OhioEPA

State of Ohio Environmental Protection Agency

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Certified Mail
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Re: ***BFI Energy Systems of Boston, Inc.***
dba Ecological Services, Inc.
EPA ID # OHD 980 795 264
Decision Document of Corrective Action

November 20, 2006

BFI Energy Systems of Boston, Inc.
Attn: Joseph Montello
91 Paw Paw Lake Drive
Chagrin Falls, Ohio 44022

Dear Mr. Montello:

Here is the final Declaration and Decision Document for the Remediation (Decision Document) of the Ecological Services, Inc. property in East Palestine, Ohio. Staff at the Ohio EPA, Division of Hazardous Waste Management (DHWM), have reviewed Ecological Services, Inc.'s Corrective Action Measures Work Plan submitted for the property and issued a Statement of Basis seeking public input on the proposed remedies. The Agency did not receive written comments concerning the Statement of Basis.

Since the preferred remediation of wastes or constituents appear to comply with applicable hazardous waste rules, the Declaration and Decision Document represent the selected remedial actions for Ecological Services, Inc., (BFI Energy Systems) in accordance with the policies of the Ohio EPA and the statutes and regulations of the State of Ohio.

In accordance with the Environmental Covenant section of the Remedy Summaries, use of appropriate portions of the site will be restricted to operation, inspection and maintenance for the current purpose of waste containment. Site use of ground water will also be prohibited for potable use.

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of $70.00 which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission
309 South Fourth Street, Room 222
Columbus, OH 43215

If you have any questions concerning the Corrective Action Remedies, please call Bill Lutz of Ohio EPA's Northeast District Office at (330) 963-1200.

Sincerely,

Pamela S. Allen

Pamela S. Allen, Manager
Regulatory and Information Services
Division of Hazardous Waste Management

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cc: Edwin Lim, ERAS, DHWM, CO
Jeremy Carroll/Marie Jordan, ERAS, DHWM, CO
Kurt Princic/Bill Lutz, DHWM, NEDO
Dale Meyer, US EPA, Region 5
Carol Hester, PIC
file

PUBLIC NOTICE

Columbiana County

OHIO EPA ISSUES DECLARATION AND DECISION DOCUMENT FOR BFI ENERGY SYSTEMS OF BOSTON, INC.

On November 20, 2006, Ohio EPA issued a Declaration and Decision Document to BFI Energy Systems of Boston, Inc., (BFI) dba Ecological Services, Inc., for the property located at 6201 South Pleasant Drive, East Palestine, Ohio 44413. The EPA Identification Number for this facility is OHD980795264.

Why does BFI need this Declaration and Decision Document?

BFI Energy Systems of Boston, Inc. has assumed clean-up responsibilities at the Ecological Services, Inc. facility and voluntarily agreed to address its corrective action obligations. The Decision Document identifies Ohio EPA's selected remedies for Cells 1, 2, and 3 at the site, and explains the reasons for the selection of the remedies.

Can I appeal this Declaration and Decision Document?

Yes, if you are an officer of an agency of the state or of a political subdivision, acting in a representative capacity, or any person who would be aggrieved or adversely affected by this Declaration and Decision Document, you have the right to appeal this decision to the Environmental Review Appeals Commission (ERAC).

If I decide to appeal this Declaration and Decision Document, how and when must I make the appeal?

If you file an appeal, you must put it in writing no later than December 21, 2006. Your appeal must explain why you are appealing the action and the grounds you are using for your appeal. The appeal must be accompanied by a filing fee of $70.00 which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. You must file your appeal, according to Ohio Revised Code § 3745.04 with ERAC at the following address: ***Environmental Review Appeals Commission***, 309 South Fourth Street, Room 222, Columbus, Ohio 43215. You must send a copy of the appeal to the director of Ohio EPA at the following address no later than three (3) days after you file it with ERAC: ***Joseph P. Koncelik, Director of Ohio EPA***, P.O. Box 1049, Columbus, Ohio 43216-1049.

OHIO E.P.A.
NOV 20 2006
DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official documents as filed in the records of the Ohio Environmental Protection Agency.
By: [signature] Date: 11-20-06

DECLARATION

SITE NAME AND LOCATION

BFI Energy Systems of Boston, Inc. dba Ecological Services, Inc.
East Palestine Landfill, East Palestine, Ohio
6201 South Pleasant Drive
East Palestine, Ohio (Columbiana County)

STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the selected remedial actions for The Ecological Services, Inc. BFI East Palestine Landfill in accordance with the policies of the Ohio Environmental Protection Agency, statutes and regulations of the State of Ohio. This Decision Document also represents Ohio EPA's approval of the Work Plan submitted by the facility.

ASSESSMENT OF THE SITE

The facility completed an extensive soil, ground water and surface water investigation in and around areas of the site that were affected by previous waste management practices. Surface and sub-surface sampling in Cells 1 and 2 revealed that the primary constituents of concern that posed a potential risk were antimony, arsenic, chromium, iron and lead. Ohio EPA found that the implementation of the selected remedies will protect public health and the environment by permanently reducing risks to acceptable levels once the remedies are completed.

