be suitable as a residential area even with the treatment measures that have been proposed under Alternative 8C. In this respect this citizen is correct. However, ISVE, if it were successful, or offsite incineration, if ISVE is not successful, would remove the contaminants from the waste layer in the eastern disposal trench. This treatment is permanent, unlike capping alone, which allows the contamination source to remain onsite increasing the possibility that additional remediation measures will be necessary in the future. In addition, removal of hazardous substances from the barrel trench, if deemed necessary by EPA following additional studies in this trench, would also represent use of permanent remediation measures.

120. One citizen made the following statement, "In your March 19, 1994, newsletter you state, "EPA by law, has a preference to treat rather than rather than contain (e.g.,cap) concentrated hazardous waste that is likely to move." At no time have you provided any evidence showing the probability of the VOC's to move from their present position".

EPA Response: The concentrated waste sources at this Site are present in trenches that are no deeper that 15 feet. These waste sources contain extremely high concentrations of VOCs. Ground water is encountered approximately 30 to 35 feet below the ground surface. The ground water is contaminated with the same contaminants found in the waste sources onsite. Therefore, the contaminants have migrated from the trenches to the ground water. With regard to lateral movement, the plume of contaminated ground water has expanded approximately 140 feet from the center of the Site (MW-2 well cluster). As far as the probability that the contaminants will move from their present position is concerned should a RCRA cap be installed at the Site, it is difficult to calculate such probabilities. However, keep in mind that all ground water moves and this ground water contamination has moved already. The data outlined above is evidence that the ground water has moved. Nonetheless, the selected remedy in the ROD gives the implementing party the opportunity to cap and monitor the Site with the contingent source control and ground water treatment measures if the ground water migrates beyond the points

of compliance. These monitoring points are approximately 60 feet beyond where the plume was estimated (by the PRPs) to be in July of 1992.

121. One citizen made the statement that, "You (EPA) disregard the possibility that a future treatment could be more efficient, effective, which could erase the problem, and not just cause us to spend millions now and again later."

EPA Response: EPA is responsible for cleaning up hazardous waste sites. The decisions regarding what technologies/treatment measures will be used to clean up these sites must be documented in Records of Decision (RODs). EPA cannot postpone the issuance of RODs on all Superfund sites in hopes that in the future there will be more effective cleanup technologies. However, if Option 1 of the selected remedy is implemented, the Site will be capped and monitored until migration of the ground water contamination is detected at the points of compliance, at which time the source control measures outlined in the ROD will be implemented. If there is a new technology available that is more effective and is feasible for this Site, EPA could choose at that time to change the selected remedy in a document called an Explanation of Significant Differences (ESD) or an amendment to the existing ROD.

122. At the public meeting on April 26, 1994, EPA indicated that there was a similar site in Manassas, Virginia where ISVE was being used successfully. One citizen commented that when checking out this site, he found that ISVE had been operating for three years, "double what you (EPA) are allowing for the Buckingham Site", and the remediation was not yet complete. This citizen then indicated that EPA's estimate of time for ISVE to work and cost figures for ISVE were therefore not accurate.

EPA Response: EPA based its ISVE time frames and cost estimates on information supplied by the PRPs. Prior to issuance of the Addendum, the PRPs indicated to EPA that they could meet EPA's cleanup standards for ISVE in 18 months (see response to comments 78(b), 84, and 85). The PRPs also estimated that it would cost $600,000 to construct the ISVE system and $700,000 to operate it for 18 months.

123. One citizen commented on EPA's proposal to dispose of treated ground water at a Publically Owned Treatment Works (POTW). This citizen indicated that there were only two POTWs in the county neither of which has the capacity for the treated water from this Site. This citizen went on to discuss the costs of disposing at a POTW and concluded that this disposal, not including transportation costs, would be too expensive.

EPA Response: The ground water treatment contingency included in both options of the selected remedy do not include disposal of treated water at a POTW.

124. One citizen commented that EPA's March 1992 fact sheet indicated that there were unacceptable levels of two substances, beryllium and chromium. This citizen wanted to know why our evaluation of the contamination at the Site had changed to focus on VOCs.

EPA Response: The most up to date sampling data, as well as, the most comprehensive data for this Site can be found in the Remedial Investigation Report (RI). The sampling data from the RI, specifically for the ground water which is the media that EPA is most concerned about, was obtained in July of 1992. This was after the fact sheet referred to by this citizen. The RI and the Baseline Risk Assessment identified VOCs as the contaminants of concern. EPA continues to have concerns regarding metals in the ground water and metals analysis will be included in the long term ground water monitoring program which is part of both options of the selected remedy. It is unclear why earlier sampling events did not identify VOCs as contaminants of concern.

