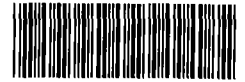


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029



SDMS DocID 2102896

SUBJECT: OU2 Record of Decision - Transmittal Memo
Centre County Kepone Superfund Site

FROM: James Webb, Associate Director
Office of Superfund Site Remediation (3HS20)

TO: Kathryn A. Hodgkiss, Acting Director
Hazardous Site Cleanup Division (3HS00)

Attached is the Record of Decision ("ROD") for the second Operable Unit ("OU2") at the Centre County Kepone Site located in State College, Centre County, Pennsylvania. This ROD addresses the soils in the Former Spray Field Area and is expected to be the final Operable Unit for the Site.

The major components of the OU2 remedy include: a combination soil cover, pavement/building cover, and excavation and off-Site disposal for impacted surface soils in the Former Spray Field Area; security fencing between the Redevelopment and Remediation Parcels on the Former Spray Field Area; institutional controls to prevent disturbance of those impacted surface soils which are capped (soil cover or asphalt/building cover) and to protect the continued stability and integrity of the remedy; and, mitigation measures for vapor intrusion ("VI") for any existing or planned structure/building within the area of the VOC contamination and occupied by persons, if warranted by the results of the VI Study being performed under OU1. There are no unacceptable risks to human health for the Former Spray Field Area based on industrial/commercial use of the property. Construction on the remedy is expected to be completed in 2010.

The Commonwealth of Pennsylvania Department of Environmental Protection ("PADEP") concurs with the OU2 remedy. The concurrence letter of July 10, 2009 is attached.

**RECORD OF DECISION
CENTRE COUNTY KEPONE SITE
OPERABLE UNIT 2**

PART 1 - DECLARATION

SITE NAME AND LOCATION

Centre County Kepone Site
State College, Centre County, Pennsylvania
CERCLIS ID# PAD000436261
Operable Unit 2

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for OU2 ("OU2") at the Centre County Kepone Site in College Township, Centre County, Pennsylvania (the "Site"), chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, ("CERCLA"), 42 U.S.C. §§ 9601 *et seq.*, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan ("National Contingency Plan" or "NCP"), 40 C.F.R. Part 300. The ROD ("ROD") explains the factual and legal basis for selecting the remedial action for OU2 at this Site. The information supporting the ROD is contained in the Administrative Record for this Site.

The Commonwealth of Pennsylvania Department of Environmental Protection ("PADEP") concurs with the Selected Remedy. The concurrence letter from the Commonwealth is contained in the Administrative Record.

ASSESSMENT OF THE SITE

The response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

DESCRIPTION OF THE SELECTED REMEDY

OU2 is the second and expected to be the final operable unit for the Site, subject to the conclusion of a vapor intrusion ("VI") study currently being conducted under OU1. The Site consists of an approximate 35-acre Property housing the RUTGERS Organics Corporation ("ROC"), a former chemical manufacturing plant, and a portion of the Spring Creek watershed. OU2 areas that were investigated include the soils from the 15-acre Former Spray Field Area and riparian areas of Spring Creek, and sediments from the lower freshwater drainage ditch ("FWDD"), Thornton Spring outlet and drainage channel ("TSC"), and depositional areas of Spring Creek downstream of Benner Fish Hatchery. As a result of the OU2 field investigations and the sediment removal action performed under the 2007 Administrative Settlement and Order on Consent, the Former Spray Field Area surface soils are the only part of OU2 that must be addressed for further action and is the subject of this ROD.

The Selected Remedy for OU2 is the preferred alternative identified in the Proposed Remedial Action Plan ("Proposed Plan") dated March 5, 2009. The Selected Remedy is Alternative 5 - - the Combination Remedy (Combination of Alternatives 2, 3, & 4) - - which consists of a combination of soil cover, pavement/building cover, and excavation and off-Site disposal for surface soils in the Former Spray Field Area.

The Selected Remedy includes the following major components:

- A soil cover for those surface soils above the Preliminary Remediation Goal ("PRG") of 190 ppb for kepone, (i.e. the "cleanup level"), **within the Remediation Parcel portion of the Former Spray Field Area;**
- Any combination of a soil cover, pavement/building cover, or excavation/disposal and replacement with clean soil for those surface soils above the PRG **within the Redevelopment Parcel portion of the Former Spray Field Area;**
- Security fencing between the Redevelopment and Remediation Parcels;
- Institutional controls to prevent disturbance of those surface soils above the PRG which are capped (soil cover or asphalt/building cover) and to protect the continued stability and integrity of the remedy; and
- Mitigation measures for VI for any existing or planned structure/building within the area of VOC contamination and occupied by persons, if warranted by the results of the VI Study being performed under OU1.

There are no unacceptable risks to human health for the Former Spray Field Area based on industrial/commercial use of the Property. The Selected Remedy will provide protection of the environment by effectively mitigating plant and animal exposure by capping (soil or pavement/building) or by excavation and off-Site disposal. Surface soils in the Former Spray

Field Area exceeding the PRG of 190 ppb for kepone will be addressed by the Selected Remedy. The Selected Remedy would also prevent surface soils exceeding the PRG from migrating off-Site. Any future use of the ROC Property must be consistent with the institutional controls which were required by the 1995 ROD, Consent Decree, and required by this ROD.

ROD DATA CHECKLIST

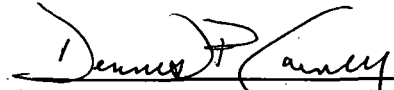
The following information is included in Part 2 - Decision Summary of this ROD for OU2. Additional information may be found in the Administrative Record for this Site.

- Contaminants of concern ("COCs") and their respective concentrations (pages 12-15);
- Current and future land use assumptions (pages 15-17);
- Baseline risk represented by the COCs (pages 18-20);
- Cleanup levels established for COCs and the basis for these levels (page 20);
- How source materials constituting principal threats are addressed (page 30);
- Estimated capital, annual operation and maintenance, and total present worth costs, discount rate and number of years over which the remedy cost estimates are projected (page 33);
- Potential land use that will be available at the Site as a result of the Selected Remedy (page 33); and
- Key factors that describe how the Selected Remedy provides the best balance of tradeoffs with respect to balancing and modifying criteria (pages 31-35).

STATUTORY DETERMINATIONS

The Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy uses permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable. No source materials as principal threats are present in the Former Spray Field Area and therefore there is no remedy preference for treatment of principal threat wastes.

Because hazardous substances remain at the Centre County Kepone Site from actions under OU1, the review described in Section 121(c) of CERCLA, 42 U.S.C. § 9621(c) and Section 300.430(f)(4)(ii) of the NCP will continue to be conducted no less than every five years. The last Five-Year Review of the Site was conducted on September 10, 2004.


Kathryn A. Hodgkiss, Acting Director
for Hazardous Site Cleanup Division

7/24/09
Date

CENTRE COUNTY KEPONE SUPERFUND SITE
State College, Centre County, Pennsylvania

OPERABLE UNIT 2

RECORD OF DECISION

**ROD
CENTRE COUNTY KEPONE SITE
OPERABLE UNIT 2**

PART 2 - DECISION SUMMARY

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List of Acronyms

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
EPA	United States Environmental Protection Agency
FWDD	Freshwater Drainage Ditch
NCP	National Oil and Hazardous Substances Pollution Contingency Plan or the National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PADEP	Pennsylvania Department of Environmental Protection
PRG	Preliminary Remediation Goals
PRPs	Potentially Responsible Parties
RA	Remedial Action
RAO	Remedial Action Objective
RAP	Response Action Plan
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROC	RUTGERS Organics Corporation
ROD	Record of Decision
TSC	Thornton Spring Outlet and Drainage Channel
UAO	Unilateral Administrative Order
VI	Vapor Intrusion
VOC	Volatile Organic Compound

**RECORD OF DECISION
CENTRE COUNTY KEPONE SITE
OPERABLE UNIT 2**

PART 2 - DECISION SUMMARY

I. SITE NAME, LOCATION, AND DESCRIPTION

The Centre County Kepone Site (the "Site") includes an approximate 35-acre property owned by RUTGERS Organics Corporation ("ROC") (hereinafter, the "ROC Property" or "Property") and a portion of the Spring Creek watershed, including Thornton Spring (See Figure 1). The ROC Property includes a former chemical manufacturing plant which was closed in 2004. The United States Environmental Protection Agency ("EPA") is the lead agency and has identified the Site in the National Superfund electronic database identification number as PAD000436261. The Site was placed on the National Priority List ("NPL") in September 1983.

The Site is located in College Township, Centre County, Pennsylvania and is situated on Struble Road off of Pennsylvania State Highway 26, approximately 2.25 miles northeast of the Borough of State College and 800 feet south of the intersection of Pennsylvania State Highways 26 and 150. The ROC Property was subdivided into two parcels in 2008 - - both of which include a portion of the Former Spray Field Area, and is the subject of this ROD. The ROC Property is adjacent to the southeastern border of a local Pennsylvania Railroad spur. A number of buildings and ancillary facilities associated with ROC's former chemical manufacturing plant occupy the northern portion of the ROC Property, which is mostly covered by asphalt pavement and concrete. The southern and southwest portions of the ROC Property are primarily open fields and grassed. A freshwater drainage ditch ("FWDD") is located along the western boundary of the ROC Property. The FWDD crosses under PA Route 26 and enters the Spring Creek, immediately downstream from the PA Route 26. Stream flow in the FWDD is dependent upon stormwater runoff and discharges from the Site's groundwater treatment facility.

In the immediate vicinity of the Site, the land use is primarily industrial/commercial with some residential. Several residential dwellings are located along the southeast border of the Site on First Avenue. Commercial establishments are located along State Route 26 which is heavily traveled and runs adjacent to the Site. A restaurant, garden center, lumber yard, and concrete plant are located within 300 feet of the former manufacturing plant. Public water is available in the area surrounding the Site. The College Township Water Authority is the local municipal water provider.

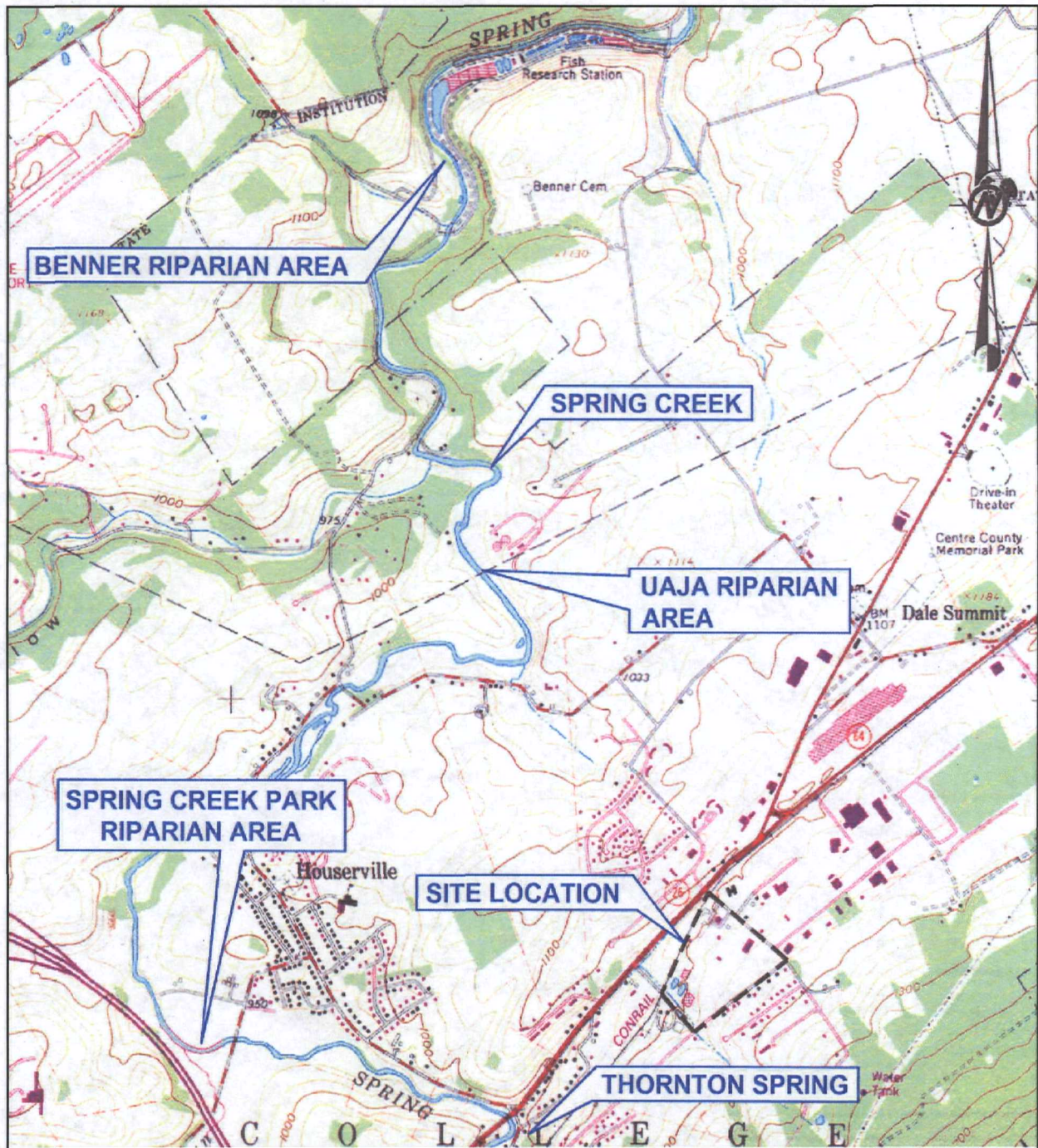


Figure 1 – Site Location

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

From 1958 through 1977, the 32.2-acre Site was owned and operated by Nease Chemical Company, Inc. On December 30, 1977, Nease Chemical Company, Inc., including the Site, was acquired by and merged with Ruetgers Chemicals, Inc. The company resulting from the merger was Ruetgers-Nease Chemical Company, Inc., which subsequently became ROC. ROC operated the plant until chemical manufacturing operations ceased in 2004.