DESCRIPTION OF THE SELECTED REMEDIES

The selected remedies will include:

- Environmental Covenant
  The facility will enter into an environmental covenant to eliminate all future potential uses for Cells 1 and 2 with the exception of operation, inspection, and maintenance for the current purpose of waste containment. Site use of ground water will also be prohibited from potable use. The environmental covenant runs with the land and is binding upon existing and any future property owner, should the property be sold. Ohio EPA will monitor the property owner's adherence to the environmental covenant to help ensure continued protection of human health and the environment. Restrictions are already placed on Cell 3 through the facility's approved Post-Closure Plan.

- Water Sampling
  As part of the facility's approved Post-Closure Plan, the facility is required to monitor ground water, surface water discharges, and State Line Creek for thirty years. The facility will continue this sampling to determine if the media

is contaminated. Ground water sampling purge water will be sampled, and according to the sampling results, sent to an appropriate facility for disposal and/or treatment.

- Maintain Passive Treatment System
  Mine seep ground water contamination will continue to be treated and controlled through the Passive Treatment System. The ground water monitoring network covers the whole facility, including Cells 1, 2 and 3. The Passive Water Treatment System was designed to expand existing wetlands by using limestone and plant life to act as a buffer and filter mine water.

- Fencing and Implement an Operation & Maintenance Plan
  BFI will place fencing around Cells 1 and 2, thus preventing unauthorized access to them. Signs will be posted, and an Operation & Maintenance Plan will be developed by BFI, approved by Ohio EPA, and implemented. The Operation & Maintenance Plan will detail the steps to be taken by Ecological Services, Inc. to insure that the fencing, cell cover and Passive Treatment System are functioning properly. Maintenance of the cell covers will be required to ensure that erosion of the cover does not occur. The Operation & Maintenance Plan would be similar to the approved plan for Cell 3 and will include annual inspection and reporting to Ohio EPA.

STATUTORY DETERMINATIONS

Today's selection and required implementation of remedial actions is protective of human health and the environment, is in accordance to applicable State and federal laws and is responsive to public participation and input. The remedies utilize permanent solutions, to the maximum extent practicable, to reduce toxicity, mobility and volume of hazardous substances at The Ecological Services, Inc. BFI East Palestine Landfill. The effectiveness of the remedies will be reviewed regularly.

November 20, 2006

Joseph P. Koncelik
Director

Date

BFI.Final.Declaration.jms.wpd

Decision Document for the Remediation of
BFI Energy Systems of Boston, Inc., dba The Ecological Services, Inc.
East Palestine Landfill, East Palestine, Ohio
(Columbiana County)
OHD 980 795 264

Prepared By
The Ohio Environmental Protection Agency
November 2006

OHIO EPA DHWM

NOV 20 2006

Table of Contents

1.0 INTRODUCTION ..... Page 1
1.1 Executive Summary ..... Page 1
1.2 How the Corrective Action Process Works ..... Page 2

2.0 SITE HISTORY ..... Page 2

3.0 SUMMARY OF THE FACILITY INVESTIGATION ..... Page 3
3.1 Site Wide Ground Water ..... Page 3
3.1.1 Site Wide Ground Water Evaluation Criteria ..... Page 3
3.1.2 Site Wide Ground Water Monitoring System ..... Page 5
3.1.3 Ground Water Sampling and Analysis ..... Page 5
3.1.4 Ground Water NPDWR and NSDWR 2005 Exceedances ..... Page 6
3.1.5 Site Wide Ground Water Treatment ..... Page 7
3.2 Soil ..... Page 8
3.2.1 Soil Evaluation Criteria ..... Page 8
3.2.2 Past Soil Investigations ..... Page 8
3.2.3 Recent Soil Investigation ..... Page 8

4.0 EVALUATION AND SELECTION OF REMEDIES ..... Page 10
4.1 Description of the Evaluation Criteria ..... Page 10
4.2 Ohio EPA's Evaluation of Selected Remedies ..... Page 11
4.2.1 Environmental Covenant, Ground Water Sampling, Maintain Passive Treatment System, Fencing, Implement an Operation & Maintenance Plan .... Page 12

5.0 CONCLUSIONS .....Page 14

APPENDIX
Tables and Figures

OHIO EPA DHWM

NOV 20 2006

1.0 INTRODUCTION

1.1 Executive Summary

The Ohio Environmental Protection Agency (Ohio EPA) has prepared this Decision Document for the remediation of the Ecological Services, Inc. Landfill, also referred to as the BFI East Palestine Landfill, in East Palestine, Ohio. This Decision Document identifies Ohio EPA's selected remedies, and explains the reasons for the selection of the remedies.

Under the Resource Conservation and Recovery Act (RCRA), the Corrective Action program was created to address threats to human health and the environment from historic or past waste management areas at RCRA treatment, storage or disposal facilities (TSDF). The Ecological Services, Inc. Landfill in East Palestine was a TSDF for disposal of hazardous waste in Cell 3 and therefore Corrective Action requirements are applicable. The facility met its closure requirements for Cell 3 as discussed later in Section 2 of this document and the facility's Post-Closure Plan was approved on June 20, 2002. However, historic contamination issues at the property (pre-RCRA) still remain subject to the Corrective Action program for final clean-up.

To address the facility's Corrective Action requirements, BFI Energy Systems of Boston, Inc. (dba Ecological Services, Inc.) (BFI) voluntarily agreed to work with the Ohio EPA Division of Hazardous Waste Management (DHWM), and has conducted extensive soil and ground water sampling at the Ecological Services, Inc. Landfill in East Palestine, Ohio. A summary of the facility investigation is discussed in Section 3.