125. Commonwealth of Virginia State Senator R. Edward Houck, in discussing the draft proposal for reauthorization of the Superfund Law, Senator Houck made the following statement, "Specifically the proposal provides that the President shall give "substantial weight" to any consensus recommendation of the community working group with respect to future land use of a site."

EPA Response: EPA, the PRPs and most of the community agree that this Site will not be used as a residential property in the future. Nonetheless, the Agency is required to base its site remediation decisions on the existing law and not on the draft language in the reauthorization proposals. Aside from the fact that these proposals are not the law, the draft language contained in these proposals might be greatly modified or totally eliminated prior to the enactment of any given reauthorization proposal.

126. EPA received several letters from one particular resident, Mr. Earl Repsher, from Forest, Virginia. Forest is approximately 50 miles away from the Site and is not located in Buckingham County. His questions/comments that have not previously been answered in this Responsiveness Summary are responded to below.

(a) In discussing the EPA fact sheet dated February 23, 1994, Mr. Repsher was concerned with the statement that delaying the cleanup of hazardous waste can be costly. Specifically all three statements under this heading assumed that the waste had to be treated and that he did not believe this to be the case.

EPA Response: EPA is aware that there are differing opinions on this issue. Therefore, the selected remedy was structure to allow for the following two options, (1) cap and monitor with source control contingencies if the ground water moves; and (2) implementation of source control measures, cap, and monitor.

Extraction and treatment of the ground water will be implemented under both options if the ground water moves to the compliance monitoring wells.

(b) Mr. Repsher also had concerns regarding ISVE, specifically how long it would continue and how it would be evaluated.

EPA Response: Performance standards for ISVE regarding how long it would have to operate and what cleanup standards it would have to achieve are difficult to set without having more information specifically regarding the feasibility of this technology at this Site. The selected remedy allows the implementing party the opportunity to conduct a treatability study for ISVE at this Site to obtain the information necessary to set performance standards which would include how long the system would have to run.

(c) Mr. Repsher was also particularly concerned with the proposed sampling in the barrel trench and wanted to know how EPA would prevent precipitation from seeping through the contaminated area into the ground water.

EPA Response; See response to comment 87.

VII. SUMMARY OF SIGNIFICANT COMMENTS FROM THE PRPS RECEIVED DURING THE SECOND PUBLIC COMMENT PERIOD AND EPA RESPONSES

During the second public comment period, EPA received formal comments from the PRPs or their respective representatives. Many of the comments in the letters listed below have been addressed previously in this responsiveness summary and therefore, are not addressed below. The following additional comments/concerns about the Addendum to the Proposed Plan, which are significant and relevant to this Site, were raised in the letters from PRPs:

Buckingham County Board of Supervisors

- Letter to Melissa Whittington from David Moorman, County Administrator, dated May 3, 1994.

127. Mr. Moorman discussed the EPA proposal to amend the Superfund law and specifically the role of the community under the new Superfund law.

EPA Response; The Agency is required to base its remediation decisions on existing law rather than draft language in reauthorization proposals. Aside from the fact that these proposals are not the law, the draft language contained in these proposals might be greatly modified or totally eliminated prior to the enactment of any given reauthorization proposal.

128. Mr. Moorman made the following statement, "The Board places great significance, and urges EPA to place great significance, on the fact that the Commonwealth of Virginia supports Buckingham

County's desire to for a cap and monitor remedy at this Site."

EPA Response: Although Virginia Department of Environmental Quality (VDEQ) did not concur with EPA's proposal due to its concern over the excavation contingencies included in the Addendum to the proposed plan, VDEQ has never indicated to EPA that it supports the cap and monitor remedy. Moreover, VDEQ had a key role in the inclusion of ISVE as part of the preferred remedy in the Addendum.

129. Mr. Moorman indicates that the Site was closed with the approval of EPA.

EPA Response: Although EPA reviewed the closure plans, EPA's records do not indicate that EPA ever formally approved the closure plan for this Site or certified completion of such closure. In any event, it appears that the existing cap was not constructed in accordance with design specifications and is not performing in a manner sufficient to prevent infiltration of precipitation through the waste materials. Moreover, EPA advised the County when it closed the Site that it may be required to take additional actions in the future regarding the wastes present in the trenches. Also, see response to comment 38.