Since the beginning of operations at the Site in 1958, a variety of organic chemicals were produced, many with specialized applications, including products and intermediates utilized in the soap and detergent industry, in the manufacture of pharmaceutical products, in the agricultural chemical industry, in metal plating, and in the manufacture of plastics. The primary organic raw materials used in the production of intermediates and products included, but were not limited to, benzene, methanol, tetrachloroethene ("PCE"), tetrachloroethane ("TCA"), toluene, and xylene. Two organic compounds of particular interest which were manufactured as custom products at the facility are kepone (chlordecone) and mirex (dodecachloropentacyclodecane). Kepone was produced in two different time periods between 1959 and 1963. Mirex was manufactured at the facility from 1973 through 1974.

In the early 1960s, waste disposal was conducted on-Site by utilizing earthen lagoons. By 1963 the earthen lagoons were replaced with concrete and asphalt lagoons, in which treatment of the production wastewater was conducted with the treated water sprayed on an open grassy area at the southern end of the Site (now identified as the Former Spray Field Area). Since April 1972, all waste materials have been disposed at permitted off-Site facilities.

A Remedial Investigation/Feasibility Study ("RI/FS") was conducted to assess the nature and extent of contamination at the Site, including a Risk Assessment in order to evaluate the human health risks and the environmental impacts associated with exposure to Site contaminants. Sampling was conducted between September 1990 and May 1992 and included surface soils, subsurface soils, sediments, surface water, groundwater, ambient air, and fish tissue.

Volatile Organic Compounds ("VOCs") were detected in groundwater monitoring wells, including benzene, 1,2-dichloroethene, ethylbenzene, tetrachloroethene ("PCE"), toluene, trichloroethene ("TCE"), vinyl chloride, and xylenes. VOCs detected in the surface water at Thornton Spring included 1,2-dichloroethene, ethylbenzene, 1,1,2,2-tetrachloroethane, toluene, TCE, and xylene. VOCs detected in the sediment at Thornton Spring include 1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,2-dichloroethane, and TCE, along with mirex and kepone. VOCs were detected in surface and subsurface soils and sediments of the FWDD on the Site, including TCE, PCE, and toluene, as well as mirex and kepone. Mirex and kepone have also been historically detected in the sediment and fish of Spring Creek.

Initial Response

Prior to the Site being included on EPA's National Priorities List ("NPL"), the Commonwealth of Pennsylvania was mainly responsible for directing corrective actions at the Site, which were implemented by ROC. In 1962 and 1963, ROC constructed a concrete lagoon and macadamized an earthen lagoon with asphalt pursuant to a Pennsylvania Department of Environmental Protection ("PADEP") order. In November 1972, ROC performed in-situ treatment of the wastewater and sludge in the concrete and earthen lagoons using a process called Chemfix, disposed of the contents of the asphalt impoundment, and backfilled the asphalt and earthen impoundments. ROC constructed an on-Site groundwater treatment facility in October 1982, and commenced operations of the facility in November 1982.

In May 1986, the lead role in overseeing cleanup activities was transferred from PADEP to the USEPA.

Basis for Taking Action

EPA proposed the Site for inclusion on the NPL on December 1, 1982 and listed it on the NPL on September 8, 1983.

Pursuant to CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986 ("SARA"), ROC and EPA entered into an Administrative Order on Consent, ("AOC"), EPA Docket No. III-88-22-DC, on November 7, 1988. The AOC required that a RI/FS be performed for the Site including the manufacturing area and specific off-Property areas including Thornton Spring and a portion of Spring Creek.

The results of the RI/FS conducted from 1990 to 1992 indicated a total of twenty-nine (29) chemicals, including VOCs, mirex, and kepone which were detected in the environmental media sampled. It was determined that the actual or threatened releases of hazardous substances at this Site may present an imminent and substantial endangerment to public health, welfare, or the environment, therefore remediation of the groundwater, Thornton Spring surface water, and on-Property soils and sediment was warranted.

OUI ROD

In April 1995, EPA issued a ROD; which among other things, stated that the Site would be divided into two (2) operable units as follows:

OUI addresses:

- Contaminated groundwater and surface water;
- Contaminated soils (excluding the 15-acre Former Spray Field Area); and,
- Contaminated sediments (on the ROC Property and Spring Creek).

OU2 addresses:

- Soils from the 15-acre Former Spray Field Area and riparian areas of Spring Creek; and,
- Sediments from the lower FWDD, the Thornton Spring drainage channel ("TSC"), and depositional areas of Spring Creek downstream of the Benner Fish Hatchery.

The remedy for OU1 addressed the primary threats to human health and the environment posed by the Site due to VOCs in the groundwater and surface water; mirex and kepone in fish tissue; and mirex, kepone, and VOCs in soils and sediments. It provided for construction of a groundwater extraction and treatment system and a soil vapor extraction system. Additional components of the remedy included: excavation and off-Site disposal of contaminated soils and sediments located on-Site, improvements to the surface water drainage system, monitoring of groundwater, surface water, fish tissue, and stream channel, fencing, property deed restrictions, and additional investigations associated with OU2.

ROC entered into a Consent Decree with EPA in April 1997 to implement the remedy selected in the OU1 ROD. On March 8, 2001, EPA issued a ROD Amendment that modified the soil clean up approach to utilize SVE as part of the remedy. All of the components of the remedial action required by the OU1 ROD and Amendment and the Consent Decree have been implemented by ROC. The required soil and sediment excavations have been completed and engineering and institutional controls are in place. Similarly, the groundwater extraction, SVE, and associated treatment systems have been constructed and are currently in operation. The OU1 ROD performance standard for fish tissue in Spring Creek was to decrease the levels of mirex and kepone to below the established FDA action levels such that the catch-and-release order on the Creek could be lifted. This standard was attained, and in 2001, the State agencies lifted the catch-and-release order that had previously been in place based on fish tissue levels. However, a catch-and-release order remains for wildlife management purposes only.

OU2 Sediment Removal Action

In September 2002, following the OU2 field investigation, a meeting was held between ROC and various agencies. At that meeting, it was concluded that removal of fine-grained sediment from the lower FWDD and from the TSC would be appropriate. ROC performed initial scoping for a potential sediment removal action and estimated the in-place sediment volume of approximately 118 cubic yards for the lower FWDD and approximately 16 cubic yards for the TSC in August 2003.

ROC and EPA subsequently entered into an Administrative Settlement and Order on Consent in May 2007 ("2007 AOC") for removal of the fine-grained sediments. The 2007 AOC required that all fine-grained sediments/soils in the lower FWDD and the TSC be removed to a depth of 2 feet to be protective of environmental receptors. An added benefit to this removal action is that the sediments/soils would be prevented from migrating downstream into Spring

Creek. The depth of excavation might be limited by the occurrence of bedrock. However, if sediments/soils remained after excavation, they were to meet the soil cleanup levels established in the 1995 ROD. Any residual sediment/soil contamination remaining in place was to be contained by lining the excavated areas and employing approved erosion control measures. The 2007 AOC also required the submission of a Response Action Plan ("RAP") together with an expeditious schedule for completion of the response action in the lower FWDD and TSC.

In order to provide information on current Site conditions for preparation of the RAP, additional sediment samples were collected, and confirmation sediment probing was conducted by ROC in June 2007 using the same methods as the previous work. A summary of the sediment sampling program was presented in a RAP submitted to EPA in July 2007. In general, the 2007 sampling event indicated that mirex and kepone were present in the FWDD and TSC at concentrations comparable to previous sampling results. The results of the 2007 sediment thickness survey were also comparable to previous results and are summarized in the RAP. EPA conditionally approved the RAP by letter dated October 5, 2007, and EPA's comments were addressed in the Response Action Design Report ("RADR") that was submitted to EPA on October 22, 2007. EPA completed review of the RADR and conditionally approved it on April 9, 2008.

On April 28, 2008, response action operations commenced in the FWDD by an approved contractor; however, heavy rains over the weekend caused increased surface water flow from the surrounding upgradient areas to the FWDD. Heavy rains persisted into the following week and EPA approved a delay in field work and an extension to project schedule until conditions improved. On May 27, 2008, the contractor remobilized at the Site to continue sediment removal activities.

Sediment removal was initiated in the FWDD and TSC primarily using vacuum dredging. Where sediment removal became more cumbersome, a field crew of two supplemented the vacuum operation by loosening the material with hand shovels. All fine-grained sediments/soils were removed to a minimum depth of at least 2 feet to be protective of environmental receptors. Much of the extent of excavation was limited by the occurrence of bedrock at depths shallower than 2 feet. The upper portion of the TSC was the only area of excavation in which sediments/soils remained below a depth of 2 feet after excavation. In this area, coir matting was installed in the channel to assist in stabilizing the channel and stone placed on top. After placing the stone, coir logs were staked into the side-slopes of the stream channel to assist in stabilizing the banks. Since sediments/soils were left in place in this upper portion of the TSC, three post-excavation confirmatory samples were collected and analyzed for mirex and kepone prior to channel lining. Results from the post-excavation confirmatory samples did not exceed the standards required by the 2007 AOC and are therefore protective of environmental receptors and impacts to groundwater. Furthermore, this residual sediment/soil remaining in place has been contained by lining the excavated areas and employing approved erosion control measures to prevent future impact to the downgradient stream system. It should be noted that all attempts were made to retain the natural rocky substrate of the TSC using the existing rocks in the stream, not imported material, to minimize the impact to the stream bank as requested by the agencies.

Remedial activities at the FWDD and TSC were completed from May 27, 2008 through June 25, 2008. The total weight of material removed from the FWDD and TSC under the removal action was 116.21 tons. Excavated sediments were temporarily staged on the ROC Property while awaiting characterization sample results. Based on the results, the sediment was removed from the ROC Property and disposed as non-hazardous waste to an approved landfill on September 23, 2008.

As a result of the OU2 sediment removal action performed under the 2007 AOC, there is no further action required for sediments in the lower FWDD and the TSC. The Former Spray Field Area soils are the only part of OU2 that must be addressed for further action.

III. HIGHLIGHTS OF COMMUNITY PARTICIPATION

On March 5, 2009, pursuant to Sections 113(k)(2)(B)(i-v) and 117(a) of CERCLA and 42 U.S.C. §§ 9613(k)(2)(B)(i-v) and 9617(a), EPA released for public comment the Proposed Remedial Action Plan for Operable Unit 2 ("Proposed Plan for OU2") setting forth EPA's preferred remedial alternative for the Site. The Proposed Plan for OU2 was based on documents contained in the Administrative Record File. EPA made these documents available to the public in the EPA Administrative Record Room in EPA Region III's office located at 1650 Arch Street in Philadelphia, Pennsylvania, and at the local information repository at the Schlow Memorial Library located at 211 South Allen Street in State College, Pennsylvania. A notice of availability of the RI/FS and Proposed Plan for OU2 was published in the *Centre Daily Times* on March 5, 2009.

EPA opened a 30-day public comment period on March 5, 2009 to receive comments on EPA's preferred alternative and the other alternatives identified in the Proposed Plan for OU2. On March 13, 2009, EPA mailed fact sheets to residents living near the Site informing them of the Proposed Plan for OU2 and the upcoming public meeting. EPA held a public meeting on March 23, 2009 at the Mount Nittany Middle School in State College, Pennsylvania. At that meeting, EPA announced that the comment period would be extended until April 22, 2009. A notice that the comment period was extended was published in the *Centre Daily Times* on April 19, 2009. Comments received during this public comment period, as well as EPA's response to such comments, are summarized in Part 3 - Responsiveness Summary of this ROD. A detailed discussion of the recent community activities is presented in Section X under the subheading "Community Acceptance".