Ohio EPA has reviewed BFI's submittals that document the results of the facility investigation and previously available information and has selected remedies to remediate the site. The evaluation criteria Ohio EPA used in selecting the remedies is discussed in Section 4.

In brief, Ohio EPA's selected remedies require that a fence be placed around Cells 1 and 2, an environmental covenant be entered into for the facility, including the two waste cells, an Operation and Maintenance Plan be developed for Cells 1 and 2, approved by Ohio EPA and implemented, that the Passive Treatment System for surface and mine water continue to be operated and monitored, and that ground water continue to be monitored in accordance with the most current approved Post Closure Plan for Cell 3. The facility already has a financial insurance policy to cover all associated costs required to maintain the site, including ground water monitoring, operation and maintenance for the entire site, and maintaining the passive treatment system. BFI will be required to continue to maintain financial assurance for the entire site. A summary of Ohio EPA's selected remedies is discussed in Section 5. Ohio EPA finds that these remedies will further protect public health and the environment by permanently reducing risks to acceptable levels once the remedies are implemented.

OHIO EPA DHWM

NOV 20 2006

1.2 How the Corrective Action Process Works

The initial step in the corrective action process for facilities regulated under RCRA is site characterization or investigation to define the nature and extent of contamination at the facility. The information collected supports the selection and implementation of a remedy or remedies. This step culminates with the facility's submission of a report summarizing the investigation data. BFI has completed an investigation and submitted a report to Ohio EPA for review.

In the next step of the Corrective Action process, Ohio EPA generates a Statement of Basis which summarizes Ohio EPA's preferred remedies for the facility. This document is then made available to the public for review and comment. Ohio EPA issued the Statement of Basis for the Ecological Services, Inc., East Palestine Landfill on June 8, 2006. This document was made available to the public at the East Palestine Library to review and comment on from June 8, 2006 through July 24, 2006. Ohio EPA did not receive any comments during the comment period.

After considering all comments received during the Public Comment period, Ohio EPA then issues a Decision Document. This document meets that purpose and is the Decision Document for the Ecological Services, Inc., BFI East Palestine Landfill.

2.0 Site History

The Ecological Services, Inc. currently owns the site which is located at 6201 South Pleasant Drive, approximately two miles southeast of East Palestine, Ohio. A map displaying the facility's location is included in the Appendix of this document. The site occupies approximately 290 acres of which approximately 30 acres were used for waste management operations. When the site was operating, major site features included waste Cells 1, 2 and 3, the treatment plant, underground mine drainage collection and pumping facilities, polishing ponds, culverts and ditches used to direct water through the site. The site is no longer in operation.

Extensive surface and underground mining occurred on the site in the 1940s and 1950s. Surface mining has been conducted over much of the site in both the Mahoning and Upper Freeport coals. Deep mining of the Mahoning Coal was limited to the area north of the disposal cells. The deep mine in the Upper Freeport Coal lies under much of the site north of Cell 3.

In the 1970s, a portion of the previously stripped area was used for the treatment of liquid industrial wastes. The wastes were treated in three different pits excavated within the soil left behind following coal stripping operations. Treatment of the wastes was halted in the late 1970s.

OHIO EPA DHWM

NOV 20 2006

Between September 1973 and December 1979, the facility was utilized for the lime neutralization treatment of spent pickle liquor and the management of other aqueous organic and inorganic liquid and semisolid wastes. During facility operations, spent pickle liquor was transported to the site via trucks, where it was treated by lime neutralization and aeration. Neutralization was achieved by mixing the sludge with a slurry composed of powdered byproduct lime and water. Following neutralization, the treated wastes were discharged to impoundments (cells) for gravity sedimentation of solids.

Three cells (Cells 1, 2 and 3) were used for the disposal of neutralized wastes. Cell 1 was constructed in August of 1973 and operated until approximately October of 1974. This cell was constructed by damming two ends of an old Mahoning Coal strip cut. Closure of this cell was completed in December of 1978 by sludge stabilization with on-site soils, capping with relatively impermeable on-site clay, and subsequent revegetation.

Cell number 2 began operations in October 1974 and continued through July of 1976. This cell was also constructed on an abandoned strip bench of the Mahoning coal seam and, reportedly, on-site clay material was placed along its sides. Wastes received in this cell were essentially the same as the wastes received in Cell 1. Closure of Cell 2 was completed in April of 1981 by sludge stabilization with on-site soils, capping with relatively impermeable on-site clay, and subsequent revegetation.

Cell 3 received neutralized waste materials between June of 1976 through December of 1979. The cell reportedly contained 41 million gallons of supernatant liquid and 40 million gallons of sludge. This cell was constructed on an Upper Freeport Coal strip bench by compacting in-place clay on the flat bottom portion and adding and compacting a clay liner on all sides.

Cell 3 underwent closure with approval from Ohio EPA. As part of closure, contaminated soils above background levels adjacent to the cell and in the waste processing area for Cell 3 were removed and replaced with clean fill. More detailed information regarding the sites's past investigations is provided in the following document:

Certification Document, Facility Decontamination/Liquid Management Cell No. 3 Closure, Earth Sciences, February 2000.

