

SITE: A.L. Taylor
BREAK: 8.0
OTHER: 05

Five-Year Review Report

**Fourth Five-Year Review Report
for
A.L. Taylor (Valley of Drums)**

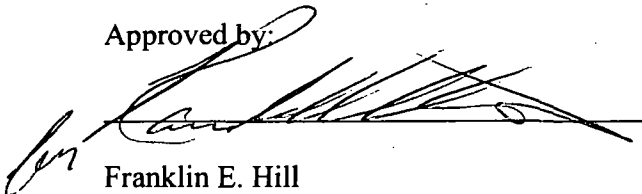
**Brooks
Bullitt County, Kentucky**

May 2008

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For:
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6/26/08



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List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
DAF	Dilution Attenuation Factor
EPA	Environmental Protection Agency
FYR	Five-Year Review
IC	Institutional Control
KNREPC	Kentucky Natural Resources and Environmental Protection Cabinet
KDEP	Kentucky Department for Environmental Protection
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
µg/kg	micrograms per kilogram
mg/L	milligrams per liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PCBs	Polychlorinated biphenyls
PRGs	Preliminary Remediation Goals
PRP	Potentially Responsible Party
RA/FS	Remedial Action/Feasibility Study
RAO	Remedial Action Objectives
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SARA	Superfund Amendments and Reauthorization Act of 1986
SSLs	Soil Screening Levels
VOC	Volatile Organic Compound

Executive Summary

Introduction

The remedy for the A.L. Taylor Site (the Site) in Brooks, Kentucky, included removing drums and ponded water and placing a cap over contaminants that were left on site. A surface water drainage diversion was constructed to route water around the cap and a ground water monitoring system was implemented to provide early indication of contaminant migration toward Wilson Creek. Wilson Creek was to be regularly monitored to evaluate the effectiveness of the cap because it is the only potential receptor for contaminant migration. The remedy also called for a six-foot fence to secure the Site and regular inspections and maintenance of the Site. The State of Kentucky (the State) has been responsible for implementing the operation and maintenance (O&M) at the Site.

The Site covers 23 acres, which includes the six acres of the fenced-in cap and 17 acres of wooded area. There are no institutional controls (ICs) for the Site to regulate ground water usage or restrict land use. The triggering action for this Five-Year Review (FYR) was the signing of the previous FYR on March 28, 2003.

Remedial Action Objectives

The remedial action objectives (RAOs) established to address human health concerns were discussed in the ROD for the Site. The RAO's noted in the ROD include the following:

- 1) Air quality will be protected by the control of emissions of particulate matter and toxic gases.
- 2) The recreational users and biota of downstream surface waters will be protected from leachate and contaminated runoff.
- 3) Ground water contributions to surface water will be protected by reducing aquifer recharge.
- 4) Local populations will be protected from direct contact with contaminated soils.

RAO's noted within the Final Design Report for the A.L. Taylor site include:

- Provide on-site containment for buried waste and contaminated soils;
- Protect the public health and welfare of the environment;
- Protect recreational users and biota of downstream surface waters (Wilson Creek) from leachate and contaminated runoff (i.e., prevent migration of contaminants off site);
- Restore the Site by regrading and revegetation;
- Protect local population from direct contact with contaminated soils and surface water; and
- Preclude access to the Site by the general public.

The RAOs for the Site were achieved by excavation and replacement of contaminated soils and installation of the cap. Monitoring wells were installed to detect migration of contaminants to Wilson Creek. The capped portion of the Site was enclosed by a fence to prevent public access.

Technical Assessment

The technical assessment of the Site found that the cap appears to be functioning as intended, but several issues may need to be addressed for the remedy to remain protective in the long term. Most of the ground water monitoring wells are not functioning or clearly marked. The function of an unmarked pipe needs to be investigated. O&M activities need to occur consistent with the requirements established in the Operations and Maintenance (O&M) plan. The O&M activities are funded by the potentially responsible parties (PRPs), and the State is responsible for carrying out the O&M. In addition, the drainage ditch designed to route water around the Site was significantly overgrown during the site inspection. Some areas of the drainage ditch outside of the fence were also filled in.

Although ground water under the Site is not considered to be a viable source of drinking water, restrictions should be put in place to prevent consumption of ground water. To ensure the long-term protectiveness of the Site, ICs should be put in place to restrict land uses that would damage the remedy. Contaminated ground water and surface water runoff to Wilson Creek continue to be potential exposure pathways. Testing performed in 2003 indicated that there are residual hardened sludges in Wilson Creek that may be contributing to contamination found in the sediment. No ground water samples have been analyzed since the previous FYR, but surface water and sediment samples were collected in December 2007. No contaminants were detected in these surface water samples, but sediment samples contained polychlorinated biphenyls (PCBs), which were also detected during the 2003 FYR process.

The Site is not currently in use. The area surrounding the Site remains a mix of wooded areas, pastures, and residential and commercial properties. There is evidence that the Site is being utilized for recreational all-terrain vehicle use. All-terrain vehicle users are not currently accessing the capped area because it is fenced. All-terrain vehicle tracks may be contributing to ponding on the southeastern portion of the Site. Appropriate actions need to be taken to fill in and regrade the area to prevent any potential future damage to the cap and to keep water from ponding next to the cap. The possibility of installing a gate to the Site may need to be considered to prevent all-terrain vehicle users from trespassing on the property.

Based on data review, the site inspection, interviews, and the status of the remedial components, the Site is protective of human health and the environment in the short term. Follow-up activities will be needed to ensure that O&M activities outlined by the Record of Decision (ROD) and specified in the O&M Plan are followed. Sampling data detected PCBs (Aroclor-1254 and Aroclor-1260) in six of the seven locations that were sampled in Wilson Creek and organic compounds in four of the seven locations sampled. Follow-up activities will be needed to confirm the source of this contamination and address it as appropriate. Additional drums found on the Jefferson Memorial property to the north have also been identified and could date from the period during which the A.L. Taylor Site was used as a waste storage facility.

Conclusion

The remedy at the A.L. Taylor Site currently protects human health and the environment because the cap portion of the remedy appears to be functioning as intended by the selected remedy within the ROD by preventing off-site contaminant migration. However, for the remedy to be protective in the long term, the drainage ditch needs to be maintained to function as intended by the selected remedy within the ROD, which will require removing any vegetation or fill that is obstructing the drainage ditches both inside and outside of the fenced area. EPA should also work with the State to fill in a large hole just outside of the fence on the southeastern portion of the capped area to prevent ponding adjacent to the cap. Appropriate steps should be taken to promote drainage towards the Wilson Creek in this area and discourage activities that may result in future ponding. EPA should confer with the State to determine whether signage identifying the Site as a Superfund site should be posted to discourage trespassing, or if these signs might have the opposite effect. Another option to deter trespassing may be to install an additional gate at the entrance to the Site.

Ground water monitoring wells need to be restored to working order, and all O&M activities need to occur on a quarterly basis. This includes maintaining the sampling and observation schedules required by the 1988 O&M Plan to observe any trends that may indicate migration of contaminants of concern (COCs). ICs restricting ground water and land use should be put in place, so that any future use of the Site will remain protective of human health and the environment. EPA and the State should conduct further investigations to determine the source of PCBs and organic contaminants and appropriate actions to remove them from Wilson Creek in a timely manner.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (from WasteLAN): A.L. Taylor		
EPA ID (from WasteLAN): KYD980500961		
Region: 4	State: KY	City/County: Brooks/Bullitt County
SITE STATUS		
NPL status: <input type="checkbox"/> Final <input checked="" type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
Remediation status (choose all that apply): <input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
Multiple OUs? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Construction completion date: 8/10/1990	
Has site been put into reuse? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
REVIEW STATUS		
Lead agency: <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency		
Author name: Kristin Sprinkle		
Author title: Project Manager	Author affiliation: E ² Inc.	
Review period*: 10/29/2007 to 05/30/2008		
Date(s) of site inspection: 10/29/2007		
Type of review:		
<input type="checkbox"/> Post-SARA	<input checked="" type="checkbox"/> Pre-SARA	<input type="checkbox"/> NPL-Removal only
<input type="checkbox"/> Non-NPL Remedial Action Site	<input type="checkbox"/> NPL State/Tribe-lead	
<input type="checkbox"/> Regional Discretion		
Review number: <input type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input checked="" type="checkbox"/> Other (specify) 4		
Triggering action:		
<input type="checkbox"/> Actual RA Onsite Construction at OU#	<input type="checkbox"/> Actual RA Start at OU#	
<input type="checkbox"/> Construction Completion	<input checked="" type="checkbox"/> Previous Five-Year Review Report	
<input type="checkbox"/> Other (specify)		
Triggering action date (from WasteLAN): 03/28/2003		
Due date (five years after triggering action date): 03/28/2008		

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Issues:

- 1) The requirement of ICs was not documented in the ROD. It appears that ICs may be necessary because there are no restrictions in place to protect the integrity of the remedy and to prevent exposure to contaminated groundwater that remains onsite.
- 2) Identification of drums and other potential source materials outside the fence line in Wilson Creek.
- 3) Lack of maintenance for the surface water ditch/standing water in the drainage ditch system.
- 4) Lack of ground water, surface water, and sediment data since the last Five-Year Review.
- 5) Lack of regular O&M since the last Five-Year Review.
- 6) Presence of PCBs, potentially from hardened sludge and drum carcasses, in the surface water and sediment in Wilson Creek.
- 7) Most ground water monitoring wells are not functioning or clearly marked.
- 8) Ponding of water on the southeastern portion of the Site against the cap.
- 9) Use of all-terrain vehicles outside the fence line that may be interrupting surface water flow off the Site to Wilson Creek.
- 10) Presence of unmarked pipe..
- 11) All ground water monitoring wells are compromised.
- 12) No signs identifying the Site as a Superfund site.

Recommendations and Follow-up Actions:

- 1) Work with KDEP to evaluate options for implementing ICs to protect the integrity of the remedy and to prevent exposure to contaminated ground water that remains onsite.
- 2) Conduct further investigations to determine if the drums and materials in the Creek are contaminants and take appropriate future actions.
- 3) Perform maintenance on the ditch both inside and outside of the fence by removing vegetation and ensuring functionality.
- 4) Work with KDEP to ensure data for the Site are regularly collected in the future and ensure the sampling at the Site is in accordance with the O&M plan.
- 5) Work with KDEP to ensure the O&M schedule is being followed.
- 6) EPA and the State should conduct further investigations to determine the source of PCBs and appropriate actions to remove them from Wilson Creek.
- 7) Clearly mark the ground water monitoring wells.
- 8) Conduct investigations to determine what is causing ponding and take appropriate actions to stop ponding from occurring and promote drainage toward Wilson Creek.
- 9) Work with the State to consider actions to deter trespassing that may potentially interfere with the remedy.
- 10) Conduct investigations of the unmarked pipe and evaluate whether it compromises human health or the environment; if so, determine appropriate actions.
- 11) Determine actions necessary to repair monitoring wells to become functional or replace as needed.
- 12) Confer with the State to determine if signs are necessary to protect the remedy or if they will have unintended impacts.

Protectiveness Statement(s):

The remedy at the A.L. Taylor Site currently protects human health and the environment because the cap portion of the remedy appears to be functioning as intended by the selected remedy within the ROD by preventing off-site contaminant migration. However, in order for the remedy to be protective in the long term, the drainage ditch needs to be maintained to function as intended by the selected remedy within the ROD, which will require removing any vegetation or fill that is obstructing the drainage ditches both inside and outside of the fenced area. EPA should also work with the State to fill in a large hole just outside of the fence on the southeastern portion of the capped area to prevent ponding adjacent to the cap. Appropriate steps should be taken to promote drainage towards Wilson Creek in this area and discourage activities that may result in future ponding. EPA should confer with the State to determine whether signage identifying the Site as a Superfund site should be posted to discourage trespassing, or if these signs might have the opposite effect. Installing an additional gate at the entrance to the Site may be another option to deter trespassing.

In addition, ground water monitoring wells need to be located, marked and restored to working order, and all O&M activities need to occur on a quarterly basis. This includes maintaining the sampling and observation schedules required by the 1988 O&M Plan to observe any trends that may indicate migration of contaminants of concern (COCs). The requirement of ICs was not documented in the selected remedy within the ROD. However, options for implementing ICs to restrict ground water and land use should be evaluated. ICs restricting ground water and land use are needed, so that any future use of the Site will remain protective of human health and the environment. EPA and the State should conduct further investigations to determine the source of PCBs and take appropriate actions to remove them from Wilson Creek in a timely manner.

Other Comments:

There are no other comments for this FYR.