More detailed documentation on the information contained in this ROD may be found in the Administrative Record which contains the Remedial Investigation, Feasibility Study, Removal Action, and other information used by EPA in the decision making process. EPA encourages the public to review the Administrative Record in order to gain a more comprehensive understanding of the Site and the activities that have been and will be conducted there. The Administrative Record can be viewed at the Schlow Memorial Library located at 211

South Allen Street in State College, PA and is also available at the EPA Region III Office located at 1650 Arch Street in Philadelphia, PA. To review the Administrative Record at EPA's Philadelphia office, contact Ms. Anna Butch, Administrative Record Coordinator, at (215) 814-3157. The Administrative Record for the Site can also be accessed on the web at www.epa.gov/arweb. Copies of this ROD are available for public review in these information repositories.

IV. SCOPE AND ROLE OF THIS RESPONSE ACTION

The Centre County Kepone Site has been divided into two operable units ("OUs"), or Site components, in order to simplify and expedite action at the Site. The two OUs and the areas they address are as follows:

- **Operable Unit 1:** Contaminated groundwater and surface water, contaminated soils (excluding the 15-acre Former Spray Field Area), and contaminated sediments on the ROC Property and in Spring Creek.
- **Operable Unit 2:** Soils from the 15-acre Former Spray Field Area, and riparian areas of Spring Creek, and sediments from the lower portion of the FWDD, TSC, and depositional areas of Spring Creek downstream of the Benner Fish Hatchery.

EPA has already selected the remedy for OU1 in a ROD signed on April 21, 1995. The remedy for OU1 addressed the primary threats to human health and the environment posed by the Site due to volatile organic compounds ("VOCs") in the groundwater and surface water; mirex and kepone in fish tissue; and mirex, kepone, and VOC contamination in soils and sediments. The remedy provided for construction of a groundwater extraction and treatment system and a soil-vapor extraction ("SVE") system. Additional components of the remedy included: excavation and off-Site disposal of contaminated soils and sediments located on-Site, improvements to the surface water drainage system, monitoring of groundwater, surface water, fish tissue, and stream channel, fencing, property deed restrictions, and additional investigations associated with OU2.

ROC entered into a Consent Decree with EPA in April 1997 to implement the remedy contained in the OU1 ROD. On March 8, 2001, EPA issued a ROD Amendment that modified the soil clean-up approach to utilize SVE as part of the remedy. All of the remedial actions required by the OU1 ROD, ROD Amendment, and Consent Decree have been implemented by ROC. The required soil and sediment excavations have been completed and engineering and institutional controls are in place. Similarly, the groundwater extraction, SVE, and associated treatment systems have been constructed and are currently in operation. The ROD performance goal for Spring Creek was to achieve fish tissue levels of mirex and kepone such that the catch-and-release order on the Creek could be lifted. This goal has been attained and in 2001 the State

agencies lifted the catch-and-release order that had previously been in place based on tissue levels.

The second operable unit ("OU2"), the subject of this ROD, investigated the mirex, photomirex, and kepone ("MPK") contaminated soils from the 15-acre Former Spray Field Area and riparian areas of Spring Creek, and the MPK contaminated sediments from the lower portion of the FWDD, TSC, and depositional areas of Spring Creek downstream of Benner Fish Hatchery. As a result of the OU2 field investigations and the sediment removal action performed under the 2007 Administrative Settlement and Order on Consent, the Former Spray Field Area surface soils are the only part of OU2 that must be addressed for further action and is the subject of this ROD. The second operable unit is expected to be the final operable unit for this Site, subject to the conclusion of a VI Study currently being conducted under OU1.

V. SUMMARY OF SITE CHARACTERISTICS / EXTENT OF CONTAMINATION

A. Geographical, Topographical, and Hydrogeological Features

Surface Features and Resources. The Site lies within the Spring Creek basin in south-central Centre County. Surface features include Nittany Mountain, which rises to the southeast of the Site and Bald Eagle Mountain which rises across Nittany Valley to the northwest of the Site. Spring Creek meanders generally northward through the Nittany Valley. Nittany Valley ranges in elevation from 800 to 1,200 feet above mean sea level ("MSL"), while Nittany Mountain rises to approximately 2,070 feet, MSL. In this locale, topography is aligned in a prominent southwest to northeast direction, reflecting the influence of underlying geologic structure and rock types.

The Site includes paved and grassed areas, and buildings and ancillary facilities from ROC's former manufacturing plant. A FWDD runs along the western boundary of the Site, crosses under PA Route 26, and enters Spring Creek immediately downstream from PA Route 26. Stream flow in the FWDD is dependent upon both stormwater runoff and discharges from the Site groundwater treatment facility.

Thornton Spring lies to the southwest of the Site. Thornton Spring is a perennial first-order stream that originates from a groundwater seep at the southern end of Nittany Mountain. Thornton Spring flows approximately 300 feet before emptying into Spring Creek through a culvert under Pike Street immediately upstream from PA Route 26. The streambed of Thornton Spring is two to four feet wide. Land immediately adjacent to Thornton Spring is forested by hardwoods and a few shrubs, and the lawn of an adjacent private residence borders the stream before it goes through the Pike Street culvert and into Spring Creek.

The Spring Creek portion of the Study Area includes Spring Creek and its riparian zone (i.e., floodplain). Spring Creek is a natural (versus channelized), approximately third-order cold water stream with a riparian zone that is alternately forested and maintained as residential lawns.

The canopy over Spring Creek at this location covers 30-40 percent of the stream. Sediments in the streambed are composed primarily of sand, gravel, and cobble.

Geology. The Site is located in the Valley and Ridge Physiographic Province of the Appalachian Mountains in Central Pennsylvania. This region is characterized by a series of alternating elongated, high ridges and broad valleys trending southwest to northeast. This province is characterized by tightly folded and faulted sedimentary rocks that have been uplifted and subsequently eroded. Limestone of the Site has developed solution features typical of karst terrain.

The geologic units underlying the Site are represented by a structurally duplicated sequence of carbonate rocks of Ordovician age comprising the Loysburg Group and Bellefonte Dolomite. The Bellefonte Dolomite, comprised in the Site vicinity by the Tea Creek and Dale Summit Members, is the lowest stratigraphic unit observed within the limit of investigation. The Tea Creek Member consists of a medium-light gray, cryptocrystalline dolomite that varies from finely laminated to massive. The Dale Summit Sandstone Member occurs below the Tea Creek Member and is characterized as a fine to coarse grained conglomerate sandstone. The Loysburg Group overlies the Bellefonte Dolomite. The Loysburg Group consists of interbedded dark gray limestone, dolomitic limestone and minor dolomite.

The bedrock beneath the Site lies within the northwest limb of the Nittany Mountain syncline. Bedding planes strike northeast-southwest, and dip approximately 25 degrees to the southeast toward the axis of the syncline. A thrust fault, apparently related to the later stages of the Nittany syncline folding event, parallels the bedding strike through the Site. The faulting is responsible for the structural duplication of the major rock units on Site.

Soils. The specific soil types identified on-Site are the Murrill gravelly loam, and urban land soils. Two soils within the Murrill channery silt loam on 3 to 8 percent slopes (MuB) and the Murrill channery silt loam on 8 to 15 percent slopes (MuC) are reportedly formed from sandstone colluvium and weathered residue from underlying limestone. These soils consist of deep, well-drained soils usually situated on level to moderately steep slopes along the edges of the limestone valleys.

The urban land soils are soils that have been altered by excavation, removal, and filling activities. Urban lands soils exist within most of the fenced/developed areas of the Site.

Depth to bedrock at the Site is variable and typically more than 6 feet. Soil thickness was found to be as much as 25 feet in the plant production area.

Hydrogeology. Groundwater movement at the Site occurs as conduit and diffuse flow. Conduit flow occurs along bedding-plane partings and fractures enlarged by solutioning. Diffuse flow is through the rock matrix. Groundwater storage in bedrock occurs in both the primary porosity of the rock matrix and secondary porosity, enhanced by solutioning. Dissolution features are more strongly developed in the limestone of the Loysburg Group than in the

Bellefonte Dolomite. The dominant conduit flow is along the fault which bisects the Site and brings the dolomite east of the fault in contact with the limestone to the west. High hydraulic conductivity, or permeability along solutioned zones, functions as a drain for the groundwater system; surrounding diffuse flow zones tend to drain toward the conduit flow zone.

Residual soil overlies the bedrock at the Site. Saturation generally occurs 8 to 10 feet below ground surface. The soil is not considered to be part of the aquifer. The bedrock, where permeable, drains soils by vertical flow. Lateral flow at the soil-bedrock interface occurs at competent bedrock, until flow reaches a weathered or fractured zone. Soil permeability is too low for soil to completely drain, creating a saturated (perched) zone in the soil overburden.

Groundwater from the Site generally flows toward the southwest, along a thrust fault which runs northeast to southwest through the Site. Groundwater flow for the bedrock aquifer, appears to be controlled by solution cavities and fracture systems. Solution cavities, or a fracture system appears to be directing shallow groundwater from the plant area and the geologic contact into a slightly deeper groundwater zone at the center of the Site. Groundwater conduit flow moves from the Site towards the southwest, where it emerges as surface water at Thornton Spring. Deeper regional groundwater flow systems have not been evaluated.

Site Drainage. Site surface drainage via overland flow is primarily directed by surface drains to the FWDD along the western boundary of the Site. Surface water leaves the Site via the FWDD which also includes treated water from the groundwater treatment facility. The FWDD crosses under and follows PA Route 26 in a southwesterly direction until it intersects Spring Creek.

B. Extent of Contamination

Site Characteristics for OU2

In accordance with the requirements of the 1995 ROD for OU1, investigation work was carried out in each of the OU2 areas, including:

- Surface soil sampling for MPK in the 15-acre area defined in the ROD, including the Former Spray Field Area;
- Riparian Area soil sampling for MPK at three transects along Spring Creek; and,
- Additional sediment sampling for MPK in the lower (off-Property) portion of the FWDD, the TSC, and in depositional areas of Spring Creek beyond the Benner Fish Hatchery.

An OU2 Investigation Work Plan was submitted to EPA and PADEP in December 1997. Following meetings and discussions with the EPA, PADEP, Pennsylvania Fish & Boat Commission ("PFBC"), and U.S. Fish & Wildlife Service ("USFWS") (collectively, the

“Agencies”), a revised Work Plan was submitted in July 2001 (Golder Associates, 2001) and conditionally approved by EPA in August 2001. The following sections present the results of the field investigations, leading to the conclusion that the Former Spray Field Area soils and the Lower FWDD and TSC sediments are the only OU2 areas of concern.

OU2 Field Investigation

The first phase of OU2 field investigation was performed between August 27, 2001 and September 14, 2001, with assistance and oversight from representatives of the Agencies. U.S. Filter, a contractor from State College, Pennsylvania, performed geoprobe drilling for the collection of soil samples located in the Former Spray Field Area. In October 2003, additional riparian area soil samples were collected from the University Area Joint Authority (“UAJA”) property at locations that were agreed upon by the Agencies.

OU2 Investigation Results

The results of the OU2 field investigation work are documented in the OU2 Investigation Report, which was submitted to EPA and PADEP on March 20, 2002, and in a supplemental letter report dated March 1, 2004. The data collected from the reports are summarized below:

Former Spray Field Area Soils

Surface soil samples were collected from the 0 - 24 inch depth interval from a total of 45 locations within the 15-acre area that includes the Former Spray Field Area as shown on Figure 2. Three locations also had duplicate samples collected. Sampling results show that mirex was detected in 33 of 48 samples at concentrations up to 6,860 µg/kg; kepone was detected in 28 of 48 samples at concentrations up to 2,130 µg/kg; and, photomirex was detected in 7 of 48 samples at concentrations up to 43.7 µg/kg.