130. Mr. Moorman made the following statement, "...we support long-term monitoring to make sure no significant migration of contaminated ground water occurs...".

EPA Response: This statement has been a recurring theme in many of the letters received by EPA. Although previously addressed in response to various other comments, the following point is important enough to reiterate. Monitoring of the ground water alone will not, in any way, ensure that significant migration of the ground water will not occur. The purpose of long-term ground water monitoring is to alert EPA when the ground water has migrated. It will then be necessary to take additional actions to ensure that the ground water contamination does not migrate further. The selected remedy includes extraction and treatment of the ground water if migration of the contaminated ground water is detected at the points of compliance.

Womble Carlyle Sandridge and Rice (WCSR)

- Letter (including enclosures) to Melissa Whittington from Karen Carey, dated May 3, 1994.
- Letter (including enclosures/attachments) to Melissa Whittington from Karen Carey, May 3, 1994.

131. Ms. Carey enclosed a letter from Engineering-Science dated October 12, 1993 re: Review of Analytical Findings From Historical Sampling and RI/FS Sampling, Buckingham County Landfill Site. According to Ms. Carey, this letter indicates there is no cause for concern in the barrel trench. This letter raises the following issues:

(a) According to ES, because data from one soil boring collected from the barrel trench in 1983, by NUS Corporation, indicates that the contaminants of concern in the ground water were not found in the barrel trench, that EPA should therefore conclude that the barrel trench is not a source of the ground water contamination.

EPA Response: The barrel trench covers a relatively large area, its dimensions are 400 feet long by 20 feet wide. NUS only took one soil boring sample from the barrel trench. One sample is not enough to characterize the entire trench. Additionally, ES does not indicate where from within the trench this sample was taken. During the RI, ES contends to have sampled the barrel trench, when in fact they actually sampled the domestic waste landfill located south of the barrel trench. EPA does not consider the data presented by ES to be comprehensive or conclusive enough to exclude the barrel trench from remediation. However, before EPA makes a final decision regarding whether and to what extent excavation may be warranted in the barrel trench, additional studies will be required. Based on information gained by these studies EPA will make a decision regarding the necessary source control measures in this trench. This decision will be subject to public comment.

132. Ms. Carey enclosed tables prepared by Engineering-Science dated November 6, 1993. According to Ms. Carey, these tables represent numbers generated by using the Summers Method which "confirm" that the eastern disposal trench is not posing a threat to ground water.

EPA Response: The Summers Method is a model that when used appropriately indicates what level of contamination can be left in the soil without threatening the ground water. This model is designed to set soil cleanup levels. There is a layer of concentrated hazardous waste present in the eastern disposal trench. Although EPA used the Summers Method to calculate soil cleanup levels in the Proposed Plan, the use of these cleanup levels would be in conjunction with complete removal of the source itself, the waste layer. ES appears to be using the Summers Method to calculate cleanup levels for waste, which is an inappropriate use of the model. Furthermore, EPA and ES have differences of opinion regarding what parameters should be used when running this particular model. EPA does not concur with ES's contention that the Summers Method indicates that no cleanup is necessary in the eastern disposal trench.

133. One of the letters dated May 3, 1994, from Ms. Carey enclosed a variety of newspaper articles, editorials, photographs from the April 26, 1994 public meeting, a memorandum from Buckingham County Board of Supervisors and Armstrong Furniture, and a videotape of television news coverage of the Site. Ms. Carey requested that EPA respond to these items in the Responsiveness Summary.

EPA Response: The enclosed items are not comments, were not submitted by the respective authors to EPA for comment and therefore, are not addressed in this Responsiveness Summary.

Engineering-Science, Inc.

- Letter (including attachments) to Melissa Whittington from Susan Fullerton, dated May 3, 1994.
- Letter (including attachments) to Melissa Whittington from Susan Fullerton, dated august 25, 1994.

A majority of the concerns expressed in these two letters either have been previously addressed in this Responsiveness Summary or are not relevant to the Addendum to the Proposed Plan or selection of remedy at this Site and therefore are not addressed below. The following are relevant comments not previously made and EPA response to these comment.

134. ES stated, "The only future threats are associated with the use of ground water within the four-trench area..".

EPA Response: The contaminated ground water within the four-trench area is to be monitored and contained. However, the primary threat posed by this ground water is not its current location underneath the four trench area, but the potential migration of this contamination toward residential areas. It should be noted that the contaminated ground water has migrated beyond the four-trench area, specifically levels of VOCs have been detected above MCLs in monitoring well 6S, which at least 60 feet beyond the four-trench area.