3.0 Summary of the Facility Assessment

3.1 Site Wide Ground Water

3.1.1 Site Wide Ground Water Evaluation Criteria

Three sets of standards were used to evaluate site ground water. The first set of standards was developed by the United States Environmental Protection Agency (USEPA)

OHIO EPA DHWM

NOV 20 2006

and is called 1) National Primary Drinking Water Regulation (NPDWR), and 2) National Secondary Drinking Water Regulation (NSDWR). The second set of standards was developed by Ohio EPA and is called the Generic Cleanup Numbers (GCNs). The third set of standards was developed by Ohio EPA and is called Ohio River Basin Aquatic Life and Human Health Tier I and Tier II Values. A brief explanation of these standards is listed below:

National Primary Drinking Water Regulation (NPDWR)

The Safe Drinking Water Act (SDWA), passed in 1974 and amended in 1986 and 1996, gave the USEPA the authority to set drinking water standards. Drinking water standards are regulations that USEPA sets to control the level of contamination in the nation's drinking water.

The NPDWR is a legally-enforceable standard that applies to all public water systems. Primary standards protect drinking water quality by limiting the levels of specific contaminants that can adversely affect public health and are known or anticipated to occur in water. They take the form of Maximum Contaminant Levels or Treatment Techniques.

National Secondary Drinking Water Regulation (NSDWR)

The NSDWR is a non-enforceable guideline addressing contaminants that may cause cosmetic effects such as skin or tooth discoloration, or aesthetic effects such as taste, odor, or color, in drinking water. US EPA recommends secondary standards to water systems but does not require systems to comply.

Ohio EPA Division of Hazardous Waste Management Generic Cleanup Numbers (GCNs)

GCNs provide initial cleanup standards for individual chemicals. The risk-based GCNs were calculated by DHWM using generic default values in equations used during risk assessments. A risk assessment is a process utilized to determine if the hazardous waste constituent(s) present in or potentially present in environmental media pose a threat to human health or the environment. When the GCNs are appropriately used, they can be substituted for a site-specific risk assessment to meet the closure performance standard.

Ohio River Basin Aquatic Life and Human Health Tier I and Tier II Values

The Ohio River Basin Aquatic Life and Human Health Tier I and Tier II Values were derived from laboratory studies. Numeric criteria are estimations of concentrations of chemicals and degree of aquatic life toxicity allowed in a water body without adversely impacting its beneficial use.

OHIO EPA DHWM

NOV 20 2006

3.1.2 Site Wide Ground Water Monitoring System

There are four water bearing zones identified underneath the facility, the Upper Freeport Coal, the Butler Sandstone/Lower Freeport Coal, the Freeport Sandstone, and the Lower Worthington Sandstone/Lower Kittanning Coal. Ground water monitoring wells have been installed and sampled in the following zones:

Upper Freeport Coal Wells (see Figure 3 in the Appendix):
U-4, U-5, UJ-8, UK-9, UM-15, U-16, U-17

Butler Sandstone/Lower Freeport Coal Wells (see Figure 4 in the Appendix):
W-1, W-2, W-3, W-4, W-5, W-6, W-8, W-15, W-16, W-18

Freeport Sandstone Wells (see Figure 5 in the Appendix):
F-3, F-6, F-16

Lower Worthington Sandstone/Lower Kittanning Coal Wells (See Figure 6 in the Appendix):
LW-3, LW-6, LW-16

As part of the agreement between BFI and Ohio EPA, BFI installed a temporary additional well, MW-U18, to the southeast of Cell 2 (see Figure 3 in the Appendix). This well provided additional information regarding ground water around Cells 1 and 2. BFI collected data for four consecutive quarters at well MW-U18.

Ground water discharging to the surface is monitored at three locations designated S-1, S-6, and S-19. S-1 is a small stream southeast of Cell Number 3 and is a discharge point for the Butler Sandstone/Lower Freeport Coal water bearing zone. The other two locations are the primary discharge points from the Upper Freeport Coal Mine. S-6 is where mine water exits at a location known as the "Hole," on the northwest side of the site. S-19 is at the edge of a pond along the eastern boundary of the site in Pennsylvania, referred to as the Old Pennsylvania Mine Discharge. In order to further evaluate potential contamination migration, samples are collected from both the East and West Forks of State Line Creek. All monitoring well locations, the three ground water discharge points, and the sample points for the two creeks are identified in Figure 2 in the Appendix of this document.

3.1.3 Ground Water Sampling and Analysis

Since May of 1986, ground water at the site has been monitored quarterly. As part of the facility's approved Post Closure Plan, the facility is required to perform ground water and surface water monitoring. Biennially, the Upper Freeport Coal and Butler Sandstone/Lower Freeport Coal aquifers are monitored for chemicals on USEPA's Appendix IX list (40 CFR

OHD EPA DHWM

NOV 20 2006

264). The Freeport Sandstone and Lower Worthington Sandstone/Lower Kittaning Coal aquifers are sampled for the Appendix IX list every five years. Analytes that are detected and confirmed during the annual, biennial and five year sampling events are added to the analyte list for quarterly sampling events. A list of sampling frequency and constituents analyzed is included in Tables 1 through 3 of the Appendix of this document.

3.1.4 Ground Water NPDWR and NSDWR 2005 Exceedances

In 2005, NPDWR exceedances were arsenic, barium and benzene; NSDWR exceedances were chloride, iron, manganese and sulfate (see Tables 4-7 in the Appendix).