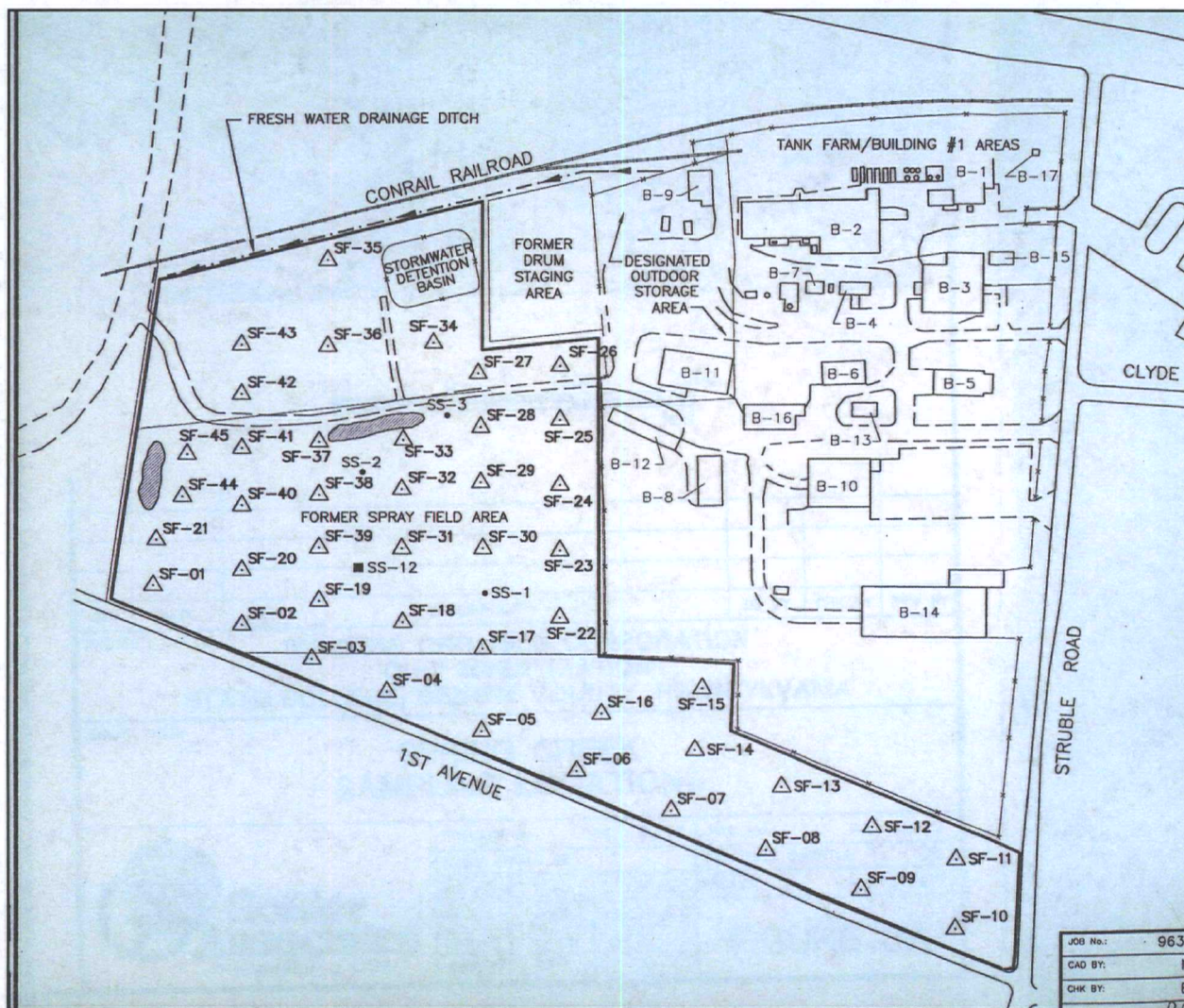


Figure 2 - Former Spray Field Area Sampling Locations

Spring Creek Riparian Areas Soils

Three riparian area transects were sampled along the four-mile stretch of Spring Creek, located in areas where the floodplain was sufficiently wide and accessible to allow significant deposition. Riparian Area #1 was located in Houserville, about 300 feet downgradient of the Puddingtown Road bridge over Spring Creek. Riparian Area #2 was located on UAJA property and Riparian Area #3 was located northeast of the bridge over Spring Creek that leads to the Benner Fish Hatchery and about 300 feet downstream from Benner Spring. Four sampling locations were identified for each transect with samples to be collected at depths of 0 - 6 inches and 6 - 24 inches below ground surface. However, field conditions at Riparian Area #3 did not allow collection of all deep samples due to sampler refusal.

The sampling results for the Spring Creek riparian areas soils showed that mirex was detected in only one of 21 riparian area soil samples, and kepone and photomirex were not detected in any of the samples. Sample locations were conservatively selected by biasing to the wider, undisturbed portion of the floodplain, where floodwater flow velocities are minimized and hence fine sediment deposition maximized. Elevations of sample locations were close to creek level, in order to obtain samples from areas that are more frequently flooded. In a few cases, detection limits were elevated due to sample matrix interference, but in the large majority of cases detection limits were less than 20 µg/kg for mirex and photomirex, and less than 60 µg/kg for kepone.

Lower Freshwater Drainage Ditch (FWDD) Sediments

For the OU2 sampling, the portion of the lower FWDD to be sampled was divided into three reaches of approximately equal length. In coordination with EPA, PADEP, PFBC, and USFWS, one area within each reach was identified at which sample collection was attempted. Discrete sediment samples were to be collected from the 0 - 6 inch and 6 - 14 inch depth intervals. Insufficient fine-grained material was available in one of the sampling reaches. The channel bottom in this reach was composed of outcropping bedrock, and sediments observed in channel consist of sands and gravels. As a result, only 4 sediment samples were collected in the lower FWDD.

The sampling results for the lower FWDD sediments showed that mirex was detected in all four primary samples of fine grained sediment at concentrations up to 1,420 µg/kg, kepone was detected in two samples at concentrations up to 173 µg/kg, and photomirex was detected in one sample at a concentration of 83 µg/kg.

Thornton Spring Outlet and Drainage Channel (TSC) Sediments

Sediment samples were collected from three depositional areas near Thornton Spring outlet and along its tributary drainage channel to Spring Creek. In coordination with the Agencies, the length of the drainage channel from Thornton Spring outlet to the channel's confluence with Spring Creek was divided into three equal reaches and one depositional area was identified within each reach for sample collection.

Within the reach closest to Spring Creek, a depositional area about 8 feet upstream of the Spring Creek confluence and about 10 feet downstream of the outfall from the culvert passing under Pike Street was sampled. A sample was collected from the 0 - 6 inch depth interval; however, sample refusal occurred at 8 inches and so a second sample was collected from the 6 - 8 inch interval. In the central reach, a depositional area about 75 feet downstream of the Thornton Spring outlet was sampled. Following collection of a sample from the 0 - 6 inch interval, refusal was encountered and deeper samples could not be obtained. In the reach closest to the Thornton Spring outlet, two discrete sediment samples (0 - 6 and 6 - 24 inch depth intervals) were collected from a depositional area about 30 feet from the Thornton Spring outlet.

The sampling results for the TSC sediments showed that mirex and kepone were present in virtually all samples of fine grained sediments within the TSC. Mirex was present at concentrations up to 309 µg/kg and kepone up to 765 µg/kg; photomirex was not detected.

Spring Creek Sediments Downstream of Benner Fish Hatchery

Depositional areas of concern downstream of the Benner Fish Hatchery were identified in consultation with EPA, PADEP, USFWS, and PFBC to be upstream of Tally Rand Dam in Bellefonte and McCoy's Dam near Milesburg, PA. Thirteen (13) fine grained sediment samples were collected from these areas in cooperation with PADEP and USFWS that supplemented previous PADEP sampling at McCoy's Dam. Subsequently, PADEP collected additional samples in November 2004 in connection with the planned removal of McCoy's Dam. In all, a total of 34 samples have been collected from multiple depths, and mirex was detected in only one sample at a concentration of 19.8 ug/kg. Kepone and photomirex were not detected. Although detection limits were elevated for some of the samples collected in 2001 due to matrix interferences and high moisture, PADEP achieved detection limits of 50 µg/kg for kepone and 10 µg/kg for mirex in its subsequent sampling.

As a result of the OU2 field investigations and the sediment removal action performed under the 2007 AOC, the Former Spray Field Area soils are the only part of OU2 that must be addressed for further action and is the subject of this ROD.

VI. CURRENT AND POTENTIAL FUTURE LAND AND WATER USES

The Site consists largely of the Property owned by ROC which was used as a former chemical manufacturing plant. The Site is located in College Township, Centre County, Pennsylvania and is situated on Struble Road off of PA Route 26, approximately 2.25 miles northeast of the Borough of State College and 800 feet south of the intersection of State Highways 26 and 150.

In the immediate vicinity of the Site, land use is primarily industrial/commercial with some residential. Several residential dwellings are located along the southeast border of the Site on First Avenue. Commercial establishments are located along State Route 26 which is heavily traveled and runs adjacent to the Site. A restaurant, garden center, lumber yard, and concrete plant are located within 300 feet of the former manufacturing plant. Public water is provided to residents in the surrounding area by the College Township Water Authority.

The majority of the ROC Property is zoned as I-1, General Industrial, with a 200' wide strip of property along First Avenue zoned as R-2, Two-Family Residential. Deed restrictions are in place for the entire ROC Property. The deed restrictions were required by the 1995 ROD and Consent Decree. The deed restrictions prohibit: (1) the use of the Property for residential, non-manufacturing related commercial, or agricultural purposes; and (2) the use of groundwater on the ROC Property for domestic purposes, including drinking water. In addition, future land

use must comply with the institutional controls established by this ROD.

In December 2003, following the announcement of the cessation of manufacturing operations at the Site, EPA and PADEP met with ROC to discuss the proposed future use strategy for its Property. At that meeting, ROC proposed that the properties be divided or categorized into three parcels. The three parcels included:

- The Administration Parcel (approximately 9 acres) located north of Struble Road. This area was not contaminated and is upgradient of the plant production facilities. This parcel housed the main administration building and parking lot for ROC. On September 27, 2004, EPA published in the Federal Register a direct final notice of partial deletion of the Centre County Kepone Superfund Site to remove this parcel from the National Priorities List. This deletion became effective on November 26, 2004.
- The Remediation Parcel (approximately 16 acres) where the chemical manufacturing activities previously occurred and where most of the OU1 remedial activities were required. This area includes ongoing remedial activities (groundwater and soil vapor extraction systems). The western portion of the Former Spray Field Area (approximately 4 acres) is included in this parcel.
- The Redevelopment Parcel (approximately 19 acres) includes the remainder of the Former Spray Field Area and the non-manufacturing areas of the Site. The southeastern boundary of this parcel is First Avenue.

ROC currently utilizes the main administration building and parking lot on the Administration Parcel. The ROC Property on the south side of Struble Road is the Centre County Kepone Site. In 2008, ROC subdivided its Property consistent with that shown on Figure 3.

ROC recently entered into an Agreement of Sale for the Redevelopment Parcel. The Agreement of Sale for the Redevelopment Parcel is conditioned upon future use of this portion of the Property for non-residential purposes as offices, warehousing or other non-manufacturing purposes consistent with the zoning classification (I-1) in College Township. The permitted uses associated with this zoning are acceptable and consistent with the requirements of the OU1 ROD and Consent Decree. The Agreement of Sale also provides for continued access by ROC and EPA for remediation and monitoring purposes, and settlement will not occur until after EPA issues a Final ROD for OU2. It is the intent of ROC, the prospective buyer, and EPA that maximum synergy be obtained between the remediation requirements and the planned future use for the Redevelopment Parcel. It should, however, be noted that the ROC Property along First Avenue is zoned as R-2 (Two-Family Residential) and this zoning is not consistent with the deed restrictions (institutional controls) that are currently in place. Any future redevelopment must be consistent with the restrictions in the OU1 ROD as well as the institutional controls identified in this ROD.

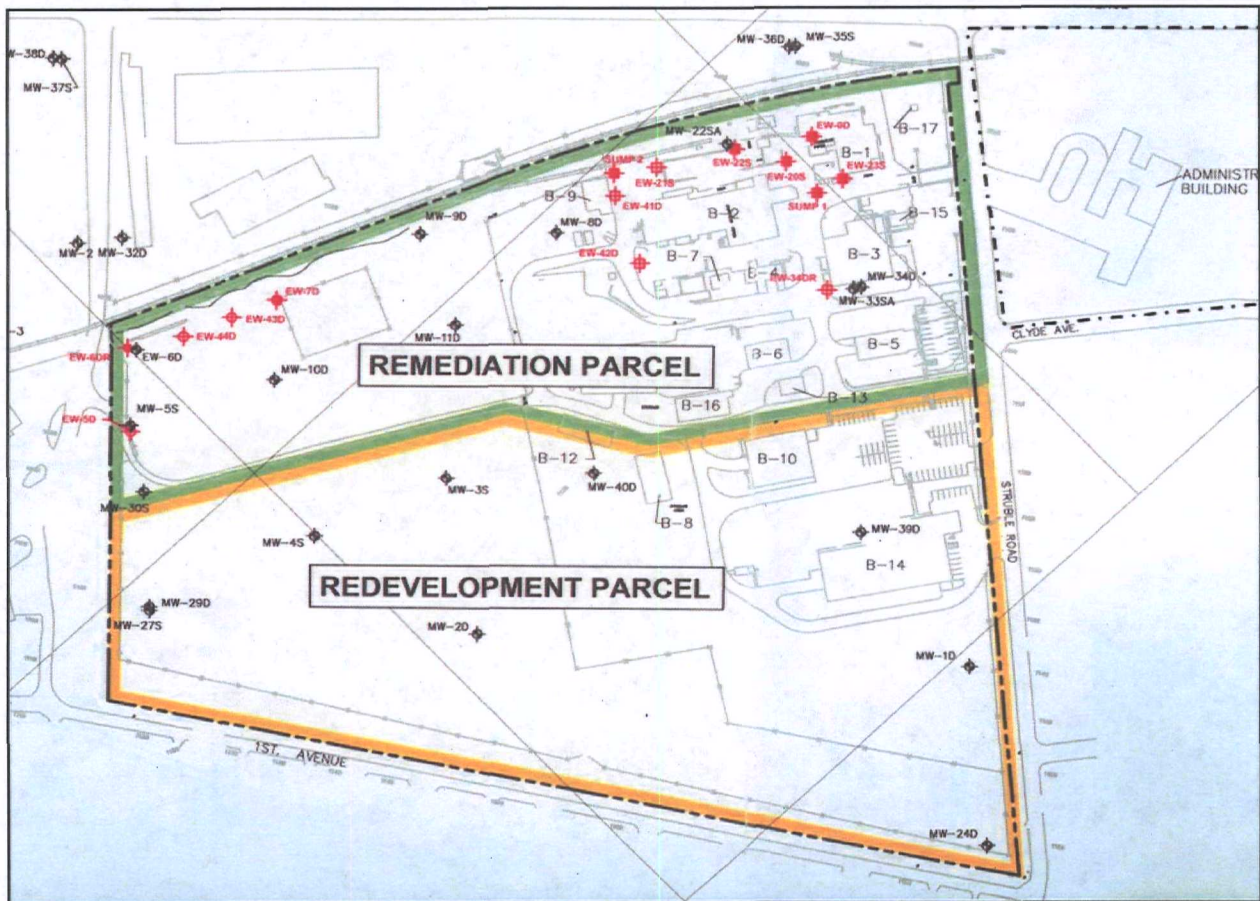


Figure 3 – ROC Property; Remediation and Redevelopment Parcels

Future land use of the Remediation Parcel in all likelihood would remain the same as the current land use. The Remediation Parcel contains monitoring and extraction wells, and the treatment facility which is necessary for ongoing and future remedial activities.