Fourth Five-Year Review Report for A.L. Taylor Superfund Site

1.0 Introduction

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. The methods, findings, and conclusions of FYRs are documented in FYR reports. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121 and the National Contingency Plan (NCP). CERCLA 121 states:

“If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.”

EPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

“If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action.”

This is considered a ‘policy’ FYR because the Record of Decision (ROD) for this site was signed before CERCLA was amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). Pre-SARA RODs which leave hazardous substances, pollutants, or contaminants on site above levels that allow for unlimited use and unrestricted exposure are considered policy FYR’s.

E² Inc., an EPA Region 4 contractor, conducted the FYR and prepared this report regarding the remedy implemented at the A.L. Taylor Site in Brooks, Bullitt County, Kentucky. EPA collected surface water and sediment samples from the Site on December 4th and 5th, 2007, to inform this review. This FYR was conducted from October 2007 to May 2008. EPA is the lead agency for developing and implementing the remedy for the Superfund-financed cleanup at the A.L. Taylor Site. The O&M activities are funded by the PRPs, and the State is responsible for

carrying out the O&M. The Kentucky Natural Resources and Environmental Protection Cabinet (KNREPC), the support agency representing the State of Kentucky, has reviewed all supporting documentation and provided input to EPA during the FYR process.

The A.L. Taylor Site has one operable unit (OU), which will be discussed in this report. All remedial actions are complete for this Site.

This is the fourth FYR for the A.L. Taylor Site. The triggering action for this review was the signing of the third FYR on March 28, 2003. The FYR is required because the remedy leaves hazardous substances, pollutants, or contaminants on site above levels that allow for unlimited use and unrestricted exposure. This review is considered a "policy" FYR because the ROD for this Site was signed before CERCLA was amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The next FYR will be required in June 2013.

2.0 Site Chronology

Table 1 lists the dates of important events for the A.L. Taylor Superfund Site:

Table 1: Chronology of Site Events

Event	Date
Fire lasting over a week occurs at the Site	November 1966
KNREPC first documents release of hazardous substances	1975
Releases of oil and hazardous waste discovered by EPA	January 1979
Voluntary cleanup by PRP	1980
Site inspection by EPA	1981
EPA cleanup action	September 1981
Proposed for NPL	December 1982
Remedial Investigation/Feasibility Study (RI/FS) Start	September 1981
Final listing on NPL	September 1983
Remedial Design Start	May 1986
Record of Decision signed	June 18, 1986
Remedial Action commenced	April 20, 1987
Remedial Design-completed	September 1987
Remedial Action completed	March 1989
Superfund State Contract for O&M	July 1989
Construction complete	August 1990
Consent Decree	October 1991
First FYR Report	July 1992
Notice of intent to delete	March 1996
Deletion from NPL	May 1996
Second FYR report	March 1998
Third FYR report	March 2003
Site inspection for fourth FYR report	October 2007
Sediment and surface water sampled by EPA	December 2007

3.0 Background

3.1 Physical Characteristics

The A.L. Taylor Site (the Site) is located in the community of Brooks in Bullitt County, Kentucky. The Site does not have a numbered street address, but its approximate location is 38°04'55" north latitude and 85°42'56" west longitude. Also known as "The Valley of Drums," the Site contains 23 acres located on Letts Road, which is directly off of State Highway 1020. The Crossing golf course borders the south side of the Site. The Site is not located in a heavily populated area, although there are some residences in close proximity to the Site. The nearest residence is within a few thousand feet of the Site. Woods border the north and west of the Site, and there are several private residences located to the south and east of the Site. Located on the eastern edge of the Site is Wilson Creek, which flows approximately 2.5 miles into Pond Creek. Pond Creek eventually drains into Salt River just before the Salt River's confluence with the Ohio River. The 23-acre site includes 17 acres of wooded areas and grassy area and six acres that are enclosed by a security fence to protect the capped area. Contaminants including ponded sediments, sludge, and materials in low lying areas are located beneath the capped area. Hardened sludge and drum carcasses have also been found in Wilson Creek. Figure 1 shows the location of the Site relative to the nearby roads, and Figure 2 shows a detailed map of the Site. The Site is currently zoned for agricultural use.

The Site is located in the Salt River drainage basin. Wilson Creek, which runs along the eastern edge of the Site, is a small tributary that originates from a spring (or relict farm pond) south of the Site. Wilson Creek is also considered to be an environmentally sensitive area. The normal stream flow of Wilson Creek is low and subject to fluctuation from seasonal rains and snowmelt. The low flow of the Creek combined with the high flow in the Ohio River greatly dilutes any drinking water intake on the Ohio River downstream of the Salt River.

The Site is located in the Knobs physiographic region, which is a series of erosional remnants formed of Mississippian and Pennsylvanian rocks overlying Silurian and Devonian rocks. The Mississippian rocks are limestone and siltstone with some shale beds, while the Pennsylvanian rocks are sandy limestone and sandstone, which form the cap rocks in the Knobs.

The Knobs province is on the western edge of the Jessamine Dome, a structural dome that lies along the axis of the Cincinnati Arch. The regional dip of the formations in the vicinity of the Site is gentle, and ranges from two to four degrees to the southwest. In descending stratigraphic order, the New Providence Shale, New Albany Shale, Louisville Limestone, and Waldron Shale underlie the Site. The New Providence Shale begins as shallow as three feet below ground surface and is weathered to a depth of 12 to 13 feet below ground surface. Joints and fractures in the New Providence Shale are numerous and range from two to five feet in length. At the time of the Final Design Report for the Site it was not known how open the fractures are, how continuous they are, or if there is significant intersecting of openings. This report was written in February, 1983.

Ground water at the Site is located in two aquifers. The shallow aquifer is between three and 25 feet thick in the Site area and has water levels that range from 2.4 to 6.4 feet below the land surface. The ground water flow in the aquifer is southeasterly toward the valley of Wilson Creek. A deep aquifer occurs in the limestone under the shale. The shale comprises the uppermost geologic formations in the Site area. Most of the water in the deep aquifer is pumped from consolidated rocks and moves along interconnected fractures and solution channels.

Figure 1: Location Map for the A.L. Taylor Superfund Site

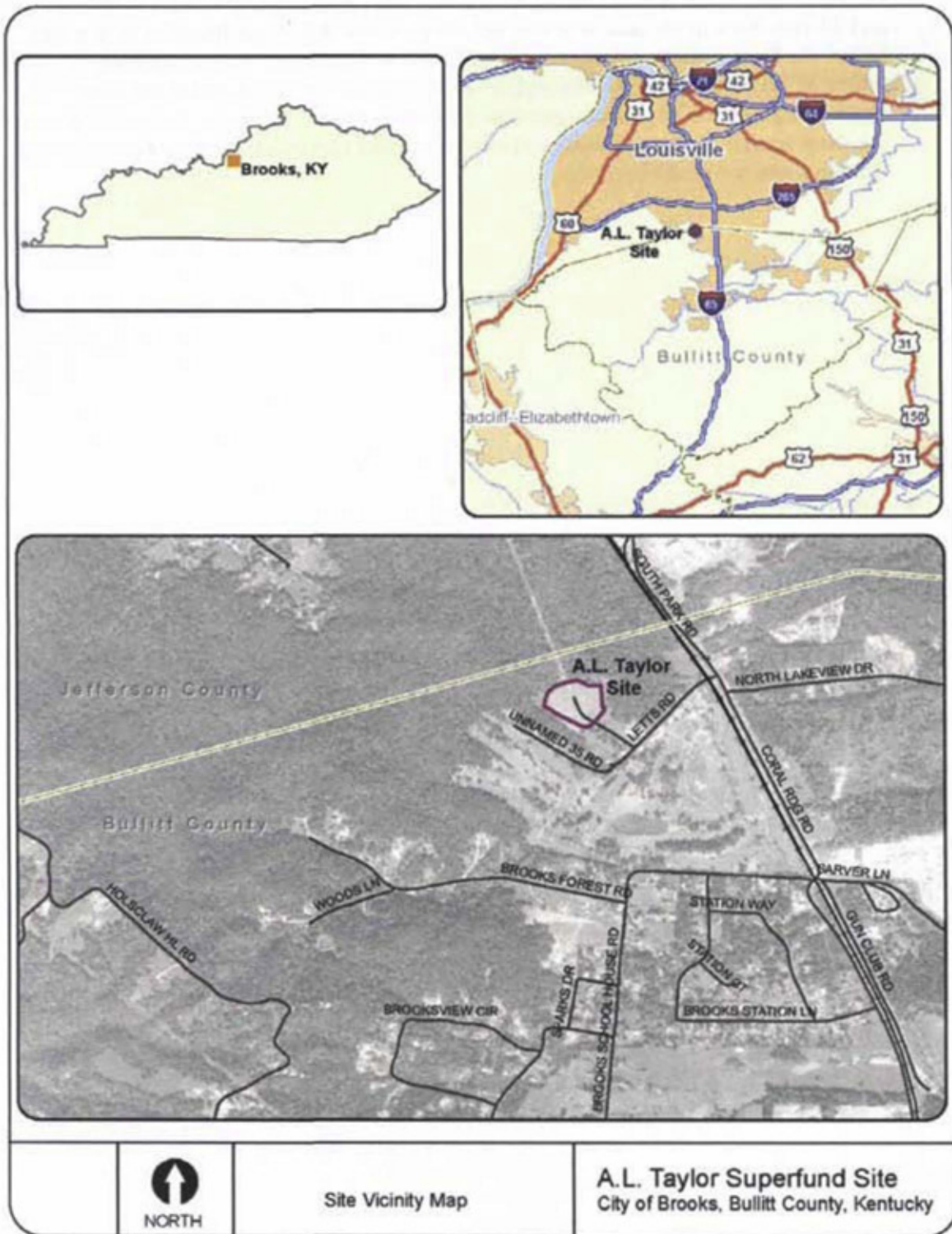
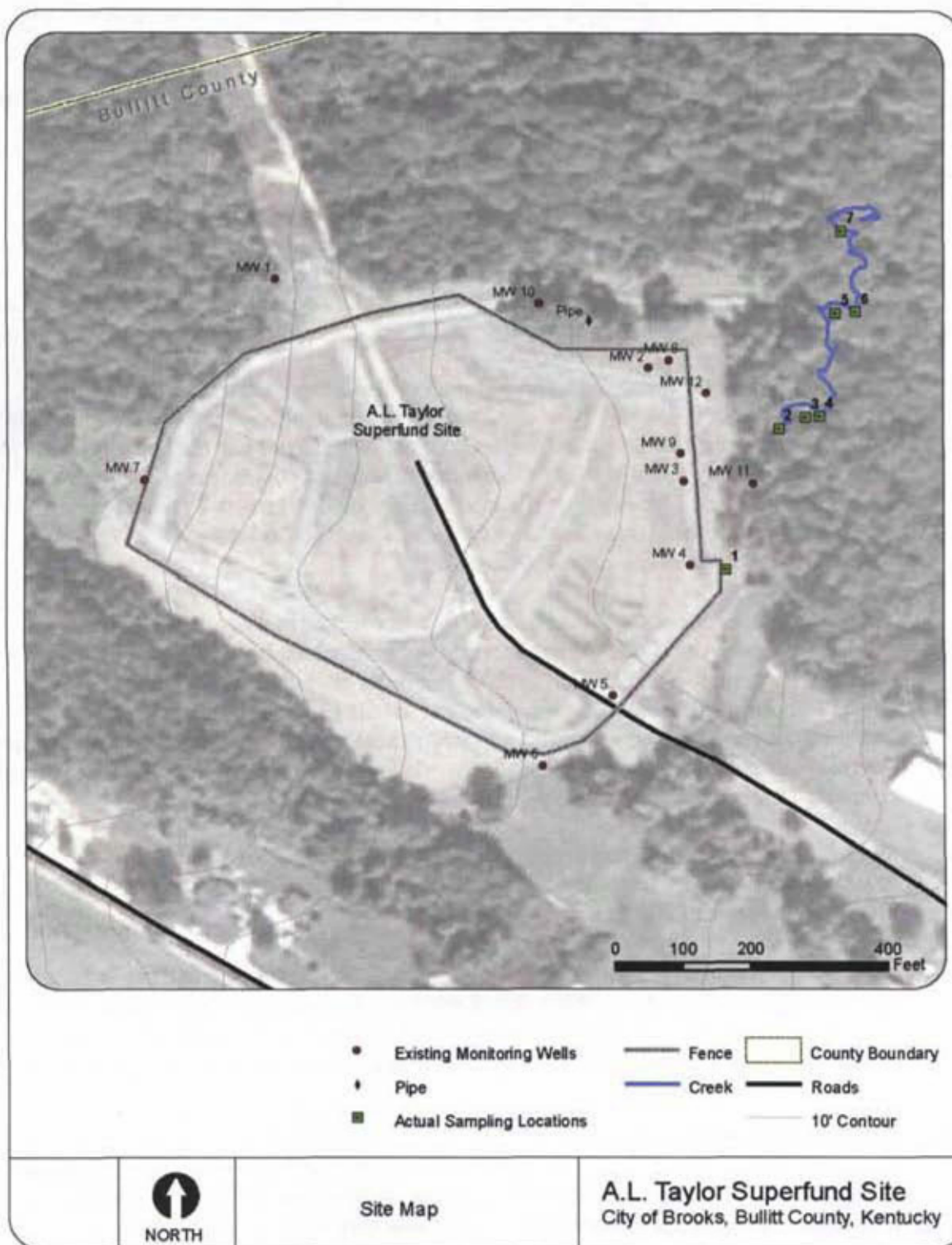


Figure 2: Detailed Map of the A.L. Taylor Superfund Site



3.2 Land and Resource Use

Land use near the Site primarily consists of pastures, residential, and commercial use. Residential homes and the Crossing golf course properties are located within a few thousand feet to the south and east of the Site, and have been located there since the Site's initial remediation. Access to the golf course is located on Letts Road just before the access road to the Site. There are also sheet metal storage buildings on the access road to the Site.