135. ES stated, "The EPA has arbitrarily used a figure of 4 feet of waste in calculating cost of excavation and incineration from the eastern disposal trench". ES believes that the actual thickness could be more that 4 feet.

EPA Response: The estimated 4 feet of waste in the eastern disposal trench is based on information provided by ES in the RI. If ES believes that the actual thickness may be more than 4 feet, it is unclear why the thickness was represented as 4 feet in the RI. Cost estimates have to be developed for all alternatives set forth in the ROD to allow for comparison of their respective cost-effectiveness. These cost estimates are based on data contained in the RI. Hence, a thickness of the 4 feet was used when costing this alternative. Additionally, an amount equal to 20% of the estimated capital cost was added to the cost estimates to account for situations where estimated volumes may not be 100% accurate.

136. ES made the following statements, "Mr. Love used the trench and fill method of disposal at this Site. He used a series of three trenches for disposal of empty drums. The first trench was filled, covered, and closed and then the second and third trenches were likewise used. Only that area of the barrel trench most recently used by Mr. Love is that portion termed the

"historical" barrel trench."

EPA Response: If these statements are true, ES did not accurately represent the barrel trench in the RI. The RI is a comprehensive document that should include all details of Site activity. EPA is concerned with concentrated waste sources in the barrel trench. The test pits that were dug south of the barrel trench, the area that ES considers to actually be the barrel trench, uncovered crushed empty drums indicating that excavation of this area in not necessary. Further study of the barrel trench will take place to determine whether and to what extent excavation is needed in this trench (unless Option 1 of the selected remedy in implemented and the contaminated plume does not migrate to the points of compliance).

137. ES listed concerns with EPA calculation of soil cleanup goals presented in the PRAP.

EPA Response: These comments are no longer relevant because EPA does not intend to use those particular soil cleanup goals in conjunction with the selected remedy. Also, see response to comment 78(b).

138. ES states, "The addended PRAP described two new alternatives for the Site and also provided cleanup/action limits for these alternatives".

EPA Response: This statement is not quite correct. While Alternative 8B in the Addendum to the PRAP contained new performance criteria for excavation in the eastern disposal trench, there are no such standards for the ISVE proposal set forth in Alternative 8C of the Addendum. As stated in the Addendum, "The ROD will set forth performance criteria by which the effectiveness of the ISVE system will be measured". The performance criteria in for ISVE in the eastern disposal trench are specified in Section IX. of the ROD.

139. ES was concerned with the possibility of using soil cleanup standards in the barrel trench based on the proposed method for setting ISVE standards in the eastern disposal trench.

EPA Response: EPA has delayed the decision on whether and to what extent excavation may be warranted in the barrel trench. until after additional studies have been conducted.

140. ES states, "At most Superfund Sites where excavation is required a contaminant structure of some type is required to contain or minimize dangerous air emissions."

EPA Response: EPA disagrees with this statement. Excavation is done routinely at Superfund Sites and only under extremely hazardous conditions are containment structures warranted such as those described by ES. EPA does not believe this to be

necessary at this Site. However, if the PRPs were to implement the ROD and excavation is performed as part of the remedy, the PRPs are not precluded from incorporating a containment structure into the excavation remedy.

141. ES states, "If long-term monitoring detects significant contaminant migration, then a further ground water containment remedy could be initiated at that time, as provided by Alternative 3".

EPA Response: Alternative 3 does not provide for implementation of a ground water containment system nor does the cost estimate for Alternative 3 include costs for a ground water containment system. However, this concept is incorporated into both options of EPA's selected remedy

142. ES states, "...contaminated ground water is restricted to the 2 acres in the centermost part of the 120 acre Site."

EPA Response: Superfund sites are not defined by the property that they are located on, but instead are defined by the actual area of contamination. Therefore, the reference to the 120 acre Site is inaccurate if ES is referring to the Superfund Site as opposed to the overall 120 acre piece of property owned by the County. Furthermore, the ground water contamination is not restricted to the 2 acres where hazardous waste disposal operations took place. The investigation conducted by ES not only indicates that the ground water contamination extends at least 60 feet beyond the 2 acre fenced area, but the contamination is present in monitoring well 6S at levels that exceed MCLs (see figure 4 of the ROD).