Future groundwater use will in all likelihood remain the same as the current groundwater use. Currently, deed restrictions prevent the use of groundwater on the ROC Property for domestic purposes, including drinking water. All homes in the area surrounding the Site are connected to public water. Water service is provided by the College Township Water Authority. While there is not a mandatory connection ordinance in place for College Township, it is unlikely that a future residence in the area of the Site would be served by a private well since public water is available. However, an ordinance may be pursued under OU1 to prevent use of groundwater in the potential plume area between the ROC Property and Thornton Spring.

VII. SUMMARY OF SITE RISKS

A. Human Health Risk

A detailed Baseline Risk Assessment (“BRA”) was previously prepared for the Site as part of the RI for OU1. The BRA identified and defined possible existing and future health risks and potential environmental impacts associated with exposure to the chemicals present at the Site if no action were taken. The BRA determined that the Former Spray Field Area soils did not pose an unacceptable risk to Site workers or trespassers. However, some EPA risk assessment guidelines have changed since the BRA was prepared in 1993. Recognizing these changes, the risk assessment calculations for potential receptors at the Former Spray Field Area were updated.

Human health risk calculations were performed for two potential receptors, an industrial/commercial worker and a construction worker, associated with the Former Spray Field Area. The industrial worker scenario provides a conservative baseline risk estimate for workers at the Former Spray Field Area for a long exposure period with moderate exposures from typical industrial/commercial activities. For conservatism, these activities were assumed to occur primarily outdoors. The construction worker scenario is intended to provide a risk estimate for workers present for shorter periods of time with intense exposures, such as during excavation activities. Both receptors were assumed to be exposed to MPK in surface soils via incidental ingestion, dermal contact, and the inhalation of fugitive dusts as particulate matter.

Both carcinogenic and noncarcinogenic risks were assessed. A cumulative incremental cancer risk (“ICR”) of 1×10^{-6} or 1E-06 indicates that the exposed receptor has a 1 in 1,000,000 chance of developing cancer as a result of the defined exposure scenario. Noncarcinogenic risk was assessed using the concept of Hazard Quotients (“HQs”) and Hazard Indices (“HIs”). An HI exceeding unity (1) indicates there may be potential noncarcinogenic health risks associated with exposure. HIs are generated by adding individual HQs for contaminants of concern.

The overall human health cancer risks were calculated as follows:

Receptor	Ingestion	Dermal	Inhalation	Overall Cancer Risk
Industrial Worker	3.8×10^{-7}	2.5×10^{-7}	6.4×10^{-11}	6.4×10^{-7}
Construction Worker	1.3×10^{-8}	3.9×10^{-9}	1.1×10^{-12}	1.7×10^{-8}

For non-cancer health effects, the overall hazard index (HI) was calculated by summing the effects of each exposure route and each chemical. This summation conservatively assumes that each chemical of concern and exposure route has the same potential health effects, and may therefore overestimate risks. The following table provides a summary of the total calculated non-cancer hazard indices:

Receptor	Ingestion	Dermal	Inhalation	HI
Industrial Worker	0.012	0.0076	1.9×10^{-6}	0.019
Construction Worker	0.040	0.0012	3.4×10^{-6}	0.052

For each receptor, both the overall cancer risks and the HI values are well below EPA's acceptable cancer risk range (1×10^{-4} to 1×10^{-6}) and non-cancer risk threshold of unity. Therefore, industrial/commercial and/or construction workers at the Former Spray Field Area are not at risk from the current concentrations of MPK in soil. The detailed human health risk calculations can be found in Appendix C of the June 2007 Feasibility Study Report.

B. Ecological Risk

An environmental risk assessment ("ERA") was performed as part of the 1993 BRA for the Site. The ERA predicted negligible risks to biota that may inhabit the Former Spray Field Area. Similar to the approach used for human health, updated calculations were performed using more recent literature derived parameters for dietary intake and food chain models, and a more comprehensive evaluation of available toxicity values. These calculations result in soil screening levels that correspond to lowest observed adverse effect level ("LOAEL") and no observed adverse effect level ("NOAEL") based HQs of unity for selected receptor species that may utilize the Former Spray Field Area, including the Short-tailed Shrew, American Robin, and Red Fox. The calculated screening levels are shown below and the detailed calculations can be found in the revised Appendix D (May 2009) of the Feasibility Study Report.

Receptor	Chemical	LOAEL-Based Soil Screening Concentration ($\mu\text{g}/\text{kg}$)	NOAEL-Based Soil Screening Concentration ($\mu\text{g}/\text{kg}$)
Shrew	Kepone	130	26
	Mirex + 5.8 Photomirex*	22,000	4,500
Robin	Kepone	890	440
	Mirex + 3.7 Photomirex*	290,000	57,000
Red Fox	Kepone	490	100
	Mirex + 3.7 Photomirex*	6,100	1,200

* Mirex and photomirex are assumed to have equal toxicity and so their concentrations are combined. The non-linear addition reflects differences in their uptake rates.

Some of the above screening concentration levels are exceeded in portions of the Former Spray Field Area.

VIII. REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (“RAOs”) are medium specific goals developed to protect human health and the environment. The RAOs specify Site-related contaminants of concern, exposure routes, and acceptable contaminant levels for each exposure route. Protectiveness may be achieved by reducing exposure as well as by reducing actual contaminant levels.

Based upon the risk analysis in the preceding section, remedial action is **not** required based on human health risk considerations (industrial/commercial and/or construction workers) or chemical specific requirements, including Pennsylvania Act 2 Site-specific remediation standards¹.

The OU2 sediment removal action conducted under the 2007 AOC addressed MPK in the lower FWDD and TSC sediments. Based upon the results of the risk analysis, the removal action was protective of environmental receptors. The Former Spray Field Area soils are the only part of OU2 that must be addressed under this ROD for further action. The RAO for the Former Spray Field Area is therefore to mitigate exposures by ecological receptors to MPK in surface soils. This RAO would also address the potential for off-Site migration of contaminated surface soils.

PRGs consist of numerical targets for the constituents of potential concern in specific media and are intended to guide the development and evaluation of remedial alternatives. In this case, PRGs are based upon ecological considerations and are established to protect ecological communities or populations, rather, than individual organisms (USEPA, 1999) and also include consideration of the proportion of the receptor’s home range that may be impacted by constituents of concern. The most sensitive receptor to mirex/photomirex, the Red Fox, has a home range that is very much larger than the Site (1,000 acres is typical, based on USEPA, 1993), so adverse impacts are unlikely even if no action were to be taken. The NOAEL-based threshold level for mirex/photomirex for the shrew is only exceeded at one location in the Former Spray Field Area and so a PRG is not required. In addition, because kepone and mirex are substantially co-located at the Site and mirex ecological thresholds are higher, a protective PRG for kepone will also ensure that mirex impacts are appropriately mitigated. Protective PRGs correspond to levels between LOAEL and NOAEL based concentration thresholds for the two lower trophic level receptors (robin and shrew). In this case, the resulting PRG for kepone is 190 µg/kg (geometric mean of 130, 26, 890, and 440) and is considered appropriate.

¹ Residential exposures were not considered because institutional controls from the 1995 ROD prevent residential use of the Site.

IX. DESCRIPTION OF ALTERNATIVES

The Superfund Law (CERCLA) requires that any remedy selected to address contamination at a hazardous waste Site must be protective of public health and welfare and the environment, cost-effective, in compliance with regulatory and statutory provisions that are Applicable or Relevant and Appropriate Requirements (“ARARs”), and consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (“National Contingency Plan” or “NCP”) to the extent practicable. The Feasibility Study (“FS”) prepared by Golder Associates (June 2007) evaluated five alternatives for the surface soil cleanup in the Former Spray Field Area.

Current elements that would be included in each alternative, other than the No Further Action Alternative, are as follows. A deed notice is already in place for the ROC Property that limits future use of the Site to industrial or commercial uses and ensures that access is permanently available for operation, maintenance and monitoring of the Site remedy. Additionally, future land use must comply with the institutional controls established by this ROD. Approximately 1,400 linear feet of 6-foot high fence will be installed along the boundary between the Remediation Parcel and the Redevelopment Parcel. Maintenance and monitoring requirements will include routine inspections to ensure the continued integrity of the remedy. Continued access for such inspections is provided in the Agreement of Sale for the Redevelopment Parcel.

Description of Remedial Alternatives for Surface Soil

Alternative 1 - No Further Action

This alternative was developed and retained as a baseline scenario to which the other alternatives would be compared, as required by CERCLA. No additional actions would be taken under the no further action alternative except for the current institutional controls, the ongoing monitoring and maintenance under OU1, and a review of Site conditions and risks every 5 years. This alternative will not mitigate potentially unacceptable exposures to kepone by ecological receptors. No capital costs are associated with Alternative 1. The total estimated cost of this alternative is \$155,000.

Alternative 2 - Soil Cover

The soil cover alternative would consist of placement of 24-inches of clean soil over soils exceeding the PRG of 190 µg/kg for kepone to mitigate plant and animal exposure and thereby protect food chain receptors. An added benefit to the soil cover is that it would prevent off-Site migration of soils exceeding the PRG. The soil cover system would extend over the area(s) in the Former Spray Field Area that exceed the PRG totaling approximately 4.1 acres.

The soil cover system would be designed, constructed and maintained to promote stormwater drainage and prevent erosion. The following quantities are involved for this alternative:

- Site grading of approximately 21,600 square yards;
- Placement of a non-woven geotextile “marker” overlain by approximately 14,400 cubic yards of clean soil fill; and,
- Seeding of approximately 21,600 square yards to re-establish vegetation.

Institutional controls will be established to prohibit any activity that could potentially disturb or interfere with the continued stability and integrity of the OU2 remedy. Specifically, the integrity of the soil cover for surface soils above the PRG must be maintained.

Upon implementation, Alternative 2 would meet the remedial action objectives described in Section VIII. The estimated capital cost for Alternative 2 is \$398,000 with a total estimated cost for the alternative at \$720,000.

Alternative 3 - Pavement/Building Cover

The pavement/building cover alternative would consist of an engineered asphalt or equivalent pavement cover or a permanent building floor slab over soils exceeding the PRG of 190 µg/kg for kepone to mitigate plant and animal exposure and thereby protect food chain receptors. An added benefit to the pavement/building cover is that it would prevent off-Site migration of soils exceeding the PRG. The pavement/building cover system would extend over the area(s) in the Former Spray Field Area that exceed the PRG (approximately 4.1 acres). For costing purposes, a 6-inch asphalt pavement (3-inch stone layer, 2-inch binder course, and 1-inch wearing course) over the affected areas was evaluated.

Site regrading may be performed as part of these actions to enhance surface water management.

Institutional controls will be established to prohibit any activity that could potentially disturb or interfere with the continued stability and integrity of the remedy. Specifically, the integrity of the pavement or building for surface soils above the PRG must be maintained.

Upon implementation, Alternative 3 would meet the remedial action objectives described in Section VIII. The estimated capital cost for Alternative 3 is \$448,000 with a total estimated cost for the alternative at \$730,000.

Alternative 4 - Excavation and Off-Site Disposal

The excavation and off-Site disposal alternative would consist of excavation of soils

exceeding the PRG of 190 µg/kg for kepone to a depth of two-feet and replacement with clean fill to mitigate plant and animal exposure and thereby protect food chain receptors. The excavation would extend over the area(s) in the Former Spray Field Area that exceed the PRG (approximately 4.1 acres). Excavated soils would be transported off-Site to an appropriately permitted disposal facility. Excavations would be backfilled with compacted clean soil, and surface erosion protection would be provided by re-vegetation or surface gravel.

The following quantities are involved for this alternative:

- Excavate approximately 14,400 cubic yards of soil and dispose at a non-hazardous waste landfill;
- Backfill excavation with approximately 14,400 cubic yards of clean soil fill; and,
- Seeding of approximately 21,600 square yards to re-establish vegetation.