The Site was initially identified as a waste disposal site in 1967 by KNREPC. At the time, Mr. Taylor, original owner and operator at the Site, excavated pits on the Site, emptied the contents of the drums into the pits, and recycled the drums. The pits were eventually covered with soil from nearby hillsides. Drums were also stored on the Site surface during later years of operation.

The Site is currently zoned for agricultural use. While there have been no inquiries regarding reuse of the A.L. Taylor site, there has been significant population growth in Bullitt County, and other Superfund sites near the A.L. Taylor site are being returned to use. Bullitt County ranks second in Kentucky in terms of population gained between 2000 and 2006, and fifth in terms of percentage population growth over that period. It was evident at the time of the site inspection that the A.L. Taylor site is being used as a recreational area by all-terrain vehicle users.

The two aquifers under the Site produce low water yields; as a result, they are not major ground water sources. The flow of ground water is expected to be in a down slope, down-gradient direction towards Wilson Creek. The water from the aquifers also contains concentrations of iron and manganese that exceed the National Drinking Water Standards. According to the Feasibility Study Addendum and Endangerment Assessment, the residents and businesses near the Site obtain their drinking water from cisterns or are connected to the Louisville Water Company supply.

Wilson Creek, located adjacent to the Site, is a small stream that is subject to seasonal low flow conditions. The stream lies within the Salt River drainage basin and is classified for recreational use.

The Site has most likely been abandoned because there has been no activity from an owner since its remediation. While Mr. Taylor is still named the owner on the deed, the property was subject to a bank foreclosure in 1985 when Citizens Federal Bank took possession of it. Citizens Federal Bank was subsequently bought by Fifth Third Bank.

3.3 History of Contamination

In 1967, KNREPC noted that with the proper permitting, Mr. Taylor could operate an approved sanitary landfill. However, the Site was used as a waste disposal site by Mr. Taylor without proper permits. At the time, the paint and coating industries in the Louisville area were the primary waste generators using the Site. During the Site's

operation, Mr. Taylor emptied the contents of waste-containing drums into pits. The formation of the pits greatly disturbed the surface features of the Site. The waste dumped in the pits often consisted of solvents, which Mr. Taylor would then burn off. There were reports of a fire that burned for approximately one week. Mr. Taylor also buried wastes containing chemical liquids, sludge, and crushed drums in cells throughout the Site. When the pits on the Site were filled by KNREPC, thousands of drums continued to be stored on the ground surface.

KNREPC first documented releases of hazardous substances from the Site in 1975 and pursued legal action against Mr. Taylor. The ground water, surface water, and soil were determined to be contaminated with heavy metals, volatile organic compounds (VOCs) such as ketones, plastics such as phthalates, and PCBs from spills and deteriorating waste drums. During this time, Mr. Taylor continued to receive and dispose of waste at the Site until his death in late 1977.

In January 1979, there were releases of oil and hazardous substances at the Site. Pollutants were leaking from drums and spreading into Wilson Creek. At the request of KNREPC, EPA responded to prevent further migration. The PRPs were contacted in 1980 and asked to remove and properly dispose of drums that belonged to their companies. When EPA inspected the Site again in 1981, there were still deteriorating and leaking drums discharging pollutants into Wilson Creek. EPA responded under the emergency provisions of CERCLA and removed the remaining drums onsite. The 1981 Remedial Action/Feasibility Study (RA/FS) provides a table with high priority pollutants identified in soil and water samples at the Site, which can be found in table K-1 (appendix K). The table provides the range of concentrations for contaminants, including VOCs, semi-volatile organic compounds, PCBs, and metals, found in soil and water taken at various sample locations at the Site. However, the locations for the concentration levels were not provided in the RA/FS.

In 1984, the PRPs and site owner were issued demand letters to reimburse EPA and the Coast Guard for the immediate removal actions that took place in 1981. In response to the letters, the PRPs and site owner entered into an agreement with EPA to negotiate payment which was to include the government's costs for conducting the RI/FS.

A Consent Decree between EPA and the PRPs was signed in October 30, 1991. In the Consent Decree, the PRPs agreed to repay cost incurred by EPA conducted during the initial response actions to clean up the Site. PRPs also agreed to provide funding to perform monitoring, operation, and maintenance work related to the Site as described in the Final Operations and Maintenance Plan established in 1988.

3.4 Initial Response

In January 1979, at the request of KNREPC, EPA responded to releases of oil and hazardous substances at the Site. Under the authority of Section 311 of the Clean Water Act, the EPA Emergency Response Branch prevented further releases of pollutants into Wilson Creek by constructing interceptor trenches, constructing a temporary water

treatment system, securing leaking drums, and segregating and organizing drums on site. EPA operated and maintained a carbon treatment system on site until December 1979, when KNREPC assumed responsibility for the system.

After the 1979 emergency response action, EPA counted 17,051 remaining drums, of which 11,629 were empty. In 1980, KNREPC contacted five principal PRPs, who identified and removed approximately 20 percent of the drummed waste that remained on the surface. The five PRPs included: Ford Motor Co.; Reliance Universal, Inc.; Louisville Varnish Co.; George W. Whitesides Co.; and Kurfee's Coating, Inc. Following this removal, an estimated 4,200 drums remained.

In 1981, an EPA inspection revealed deteriorated and leaking drums, which were again discharging pollutants into Wilson Creek. EPA, responding under the emergency provisions of CERCLA, upgraded the existing treatment system and moved the remaining 4,200 drums from the Site for recycling or disposal. The Site was then regraded to promote positive drainage towards Wilson Creek, thus reducing the amount of ponded water and minimizing surface erosion. These measures eliminated the drummed waste from the surface, but left contaminated soils and buried drums on site.

In 1984, PRPs voluntarily conducted remedial investigations and developed conceptual designs for a remedy at the Site. On June 18, 1986, a Record of Decision (ROD) containing remedial designs from the PRPs was prepared and signed by EPA.

3.5 Basis for Taking Action

KNREPC first documented on-site hazardous substance releases in 1975. EPA inspected the Site in 1981 and discovered approximately 4,000 deteriorating and leaking drums that were discharging pollutants into Wilson Creek. Approximately 100 people lived in a residential area located within one mile of the Site. The ground water, surface water, and soil were contaminated with heavy metals, volatile organic compounds (VOCs) such as ketones, plastics such as phthalates, and PCBs from spills and deteriorating waste drums. Accidental ingestion and direct contact with the contaminated ground water, soil, and surface water presented possible health threats.

Analytical data were collected during several site actions, including the two immediate removals and the remedial investigation. Hazardous substances detected on site included the following classes of compounds: heavy metals, ketones, phthalates, PCBs, chlorinated alkanes and alkenes, aromatics, volatile organic compounds (VOCs), chlorinated aromatics, and polynuclear aromatics. In all, approximately 140 compounds were identified in collected samples. The contaminants found most often and in the highest concentrations are listed in Table 2.

Table 2: Contaminants Found Most Often and in Highest Concentrations

Contaminants	
Xylene	Fluoranthene
Acetone	Dichloroethylene
Toluene	Methylene chloride acetone
Phthalates	Anthracene
Methyl ethyl ketone	Alkyl benzene
Vinyl chloride	Aliphatic acids

PCBs were detected in low concentrations and several metals, including barium, zinc, copper, strontium, magnesium, and chromium, were detected in concentrations exceeding background levels for ground water, but were still below National Drinking Water standards.

Other than samples of drum contents, the highest organic contaminant concentrations on site were detected in liquid samples collected from the test pits. Some of the same compounds were detected in water samples collected from borings located down gradient of the test pits. It is significant to note that some of these water samples were collected immediately down gradient of disposal cells that Mr. Taylor used when the Site operated, but the contaminant concentrations were relatively low compared to the test pit samples.

Within the risk assessment at this Site, ground water and surface water were evaluated as potential routes of exposure to hazardous substances released from the A.L. Taylor Site. Under existing and projected usage patterns assessed at the time of the ROD, neither type of water source appeared to be a likely route of exposure to populations located downstream of surface water routes or down gradient of ground water movement from the Site. The potential for exposure during recreational use of surface waters was also thought to be low due to the high dilution factor. Recreational use of the streams leading from the Site was not documented; however, if present, recreational use of these streams was believed to be infrequent above the Ohio-Salt River confluence.

The risk assessment portion of the ROD also considered the modest population growth that was projected for the Site vicinity as a factor that limited future human exposure risks.

According to the health risk discussions within the ROD, the pathway of concern at the A.L. Taylor Site is the active contaminant migration of surface water runoff coming into contact with waste on site. The final cover was proposed as a method of containing waste materials and preventing contact between surface water and waste. Ground water was not considered a potential exposure pathway within the health risk discussions within the ROD because of poor water quality and low yield at the Site. Because there is a high dilution factor as surface water travels to the Ohio-Salt River confluence, surface water from the Site was not considered a potential exposure pathway.

There is no detailed Risk Assessment with the potential health threats of exposure to contaminants at the Site because the Site was not expected to have many uses in the future. According to the ROD, the potential for exposure to contaminated ground water

or surface water was low because of the current and projected use of the Site by the surrounding population. The ROD, as well as the November 1984 Feasibility Study Addendum, mentioned there was little potential for exposure to contaminants in ground water because of low yield and the surface water because it is unlikely that the surface water in Wilson Creek was being used for recreational purposes in Wilson Creek.

4.0 Remedial Actions

A number of remedial alternatives were considered for the A.L. Taylor Site, and final remedy selection within the 1986 ROD was made based on an evaluation of each alternative against various evaluation criteria that were specified in the Site's Feasibility Study and 1986 ROD. These evaluation criteria included the following: reliability, implementability, RCRA Conformance, Safety and Operation and Maintenance.

4.1 Remedy Selection

On June 16, 1983, EPA presented a proposal for cleanup of the A.L. Taylor Site. Representatives from EPA, KNREPC, local authorities, local media, and the community were present to discuss the recommended remedial alternative. There was a 30-day comment period following the meeting. No written comments were received.

The remedial alternatives evaluated at the Site were source control measures. The migration of hazardous substances from the disposal areas is minimal and the remedial alternatives were to designed control off-site migration of contaminants. The objectives of the remedial action were broad enough to address all routes of release, but focused on those areas with the greatest potential for adverse effects on public health and the environment. The remedy also took into account cost-effectiveness considerations.

The remedial action objectives (RAOs) to address human health concerns were discussed in the ROD for the Site. The RAO's noted in the ROD include the following:

- 1) Air quality will be protected by the control of emissions of particulate matter and toxic gases.
- 2) The recreational users and biota of downstream surface waters will be protected from leachate and contaminated runoff.
- 3) Ground water contributions to surface water will be protected by reducing aquifer recharge.
- 4) Local populations will be protected from direct contact with contaminated soils.

The following RAO's were noted within the Final Design Report for the Site:

- Provide on-site containment for the buried waste and contaminated soil.
- Protect the public health and welfare and the environment.
- Protect recreational users and biota of downstream surface waters (Wilson Creek) from leachate and contaminated runoff (i.e., prevent migration of contaminants off site).
- Restore the Site by regrading and revegetation.
- Protect local populations from direct contact with contaminated soils and surface water.
- Preclude access to the Site by the general public.