Naphthalene was also detected in ground water and although there is not a NPDWR or NWDWR for naphthalene, several samples showed levels above the State of Ohio's GCNs. Similar to USEPA NPDWR and NSDWR standards, GCNs are designed to be protective of human health and the environment. All ground water NPDWR and NWDWR exceedances for 2005 are included in Tables 4 through 7 in the Appendix of this document.

Evaluation of NPDWR and NSDWR Contamination

With the exception of Barium in well F-6 (Freeport Sandstone), there were no NPDWR exceedances in the lower three aquifers (Butler Sandstone/Lower Freeport Coal, Freeport Sandstone, Lower Worthington Sandstone/Lower Kittanning Coal). Upper aquifer (Upper Freeport Coal) NPDWR exceedances were limited to wells U-4, UM-15, U-16, U-17 and U-18.

Upper Freeport Coal Ground Water Contamination

Ground water flow in the Upper Freeport Coal aquifer and associated voids is to the northwest of Cell Number 3. A broad pool of water exists with a northeast/southwest orientation and a potentiometric surface elevation of approximately 1,054 feet above sea level. Major drainage from this pool to surface water occurs at an area called the "Hole" and to a considerably lesser extent at the Old Pennsylvania Mine Discharge.

Though there were ground water exceedances in the Upper Freeport Coal aquifer, ground water contamination in this area is treated by a passive system discussed in Section 3.1.5. There were no NPDWR or NSDWR exceedances in the well closest to the Pennsylvania border (U-5) in the Upper Freeport Coal aquifer. Sample results from surface water discharge S-19 (Old Pennsylvania Mine Discharge) were compared to Ohio River Basin Aquatic Life and Human Health Tier I and Tier II Values. Ohio EPA has determined that site groundwater has not adversely impacted surface waters at the Old Pennsylvania Mine Discharge area. Potentiometric surface maps for the four aquifers are presented in Figures 3 through 6 in the Appendix of this document. Site wide ground water will also be restricted from potable use as part of the selected remedies as discussed in Section 5.

OHIO EPA DHWM

NOV 20 2006

3.1.5 Site Wide Ground Water Treatment

Past studies conducted at the site indicated that there was a potential for the waste material disposed at the site to leach into deep mines and then surface through mine seeps. The waste material was found to be surfacing through mine seeps. To control runoff from the mine seeps, the facility constructed a collection, pumping and treatment system. This system was eventually replaced with a passive system. The current passive system includes the following:

- A 2-3 fold expansion of existing emergent wetlands in the upper portion of the Coal Mine Drainage (CMD) Pond. The expanded wetland at the head of the CMD Pond encompasses approximately 1 to 1.5 acres.

- Construction of an internal dike within the CMD Pond. The dike is used to further treat mine water from the expanded emergent wetland. The dike is constructed of approximately 200 tons of limestone which buffers the mine water.

- Construction of an open limestone channel and apron to transport mine water discharged from the CMD Pond to constructed wetlands. The aprons serve to slow down the mine water velocity and spread the water to form sheet flows to both existing and constructed wetlands.

- A three terraced wetland was made by constructing berms perpendicular to the ground slope. The mine water accumulates in the first section of the constructed wetland, where it accumulates to a maximum depth of 24 inches. Two additional berms were also constructed downstream of the first, where the mine water will accumulate for further treatment.

- Mine water that overflows the third berm enters the second open limestone channel where it is transported to a second series of berms.

- After passing through a limestone apron at the end of the second limestone channel, the mine water enters a second arrangement created by the construction of two additional berms. From the second terraced wetland area, the sheet flow of mine water discharges to existing wetlands for dispersion.

- A monitoring program was put in place for the first two years of the system. The monitoring program includes monitoring points throughout the treatment

OHIO EPA DHWM

NOV 20 2006

system to document removal rates through the system. Analytes monitored include iron, manganese, aluminum, sulfates, conductivity, and pH.

- To identify any impacts to State Line Creek, permanent sample sites were established upstream and downstream of the constructed wetland.

In September of 2000, Ohio EPA's Division of Surface Water (DSW) conducted a site visit to evaluate the new system. DSW concluded that the wetland plants appear to have been established as designed, water flowing through the complex appeared visually clean, and the existence of certain submergent plant species indicated sufficient alkalinity to show successful treatment of the mine drainage and leachate.

DSW conducted another inspection of the passive system on March 30, 2005. Several breaches and undercuts in the wetland berms needing repair were identified. Ohio EPA is requiring BFI to repair these identified areas. As part of the facility's Operation & Maintenance Plan, required by this Decision Document, the facility will be required to inspect the Passive Treatment System and make any identified repairs.

3.2 Site Wide Soil

3.2.1 Soil Evaluation Criteria

Ohio EPA used DHWM GCNs to evaluate soil concentrations for the site. An explanation of GCNs is discussed in Section 3.1.1.

3.2.2 Past Soil Investigations

In order to determine if soil concentrations present a risk to human health and the environment, BFI conducted a series of soil sampling events. As part of the closure of Cell 3, BFI was required to sample soil in Cell 3, as well as adjacent areas and in the waste processing area. As noted in Section 2, BFI was required to remove any contaminated soil in this area and replace it with clean fill. More detailed information regarding sampling and remediation for Cell 3 is provided in the following report:

Certification Document, Facility Decontamination/Liquid Management Cell No. 3 Closure, Earth Sciences, February 2000.