143. When discussing the proposed method of evaluation of ISVE presented by EPA in the March 30, 1994, fact sheet, ES states that, "..EPA discusses using performance-based goals. This would mean establishing the initial mass of VOCs and setting a goal of removal (i.e., 90%)."

EPA Response: In that particular newsletter EPA did not discuss establishing the "initial mass of VOCs". The 90% removal pertains to removal of VOCs in the vapor surrounding the wastes in the eastern disposal trench. This is an approach EPA is using at other sites that are using ISVE. However, refer to Section IX. of the ROD for the performance standards for ISVE at this Site.

144. In ES's August 25, 1994 letter to EPA, ES states, "This letter responds to the USEPA's request that the Potentially Responsible Parties (PRPs) submit proposed language to implement this remedy (cap and monitor with contingencies) and to provide for contingency actions should such contingency actions become necessary."

EPA Response: EPA did not request that the PRPs submit language for the ROD. Preparation of RODs is solely the responsibility of EPA. EPA is not required to include PRP proposed language in this or any other ROD.

145. ES states, "Our understanding is that the ROD will call for installation of a RCRA cap covering the entire trench area and the placement of ground water monitoring wells outside the area."

EPA Response: The ROD allows for capping as mentioned in ES's comment above. EPA has further defined the points of compliance to be no further than 150 feet from the edge of the newly installed cap and the cap is not to extend beyond the previously fenced hazardous waste disposal area.

146. ES discusses the need for contingency actions only if migration of the contamination is detected with reasonable confidence and goes on to describe how reasonable confidence should be defined.

EPA Response: EPA has determined that the contingency actions will be invoked under the following conditions: If any analytical result from a ground water monitoring sample collected at the points of compliance exceeds the Safe Drinking Water Act Maximum Contaminant Level (MCL) or the health-based contaminant level, if an MCL has not been established, for any Site-related contaminant, a confirmatory sample from the well where the exceedance occurred shall be collected and analyzed for all Site-related contaminants. If the analytical results from the confirmatory sample also exceeds the appropriate MCL or health-based level, the contingency actions appropriate for the option of the selected remedy that is being implemented shall be triggered. Assuming that this remedy will be implemented by the PRPs, EPA would split any confirmatory samples from the wells where there was an exceedance. Assuming there was an exceedance in all three samples, this would give the Agency a total of three data points making the exceedance statistically significant.

The point of compliance shall be no further than 150 feet from the edge of the cap. This cap, which will be constructed as part of both Option 1 and Option 2, shall not extend beyond the disposal trenches and previously capped area south of the barrel trench.

147. ES states, "If excavation is ultimately required, the portion of the cap covering the eastern disposal trench can be effectively removed without removing the entire cap."

EPA Response: EPA is not convinced that this is the best course of action. If this situation occurs and ES can develop a way to ensure the integrity of the synthetic liner, EPA will consider such actions. However, if this can not be done the entire cap must be removed and ultimately replaced. EPA's cost estimate for Option 1 takes the latter approach into account.

VIII. SUMMARY OF COMMENTS RECEIVED FROM CONGRESSMAN PAYNE REGARDING THE ADDENDUM TO THE PROPOSED PLAN AND EPA RESPONSES

EPA received a letter from Congressman Payne dated August 22, 1994, which discusses certain aspects of the proposed cleanup for this Site. Any comments raised by Congressman Payne that have not been addressed previously in this Responsiveness Summary are addressed below.

148. Congressman Payne discusses semi-annual sampling of ground water monitoring wells for VOCs.

EPA Response: Ground water monitoring is a very important part of both options of the selected remedy in the ROD. Although the PRPs believe that the ground water contamination will not migrate EPA believes that it will. In order to ensure that any ground water contamination at the points of compliance is detected, EPA determined that quarterly ground water sampling for both VOCs and metals will be required. If, after three years, consecutive sampling events have shown that the ground water contamination plume has not reached the points of compliance, EPA may reduce the frequency of the sampling to bi-annually.

149. Congressman Payne discusses removal of wells currently existing within the 8-acre cleared area.

EPA RESPONSE: EPA does not intend to remove all of these wells because some of them will be used as part of the monitoring network.

150. Congressman Payne discusses implementation of ISVE in the eastern disposal trench.

EPA Response: ISVE may be implemented in the eastern disposal trench if (1) the technology has been proven to be feasible at this Site during treatability studies that will be conducted during design (not at the time of trigger); and (2) the ISVE treatability study will be implemented only if the implementing party chooses to do it.