Ecology and Environment, Inc. completed a Feasibility Study in 1982. The risk assessment discussion within the ROD, which was signed by EPA in June 1986, identified ground water and surface water (Wilson Creek) as potential routes of exposure to hazardous substances.

The selected remedy in the ROD included:

- Removing ponded water from the Site.
- Securing pond sediments, sludge, and materials (from low-lying areas) beneath the cap.
- Installing final cap cover for containment of waste materials.
- Constructing a surface water drainage diversion to route surface water around the cap area and accommodate a 25-year/24-hour storm.
- Implementing a performance-monitoring program on Wilson Creek (the only potential receptor of chemical migration) to evaluate the effectiveness of the clay cap in mitigating surface contaminant migration.
- Monitoring ground water quality using eight newly installed nested wells placed along the creek valley at four locations, to monitor both the shallow and the deeper ground waters. In addition, these wells would provide an early warning of any contaminant migration toward Wilson Creek via ground water.
- Following the completion of the remedial construction, securing the Site with the installation of a six-foot high chain link fence with appropriate gates.
- Conducting a regular inspection and maintenance program for a period of 30 years following completion of remedial construction.

The cover consists of a 30-inch thick layer of clay to attain a permeability of 10^{-7} cm/sec, overlain by an 18-inch layer of material with permeability between 10^{-3} and 10^{-5} cm/sec. A six-inch layer of topsoil was then added and vegetated with plants with root systems that would stabilize the topsoil and loam against erosion without penetrating the clay material of the cap.

The 1988 Field Operations Plan gives details for the ground water and surface water monitoring plan included in the Final Operation and Maintenance Plan. For the first three years after the remedy was put into place, ground water was to be sampled quarterly. Between years 4 and 30, the ground water was to be sampled annually. The COCs to be monitored in the ground water and surface water includes VOCs, semi-volatile organic compounds, and PCBs. The Final O&M Plan in Appendix G of this FYR contains a detailed list of the compounds that were monitored.

A performance monitoring program for Wilson Creek was also developed and included in the 1988 Field Operations Plan and the Final Operation and Maintenance Plan for the Site. The monitoring program is meant to ensure the effective of the cap in mitigating the migration of chemicals to Wilson Creek. The monitoring program requires two surface water samples to be taken from Wilson Creek following the same sampling schedule as the ground water. In the instance where there is not sufficient surface water available for analysis, sediment samples are to be taken for analysis instead. The samples are to be

taken upstream of any runoff or shallow seepage from the landfill and downstream of any area providing surface runoff to Wilson Creek.

As discussed within the health risk assessment discussions within the ROD, the active contaminant migration pathway at the A.L. Taylor Site is by surface water runoff. The final cover is proposed as a method of containing waste materials and preventing contact between surface water and waste.

4.2 Remedy Implementation

Remedial design for the Site began in May 1986. In April 1987, remedial measures commenced by Haztech, Inc. included removing ponded water from the Site, and securing pond sediments, sludge, and materials (from low-lying areas) beneath the cap, the installation of a clay cap, a perimeter drainage system, monitoring wells, and a security fence. Water from a surface impoundment was discharged into Wilson Creek. In addition, quarterly ground water monitoring was implemented by Ebasco Services, Inc.

In the fall of 1988, EPA determined that reseeded and regrading of the cap was necessary due to erosion problems. In March 1989, all remedial construction was completed.

Approximately 17 acres of the Site have not been impacted by construction of the remedial facilities; this portion of the Site is woodland and grassy area. For protection of the remedial facilities, a security fence encloses approximately six acres of the Site.

In July 1989, a Superfund State Contract for O&M Activities was signed; this was an agreement between EPA and KNREPC that KNREPC would perform the Site's O&M. The Contract identified the responsibilities of EPA and the State regarding the Site. Based on a Superfund Contract between EPA and KNREPC, EPA was responsible for providing KNREPC with PRP funding for Site O&M and repairing on-site utility poles as needed to protect the integrity of the cap. KNREPC was required to provide all necessary personnel, equipment, and services to carry out O&M according to the 1988 O&M Plan.

The ground water and surface water monitoring plans have been implemented by KNREPC. Sediment samples were also taken when there were not adequate levels of surface water to sample. The Site was monitored regularly until 2003 when no other samples were taken again until 2007 to inform this review. During the 2007 sampling, only surface water and sediment samples were taken because some of the monitoring wells were not able to provide adequate water levels to collect ground water samples.

Funding for the O&M is provided by PRPs, which include Ford Motor Company, Akzo Coating, Inc., Kurfees Coatings, and George W. Whitesides. PRPs put money into a fund for monitoring, operation, and maintenance work at the Site as stated in the Consent Decree. The Consent Decree was signed on October 30, 1991 and required that the PRPs to pay for past response costs that had been incurred at the Site. PRPs were also

responsible for providing funds for the performance of work related to the Site as described in the Final Operations and Maintenance Plan.

4.3 Operation and Maintenance (O&M)

EPA performed operation and maintenance (O&M) activities from September 1988 through February 1990. Since then, the State has been conducting the O&M, including ground water monitoring, mowing and vegetation control, security fence maintenance, and cap maintenance. According to the Final Operation and Maintenance Plan for A.L. Taylor, Site O&M activities required for 30 years following the completion of the remedy include:

- Field Observation Reports to be filled out each year during the month of January and during the months of April through October;
- Topsoil and grass cover should be observed regularly to ensure erosion does not occur;
- Conduct regular observations for settlement of the cover and the landfill;
- Check for leachate seepage when inspecting the cap;
- Ensure adequate growth of grass cover to prevent erosion;
- Regular observations for areas with ponded water;
- Regularly mow the cover and areas adjacent to facilities constructed at the Site;
- Sample and analyze surface water and ground water;
- Sample surface water upstream and downstream of any areas contributing to Wilson Creek;
- Sample ground water from the monitoring wells annually to check water quality; and
- Remove any vegetation causing the drainage ditch to function improperly.

The Final O&M Plan provides details of the requirements for monitoring ground water and surface water at the Site. A schedule for how frequent the ground water and surface water at the Site was to be monitored was established. For the first three years after the remedy was put in place, the ground water and surface water were to be sampled on a quarterly basis, and each year after on an annual basis up to 30 years after the remedy was put in place. Table 5-2 in the O&M Plan provides the compounds that are to be monitored. The samples are analyzed for these compounds because they were identified as high priority pollutants during the RA/FS. The O&M Plan is included in Appendix G of this FYR.

The selected remedy was a combination of the on-site containment alternative and the excavate-and-relocate alternative. The estimated costs presented in the 1986 ROD include the estimated capital costs for implementation of alternatives and the associated long-term monitoring costs for the individual alternatives before the cost of combining the alternatives was determined. The capital cost for implementing the on-site containment alternative was \$602,000 and \$239,290 for long-term monitoring costs. The capital cost for implementing the excavate-and-relocate alternative was \$2,934,000 and \$86,396 for long-term monitoring costs.

Between 1999 and 2003, regular O&M at the Site occurred. This included periodic field observations, regular mowing and weeding of the cap, and annual sampling of the monitoring wells to check for the presence of contaminants. The soil remedy did not require O&M; only the fence surrounding the cap to prevent public access to the Site was required. At the time of the 2003 FYR, the O&M costs were approximately \$1,500 per month. The Commonwealth of Kentucky received funding for the O&M from a cost recovery settlement with the PRPs for the Site. The settlement provided funds for 29 years of routine O&M at the Site.

Since the previous FYR, the only O&M performed included periodic field observations to ensure that the fence was maintained and the gates to the Site remained locked. The cap was also mowed once in 2005 and once in October 2006. In October 2007, KDEP conducted a site inspection and site maintenance. KDEP found the Site to be overgrown with grass and weeds, and placed new locks on gates. During the inspection, KDEP also met with Brother's Operation and Maintenance to discuss performance of the Site O&M, including mowing, fence, and monitoring well maintenance. Tracks from all-terrain vehicles were also observed during KDEP's site inspection.

The State of KY provided several reasons for why O&M took place less frequently from 2003 to 2008, including:

- the Site had been deleted from the NPL and was less of a priority;
- the Site had changed management, and the new site manager was unaware that there were funds available to perform O&M activities;
- a contract fell through when a contractor's company dissolved; and
- the State did not have adequate personnel to visit and inspect sites as frequently as they would have liked.

An issue that has arisen with O&M at the Site since the remedy was constructed has been getting suitable ground water samples. During the previous FYR process, two monitoring wells were not able to provide enough ground water for samples taken during 2003 for the previous FYR did not yield clean ground water samples. Ground water samples from two monitoring wells could not provide enough water for analysis and mud samples were analyzed instead. During this FYR process, many of the wells were not able to provide adequate levels of ground water samples for analysis.

The cap was mowed in October 2007, prior to the site inspection for this FYR. There were no samples collected from the monitoring wells between 2003 and 2007. Costs associated with these activities are included in the table below. As of January 2008, the current balance for the O&M fund is \$1.5 million.

Table 3: O&M Costs Associated with the A.L. Taylor Site from 2003 to 2007

Dates		Total cost rounded to nearest \$1,000
From	To	
6/2003	5/2004	\$6,000
6/2004	5/2005	\$9,000
6/2005	5/2006	\$1,000
6/2006	5/2007	\$2,000

5.0 Progress Since the Last Five-Year Review

The previous FYR included the following Protectiveness Statement:

“Based upon a review of analytical data for the ground water, surface water, and sediment samples and site visits, the remedial action taken at the Site has been effective in protecting human health and the environment. As long as the cap remains in good condition, the Site is kept free of development, no penetrations through the cap are made, and ground water is not used for private or industrial purposes, the remedial action should remain effective. The remedy at the Site currently protects human health and the environment because the 13-acre landfill cap prevents infiltration and subsequent migration of contaminated ground water off-site. Also, institutional controls have been implemented to prevent disturbance of the cap, and development of the property.”

The 2003 FYR found that the cap was functioning in accordance with the selected remedy within the ROD. An issue in the previous FYR was high PCB concentrations in Wilson Creek and monitoring well ALT-04 and the need to determine the source of this surface water and ground water contamination. In addition, the condition of monitoring well ALT-03 needed to be addressed, because it had become fouled. There was also the discovery of an unidentified pipe, which needed inspection to determine its status. According to the 2003 FYR, the ICs at the Site consisted of a chain-link fence surrounding the cap. Posting of signs identifying the Site as a Superfund Site and warning signs were recommended as additional ICs.

Table 4 provides a summary of all the recommendations made in the 2003 FYR as well as follow up actions taken to address the recommendations.

Table 4: Progress on Recommendations from the 2003 FYR

Section	Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
5.1	The grass cover should be mowed twice a year.	State	Twice per year	The cap was mowed once in 2005 and once in 2006. It was not mowed again until 2007 prior to the site inspection.	October 2006 and October 2007
5.2	Any areas of erosion or stressed vegetation should be filled with appropriate cover materials.	State	None given	No action was taken to address areas of erosion or areas with stressed vegetation.	Not completed
5.3	Herbicides should be used to keep drainage ditch and terraces free of vegetation.	State	Semi-annual	No herbicides were used to control growth of vegetation. The drainage ditch and terrace had vegetative growth during the site inspection.	Not completed

Section	Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
5.4	Determine the source for PCBs found in Wilson Creek and MW ALT-04, and continue analyzing surface water samples for PCBs.	State	None given	Samples were taken in 2003 to determine the PCB concentrations in Wilson Creek. The source of the PCBs has not been determined, and surface water samples have not been collected or analyzed regularly.	February 2003
5.5	Repair or replace monitoring well ALT-03 and appropriately mark all ground water monitoring wells.	State	None given	No action was taken to address the working status of monitoring well ALT-03. The monitoring well has not been repaired or replaced, and no monitoring wells have been marked.	Not completed
5.6	Investigate unmarked pipe riser.	State	None given	The purpose of the unmarked pipe has not been determined since the previous FYR.	Not completed
5.7	Post appropriate identification and warning signs.	State	None given	The Site still lacks signs to identify the Site as a Superfund Site and provide warnings.	Not completed

The following sections provide more information about the progress on the recommendations from the 2003 FYR.

5.1 Cap Maintenance and Mowing

Regular biannual mowing of the cap should occur, along with regular cap maintenance activities. Site inspections should be performed quarterly, but there are no records indicating that they have occurred regularly since the previous FYR. As specified in the O&M Plan, site inspections should check for erosion, seepage, and other possible damage to the cap, secure Site gates, remove debris and vegetation in the drainage ditch, and confirm that ground water monitoring wells and the security fence are intact.