3.2.3 Recent Soil Investigation

As part of the agreement between Ohio EPA and BFI, in January 2005 BFI conducted additional sampling in and around Cells 1 and 2. The results of their sampling are included in Tables 8 and 9 in the Appendix of this document and in the following report:

OHIO EPA DHWM

NOV 20 2006

Final Report Characterization of Cells 1 and 2, BFI Energy Systems, Inc., Ecological Services, Inc. Site, East Palestine, Ohio, September 2005

Cells 1 and 2

BFI conducted additional sampling in Cells 1 and 2. Samples were analyzed for volatiles, semivolatiles, PCBs and metals. For Cells 1 and 2, all volatile, semivolatile and PCB constituent concentrations were below DHWM GCNs for Direct Contact; however, there were several metals concentrations which were above GCNs. As stated previously, GCNs are designed to be protective of human health and the environment. Metals Direct Contact exceedances include antimony, arsenic, chromium, iron, and lead (see Table 8 of the Appendix). The GCN exceedances listed are approximately thirty (30) feet below ground surface level. Ohio EPA is requiring BFI to place and maintain a fence around Cells 1 and 2 to control human exposure to the above contaminants. A further summary of Ohio EPA's selected remedies for Cells 1 and 2 are discussed in Section 5.

Perimeter Samples

BFI also conducted additional sampling around the perimeter of Cells 1 and 2. All perimeter samples were analyzed for volatiles, semivolatiles, PCBs and metals. All volatile, semivolatile and PCB concentrations were below DHWM GCNs. Metals Direct Contact exceedances include arsenic and iron (see Table 9 of the Appendix). Arsenic values were compared to a background study conducted in January of 1996, titled Technical Report Evaluation of Contaminated Soils Decontamination of Facility Cell No. 3 Closure, July 16, 1996. Using DHWM's Closure Plan Review Guidance For RCRA Facilities, June 2005, Appendix C: Guidance for Statistical Evaluation of Hazardous Waste Constituent Levels in Soils, Equation C-6, perimeter samples were below background levels. A summary of the results is included in Table 10 in the Appendix of this document. Perimeter data and background data were compared to a background study for the State of Ohio conducted by Ohio EPA. Both the site background and perimeter data were not abnormal. A summary of the findings for the State of Ohio background study is included in the following document:

Closure Plan Review Guidance For RCRA Facilities, June 2005, Appendix B: Development of Alternative Metal Standards.

Several perimeter samples were slightly above GCN Direct Contact numbers for iron. Ohio EPA has determined that current levels do not present an unacceptable risk to human health and the environment. Exceedances of iron may reflect local conditions and may not necessarily reflect results from site operations. The primary concern with iron is in ground water. As stated previously in Section 3.1.5, the

DHWM
NOV 20 2006

effects of iron in ground water (Upper Freeport Coal) at the site are minimized by the Passive Treatment System described in Section 3.1.5.

4.0 Evaluation and Selection of Remedies

4.1 Description of the Evaluation Criteria

As part of the facility investigation/corrective measures/remedy study process, criteria for evaluating potential remedies were developed by U.S. EPA under the RCRA Corrective Action program. The evaluation criteria are found in U.S. EPA guidance documents. The criteria are used by Ohio EPA to evaluate the remedies for a facility when it is determined that environmental conditions on the property require some type of action to reduce the potential risk to human health and the environment, posed by the presence of environmental contaminants, to acceptable levels. The evaluation criteria are listed and described below:

Remedy Selection Evaluation Criteria

1. **Protect human health and the environment** - Remedies shall be evaluated to determine if they can adequately protect human health and the environment, in both the short and long term, from unacceptable risks posed by environmental contaminants present at the facility.

2. **Attain media cleanup standards set by the implementing agency** - Remedies shall be evaluated to determine if the final numerical standards for the subject environmental media will be achieved. The evaluation will include the method of verification, and its supporting quality assurance and quality control procedures, used to make the determination. USEPA NPDWR and NSDWR standards and Ohio EPA GCNs were used as cleanup standards for the facility.

3. **Control source of the release(s) to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment** - Remedies shall be evaluated to determine if it is practicable to physically remove the source of environmental contamination as part or all of the remedy.

4. **Comply with applicable standards for management of waste** - Remedies shall be evaluated to determine if they meet all of the applicable requirements of state, federal and local environmental laws for waste management.

5. **Long term reliability and effectiveness** - Remedies shall be evaluated to determine their ability to maintain reliable protection of human health and the environment over time once the measure is fully implemented. This includes

OHIO EPA DHWM

NOV 20 2006

assessment of the residual risks remaining from the untreated wastes and the adequacy and reliability of controls such as containment systems and enforceable land use restrictions.

6. **Reduction in the toxicity, mobility or volume of wastes** - Remedies shall be evaluated to determine the degree to which recycling or treatment are utilized to reduce the toxicity, mobility or volume of wastes present at the facility.

7. **Short term effectiveness** - Remedies shall be evaluated to determine the following: a) short term risks that might be posed to the community during implementation of the remedy, b) potential impacts on workers during implementation of the remedy and the effectiveness and reliability of worker protection measures, c) potential environmental impacts of the remedy and the effectiveness and reliability of mitigative measures employed during implementation, and d) time until protection is achieved.