151. Congressman Payne provided information on ISVE performance standards.

EPA Response: See Section IX of the ROD for ISVE performance standards.

152. Congressman Payne indicated that information gained during additional study of the barrel trench should be used in preparation of a Focused Feasibility Study for that trench.

EPA Response: EPA agrees that a Focused Feasibility Study is necessary and has incorporated this approach into the ROD.

153. Congressman Payne indicated that two test pits would be excavated in the barrel trench and that these test pits would be ten feet long by five feet wide.

EPA Response: The number and size of test pits to be dug in the barrel trench will be determined during design. However, a sufficient number of test pits will be required to determine the conditions in this trench.

154. Congressman Payne discussed additional monitoring of the ground water after all contingency requirements have been completed at the Site.

EPA Response: If the ground water contamination migrates to the points of compliance, EPA will require extraction and treatment of the ground water to ensure that the contamination remains within the points of compliance. Monitoring of the ground water will be required in conjunction with extraction and treatment.

IX. SUMMARY OF COMMENTS RECEIVED FROM THE VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY (VDEQ) ON THE DRAFT RECORD OF DECISION AND EPA RESPONSES

VDEQ supplied comments to EPA on the draft ROD that was submitted to them for comment. EPA has incorporated these comments into the ROD to the extent possible. The following is a summary of VDEQ's comments and EPA responses.

155. VDEQ indicated that the requirement of monthly sampling was excessive.

EPA Response: EPA agrees and has changed this requirement to quarterly sampling in the ROD.

156. VDEQ indicated that the performance standard for triggering additional action at the Site were not consistent with "typical CERCLA methodology". MCLs were suggested.

EPA Response: EPA has changed the basis for the standard to MCLs or equivalent risk-based standards if MCLs have not been established.

157. VDEQ indicated that the draft ROD did not specify how an exceedance at a trigger well would be determined. Using "statistically significant" language was suggested.

EPA Response: See response to comment 145.

158. VDEQ stated that the requirement for additional ground water studies appeared to be too broad.

EPA Response: EPA did not intend to indicate that additional studies, above and beyond what is typically done during design of a ground water monitoring system, would be required. The ROD

language has been revised to reflect this.

159. VDEQ indicated that the State did not agree with the methods EPA had outlined for evaluation of the ISVE system in the draft ROD.

EPA Response: The ROD was revised to indicate that the treatability study for ISVE would have to provide evidence that ISVE is feasible for this Site. See Section IX. for ISVE performance standards.

160. VDEQ had concerns with the contingency actions in the barrel trench and suggested a focused feasibility study.

EPA Response: EPA agrees with this comment and will conduct such a study after test pits have been excavated and samples from this trench have been analyzed.

161. VDEQ had concerns with the requirement to remove the entire cap if contingency actions were triggered.

EPA Response: See response to comment 146.

162. VDEQ had concerns with the requirement for extraction and treatment upon detection of the migration of the plume to the points of compliance.

EPA Response: EPA contends that ground water extraction and treatment will be necessary to ensure that the ground water contamination remains within the points of compliance. All remedial actions are required to meet MCLs in the area of attainment, which lies beyond the points of compliance. If after implementation of the extraction and treatment, it is discovered that the plume no longer extends to the points of compliance, EPA may then determine that the extraction and treatment can be suspended until such a time that the plume again migrates to the points of compliance. See also Section 5.2 of EPA's Guidance on Remedial Action for Contaminated Ground Water at Superfund Sites, December 1988, OSWER Directive 9283.1-02.

163. VDEQ suggested that EPA should include analysis for metals into the ground water monitoring program.

EPA Response: EPA has included metal analysis in the ground water monitoring program required in the ROD.

APPENDIX A - GLOSSARY

of Superfund Terms

This glossary defines terms often used by the U.S. Environmental Protection Agency (EPA) staff when describing activities under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, commonly called Superfund), as amended in 1986. The definitions apply specifically to the Superfund program and may have other meanings when used in different circumstances. Underlined words included in various definitions are defined separately in the glossary.

Administrative Order on Consent (AOC): A legal agreement between EPA and potentially responsible parties (PRPs) whereby PRPs agree to perform or pay the cost of a site cleanup. The agreement describes actions to be taken at a site and may be subject to a public comment period. Unlike a consent decree, an administrative order on consent does not have to be approved by a judge.