5.2 Fill Areas of Erosion and Ponding Water

To prevent further erosion, areas with erosion and stressed vegetation should be graded and reseeded. In addition, areas with standing or ponded water should be filled with appropriate cover material, regraded to drain, and reseeded to prevent possible infiltration through the clay cover and control mosquito populations. There are no records indicating that any areas have been filled or have required filling since the previous FYR.

5.3 Use Herbicide for Drainage Ditch and Terrace

To prevent vegetative growth in the drainage ditch and terrace, the previous FYR recommended using herbicide. Keeping vegetation out of the drainage ditch causes surface water to be diverted around the cap. There are no records of vegetation being removed from the drainage ditch or treated with herbicide since the previous FYR.

5.4 Ground Water and Surface Water Monitoring

The selected remedy within the ROD states that a performance monitoring program should be established for Wilson Creek because it is a potential receptor for contaminant migration from the Site. Samples from the Creek contained elevated levels of PCBs and organic compounds. Because the Creek is designated as a warm water habitat and is considered a recreation resource, it is important to determine the source of the contamination. The source of the contamination is still unknown; however, EPA visited the Site on December 4th and December 5th, 2007 to collect sediment, ground water, and surface water samples. EPA collected sediment and surface water samples at several points in Wilson Creek, including locations where hardened sludges and drums have been found. EPA was unable to collect any ground water samples because the monitoring wells were not able to yield adequate samples.

5.5 Monitoring Wells

The monitoring wells were securely locked when inspected on October 29, 2007. When EPA returned to the Site in December 2007 to collect ground water samples, most of the monitoring wells were not functioning properly. During sampling attempts for monitoring wells ALT-01, ALT-04, ALT-05, ALT-06, ALT-07, and ALT-09, approximately 26 gallons of water were initially purged from each well. After purging, the wells were left to recharge, but the wells remained dry and no samples could be collected. Sediment buildup was also found in several of the wells. It was also noted that the water purged from ALT-09 was gray and had a strong sulfur smell. Based on the previous FYR, it was already known that ALT-03 was compromised. There is no indication that any actions have been taken to repair ALT-03 since the previous FYR. Appropriate activities need to occur to determine which monitoring wells can be restored and which need to be replaced. In addition, although the monitoring wells were easily located, the well numbers were not easily identified without a map of the Site.

5.6 Unidentified Pipe Riser

The pipe riser discussed in the previous FYR has not been investigated. Water Well Construction Practices and Standards should be used to prevent a potential pathway of water to the cap if it is determined that the pipe riser is an abandoned well.

5.7 Post Proper-Identification and Warning Signs

The Site currently lacks signs to identify the Site as a Superfund site. While the previous FYR indicated that appropriate signs need to be posted to deter any trespassing, State representatives noted that posting such signs has led to increased vandalism and trespassing in the area. During this FYR process, the State and EPA also recognized that land and ground water restrictions need to be put in place to ensure that the remedy remains protective.

6.0 Five-Year Review Process

6.1 Administrative Components

EPA Region 4 initiated this FYR in October 2007 and scheduled its completion for May 2008. The A.L. Taylor FYR team was led by Yvonne Jones of EPA, Remedial Project Manager (RPM) for this FYR, and also included the EPA site RPM, Femi Akindele, site attorney, Wilda Cobb, and contractor support provided to EPA by E² Inc. In November 2007, EPA held a scoping call with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place. Yvonne Jones established a review schedule that consisted of the following:

- Community notification;
- Document review;
- Data collection and review;
- Site inspection;
- Local interviews; and
- FYR Report development and review.

6.2 Community Involvement

On March 26, 2008, a public notice was published in Louisville, KY's *Courier Journal* announcing the commencement of the FYR process for the A.L. Taylor Site, providing Yvonne Jones' contact information, and inviting community participation. The press notice is available in Appendix B. The FYR report will be made available to the public once it has been finalized. Copies of this document will be placed in the designated public repository: Ridgeway Memorial Library, 127 N. Walnut St., Shepherdsville, Kentucky, 40165. On October 29, 2007, as part of the site inspection, E² Inc. staff visited the Ridgeway Memorial Library and confirmed that A.L. Taylor Site documents were readily available to the public and the information was up to date in the library's reference room. Upon completion of the FYR, a public notice will be placed in the *Courier Journal* to announce the availability of the final FYR report in the site document repository. No citizen comments or concerns regarding cleanup activities at the Site have been received from the public to date.

PRPs were not notified that the FYR process was beginning for this Site. The PRPs agreed to provide funding for operations and maintenance at the Site per a Consent Decree signed in 1991. Since the signing of the Consent Decree, EPA and the State of Kentucky, through a Superfund State Contract for Operation and Maintenance Activities agreement, have been responsible for maintaining the Site and implementing O&M requirements.

6.3 Document Review

This FYR included a review of relevant, site-related documents including the ROD, remedial action reports, and recent monitoring data. A complete list of the documents reviewed can be found in Appendix A.

ARARs Review

Section 121 (d)(2)(A) of CERCLA specifies that Superfund remedial actions associated with RODs written after September 1986 must meet any federal standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate requirements (ARARs). ARARs are identified in RODs and are determined during the RI/FS and at other stages in the remedy selection process. ARARs are those standards, criteria or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA Site.

ARARs were not defined for this Site in the June 1986 ROD because the Superfund Amendments and Reauthorization Act (SARA) was enacted in September 1986, and pre-SARA RODs were not required to identify ARARs within the remedy selection discussions.

In conducting a five-year review, EPA will assess and determine the effect of a newly promulgated or modified standard or "to be considered" (TBCs) on the protectiveness of the remedy originally selected in the ROD. EPA evaluates the newly promulgated or modified requirement or TBCs to determine if the selected remedy established in the ROD remains protective.

6.4 Data Review

Federal and Kentucky Drinking Water Standards

Although ground water at the Site is not of sufficient quantity and quality to be considered as a drinking water source, limited water supplies in the future could result in a need for the public to use ground water in the vicinity of the site as drinking water. No ground water samples have been collected in the past five years, which makes it difficult to adequately make conclusions about the current status of the ground water at the Site.

Current maximum contaminant levels (MCLs) for the four constituents found to exceed MCLs that existed at the time of the previous FYR are reviewed in this FYR. The constituents include bis(2-ethylhexyl)phthalate, 1,2-dichloropropane, nickel, and Aroclor 1254. The current MCLs are the same for bis(2-ethylhexyl)phthalate and Aroclor 1254. There has been a slight change to the MCL for 1,2-dichloropropane from 0.006 milligrams per liter (mg/L) to 0.005 mg/L, and the MCL for nickel has changed from 0.14 mg/L to 0.10 mg/L (note that the MCL for nickel is not a current legal limit and

could be dated based on the current fact sheet available). Table I-1 (Appendix I) contains the 2003 and 2007 MCLs for the constituents.

Preliminary Remediation Goals and Soil Screening Levels

There are no specific promulgated standards for sediment, so guidance on soil cleanup levels is used by EPA Region 4 to determine whether soils are protective at a site. The Site is overseen by EPA Region 4, and Region 4's Preliminary Remediation Goals (PRGs) and Soil Screening Levels (SSLs) are considered "to be considered" (TBCs). Region 4 uses the PRGs published by Region 9; see <http://www.epa.gov/region4/waste/ots/healthbul.htm>. The Site is currently zoned for agricultural use. Because the Site was previously used for industrial purposes and continues to be used as a waste repository with drums in place under the cap, industrial standards are used to assess current sediment samples. SSLs used to assess the contaminants in the sediment are based on a Dilution Attenuation Factor (DAF) of 1 that assumes there is no dilution or attenuation between the source and receptor well. These values can be used at sites where little or no dilution or attenuation of soil leachate concentrations is expected at a site (e.g., sites with shallow water tables, fractured media, karst topography, or source size greater than 30 acres). The PRGs and SSLs for the contaminants detected in the sediment are presented in Table I-2 of Appendix I.

Summary of Previous Data

The 2003 FYR sampling results for ground water and surface water had some MCL exceedances, and sediment has some PRG and SSL exceedances. In addition, samples from seven of the ground water monitoring wells contained bis(2-ethylhexyl)phthalate concentrations that had increased consistently since 1995. In 2000, samples collected from monitoring well ALT-04 had bis(2-ethylhexyl)phthalate and Aroclor 1254 concentrations that were above MCLs. Between 1998 and 2000, surface water samples collected from Wilson Creek contained the PCBs Aroclor 1254 and 1260. Overall, PCB levels in Wilson Creek did not exceed MCLs, with the exception of one exceedance of Aroclor 1254 during 2000. PCBs were detected in sediment samples collected in 1999. Aroclor 1254 was also detected in sediment samples collected from Wilson's Creek during 2003.

Recent Ground Water Data

In January 2003, ground water samples were collected from ALT-01, ALT-02, ALT-04, ALT-05, ALT-10, ALT-11, and ALT-12. COC concentrations were below MCLs in these samples. ALT-01 and ALT-02 samples were composed of mud rather than ground water; therefore, the samples were compared to PRGs and SSLs instead of MCLs. The ALT-01 contained 68.9 mg/L of nickel and 2.7 milligrams per kilogram (mg/kg) of Aroclor 1254. ALT-02 contained 29.3 mg/L of nickel and 1.27 mg/kg of Aroclor 1254. COC concentrations for nickel in ALT-01 and ALT-02 are above SSLs and concentrations for Aroclor 1254 in ALT-01 and Alt-02 are above PRGs. VOCs were analyzed during monitoring between 1998 and 2000 based on the parameters set in the Final O&M plan, but there were no detections found during this time period. The

concentration and location for contaminants that exceeded federal guidelines for ground water MCLs at the Site during this time period are provided in Table 5.

Table 5: Exceedances of Federal Guidelines 1998-2000 from the 2003 FYR

Sample Number	Date collected	Matrix	Constituent Exceeded	Concentration (mg/L)	MCL (mg/L) ^a	Qualifier ^b
ALT-10	10/13/98	GW ^c	Bis (2-ethylexyl) phthalate	0.00857	0.006	J, L
Field Blank	08/19/1999	Water	1,2-Dichloropropane	0.00632	0.006	L
ALT-01	10/21/1999	GW	Nickel	0.108	0.14	L
ALT-04	10/21/1999	GW	Bis (2-ethylexyl) phthalate	0.0105	0.006	L
ALT-06	10/21/1999	GW	Bis (2-ethylexyl) phthalate	0.00651	0.006	J, L
ALT-07	10/21/1999	GW	Nickel	0.589	0.14	L
ALT-12	10/21/1999 11/21/1996 05/26/1995	GW	Bis (2-ethylexyl) phthalate	0.0112 0.0013 0.005	0.006	L
ALT-01	10/04/2000 05/26/1995 11/04/1994	GW	Bis (2-ethylexyl) phthalate	0.00811 0.042 0.005	0.005	B, L
ALT-02	10/04/2000 05/26/1995	GW	Bis (2-ethylexyl) phthalate	0.00690 0.015	0.006	B, L
ALT-05	10/04/2000 11/21/1996 05/26/1995	GW	Bis (2-ethylexyl) phthalate	0.0163 0.009 0.009	0.006	B, L
ALT-06	10/04/2000 11/21/1996 06/01/1995	GW	Bis (2-ethylexyl) phthalate	0.0143 0.009 0.006	0.006	B, L
ALT-07	10/04/2000	GW	Nickel	0.243	0.14	B, L
ALT-07	10/04/2000	GW	Bis (2-ethylexyl) phthalate	0.00667	0.006	B, L
ALT-08	10/04/2000 11/21/1996 05/26/1995	GW	Bis (2-ethylexyl) phthalate	0.0153 0.019 0.043	0.006	B, L
ALT-11	10/04/2000 11/21/1996	GW	Bis (2-ethylexyl) phthalate	0.00889 0.008	0.006	B, L
SW-01	10/04/2000	SW ^d	Bis (2-ethylexyl) phthalate	0.0163	0.006	B, L
ALT-04	10/12/2000	GW	Aroclor 1254	0.00103	0.005	L

a) MCLs used during the 2003 FYR.
b) J = Estimated value; L = Exceeds Drinking water MCL; B = Analyte found in field blank
c) GW = Ground water
d) SW = Surface water

No ground water samples have been collected since those used to inform the 2003 FYR. In December 2007, attempts were made to collect ground water samples that could inform this FYR. Attempts were made to collect samples at six of the wells before it was decided that it would not be possible. Ground water obtained from the wells was murky, and most of the wells ran dry before viable amounts of water could be collected.