Upon implementation, Alternative 4 would meet the remedial action objectives described in Section VIII. The estimated capital cost for Alternative 4 is \$1,523,000 with a total estimated cost for the alternative at \$2,317,000.

Alternative 5 - Combination Remedy (Combination of Alternatives 2, 3, & 4)

This alternative would consist of a combination of Alternatives 2, 3 and 4 in a manner that is consistent with the proposed re-use of the Site for light industrial and commercial purposes, consistent with I-1 zoning (general industrial district) and the current deed restrictions for the ROC Property. This alternative would require that the future use plan for the Redevelopment Parcel include a soil cover, pavement/building cover, or excavation/disposal and replacement with clean fill in the areas where soils exceed the PRG of 190 µg/kg for kepone. The affected area(s) within the Redevelopment Parcel total approximately 2 acres. The areas above the PRG that are within the Remediation Parcel (approximately 2.1 acres) would be addressed via a soil cover consistent with Alternative 2. Figure 4 illustrates those remedies for the Former Spray Field Area in relation to the Remediation and Redevelopment Parcels. Implementation of this alternative would require submission of the Redevelopment Plan to EPA in conjunction with the design of the soil cover for portions of the Remediation Parcel. If the proposed redevelopment is conducted in phases, a soil or pavement cover (consistent with Alternative 2 or 3) will initially be constructed in areas where soils exceed the PRG and that are not initially developed. This alternative would include allowing for future replacement of the initial cover with pavement or building, and/or excavation/disposal and backfilling, as part of subsequent development phases. Hence, Alternative 5 allows for substitution of one approach with another as the Property is developed.

In addition, VI is a phenomenon that environmental agencies have recently begun to explore. It is of concern where VOCs are present in the subsurface material and have the potential to migrate as a gas into buildings. A VI Study has not been completed for this Site, however a work plan is currently under development by ROC. This VI Study will be completed

under OU1. If warranted by the result of the VI Study, mitigation measures for VI will be documented in a future decision document and will be included for any existing or planned structure/building within the area of VOC contamination and occupied by persons.

Institutional controls will be established to prohibit any activity that could potentially disturb or interfere with the continued stability and integrity of the remedy. Specifically, the integrity of the areas which are capped (soil cover or asphalt/building cover) for surface soils above the PRG must be maintained.

Upon implementation, Alternative 5 would meet the remedial action objectives described in Section VIII. The capital cost for Alternative 5 is \$472,000 with the total estimated cost for the alternative at \$803,000.

X. COMPARATIVE ANALYSIS OF ALTERNATIVES

The alternatives discussed above were compared on the basis of the nine criteria set forth in the NCP at 40 C.F.R. § 300.430(e)(9)(iii) in order to select a remedy for the Site. These nine criteria are categorized according to three groups; threshold criteria; primary balancing criteria; and modifying criteria. These evaluation criteria relate directly to the requirements in Section 121 of CERCLA, 42 U.S.C. § 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 among remedies. State and community acceptance are modifying criteria formally taken into account after public comment is received on the Proposed Plan. A summary of each of the criteria is presented below, followed by a summary of the relative performance of the alternatives with respect to each of the nine criteria. These summaries provide the basis for determining which alternative provides the “best balance” of trade-offs with respect to the nine criteria.

Threshold Criteria:

1. ***Overall Protection of Human Health and the Environment*** addresses whether a remedy provides adequate protection to human health and the environment and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
2. ***Compliance with Applicable or Relevant and Appropriate Requirements (“ARARs”)*** addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of environmental statutes, regulations, and/or whether there are grounds for invoking a waiver.

Primary Balancing Criteria:

3. **Long-term Effectiveness** refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals are achieved.
4. **Reduction of Toxicity, Mobility, or Volume through Treatment** addresses the degree to which alternatives will reduce the toxicity, mobility, or volume of the contaminants causing Site risks through treatment.
5. **Short-term Effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and environment that may be posed during the construction and implementation period until cleanup goals are achieved.
6. **Implementability** addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
7. **Cost** includes estimated capital and operation and maintenance costs, usually combined as the total net present worth cost.

Modifying Criteria:

8. **State Acceptance** indicates whether, based on its review of supporting documents and the Proposed Plan, the State concurs with, opposes, or has no comment on the remedy.
 9. **Community Acceptance** will be assessed in the ROD following a review of public comments received on the Proposed Plan and supporting documents included in the Administrative Record.
1. **Overall Protection of Human Health and the Environment**

There are no unacceptable risks to human health (industrial/commercial and/or construction workers) for the Former Spray Field Area. Under the No Further Action Alternative, no remedial actions would be undertaken to mitigate potentially unacceptable exposures by ecological receptors. The No Further Action Alternative was developed as a baseline scenario to which the other alternatives could be compared, as required by CERCLA. No additional actions would be taken under the No Further Action Alternative except for the current institutional controls, the ongoing monitoring and maintenance under OUI, and a review of Site conditions and risks every 5 years.

Alternatives 2 and 3 will effectively mitigate plant and animal exposure by capping (soil or pavement/building) those areas that exceed the PRG of 190 µg/kg for kepone and protect food chain receptors thereby achieving the Remedial Action Objective ("RAO"). The RAO for the Former Spray Field Area is to mitigate exposures by ecological receptors to MPK in surface

soils. This RAO would also address the potential for off-Site migration of surface soils exceeding the PRG. Monitoring and maintenance will ensure long-term effectiveness.

Alternative 4, excavation of those portions of the Former Spray Field Area that currently exceed the PRG for kepone of 190 µg/kg (ppb) to a depth of 2 feet and disposal of the soils at an appropriately permitted non-hazardous waste landfill, offers a permanent solution and the same level of protection when compared to Alternatives 2 and 3. The excavations would be backfilled with clean soil and this would effectively mitigate plant and animal exposure and protect food chain receptors, thereby achieving the RAOs. Monitoring and maintenance will ensure long-term effectiveness.

Alternative 5 would consist of a soil cover on impacted portions of the Remediation Parcel and a combination of Alternatives 2, 3 and 4 on impacted portions of the Redevelopment Parcel in a manner that is consistent with the future re-use of the Site for light industrial and commercial purposes. Accordingly, Alternative 5 offers the same level of protection as Alternatives 2, 3, and 4. While the exact combination cannot be determined until a Redevelopment Plan is available, the FS assumed Alternative 5 to include 5% excavation, 35% asphalt cover, and 60% soil cover

2. Compliance with Applicable or Relevant and Appropriate Requirements (“ARARs”)

Section 121(d) of CERCLA, 42 U.S.C. § 9621(d), and NCP § 300.430(f)(1)(ii)(B) require that remedial actions at CERCLA Sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as “ARARs”, unless such ARARs are waived under CERCLA § 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA Site. Only those State standards that are identified by a State in a timely manner and that are promulgated and are more stringent than Federal requirements may be applicable.

Relevant and appropriate requirements are those cleanup standards, standards of control, or other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not “applicable” to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA Site address problems or situations sufficiently similar to those encountered at the CERCLA Site that their use is well-suited to the particular Site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

EPA will also consult to-be-considered material ("TBCs"). TBCs are non-promulgated advisories or guidance issues by Federal or State governments that are not legally binding and do not have the status of potential ARARs. However, EPA will consider TBCs along with ARARs and EPA may use the TBCs in determining the necessary level of cleanup for protection of human health and the environment.

There are no chemical-specific ARARs for soil and the current conditions comply with soil TBCs. The No Further Action alternative includes no additional remedial activities that would trigger location or action-specific ARAR considerations. Accordingly, this alternative would comply with ARARs.

For Alternatives 2 and 3, there are no chemical-specific ARARs for soil and no location-specific requirements for a soil or pavement/building cover in the Former Spray Field Area. However, construction of a soil or pavement/building cover would require consideration of the following action-specific requirements: 1) earthworks will need to comply with the erosion and sedimentation requirements in 25 Pa. Code §§ 102.4 and 102.31; 2) any modification of the existing storm water drainage system may need to meet the requirements of the county's storm water management plan under Pennsylvania's Storm Water Management Act (25 Pa. Code § 111); and 3) any discharge of storm water will need to meet the requirements of the Pennsylvania Discharge Elimination System Rules (25 Pa. Code §§ 92.1, 92.3 through 92.11, 92.17, and 92.41). Because the soil or pavement/building cover alternatives will disturb approximately 4.1 acres of the Former Spray Field Area, a formal Soil Erosion and Sediment Control Plan will be required. Design and construction of these alternatives can be completed in compliance with these ARARs.

Alternative 4, excavation and off-Site disposal, does not have any chemical-specific ARARs for soil and no location-specific requirements for excavation in the Former Spray Field area. However, excavation and off-Site disposal alternative would require consideration of the following action-specific requirement in addition to those in Alternatives 2 and 3: 1) the off-Site transportation and disposal of the excavated soil will have to meet the requirements of the Pennsylvania Solid Waste Management Act (25 Pa. Code § 75). Because the excavation and off-Site disposal alternative will disturb approximately 4.1 acres, a formal Soil Erosion and Sediment Control Plan will be required. Design and construction of this alternative can be completed in compliance with these ARARs.

Alternative 5 would consist of a soil cover on impacted portions of the Remediation Parcel and a combination of Alternatives 2, 3 and 4 on impacted portions of the Redevelopment Parcel in a manner that is consistent with the future re-use of the Site for light industrial and commercial purposes. Accordingly, Alternative 5 can be completed in compliance with the identified ARARs. A detailed list of all ARARs for the remedial alternatives is included in Table 1.

3. 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 clean-up levels have been met. This criterion includes the consideration of residual risk that will remain on-Site following the remediation and the adequacy and reliability of controls.

The No Further Action alternative would not provide any long-term protection of the environment since no actions would be taken to mitigate exposures by ecological receptors to MPK in surface soils. Alternatives 2 and 3 (soil cover and pavement/building cover) will provide long-term protection of the environment. Although residual concentrations will remain in the soil, the pathway to environmental receptors will be eliminated and thus the potential for off-Site migration of contaminated soils is prevented. Monitoring and maintenance will be regularly conducted to ensure the continued long-term effectiveness of the remedy.

Alternative 4, excavation and off-Site disposal, provides long-term protection of the environment by eliminating the sources of contamination through excavation. Monitoring and maintenance will be regularly conducted to ensure the continued long-term effectiveness of the remedy.

Alternative 5, which consists of a soil cover on impacted portions of the Remediation Parcel and a combination of Alternatives 2, 3 and 4 on impacted portions of the Redevelopment Parcel, will provide long-term protection of the environment. Monitoring and maintenance will be regularly conducted to ensure the continued long-term effectiveness of the remedy. In addition, Five-Year Reviews will continue to be conducted no less than every five years because hazardous substances remain at the Centre County Kepone Site from actions under OU1. The most recent Five-Year Review was conducted on September 10, 2004.

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

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

The No Further Action alternative would not reduce the toxicity, mobility, or volume of impacted soils since no remedial activities would be performed. Alternatives 2 and 3 (soil cover and pavement/building cover) will reduce the mobility of contaminants within the food chain by preventing exposure. While there is no treatment associated with Alternative 4, excavation and off-Site disposal, the removal of impacted soils from the Former Spray Field Area will reduce the volume and mobility of contaminants within the food chain by preventing exposure. Alternative 5, which includes a soil cover on impacted portions of the Remediation Parcel and a combination of Alternatives 2, 3 and 4 on impacted portions of the Redevelopment Parcel, will reduce the volume and mobility of contaminants within the food chain by preventing exposure and off-Site migration.

5. Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community, and the environment during construction and operation of the remedy until cleanup levels are achieved.

Since the No Further Action Alternative does not include any remedial action activities, there are no adverse impacts associated with its implementation. Short-term impacts to the community for Alternatives 2 thru 5 are limited to the duration of the construction activities. Disruptions may be the result of noise, vehicle traffic, and grading or excavation activities.

Routine soil erosion control measures and storm water management requirements specified by the action-specific ARARs will mitigate any potential short-term impacts associated with Alternative 2 thru 5. In addition, there are no risks to Site remediation workers associated with the contaminant levels in soils of the Former Spray Field Area. Some short-term risk is associated with the off-Site transportation of excavated soils (Alternatives 4 and 5), but it is low as the level of contaminants in the Former Spray Field Area do not represent a human health risk.

6. Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Since no active remediation would occur, the No Further Action Alternative would be readily implementable. Alternatives 2 thru 5 utilize technologies common to the construction and remediation/waste disposal industries. These alternatives can easily be implemented using standard construction practices and experienced labor. The Former Spray Field Area is easily accessible to perform the construction. All aspects of Alternatives 2 thru 5 are proven and in routine use.

7. Cost

The cost for implementing Alternative 2 (soil cover) and Alternative 3 (pavement/building cover) are very close at \$720,000 and \$730,000, respectively. Alternative 4 (excavation and off-Site disposal) is estimated at \$2,317,000. The cost to implement Alternative 5 (combination remedy) is \$803,000 and slightly more than Alternatives 2 and 3 due to the cost of off-Site disposal.