Administrative Record: A file which is maintained and contains all information used by the lead agency to make its decision on the selection of a response action under CERCLA. This file is to be available for public review and a copy is to be established at or near the site, usually at one of the information repositories. Also, a duplicate file is held in a central location, such as a Regional or State office.

Air Stripping: A treatment system that removes, or "strips," volatile organic compounds from contaminated ground water or surface water by forcing an airstream through the water and causing the compounds to evaporate.

Aquifer: An underground rock formation composed of materials such as sand, soil, or gravel that can store and supply ground water to wells and springs. Most aquifers used in the United States are within a thousand feet of the earth's surface.

Carcinogen: A substance that causes cancer.

Carbon Adsorption: A treatment system where contaminants are removed from ground water or surface water when the water is forced through tanks containing activated carbon, a specially treated material that attracts the contaminants.

Cleanup: Actions taken to deal with a release or threatened release of hazardous substances that could affect public health and/or the environment. The term "cleanup" is often used broadly to describe various response actions or phases of remedial responses such as the

Comment Period: A time period during which the public can review and comment on various documents and EPA actions. For example, a comment period is provided when EPA proposes to add sites to the National Priorities List. Also, a minimum 3-week comment period is held to allow community members to review and comment on a draft RI/FS and proposed plan.

Community Relations (CR): EPA's program to inform and involve the public in the Superfund process and respond to community concerns.

Community Relations Plan (CRP): Formal Plan for EPA community relations activities at a Superfund site.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The Acts created a special tax that goes into a Trust Fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites. Under the program, EPA can either:

- Pay for site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work; or
- Take legal action to force parties responsible for site contamination to clean up the site or pay back the Federal government for the cost of the cleanup.

Consent Decree (CD): A legal document, approved and issued by a judge, that formalizes an agreement reached between EPA and potentially responsible parties (PRPs) where PRPs will perform all or part of a Superfund site cleanup. The consent decree describes actions that PRPs are required to perform and is subject to a public comment period.

Cost-Effective Alternative: The cleanup alternative selected for a site on the National Priorities List based on technical feasibility, permanence, reliability, and cost. The selected alternative does not require EPA to choose the least expensive alternative. It requir+s that if th+re are several cleanup alternatives available that deal effectively with the problems at a site, EPA must choose the remedy on the basis of permanence, reliability, and cost.

Cost Recovery: A legal process where potentially responsible parties can be required to pay back the Federal government for money it spends on any cleanup actions.

Enforcement: EPA's efforts, thr ugh legal action if necessary, to force potentially responsible parties to perform or pay for a Superfund site cleanup.

Explanation of Significant Differences: After adoption of a final remedial action plan, if any remedial action is taken, or any enforcement action under Section 106 is taken, or if any settlement or consent decree under Sections 106 or 122 is entered into, and if

such action, settlement, or decree differs in any significant respects from the final plan, the lead agency is required to publish an explanation of the significant differences and the reasons the changes were made. See Guidance on Preparing Superfund Decision Documents: the Proposed Plan and Record of Decision for further information.

Feasibility Study (FS): See Remedial Investigation/Feasibility Study.

Ground Water: Water found beneath the earth's surface that fills pores between materials such as sand, soil, or gravel. In aquifers ground water occurs in sufficient quantities that it can be used for drinking water, irrigation and other purposes.

Hazard Ranking System (HRS): A scoring system used to evaluate potential relative risks to public health and the environment from releases or threatened releases of hazardous substances. EPA and States use ths HRS to calculate a site score, from 0 to 100, based on the actual or potential release of hazardous substances from a site through air, surface water, or ground water to affect people. This score is the primary factor used to decide if a hazardous waste site should be placed on the National Priorities List.

Hazardous Substance: Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive.

Incineration: Burning of certain types of solid, liquid, or gaseous materials under controlled conditions to destroy hazardous waste.

Information Repository: A file containing current inf rmation, technical reports, and reference documents regarding a Superfund site. The information repository is usually located in a public building that is convenient for local residents -- such as a public school, city hall, or library.

Leachate: A contaminated liquid resulting when water percolates, or trickles, through waste materials and collects components of those wastes. Leaching may occur at landfills and may result in hazardous substances entering soil, surface water, or ground water.

Monitoring Wells: Special wells drilled at specific locations on or off a hazardous waste site where ground water can be sampled at selected depths and studied to determine such things as the direction in which ground water flows and the types and amounts of contaminants present.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The Federal regulation that guides the Superfund program.