Recent Surface Water and Sediment Data

In December 2007, surface water and sediment samples were collected to inform this FYR about levels of VOCs, PCBs, and extractable organic compounds. The samples were collected in Wilson Creek near hardened sludge and drum carcasses (sample locations 6 and 7) that were found during the site inspection. The contaminants detected in the hardened sludge and drums were compared to downstream surface water and sediments samples. The results of the sampling data indicate that there is no evidence of contaminants in the surface water. Although metals were detected during the previous FYR process, no samples were analyzed for metal in this FYR. Metals were not detected at high levels of concern during historical sampling. The concentration of metals detected in surface water was below the Kentucky water quality standards for Recreational and Warm Water Aquatic Habitat waters or there were no regulatory standards available for the metal. Only contaminants that were listed as COCs were tested during the most recent sampling. Table 6 presents a comparison of the surface water data presented in the 2003 FYR to the surface water data from 2007.

The 2007 Wilson Creek sediment samples contained organic compounds and PCBs. Organic compounds present at detectable levels included benzo(b)fluoranthene, chrysene, fluoranthene, and isophorone. The concentrations for these contaminants were below the PRGs indicated in Table I-2 of Appendix I, and with the exception of isophorone, concentrations were also below acceptable SSL levels. Although trace amounts of other organic compounds were detected in sediments, PCBs were the only contaminants that were detected above acceptable PRG and SSL levels indicated in Table I-2 of Appendix I.

Table 6: Comparison of Surface Water Data to the Kentucky Surface Water Standards

Pollutants	Kentucky Water Quality Standards ^a		Surface Water Sampling Results ^b			
	Acute	Chronic	1998 ^c	1999 ^c	2000 ^c	2007
Xylene	NR ^d	NR	ND ^e	ND	ND	ND
Methylene Chloride	NR	NR	ND	ND	ND	ND
Toluene	NR	NR	ND	ND	ND	ND
Alkyl Benzene	NR	NR	0.000092	ND	ND	NA ^f
Dichloroethylene	NR	NR	ND	ND	ND	ND
Methyl Ethyl Ketone	NR	NR	ND	ND	ND	ND
Acetone	NR	NR	0.00556 ^g	0.0110 ^g	0.00892 ^g	ND
Anthracene	NR	NR	ND	ND	ND	NA
Fluoranthene	NR	NR	ND	ND	ND	NA
Vinyl chloride	NR	NR	ND	ND	ND	ND
PCBs	NR	0.0014	0.000092	ND ^h	ND ^h	ND
Strontium ⁱ	NR	NR	0.257	0.510	0.149	NA
Barium ⁱ	NR	NR	0.045	0.058	0.031	NA
Zinc ^{i,k}	$e^{0.8473 \times \ln(\text{Hard}^*)} - 0.884$	$e^{0.8473 \times \ln(\text{Hard}^*)} - 0.884$	0.007	ND	ND	NA
Copper ^{i,k}	$e^{0.9422 \times \ln(\text{Hard}^*)} - 1.700$	$e^{0.8545 \times \ln(\text{Hard}^*)} - 1.702$	0.001	0.004	0.002	NA
Magnesium ⁱ	NR	NR	14.5	55.3	15.6	NA
Chromium ^{i,j,k}	$e^{0.8190 \times \ln(\text{Hard}^*)} - 3.726$	$e^{0.8190 \times \ln(\text{Hard}^*)} - 0.685$	ND	0.001	0.001	NA

a) Kentucky standards provided are for Warm Water Aquatic Habitat waters and are given in units of mg/L. Exceedances are indicated in bold.
b) Sampling data is given in units of mg/L and represent the highest detected level for the sampling year.
c) "Superfund Third Five-Year Review Report for A.L. Taylor (Valley of Drums) Operable Unit 1, Brooks, Bullitt County, Kentucky," prepared by U.S. Army Corps of Engineers, Louisville District. February 2003.
d) NR = no regulatory value
e) ND = Non Detect
f) NA = Not analyzed for this contaminant
g) Acetone values were "J" flagged as estimated values and/or as "B" flagged for being present in blanks.
h) 1999 and 2000 PCB data was all ND, however, the detection limits were above the water quality criteria Standards. In 2003, Aroclor 1254 was detected at a concentration of 2.70 mg/kg in a mud sample taken at the Site.
i) Metals were not tested in December 2007 sampling.
j) Type of chromium is not specified in ROD. In the 2003 FYR, chromium is assumed to be Chromium III Kentucky Water Quality Standards
k) Concentration for hardness-dependent metals can be calculated and compared.

The previous FYR documented that PCBs were detected in sediment samples from Wilson Creek dating as far back as 1998. During the December 2007 sampling, PCBs were detected at six out of the seven sediment sample locations in Wilson Creek; Aroclor 1254 and Aroclor 1260 were the PCBs detected. The PCB concentrations at sample locations 2, 4, and 5 exceeded PRGs indicated in Table I-2 of Appendix I. While further investigation should take place to determine the source of this contamination, the contamination may be linked to the presence of hardened sludges that were found in Wilson Creek during the previous FYR. One sample of a hardened sludge was taken in January 2003, and was found to contain Aroclor 1254, which was also found in the most recent sediment samples at the Site. Based on observations during the Site inspection, the cap appears to be functioning properly and does not show signs of being compromised.

However, it is not possible to confirm the source of PCB contamination in Wilson Creek with only one set of data. EPA or the State should conduct activities to delineate areas in Wilson Creek with elevated PCB concentrations and, pending an evaluation of possible exposures, take the appropriate steps to address this contamination. Table 7 presents the contaminants that were detected in the Wilson Creek sediments as well as the sample locations. Figure 3 presents the organic contaminant concentrations detected at the sample locations, and Figure 4 presents the PCB concentrations.

Table 7: Compounds with Detectable Concentrations in the 2007 Sediment Samples

Sample ID ^a	Compound	Sediment Concentration milligrams per kilogram (mg/kg)	PRGs (mg/kg)	SSLs (mg/kg)	Data Qualifier ^b
SD21207	Trimethylhexane ^c	0.050	NA ^d	NA	NJ
	Benzo(b)fluoranthene	0.064	2.1	0.2	
	Chrysene	0.064	210	8.0	
	Fluoranthene	0.048	22,000	210	
	Pyrene	0.120	29,000	210	
	PCB-1254	11.0	0.74	NA	
	PCB-1260	4.10	0.74	NA	
SD31207	Tetrachloroethene	0.001	1.3	0.003	
	Isophorone	0.061	510	0.03	J
	PCB-1254	0.250	0.74	NA	
	PCB-1260	0.250	0.74	NA	
SD41207	Trimethylhexane	0.020	NA	NA	NJ
	PCB-1254	1.60	0.74	NA	
	PCB-1260	0.89	0.74	NA	
SD51207	PCB-1254	2.20	0.74	NA	
	PCB-1260	1.80	0.74	NA	
SD61207	PCB-1254	0.350	0.74	NA	
	PCB-1260	0.370	0.74	NA	
SD71207	PCB-1254	0.170	0.74	NA	
	PCB-1260	0.190	0.74	NA	
SD7D1207	PCB-1254	0.250	0.74	NA	
	PCB-1260	0.310	0.74	NA	

a. The first number in the sample ID is the sample location from Wilson Creek.
b. Data Qualifier Definitions: J – Estimated value; NJ – Presumptive evidence of analyte; therefore, value is estimated
c. No PRGs or SSLs for trimethylhexane.
d. NA = No applicable values provided for the compound.

Figure 3: Organic Compound Concentrations at Sediment Sample Locations in Wilson Creek

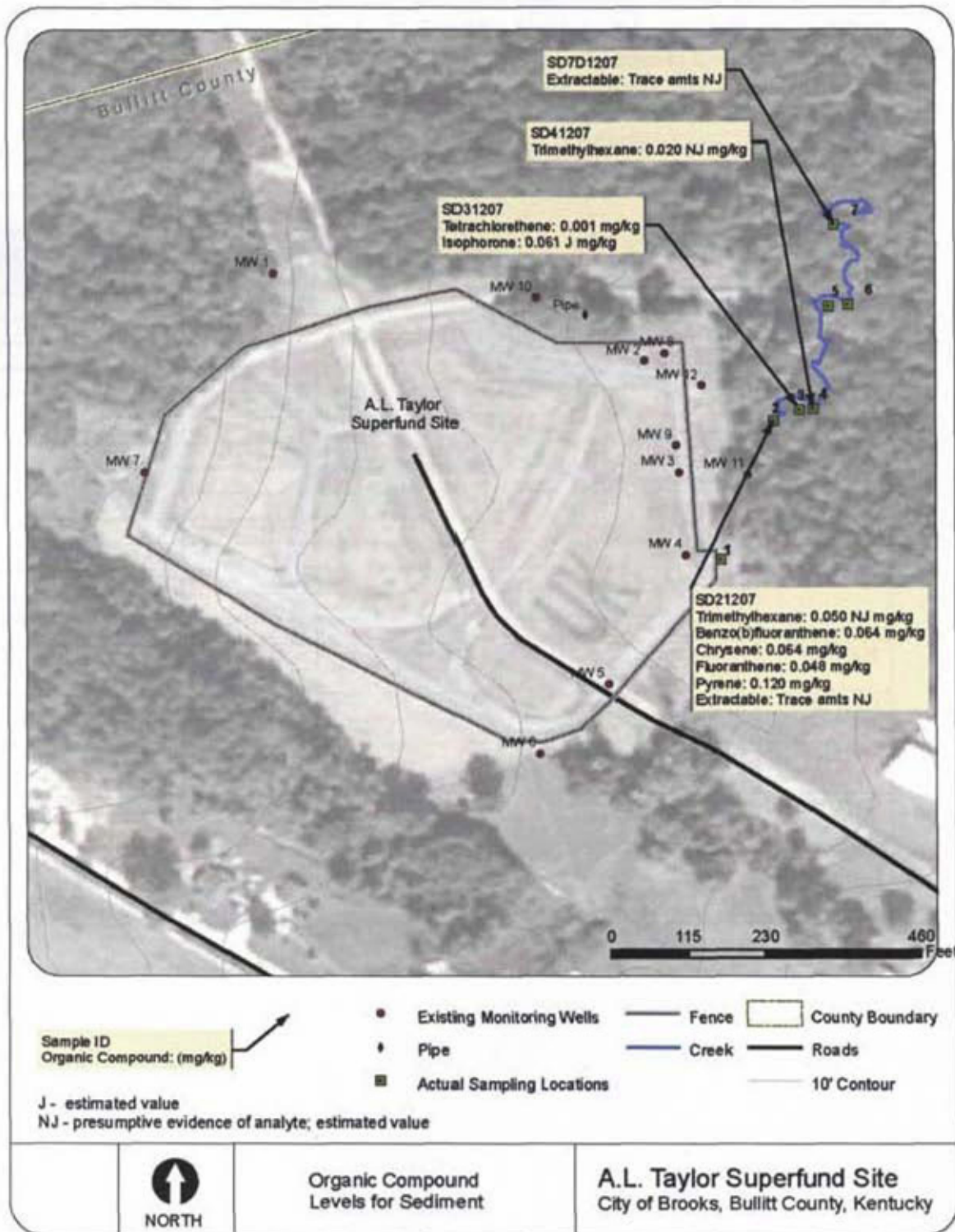
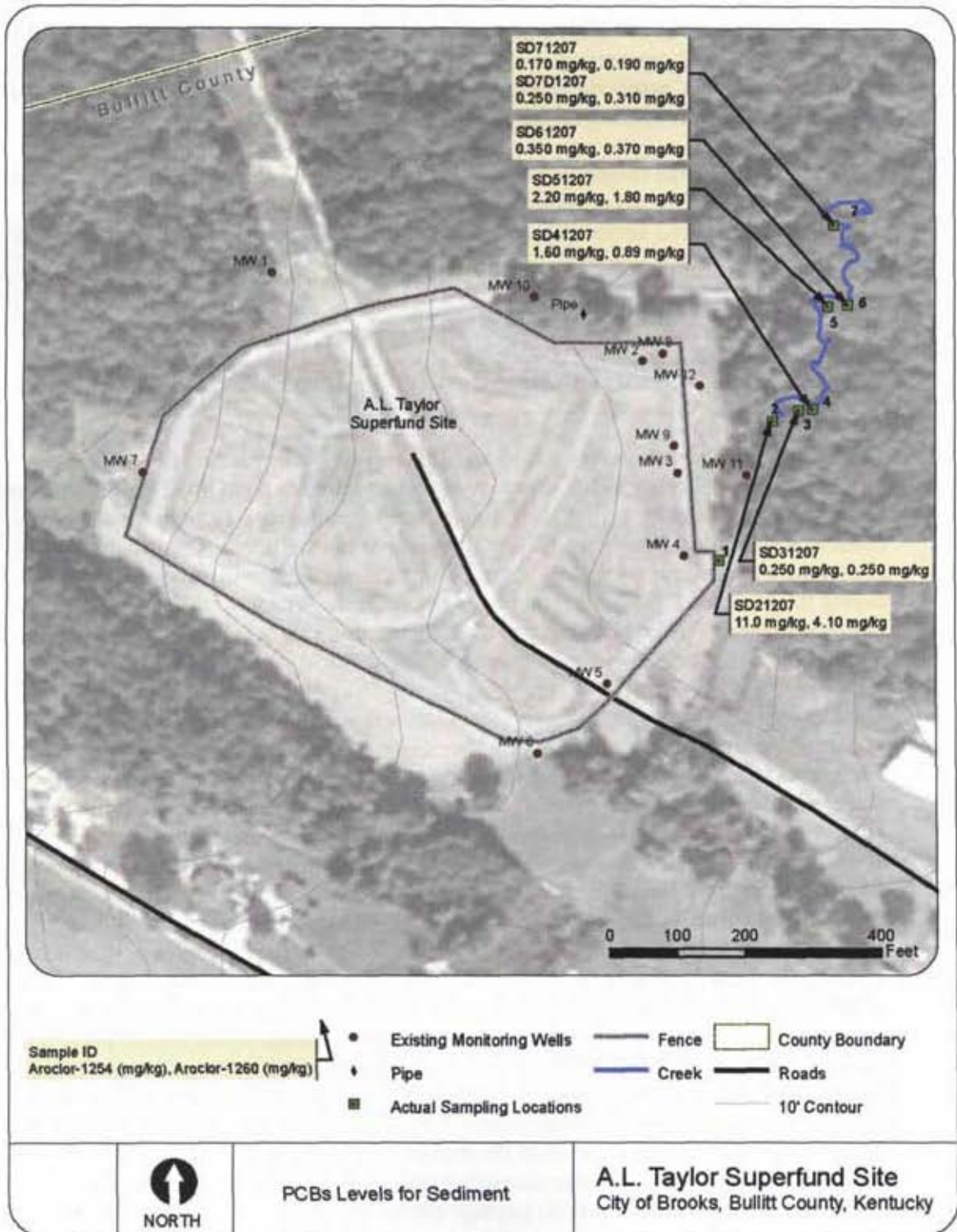