8. **Implementability** - Remedies shall be evaluated to determine the ease or difficulty of implementation and shall include, as appropriate, the following: a) technical difficulties and unknowns associated with the construction and operation of a technology, the reliability of a technology, ease of undertaking additional remedies, and the ability to monitor the effectiveness of the remedy, b) administrative feasibility, including activities needed to coordinate with other offices and agencies and the ability and time required to obtain the necessary approvals and permits, as necessary, and c) the availability of any services and materials needed to support and complete the remedy.

The first four evaluation criteria are threshold criteria required for acceptance of a remedy. All four of these criteria, as they are applicable, must be met in order for the remedy to be acceptable. The last four evaluation criteria are balancing criteria used to help select the best remedy.

4.2 Ohio EPA's Evaluation of the Selected Remedies

To aid in selecting the most appropriate remedies, facilities submit a corrective measures study to identify and compare different remedial alternatives. In this instance, due to the site history, Ohio EPA and BFI agreed early on the preferred remedial approaches and a corrective measures study was not performed. There were three options discussed for the remediation of the site: no further action, the remedies described below in Section 4.2.1, and the remedies described in Section 4.2.1 without the additional fencing around Cells 1 and 2. It was quickly determined that a no further action option would not meet the criteria described in Section 4.1 and is not discussed in this document. Although the option of the remedies described in Section 4.2.1 without the additional fencing is considered to meet the remedy selection criteria, it is also not discussed in this document because BFI

OHWM

NOV 20 2006

has agreed to use the fencing. The following discussion demonstrates how the selected remedies meet the threshold criteria listed in Section 4.1.

4.2.1 Environmental Covenant, Ground Water Sampling, Maintain Passive Treatment System, Fencing, Implement an Operation & Maintenance Plan

Under these remedies, BFI will enter into an environmental covenant with Ohio EPA to eliminate all potential future uses of Cells 1 and 2 with the exception of operation, inspection, and maintenance for the current purpose of waste containment. Site use of ground water will also be prohibited from potable use. An environmental covenant is a legally enforceable document that imposes activity and use limitations and meets the requirements established in sections 5301.80 to 5301.92 of the Ohio Revised Code. This use restriction runs with the land and is binding upon the existing and any future property owner, should the property be sold. Ohio EPA monitors the property owner's adherence to the use restriction to help ensure continued protection of human health and the environment. Restrictions are already placed on Cell 3 through the facility's approved Post-Closure Plan.

A ground water monitoring program was developed to cover all three waste cells. As part of the facility's approved Post Closure Plan the facility is required to monitor ground water, surface water discharges, and State Line Creek for thirty (30) years. The ground water monitoring network was designed to cover the whole facility, including Cells 1 and 2. As part of the selected remedies, the facility would maintain the current Passive Treatment System for mine seep ground water. Fencing will be placed around the perimeter of Cells 1 and 2 to control human and animal exposure. Signs will also be posted and an Operation & Maintenance Plan would be developed and approved by Ohio EPA for Cells 1 and 2. The Operation & Maintenance Plan would be similar to the plan developed for Cell 3 and would include annual inspection and reporting to Ohio EPA. The facility already has a financial insurance policy to cover all associated costs required to maintain the site, including ground water monitoring, operation and maintenance for the entire site, and maintaining the passive treatment system. BFI will be required to continue to maintain financial assurance for the entire site.

Evaluation of How the Selected Remedies Meet the Threshold Criteria

1. Protection of human health and the environment

Ohio EPA believes the remedies described above are protective of human health and the environment. An environmental covenant would reduce human exposure to Cells 1 and 2. A fence, placed around Cells 1 and 2, will further reduce the potential for human or animal exposure by preventing unauthorized access. Monitoring would determine if site activities have had a negative impact to ground water, surface water and State Line Creek. If it was determined that site conditions

OHIO EPA DHWM
NOV 20 2006

were having an adverse effect, the facility would be required to take additional corrective action measures.

2. Attain media cleanup standards set by the implementing agency

The selected remedies meet Ohio EPA's media cleanup standards outlined in Sections 3.1.1 and 3.2.1. Areas not meeting cleanup standards (Cells 1 and 2), and ground water, would be prohibited from direct contact use through an environmental covenant and by placing a fence around Cells 1 and 2.

3. Control source of the release(s) to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment

The selected remedies will control the source of a potential release by requiring the facility to maintain the cover on Cells 1 and 2. The facility will be required to inspect the cover on Cells 1 and 2 on an annual basis, and if needed, make necessary repairs.

4. Comply with applicable standards for management of waste

The selected remedies comply with all applicable standards for managing waste at the facility. The only waste currently being generated on-site is purge water from well sampling which the facility characterizes and disposes of properly in accordance with its approved Post-Closure Plan.

5. Long term reliability and effectiveness

The selected remedies are reliable and effective in the long term. An environmental covenant is a restriction associated with the land and is binding upon existing and any future property owner.

6. Reduction in the toxicity, mobility or volume of wastes

This is a balancing criteria. The facility previously has treated and removed a large volume of waste. Under the selected remedies, the covers on cells 1 and 2 will be inspected annually and any identified problems will be corrected. This will severely reduce mobility. The Passive Treatment System will also remain operational, and will reduce the toxicity of ground water.