8. State Acceptance

The EPA, as the lead agency for this Site, selects the remedy in consultation with the State. In a letter dated July 10, 2009, PADEP expressed its support for the selection of Alternative 5 (Combination Remedy) for the Former Spray Field Area.

9. Community Acceptance

A thirty-day public comment period on EPA's Proposed Plan for Operable Unit 2 at the Centre County Kepone Site began on March 5, 2009. On March 13, 2009, EPA mailed a fact sheet to residents living near the Site informing them of the Proposed Plan for OU2 and the upcoming public meeting. An advertisement announcing the issuance of the Proposed Plan and a public meeting to discuss the Plan was placed in the *Centre Daily Times*. The public meeting was held on March 23, 2009 at the Mount Nittany Middle School in State College, Pennsylvania. At the meeting, EPA announced that the comment period would be extended until April 22, 2009. A notice that the comment period was extended was published in the *Centre Daily Times* on April 19, 2009. The meeting was attended by approximately ten members of the community.

With the exception of one written comment and one verbal comment, the community appears to support EPA's findings and the preferred alternative. The comments and EPA's responses are detailed in the Responsiveness Summary section of this ROD. A copy of the transcript of the public meeting is included in the Administrative Record.

XI. PRINCIPAL THREAT WASTES

The NCP establishes an expectation the EPA will use treatment to address the principal threats posed by a Site wherever practicable (NCP § 300.430 (a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund Site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water or air, or acts as a source for direct exposure.

There are no principal threat wastes, as defined by the NCP, identified for the soils in the Former Spray Field Area. The concentrations of MPK found in the soils of the Former Spray Field Area from the March 2002 OU2 Investigation are below those levels established in the April 21, 1995 ROD to be protective of groundwater. In addition, there are no unacceptable risks to human health based on industrial/commercial use of the Property.

XII. SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

Following the consideration of the requirements of CERCLA, a detailed analysis of the alternatives using the nine criteria set forth in the NCP, and careful review of public comments, EPA, in consultation with PADEP, has selected **Alternative 5: Combination Remedy (Combination of Alternatives 2, 3, and 4)** as the remedy for OU2 at the Centre County Kepone Site.

Description of the Selected Remedy

Soil Cover

Alternative 5: Combination Remedy, would consist of a combination of Alternatives 2, 3 and 4 in a manner that is consistent with the proposed re-use of the Site for light industrial and commercial purposes, consistent with the current I-1 zoning (general industrial district) in College Township. This alternative would require that the future use plan for that portion of the Former Spray Field Area within the Redevelopment Parcel include any combination of a soil cover, pavement/building cover, or excavation/disposal and replacement with clean fill in the areas where soils exceed the PRG of 190 $\mu\text{g}/\text{kg}$ (ppb) of kepone. The affected area(s) within the Redevelopment Parcel is approximately 2 acres. The areas above the PRG for that portion of the Former Spray Field Area within the Remediation Parcel (approximately 2.1 acres) would be addressed via a soil cover consistent with Alternative 2. Figure 4 illustrates those remedies for the Former Spray Field Area in relation to the Remediation and Redevelopment Parcels. Implementation of this alternative would require submission of a Redevelopment Plan to EPA in conjunction with the design of the soil cover for portions of the Remediation Parcel. If the proposed redevelopment is conducted in phases or is not implemented, a soil or pavement cover (consistent with Alternative 2 or 3) will initially be constructed in areas where soils exceed the PRG and that are not initially developed. This alternative would include allowing for future replacement of the initial cover with pavement or building, and/or excavation/disposal and backfilling, as part of subsequent development phases. Hence, Alternative 5 would allow for substitution of one approach with another as the Property is developed.

Vapor Intrusion ("VI")

VI is a phenomenon that environmental agencies have recently begun to explore. It is of concern where VOCs are present in the subsurface material and have the potential to migrate as a gas into buildings. A VI Study has not been completed for this Site, however a work plan is currently under development by ROC. This VI Study will be completed under OU1. If warranted by the results of the VI Study, mitigation measures for VI will be documented in a future decision document and shall be included for any existing or planned structure/building within the area of VOC contamination and occupied by persons.

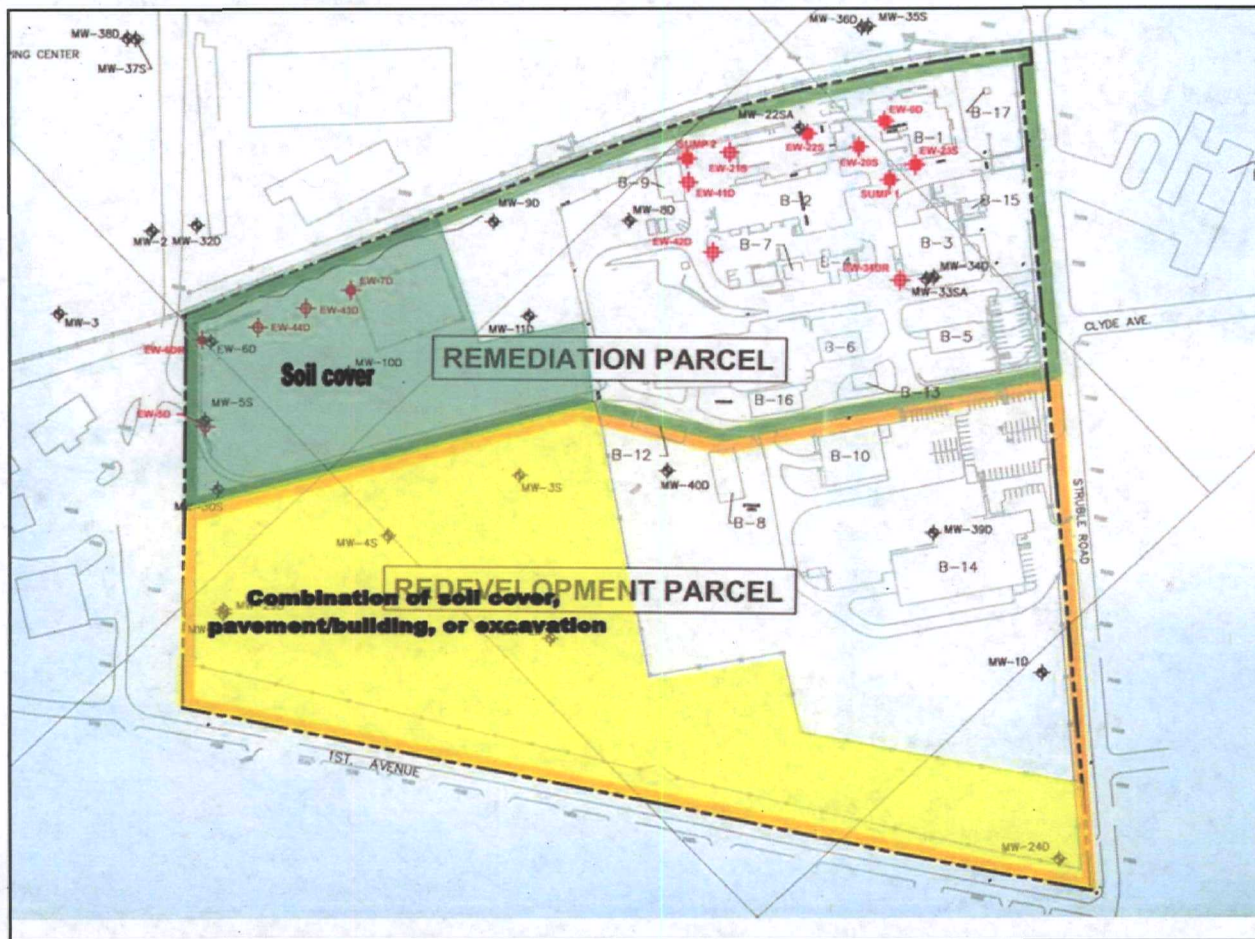


Figure 4 - Areas Addressed by the Selected Remedy (Alternative 5; Combination Remedy)

Institutional Controls (“ICs”)

Institutional controls shall be placed on those soils above the PRG which are capped (soil cover or asphalt/building cover). Specifically, institutional controls, specific for the Former Spray Field Area, will be established to prohibit:

- 1) Any excavations on the capped areas;
- 2) Any installation or building of structures on the capped areas;
- 3) Any activity that could compromise the integrity of the erosion control devices;
- 4) Operation of heavy equipment or vehicles on the capped areas;
- 5) Any modification of the Site fencing; and
- 6) Any activity that could potentially disturb or interfere with the continued stability and integrity of the existing remedy(s).

The above prohibitions would apply to activities unless appropriate investigations and plans are submitted and approved in advance by EPA in consultation with PADEP. EPA will not approve activities that compromise the remedial action objectives developed for the Site, that

compromise the remedy, or that are not protective of human health and the environment.

The required institutional controls could be implemented through property use controls such as easements and restrictive covenants and/or governmental controls such as zoning ordinances. For example, the institutional controls could be implemented through an environmental covenant between EPA and the current owner of the Site, pursuant to the Pennsylvania Uniform Environmental Covenants Act, 27 Pa.C.S.A. §§ 6501 *et seq.* In addition, PADEP may issue an Administrative Order (“512 Order”) pursuant to Sections 512(a) and 1102 of the Pennsylvania Hazardous Sites Cleanup Act (“HSCA”), 35 P.S. §§ 6020.512(a) and 6020.1102, which grants PADEP the authority to issue such orders precluding or requiring cessation of an activity or activities at a facility which PADEP finds would disturb, or is inconsistent with, a response action being implemented at that facility.

In addition, approximately 1,400 linear feet of 6-foot high fence will be installed along the boundary between the Remediation Parcel and the Redevelopment Parcel. Maintenance and monitoring requirements will include routine inspections to ensure the continued integrity of the remedy.

Summary of the Estimated Remedy Costs

The total estimated cost of implementing Alternative 5, the Combination Remedy, (Combination of Alternatives 2, 3, and 4) as provided in the June 2007 Feasibility Study for Operable Unit 2 was \$803,000 including \$472,000 in capital costs. Present net value of the operation and maintenance was estimated at \$107,000.

Expected Outcomes of Selected Remedy

The Selected Remedy will reduce the mobility of contaminants within the food chain by preventing exposure. Implementation of the Selected Remedy will achieve the remedial action objective of mitigating exposures by ecological receptors to MPK in surface soils and also prevent the off-Site migration of contaminated soils. Areas above the PRG of 190 ppb for kepone in the Remediation Parcel of the Former Spray Field Area will be addressed by a two-foot thick soil cover and this portion of the Site will be retained by ROC for ongoing long-term remediation activities. Areas above the PRG in that portion of the Former Spray Field Area within the Redevelopment Parcel will be addressed by any combination of a two-foot thick soil cover, a pavement/ building cover, or by excavation and off-Site disposal. It is anticipated that the Redevelopment Parcel will be sold by ROC soon after this ROD is issued. Implementation of this portion of the Selected Remedy will require submission of a Redevelopment Plan. In addition, a 6-foot high fence will be installed along the boundary between the Remediation and Redevelopment Parcels. A deed notice is in place for the ROC Property (performed under the OU1 remedy) and will be maintained in the land records for Centre County, PA. The deed notice limits future use of the Site to industrial or commercial uses and ensures that access is permanently available for operation, maintenance, and monitoring of the Site remedy.

Performance Criteria of the Selected Remedy

There are no unacceptable risks for the Former Spray Field Area based on human health risk considerations (industrial/commercial and/or construction workers) or chemical specific requirements, including Pennsylvania Act 2 Site-specific remediation standards, for industrial/commercial use of the Property. Also, there are no chemical-specific ARARs for soil. The current conditions comply with soil TBCs.

The RAO for the Former Spray Field Area is to mitigate exposures by ecological receptors to MPK in surface soils. This RAO would also address the potential for off-Site migration of contaminated surface soils. The Performance Standards (i.e. "the cleanup levels") for OU2 are the PRGs. The PRGs were developed from ecological thresholds in the Ecological Risk Assessment and are summarized in Section VII.B of this ROD. Because kepone and mirex are substantially co-located at the Former Spray Field Area and mirex ecological thresholds are much higher, a protective PRG for kepone will ensure that mirex impacts are appropriately mitigated. The surface soil PRG for kepone is calculated based on the geometric mean of the lowest observed adverse effect level ("LOAEL") and no observed adverse effect level ("NOAEL") based concentration thresholds for the two lower trophic level receptors (robin and shrew). In this case, the resulting PRG for kepone is 190 $\mu\text{g}/\text{kg}$ (geometric mean of 130, 26, 890, and 440) and is considered appropriate to mitigate exposures by ecological receptors.