National Priorities List (NPL): EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial response using money from the Trust Fund. The

list is based primarily on the score a site receives on the Hazard Ranking System (HRS). EPA is required to update the NPL at least once a year.

Operable Unit: An action taken as one part of an overall site cleanup. For example, a carbon absorbtion system could be installed to halt rapidly spreading ground-water contaminants while a more comprehensive and long-term remedial investigation/feasibility study is underway. A number of operable units can be used in the course of a site cleanup.

Operation and Maintenance (O&M): Activities conducted at a site after a response action occurs, to ensure that the cleanup or containment system is functioning properly.

Parts Per Billion (ppb)/Parts per Million (ppm): Units commonly used to express low concentrations of contaminants. For example, 1 ounce of trichloroethylene (TCE) in 1 million ounces of water is 1 ppm; 1 ounce of TCE in 1 billion ounces of water is 1 ppb. If one drop of TCE is mixed in a competition-size swimming pool, the water will contain about 1 ppb of TCE.

Potentially Responsible Party (PRP): An individual(s) or company(ies) (such as owners, operators, transporters, or generators) potentially responsible for, or contributing to, the contamination problems at a Superfund site. Whenever possible, EPA requires PRPs, through administrative and legal actions, to clean up hazardous waste sites they have contaminated.

Proposed Plan: A public participation requirement of SARA in which EPA summarizes for the public the preferred cleanup strategy, the rationale for the preference, reviews the alternatives presented in the detailed analysis of the remedial investigation/feasibility study, and presents any waivers to cleanup standards of §121(d)(4) may be proposed. This may be prepared either as a fact sheet or as a separate document. In either case, it must actively solicit public review and comment on all alternatives under Agency consideration.

Record of Decision (ROD): A public document that explains which cleanup alternative(s) will be used at National Priorities List sites. The record of decision is based on information and technical analysis generated during the remedial investigation/feasibility study and consideration of public comments and community concerns.

Remedial Action (RA): The actual construction or implementation phase that follows the remedial design of the selected cleanup alternative at a site on the National Priorities List.

Remedial Design (RD): An engineering phase that follows the record of decision when technical drawings and specifications are developed for the subsequent remedial action at a site on the National Priorities List.

Remedial Investigation/Feasibility Study: Investigative and analytical studies usually performed at the same time in an interactive, iterative process, and together referred to as the "RI/FS." They are intended to:

- Gather the data necessary to determine the type and extent of contamination at a Superfund site;
- Establish criteria for cleaning up the site;
- Identify and screen cleanup alternatives for remedial action: and
- Analyze in detail the technology and costs of the alternatives.

Remedial Response: A long-term action that stops or substantially reduces a release or threatened release of hazardous substances that is serious, but does not pose an immediate threat to public health and/or the environment.

Resource Conservation and Recovery Act (RCRA): A Federal law that established a regulatory system to track hazardous substances from the time of generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent new, uncontrolled hazardous waste sites.

Response Action: A CERCLA-authorized action at a Superfund site involving either a short-term removal action or a long-term remedial response that may include, but is not limited to, the following activities:

- Removing hazardous materials from a site to an EPA. approved, licensed hazardous waste facility for treatment, containment, or destruction.
- Containing the waste safely on-site to eliminate further problems.
- Destroying or treating the waste on-site using incineration or other technologies.
- Identifying and removing the source of ground water contamination and halting further movement of the contaminants.

Responsiveness Summary: A summary of oral and/or written public comments received by EPA during a comment period on key EPA documents, and EPA's responses to those comments. The responsiveness summary is a key part of the ROD, highlighting community concerns for EPA decision-makers.

Superfund: The common name used for the Comprehensive Environmental Response, Compensation, and Liability Act, also referred to as the Trust Fund.

Superfund Amendments aud Reauthorization Act (SARA): Modifications to CERCLA enacted on October 17, 1986.

Surface Water: Bodies of water that are above ground, such as rivers, lakes, and streams.

Treatment, Storage, and Disposal Facility (TSD Facility): Any building, structure, or installation where a hazardous substance has been treated, stored, or disposed. TSD facilities are regulated by EPA and States under the Resource Conservation and Recovery Act.

Trust Fund: A Fund set up under the Comprehensive Environmental Response, Compensation, and Liability Act to help pay for cleanup of hazardous waste sites and to take legal action to force those responsible for the sites to clean them up.

Volatile Organic Compound: An organic (carbon-containing) compound that evaporates (volatizes) readily at room temperature.