Figure 4: PCB Concentrations at Sediment Sample Locations in Wilson Creek



6.5 Site Inspection

The site inspection for this FYR was conducted on October 29, 2007 by the EPA RPM for this FYR, KDEP representatives, and contractor staff. The purpose of the inspection was to take pictures, assess the external condition of wells, inspect the cap and drainage ditch, and to seek the identity of the current site owner.

E² Inc. staff conducted research at the Bullitt County Public Records Office on October 30, 2007 and found the deed information pertaining to the Site listed in Table 8. No documents were found addressing any ICs to restrict land and ground water use at the Site. A copy of this deed is available in Appendix D.

Table 8: Deed Document for A.L. Taylor Site

Date	Type of Document	Book #	Page #
1976	Deed	195	740

The Site is currently not in reuse. There are no potable wells on the Site. While the ground water monitoring wells were locked and appeared to be in good condition, none of the wells were clearly marked and it was discovered during a subsequent sample collection attempt in December 2007 that several of the wells were not capable of producing a significant amount of water. The purpose of the unmarked pipe found on site during the previous FYR has still not been determined. Wilson Creek is classified as a recreational area. While inspecting Wilson Creek, drum carcasses and hardened sludges resembling rocks were found in various locations.

The cap appeared to be in good condition, but the drainage ditch had a significant number of plants and small trees growing in it, which may not be allowing for proper drainage. The gravel in the drainage ditch also appeared to be spread unevenly, and dips in the gravel are allowing ponding of water in the ditches on the capped portion of the Site. There was a significant rain event prior to the site inspection, and there was evidence of overland flow occurring over the cap, which may indicate that water is not being properly diverted through the drainage channels. The fence surrounding the cap has been raised in the southeast corner to allow water to flow off of the Site and two strands of barbed-wire were originally used in the unfenced portion of this area to prevent entry to the Site. The barbed wire was not present during the site inspection, but through verbal communication with KDEP the barbed wire has subsequently been reinstalled. All-terrain vehicles are being used on the Site, as is evident by tracks on areas outside of the fenced portion of the Site. All-terrain vehicle users are not currently accessing the capped area because it is fenced. The use of all-terrain vehicles may be enhancing the development of a large standing pool of water on the southeastern portion of the cap, which is the location where the fence had been raised to promote the drainage of overland flow on the Site. It appeared that one of the drainage channels located north of the standing pool had been filled in to allow all-terrain vehicle passage across the ditch.

The unknown pipe noted in the 2003 FYR was also observed east of the cap. The pipe was open and extended approximately one and a half feet above the ground.

There is the possibility that additional drums recently found on the Jefferson Memorial property, north of the A.L. Taylor property, may be connected to the contamination and activities at the A.L. Taylor Site. The drums are thought to be located within the original 17 acres of the A.L. Taylor property and are near the original location where drum storage activities occurred. However, a map showing the original 17 acres could not be located. These drums contain materials similar to those that were found on the A.L. Taylor Site. There is potential that these drums originated from A.L. Taylor during the time of the week-long fire which occurred in 1966 at the Site.

The complete site inspection checklist presenting the findings of the October 29, 2007 visit is included in Appendix E. The RPM for the Site, Yvonne Jones, returned to the Site on December 5, 2007 to obtain ground water, surface water, and sediment samples; during this visit, Ms. Jones recorded some additional observations. In particular, while collecting samples, she observed that ground water was flowing from the west towards the eastern boundary of the cap. Several ground water monitoring wells were compromised and no samples could be collected for the current FYR.

6.6 Interviews

During the FYR process, interviews were conducted with parties impacted by the Site, including nearby residents and regulatory agencies involved in or aware of the Site. The purpose of the interviews was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy that have been implemented to date. Linda Starks, the Community Involvement Coordinator, interviewed area residents and city officials, Mr. Larry Hatfield and Ms. Melanie Roberts. The KDEP staff and Mr. Femi Akindele were interviewed by E² Inc. Interviews with KDEP staff and area residents were conducted during the Site visit. City officials were interviewed in person and Mr. Akindele were interviewed by phone after the Site inspection. None of the interviewees were aware of any emergency responses or problems with the remedy at the Site. The major issue concerning the Site was implementing appropriate ground water use restrictions. Interviews are summarized below and complete interview forms are included in Appendix C.

Table 9: Interview Subjects

Position	Affiliation
Susan Mallette	KDEP
Kenneth Logsdon	KDEP
Wesley Turner	KDEP
Femi Akindele	EPA
Larry Hatfield	Solid waste coordinator
Melanie Roberts	Judge Executive of Bullitt County
Resident 1	Nearby resident
Resident 2 and 3	Nearby residents

KDEP: Susan Mallette, Kenneth Logsdon, and Wesley Turner are in charge of the work performed at the Site. They were all interviewed at the same time and their answers were

provided collectively. They stated that overall the project was doing well and the fences and caps appear to be functioning properly. Their main concern with the Site is that there may be solvents present in the ground water, and materials potentially containing PCBs have been found in Wilson Creek and need to be evaluated. They also stated that they are unsure if the ICs for the Site are adequate because they are not currently aware if any exist and are waiting for EPA to confirm that ICs exist for the Site. Their only issue with the Site is its need to be regularly mowed; efforts are being made to secure a single contractor to take care of mowing and maintenance for the property. They stated that regular inspections have been occurring quarterly during the past year to ensure the gates are locked, but that ground water and surface water samples have not been collected for the Site since 2003.

Mr. Femi Akindele: Mr. Akindele is the EPA site RPM. His overall impression of the Site is that the remedy is functioning as intended based on previous review reports. He was not aware of any complaints or inquiries regarding environmental issues since the Site's cleanup. His only recommendation for the Site is to address the one or two contaminants of concern that remain above RAOs. He suggests that it may be appropriate for PRPs to assist in finding cleanup technologies to accelerate the cleanup of such contaminants.

Mr. Larry Hatfield: Mr. Hatfield is the current solid waste coordinator for the Site. His overall impression of the Site is that it was cleaned up well and that there have been no effects on or complaints from the surrounding community. There have been no issues with trespassing or vandalism at the Site, and as the solid waste coordinator, he plans to check the Site annually. Mr. Hatfield's primary concerns about the Site were about how often the Site is monitored and inspected. He is also interested in knowing when testing occurs and what on-site contaminants are being analyzed.

Ms. Melanie Roberts: Ms. Roberts is the Judge Executive in Bullitt County; she was elected to office less than a year ago. However, she has known about the Site since its initial cleanup when she was a little girl. She is interested in how the Site will impact the community, but so far, she has not seen any impacts. There have been no issues with vandalism or trespassing and she has not heard any complaints about violations or other incidents at the Site. She feels well informed about current activities and progress at the Site. While she has no recommendations regarding the Site's management and operation, she plans to have Mr. Hatfield, the solid waste coordinator, check the Site annually.

Nearby resident 1: A resident that lives less than one half mile from the Site was interviewed about the Site. She is pleased that the Site has been cleaned up and has no major concerns about current operations. To her knowledge, there have been no issues with the Site or any changes in State laws or regulations that would impact the protectiveness of the Site.

Nearby residents 2 and 3: A couple that lives less than one half mile from the Site was interviewed about the Site. They recall when the Site was being cleaned up and how it was a large mess. Since the clean up, they have found the Site to be fine. They have

found no issues in the surrounding community and are unaware of any issues with vandalism or trespassing at the Site. The couple feels well informed about activities and progress at the Site, although there has been no information provided recently. They have no recommendations regarding the Site's management and have heard about no complaints or incidents related to the Site.

7.0 Technical Assessment

7.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?

Based on the 2007 surface water and sediment sampling results, the site inspection, and sample results summarized in the 2003 FYR, the landfill cap appears to remain effective in containing contaminants and preventing further migration of hazardous substances off site to Wilson Creek. However, sediment samples continue to contain elevated concentration levels of contaminants. The PRGs for PCBs is 0.74 mg/kg, and there are currently concentrations of Aroclor-1254 and Aroclor-1260 have been found to be as high as 11.0 mg/kg and 4.10 mg/kg, respectively, in some sediment samples. Sediment contamination may be resulting from source materials that remain in Wilson Creek. One sample collected in January 2003 showed that Aroclor 1254 was present in a hardened sludge; this is also a contaminant present in sediment. EPA should perform a study to determine the source material and work with KDEP to develop a plan for addressing the contamination. Once the potential source materials in Wilson Creek have been addressed, further actions need to occur to assess the integrity of the cap to ensure there are no issues.

Once the potential source materials in Wilson Creek have been addressed, further actions need to occur to assess the integrity of the cap to ensure there are no issues associated with long-term effectiveness of the cap.

The drainage ditch designed to divert water around the Site has been overgrown, and based on evidence of significant overland flow, may not be functioning as initially intended. Some portions of the drainage ditch outside of the fence were also found to be filled in, which may be preventing proper drainage. The fence surrounding the capped area of the A.L. Taylor site appears to be keeping recreational users off the cap, and no destructive activities were noted at the time of inspection.

Ground water data summarized in the 2003 FYR indicate that samples collected from monitoring wells ALT-01, ALT-02, ALT-05, ALT-06, ALT-08, ALT-11, and ALT-12 have had consistent MCL exceedances. Concentrations of bis(2-ethylhexyl)phthalate in samples from these wells have been consistently, and inexplicably, increasing since 1995. Monitoring well ALT-04 had isolated exceedances of the MCL for bis(2-ethylhexyl)phthalate in 1999 and Aroclor 1254 in 2000. The majority of monitoring wells with exceedances of federal and state MCLs is located east of the cap and down gradient of ground water flow. Because no ground water samples were obtained for this FYR, it was not possible to determine whether these trends continue. Ground water at and near the Site is not used for potable or industrial uses, so there is no immediate threat posed to human health or the environment. However, the compromised wells cannot "provide an early warning of contaminant movement towards Wilson Creek via ground water" per the selected remedy within the ROD. In addition, existing data do not provide sufficient information to determine whether the cap is preventing further contamination of the ground water under the landfill or to determine if concentrations of bis(2-ethylhexyl)phthalate continue to increase in the ground water at and near the Site.