The cleanup level for kepone is:

Contaminant of Concern	PRG ($\mu\text{g}/\text{kg}$)
Kepone	190

The Selected Remedy will achieve this cleanup level by a combination of capping (soil cover or asphalt/building cover) and excavation and off-Site disposal of the impacted soils in the Former Spray Field Area. The soil cover shall include placement of 24 inches of clean soil over those soils exceeding 190 $\mu\text{g}/\text{kg}$ (ppb). Before placement of the soil cover, a non-woven geotextile shall be placed to serve as a marker. The asphalt/building cover shall include an engineered asphalt or equivalent pavement cover or a permanent building slab over those soils exceeding 190 $\mu\text{g}/\text{kg}$ (ppb). The excavation option shall remove those soils above 190 $\mu\text{g}/\text{kg}$ (ppb) to a depth of two feet and replacement with clean soil. Excavated soils shall be transported off-Site to an appropriate permitted disposal facility. Site regrading may be necessary as part of these actions to enhance surface water management. All disturbed soils shall be reseeded with native seed mixes to reestablish vegetation. The exact areas targeted for capping (soil cover or asphalt/building cover) or excavation shall be determined during the remedial design and may be contained in a Redevelopment Plan. Any design submittal or Redevelopment Plan shall be subject to approval of EPA in consultation with the Commonwealth of Pennsylvania.

Institutional controls shall be placed on those soils above the 190 µg/kg cleanup level which are capped (soil cover or asphalt/building cover). Specifically, institutional controls for the Former Spray Field Area, will be established to prohibit:

- 1) Any excavations on the capped areas;
- 2) Any installation or building of structures on the capped areas;
- 3) Any activity that could compromise the integrity of the erosion control devices;
- 4) Operation of heavy equipment or vehicles on the capped areas;
- 5) Any modification of the Site fencing; and,
- 6) Any activity that could potentially disturb or interfere with the continued stability and integrity of the existing remedy(s).

The above prohibitions would apply to activities unless appropriate investigations and plans are submitted and approved in advance by EPA in consultation with PADEP. EPA will not approve activities that compromise the remedial action objectives developed for the Site, that compromise the remedy, or that are not protective of human health and the environment.

The required institutional controls could be implemented through property use controls such as easements and restrictive covenants and/or governmental controls such as zoning ordinances as set forth in **XII. Selected Remedy – Description of the Selected Remedy – Institutional Controls** herein.

In the event that an existing structure/building is utilized or a new structure/building is constructed on-Site, the results of the VI Study conducted under OU1 must be evaluated for risks posed to receptors and if warranted, mitigation measures must be taken. Mitigation measures will be evaluated and selected in accordance with CERCLA and the NCP in a future decision document. The mitigation measures selected will satisfy the remedial action objective to prevent unacceptable exposure of VOCs to future receptors within the area of VOC contamination via VI.

A chain-link fence shall be installed on the ROC Property along the boundary between the Remediation and Redevelopment Parcel. The fence shall have a minimum height of six feet and shall be equipped with a locking gate(s). The exact location and specifications of the fence shall be determined during remedial design and is subject to EPA approval in consultation with the Commonwealth of Pennsylvania. In addition, the existing Operation and Maintenance Plan shall be revised to incorporate a plan for maintenance of the new fence. Any revisions to the O&M Plan are subject to approval of EPA in consultation with the Commonwealth of Pennsylvania.

XIII. STATUTORY DETERMINATIONS

Pursuant to CERCLA § 121, 42 U.S.C. § 9621, and the NCP, the selected remedy must be protective of human health and the environment, comply with applicable or relevant and appropriate requirements or justify a waiver, be cost-effective, and utilize permanent solutions

and alternative treatment technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as a principal element and a bias against off-Site disposal and untreated wastes. The following sections discuss how the Selected Remedy meets these statutory requirements.

A. Protection of Human Health and the Environment

There are no unacceptable risks to human health for the Former Spray Field Area. The Selected Remedy (Alternative 5: Combination Remedy) will provide protection of the environment by effectively mitigating plant and animal exposure by capping (soil or pavement/building) or by excavation and off-Site disposal. Surface soils in the Former Spray Field Area exceeding the PRG will be addressed by the Selected Remedy and will be prevented from migrating off-Site. Implementation of the Selected Remedy will not pose any unacceptable short-term risks to workers or cross-media impacts. Institutional controls will be established to prohibit any activity that could potentially disturb or interfere with the continued stability and integrity of the remedy. Specifically, the integrity of the areas which are capped (soil cover or asphalt/building cover) for surface soils above the PRG must be maintained.

B. Compliance with Applicable or Relevant and Appropriate Requirements (“ARARs”)

The Selected Remedy will comply with all identified ARARs. Such requirements, standards, criteria, and limitations are identified in Table 1 of this ROD.

C. Cost-Effectiveness

The NCP at 40 C.F.R § 300.430 (f)(1)(ii)(D), requires EPA to evaluate cost-effectiveness by comparing all the alternatives meeting the threshold criteria -- protection of human health and the environment and compliance with ARARs - against long-term effectiveness and permanence; reduction in toxicity, mobility, or volume through treatment; and short-term effectiveness (collectively referred to as “overall effectiveness”). The NCP further states that overall effectiveness is then compared to cost to insure that the remedy is cost effective.

EPA concludes, following an evaluation of these criteria, that the Selected Remedy is cost-effective in providing overall protection in proportion to costs and meets all other requirements of CERCLA. The estimated present-net value cost of the Selected Remedy is \$803,000.

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

EPA has determined that the Selected Remedy represents the maximum extent to which permanent solutions can be utilized in a practicable manner for OU2. Alternative treatment

technologies and/or resource recovery technologies were found not to be appropriate for Site conditions.

E. Preference for Treatment as a Principal Element

The Selected Remedy does not satisfy the statutory preference for treatment as a principal element since remedial action is **not** required based on human health risk considerations (industrial/commercial and/or construction workers) or chemical specific requirements, including any Pennsylvania Act 2 Site-specific remediation standards. The objective of the Preferred Remedy is to mitigate exposures for ecological receptors to MPK in surface soils of the Former Spray Field Area.

F. Five-Year Review Requirements

CERCLA § 121(c), 42 U.S.C. § 9621(c) and § 300.430(f)(4)(ii) of the NCP require review of the remedy if the remedy results in hazardous substances, pollutants, or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure. Any such review must be conducted no less often than every five years after the initiation of the remedial action.

Because hazardous substances remain at the Centre County Kepone Site, the review described in CERCLA § 121(c) and § 300.430(f)(4)(ii) of the NCP will continue to be conducted no less than every five years. The last Five-Year Review was conducted on September 10, 2004.

XIV. DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan identifying EPA's preferred alternative for OU2 was released for public comment on March 5, 2009. EPA reviewed all the verbal comments received at the public meeting and written comments received during the comment period. Upon review of these comments, it was determined that no significant changes to the remedy, as it was originally identified in the Proposed Plan, were necessary. The only changes to be noted are an adjustment in the PRG for kepone from 100 ppb to 190 ppb, requiring institutional controls for the area(s) covered by capping (soil cover or asphalt/building cover). Supporting documentation to reflect the PRG change was provided in a letter from Golder Associates dated May 6, 2009 and has been added to the Administrative Record. The Proposed Plan inferred that the capped areas would not be disturbed. The goal of the institutional control is to prevent future disturbance of those soils above the PRG which are capped. A VI Study has not been completed for this Site, however a work plan is currently under development by ROC and will be performed under OU1 activities. Written comments that were received during the public comment period are addressed in Part 3 - Responsiveness Summary.

Table 1

**Centre County Kepone Superfund Site
Description of ARARs for Selected Remedy**

ARAR or TBC	Citation	Classification	Summary of Requirement	Applicability to Selected Remedy
Erosion and Sediment Control Requirements	25 Pa. Code §§ 102.4 and 102.31	Relevant and Appropriate	Requirements to minimize erosion and sedimentation for all earth disturbance activities.	Any earth disturbance activities shall meet the substantive requirements of this regulation.
Stormwater Management Act	25 Pa. Code §§ 111.12 – 111.15	Applicable	Establishes procedures for developing a plan for storm water management.	Any modification of the existing storm water drainage system may need to meet the requirements of the county's storm water management plan under Pennsylvania's Storm Water Management Act
National Pollution Discharge Elimination System	25 Pa. Code §§ 92.1, 92.3 through 92.11, 92.17, and 92.41	Relevant and Appropriate	Regulates the discharge of water into public surface waters.	Any discharge of storm water will need to meet the substantive requirements of the Pennsylvania Discharge Elimination System.
Solid Waste Management Act	25 Pa. Code §§ 260a.1 – 263a.1	Applicable	Requirements for the management of municipal, residual, and hazardous waste	The off-Site transportation and disposal of the excavated soil will have to meet the requirements of the Pennsylvania Solid Waste Management Act.

ARAR or TBC	Citation	Classification	Summary of Requirement	Applicability to Selected Remedy
Executive Order 13112 of February 3, 1999 – Invasive Species	E.O. 13112	Relevant and Appropriate	Provides for control of invasive species.	Disturbed areas should be reseeded with native seed mixes.

**RECORD OF DECISION
CENTRE COUNTY KEPONE SITE
OPERABLE UNIT 2**

PART 3 - RESPONSIVENESS SUMMARY

A public comment period on EPA's Proposed Remedial Action Plan (Proposed Plan) for the Centre County Kepone Site began on March 5, 2009. A public meeting to discuss EPA's proposed Plan was held on March 23, 2009 at the Mount Nittany Middle School in State College, Pennsylvania. EPA announced during the meeting that the duration of the public comment period would be extended until April 22, 2009. Notices regarding the public comment period were published in the *Centre Daily Times* on March 5, 2009 and April 19, 2009.

The public meeting was attended by approximately ten members of the community. Based on the public response to the Proposed Plan, it appears the community supports EPA's findings and preferred alternative with the exception of one written comment and one verbal comment, which will be discussed in detail below. A copy of the transcript of the public meeting is included in the Administrative Record.

The purpose of this document is to organize the written comments submitted during the comment period and provide EPA's response to each concern. Written comments were submitted by three members of the community. The following is a summary of the comments submitted and EPA's response to each comment.

SUMMARY OF COMMENTS AND EPA RESPONSES

Alternative 4 (Excavation/Off-Site Disposal) versus Alternative 5 (Combination Remedy)

Question/Comment: Covering the contamination is unacceptable; all affected soil should be completely removed. Contamination will migrate into the groundwater.

Response: The Remedial Investigation for OU1 determined the acceptable level of mirex (33 ppm) and kepone (72.7 ppm) that could remain in the soil and not adversely impact groundwater. These levels are documented to be protective of groundwater in the April 21, 1995 ROD (OU1 ROD). These levels are both well above the highest level of mirex (6.8 ppm) and kepone (2.1 ppm) detected in the Former Spray Field Area. Additionally, if any contaminants did migrate into the groundwater, they would be captured by the groundwater extraction well network and the groundwater would be treated to acceptable levels prior to discharge. It should also be noted that when evaluating the primary balancing criteria, Alternative 4 costs approximately 300% more than Alternative 5 (\$803K versus \$2.317 million) while not providing any additional protection to human health or the environment.

PRG for Kepone in Surface Soil

Question/Comment: The Proposed Plan refers to a PRG for kepone in surface soil of 100 parts per billion (“ppb”) as documented in the draft Feasibility Study (“FS”). However, when EPA’s comments on the draft FS are taken into account, the revised PRG for kepone in surface soil is 135 µg/kg (ppb).

Response: EPA notes that the revised PRG provided in the question/comment above is in error. Upon review of subsequent information provided by Golder Associates in a letter dated May 6, 2009, the correct value for the PRG is 190 ppb. This modification does not impact the selection of Alternative 5 as the most appropriate remedy based upon the requirements of CERCLA, a detailed analysis of the alternatives using the nine criteria set forth in the NCP, and a careful review of public comments. The supporting documentation to reflect this change has been added to the Administrative Record.

Potential for VI within the Redevelopment Parcel

Question/Comment: The Proposed Plan states that future consideration should be given to the potential for VI within the Redevelopment Parcel. Rutgers Organic Corporation (“ROC”) has evaluated the groundwater data from three shallow wells located proximate to the boundary with the Redevelopment Parcel and compared the data to the appropriate PADEP VI screening values. The PADEP VI Guidance indicates that the groundwater data does not exceed the screening values and therefore no further action should be required at this time for this potential contaminant pathway.

Response: EPA disagrees with this comment. EPA evaluated the supporting VI documentation that was provided by a letter from Golder Associates on May 7, 2009. The data is too old to make a determination, especially since there is no additional data indicating that the groundwater concentrations are stable or decreasing. Additional information such as prior land use, residual soil contamination, and the geographic extent of the plume is needed to make a proper evaluation of the VI pathway. ROC will be conducting a VI Study for the entire Site under OUI. Accordingly, EPA has revised the statement from the Proposed Plan regarding VI on the Redevelopment Parcel to state the mitigation measures for VI will be performed if warranted by the results of a VI Study performed under OUI. Mitigation measures will be evaluated and selected in accordance with CERCLA and the NCP in a future decision document.

Final ROD

Operable Unit 2 (OU2) is the second and expected to be the final operable unit for the Site. Subject to the results of the VI Study, this ROD is the final remedy selection to address the contamination at the Site. Since waste is left in place, the remedy will be evaluated for protectiveness during the Five-Year Review.