The O&M plan for the Site calls for regular mowing and keeping the drainage ditch clear of vegetation to ensure that water properly drains off of the cap. The O&M plan also requires regular sampling and analysis of sediments, ground water, and surface water to confirm that no contaminants are migrating and the remedy remains protective. Because only one set of surface water and sediment samples was collected since the previous FYR, it is difficult to evaluate the potential for contaminant migration with complete certainty.

According to the health risk discussions within the ROD, the pathway of concern at the A.L. Taylor Site is migration of surface water runoff that has come into contact with on-site waste. The final cover was proposed as a method of containing waste materials and preventing contact between surface water and waste. Wilson Creek should be sampled on a regular basis because the presence of contaminants in the Creek is one of the first warning signs that the remedy may not be functioning properly. The presence of source materials (e.g., hardened sludges and drum carcasses) in Wilson Creek, however, complicates assessment of the source of the contamination. It is also difficult to discern trends when samples are not collected on a regular basis.

The Site lacks ICs restricting land and ground water use. ICs were not required in the ROD. However, ICs need to be put in place to ensure that future users do not come in contact with waste left in place at the Site. The fence surrounding the cap has helped maintain protectiveness in the short term by keeping trespassers off of the cap. There is evidence of all-terrain vehicle use on the Site, but all-terrain vehicle users are not currently accessing the capped area because it is fenced. Their usage may be enhancing the development of a large standing pool of water on the southeastern portion of the cap, which is the location where the fence had been raised to promote the drainage of overland flow on the Site. Strands of barbed wire have been used in the past to cover the gap in the raised fence to allow for proper drainage. These strands were missing at the time of the site inspection and have since been reinstalled.

Because of the limited potability of ground water beneath the Site and the lack of functioning wells accessing the shallow aquifer, there is no exposure to ground water contamination.

7.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives Used at the Time of Remedy Selection Still Valid?

Based on the contaminants detected at the highest concentrations or above background levels at the Site, the type of media (surface water, ground water, and sediment), and the potential use of the Site (recreational use, warm water aquatic habitat), the following Federal and State regulations were used to assess the protectiveness of the Site during the last FYR (2003):

Kentucky Surface Water Standards

- 1) Kentucky Administrative Regulation Title 401, Chapter 5, Regulation 026, Section 5 Surface Water Use Designations (401 KAR 5:026, Section 5. Last Published 8/9/2007. Data Source: <http://www.lrc.state.ky.us/kar/401/005/026.htm>).

According to current 401 KAR 5:026, the surface waters for the majority of the Salt River Basin in Bullitt County, including surface water in the area of the Site, are designated as:

- Warm Water Aquatic Habitat
- Primary Contact Recreational
- Secondary Contact Recreational

These locational requirements have not changed since the 2003 FYR.

- 2) Kentucky Administrative Regulation Title 401, Chapter 5, Regulation 031, Section 4 Aquatic Life, and Section 6 Pollutants (401 KAR 5:031, Section 4 & 6. Last Published 8/9/2007. Data Source: <http://www.lrc.state.ky.us/kar/401/005/031.htm>).

The state regulation on warm water aquatic habitat for surface water can be grouped into two categories: pollutants and non-pollutants. Surface water standards that were promulgated or modified since the 1986 ROD for all contaminants detected at the Site remain unchanged between 2003 and 2008. Tables H-1 and H-2 in Appendix H present the current standards that were promulgated or modified since the 1986 ROD for pollutants and non-pollutants for warm water aquatic habitats.

- 3) Kentucky Administrative Regulation Title 401, Chapter 5, Regulation 031, Section 7 Recreational Waters. (401 KAR 5:031, Section 7. Last Published 8/9/2007. Data Source: <http://www.lrc.state.ky.us/kar/401/005/031.htm>).

The state regulation on recreational waters was previously cited as 401 KAR 5:031, Section 6 in the 2003 FYR. Criteria for a common species of bacteria in the group of Fecal coliform, *Escherichia coli*, have been added for recreational waters since the previous FYR; however, these criteria are not for the contaminants at the Site. The current Kentucky regulations for recreational waters can be found in Table H-3 of Appendix H.

Since the previous FYR, the federal and Kentucky drinking water standards have only changed for nickel (from 0.14 mg/L to 0.10 mg/L) and 1,2-dichloropropane (from 0.006 mg/L to 0.005 mg/L) of the contaminants that exceeded drinking water standards in the previous FYR.

The major exposure pathway is runoff of contaminated surface water into Wilson Creek. The surface water standards for all contaminants at the Site remain unchanged since the 2003 FYR. Surface water samples collected on December 5, 2007 did not have any MCL

exceedances. However, PCB concentrations in Wilson Creek sediment samples exceed PRGs. PCBs were found to be a component of a hardened sludge sample. These and drum carcasses in Wilson Creek could be potential sources of PCB contamination in the Creek. Additional actions may be needed to prevent migration.

RAOs for the Site remain the same and are still valid.

7.3 Question C: Has Any Other Information Come to Light That Could Call Into Question the Protectiveness of the Remedy?

During the Site inspection to inform this FYR, hardened sludge and drum carcasses were found in Wilson Creek; these may be the source of contamination in Wilson Creek.

Drums similar to those found at the A.L. Taylor site have been identified on the Jefferson Memorial property, which is adjacent to the A.L. Taylor site; the removal of these drums is being considered.

7.4 Technical Assessment Summary

Based on the site inspection and interviews, the cap-portion of the remedy appears to be functioning as intended by the selected remedy within the ROD. However, there are some aspects of the remedy that are not fully functioning as intended in the selected remedy within the ROD, including the drainage ditch, ground water wells, and O&M activities.

While the Site is currently not in reuse, ICs restricting ground water and land use on the Site were not required by the selected remedy within the ROD and there are no ICs in place. This could impact future protection of human health and the environment. Also, the Site lacks signs to deter trespassing or provide identification as a Superfund site.

The area with ponding water in the southeastern portion of the cap also needs to be addressed. EPA should work with the State to fill in the large hole that has formed there and take steps to promote drainage to Wilson Creek to prevent water from ponding against the cap. Installing an additional gate at the entrance of the Site may also help discourage further trespassing by all-terrain vehicle users and ensure that future ponding will not occur in this area.

The sampling schedule in the O&M plan has not been followed since the previous FYR. Wilson Creek and monitoring wells have not been sampled regularly to identify trends that may indicate COC migration from the cap. The evidence of residual contamination in Wilson Creek should not impact short-term protectiveness, because under existing and projected usage patterns assessed at the time of the ROD, potential exposure through recreational use of surface waters was thought to be low due to the high dilution factor. Although not documented, recreational use of the streams leading from the Site was considered infrequent before the Salt River confluence.

8.0 Issues

Table 10 summarizes the current issues for the A.L. Taylor site.

Table 10: Current Issues for the A.L. Taylor Site

Issue	Affects Current Protectiveness	Affects Future Protectiveness
The requirement of ICs was not documented in the selected remedy within the ROD. It appears that ICs may be necessary because there are no restrictions in place to protect the integrity of the remedy and to prevent exposure to contaminated ground water that remains onsite.	No	Yes
Identification of drums and other potential source materials outside the fence line in Wilson Creek	No	Yes
Lack of maintenance for the surface water ditch and standing water in the drainage ditch system	No	Yes
Lack of ground water, surface water, and sediment monitoring data since the last FYR	No	Yes
Lack of regular O&M since the last FYR	No	Yes
Presence of PCBs, potentially from hardened sludge and drum carcasses, in the surface water and sediments in Wilson Creek	No	Yes
Most ground water monitoring wells are not clearly marked.	No	Yes
Ponding of water on the southeastern portion of the Site against the cap	No	Yes
Use of all-terrain vehicles outside the fence line that may be interrupting surface water flow off the Site to Wilson Creek.	No	Yes
Presence of unmarked pipe	No	Yes
Most ground water monitoring wells compromised	No	Yes
No signs identifying the Site as a Superfund site	No	Yes

9.0 Recommendations and Follow-up Actions

Table 11 provides recommendations to address the current issues at the A.L. Taylor site.

Table 11: Recommendations to Address Current Issues at A.L. Taylor Site

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
The requirement of ICs was not documented in the selected remedy within the ROD. It appears that ICs may be necessary because there are no restrictions in place to protect the integrity of the remedy and to prevent exposure to contaminated groundwater that remains onsite.	Work with KDEP to determine appropriate action to place use restrictions on the Site.	EPA, KDEP	EPA	12/31/2009	No	Yes
Identification of drums and other potential source materials outside the fence line in Wilson Creek	Conduct further investigations to determine if the drums and materials in the Creek are contaminants and take appropriate future actions.	EPA, KDEP	EPA	12/31/2009	No	Yes
Lack of maintenance for the surface water ditch and standing water in the drainage ditch system	Perform maintenance on the ditch both inside and outside of the fence by removing vegetation and ensuring functionality.	KDEP	EPA	12/31/2009	No	Yes
Lack of ground water, surface water, and sediment monitoring data since the last FYR	Work with KDEP to ensure data for the Site are regularly collected in the future and ensure the sampling at the Site is in accordance with the O&M plan.	KDEP	EPA	12/31/2009	No	Yes
Lack of regular O&M since the last FYR	Work with KDEP to ensure the O&M schedule is being followed.	KDEP	EPA	12/31/2009	No	Yes

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Presence of PCBs, potentially from hardened sludge and drum carcasses, in the surface water and sediments in Wilson Creek	Conduct further investigations to determine the source of PCBs and appropriate actions to remove them from the Site.	EPA, KDEP	EPA	12/31/2009	No	Yes
Most ground water monitoring wells are not clearly marked.	Clearly mark the ground water monitoring wells.	KDEP	EPA	12/31/2009	No	Yes
Ponding of water on the southeastern portion of the Site against the cap	Conduct investigations to determine what is causing ponding and take appropriate actions to stop ponding from occurring and promote drainage toward Wilson Creek.	EPA, KDEP	EPA	12/31/2009	No	Yes
Use of all-terrain vehicles outside the fence line that may be interrupting surface water flow off the Site to Wilson Creek.	Work with the State to consider actions to deter trespassing that may potentially interfere with the remedy.	State	EPA	12/31/2009	No	Yes
Presence of unmarked pipe	Conduct investigations of the unmarked pipe and evaluate whether it compromises human health and the environment; if so, determine appropriate actions.	EPA, KDEP	EPA	12/31/2009	No	Yes
Most ground water monitoring wells compromised	Determine actions necessary to repair monitoring wells to become functional or abandon and replace as needed.	KDEP	EPA	12/31/2009	No	Yes
No signs identifying the Site as a Superfund site	Confer with the State to determine if signs are necessary to protect the remedy or if they will have unintended impacts.	EPA, KDEP	EPA	12/31/2009	No	No

10.0 Protectiveness Statement

The remedy at the A.L. Taylor Site currently protects human health and the environment because the cap portion of the remedy appears to be functioning as intended by the selected remedy within the ROD by preventing off-site contaminant migration. However, in order for the remedy to be protective in the long term, the drainage ditch needs to be maintained to function as intended by the selected remedy within the ROD, which will require removing any vegetation or fill that is obstructing the drainage ditches both inside and outside of the fenced area. EPA should also work with the State to fill in a large hole just outside of the fence on the southeastern portion of the capped area to prevent ponding adjacent to the cap. Appropriate steps should be taken to promote drainage towards Wilson Creek in this area and discourage activities that may result in future ponding. EPA should confer with the State to determine whether signage identifying the Site as a Superfund site should be posted to discourage trespassing, or if these signs might have the opposite effect. Installing an additional gate at the entrance to the Site may be another option to deter trespassing.

In addition, ground water monitoring wells need to be located, marked and restored to working order, and all O&M activities need to occur on a quarterly basis. This includes maintaining the sampling and observation schedules required by the 1988 O&M Plan to observe any trends that may indicate migration of contaminants of concern (COCs). The requirement of ICs was not documented in the selected remedy within the ROD. However, options for implementing ICs to restrict ground water and land use should be evaluated. ICs restricting ground water and land use are needed, so that any future use of the Site will remain protective of human health and the environment. EPA and the State should conduct further investigations to determine the source of PCBs and take appropriate actions to remove them from Wilson Creek in a timely manner.

11.0 Next Review

As established in Section 121 of CERCLA, as amended by SARA and the NCP, periodic reviews are required at least every five years for sites where hazardous substances, pollutants or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure following the completion of all remedial actions. Barring a change in the governing laws, another review should be completed within 5 years from the signature date of this document. Since waste is left onsite in site ground water and potentially in site soils that does not allow for unrestricted use and unlimited exposure, the next FYR will be due within five years of the signature/approval date of this FYR.