OHIO EPA DHWM

NOV 20 2006

7. Short term effectiveness

The selected remedies will be effective over the short term. The only construction related activities that have not already been implemented by the selected remedies is the placement of additional signs around the facility and a fence around Cells 1 and 2, which should not pose any risk to the community during implementation or cause any major risks to workers. The selected remedies will be able to be implemented in a short period of time.

8. Implementability

The selected remedies will be easy to implement. Most aspects of the selected remedies, such as ground water sampling, are already in place. Ohio EPA has procedures in place to process environmental covenants. The facility already has placed a fence around Cell 3 and placing additional fencing around Cell 1 and 2 should not be difficult to implement.

5.0 Conclusions

In conclusion, as they meet the threshold criteria for remedy acceptability, Ohio EPA has selected the remedies discussed in Section 4.2.1: Environmental Covenant, Ground Water Sampling, Maintain Passive Treatment System, Fencing, Implement an Operation & Maintenance Plan. In addition, BFI will continue to maintain the financial requirements to cover all associated costs of the site, including ground water monitoring, operation and maintenance for the entire site, and maintaining the passive ground water treatment system. The actions that BFI is required to take relative to each remedy component are as follows:

- Environmental Covenant
  BFI will enter into an environmental covenant to eliminate all future potential uses for Cells 1 and 2 with the exception of operation, inspection, and maintenance for the current purpose of waste containment. Site use of ground water will also be prohibited from potable use. The environmental covenant runs with the land and is binding upon existing and any future property owner, should the property be sold. Ohio EPA will monitor the property owner's adherence to the environmental covenant to help ensure continued protection of human health and the environment. Restrictions are already placed on Cell 3 through the facility's approved Post-Closure Plan.

- Ground Water Sampling
  Sampling of ground water, surface water and State Line Creek will identify if these

EPA DHWM
NOV 20 2006

media are contaminated. Ground water sampling purge water will be sampled, and according to the sampling results, sent to an appropriate facility for disposal and/or treatment.

- Maintain Passive Treatment System
  Mine seep ground water contamination will continue to be treated and controlled through the Passive Treatment System. As part of the facility's approved Post-Closure Plan, the facility is required to monitor ground water, surface water discharges, and State Line Creek for thirty (30) years. The ground water monitoring network was designed to cover the whole facility, including Cells 1, 2 and 3.

- Fencing and Implement Operation & Maintenance Plan
  BFI will place fencing around Cells 1 and 2, thus preventing unauthorized access to them. Signs will be posted, and an Operation & Maintenance Plan will be developed and approved by Ohio EPA for Cells 1 and 2. The Operation & Maintenance Plan would be similar to the plan developed for Cell 3 and will include annual inspection and reporting to Ohio EPA. The plan will verify the continued integrity of the fencing, the proper functioning of the Passive Treatment System, and will control releases by maintaining the cover of Cells 1 and 2.

OHIO EPA DHWM

NOV 20 2006

Appendix: Tables and Figures

Decision Document for the Remediation of
BFI Energy Systems of Boston, Inc. dba The Ecological Services, Inc.
East Palestine Landfill, East Palestine, Ohio
(Columbiana County)
OHD 980 795 264
November 2006

OHIO EPA DHWM

NOV 20 2006

Tables

Table 1	Groundwater Monitoring Program
Table 2	Groundwater Assessment Parameter List
Table 3	40 CFR 264 Appendix IX Parameter List
Table 4	1st Quarter 2005 Ground Water Exceedances
Table 5	2nd Quarter 2005 Ground Water Exceedances
Table 6	3rd Quarter 2005 Ground Water Exceedances
Table 7	4th Quarter 2005 Ground Water Exceedances
Table 8	Cells 1 & 2 Soil Sampling Data
Table 9	Perimeter Soil Sampling Data
Table 10	Comparison of Arsenic Background Data to Perimeter Results

Figures

Figure 1	Facility Location Map
Figure 2	Facility Ground Water Monitoring System
Figure 3	Potentiometric Surface Map Upper Freeport Coal
Figure 4	Potentiometric Surface Map Butler Sandstone/Lower Freeport Coal
Figure 5	Potentiometric Surface Map Freeport Sandstone
Figure 6	Potentiometric Surface Map Lower Worthington Sandstone/Lower Kittanning Coal

OHIO EPA DHWM

NOV 20 2006

Table 1: Groundwater Monitoring Program[1]

Horizon	Quarterly	Semiannual	Annual	Biennial	Periodic[2]
Upper Freeport Coal (U-4, U-5, UJ-8, UK-9, UM-15, U-16, U-17)	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals VOCs and SVOCs	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals VOCs and SVOCs	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals VOCs and SVOCs	Indicator Parameters Appendix IX Parameters	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals VOCs and SVOCs
Butler Sandstone/Lower Freeport Coal (W-1, W-2, W-3, W-4, W-5, W-6, W-8, W-15, W-16, W-18)	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals VOCs and SVOCs	Indicator Parameters Appendix IX Parameters	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals
Freeport Sandstone (F-3, F-6, F-16)	No Samples Collected	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals VOCs and SVOCs	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals VOCs and SVOCs	Indicator Parameters Appendix IX Parameters
Lower Worthington Sandstone/Lower Kittanning Coal (LW-3, LW-6, LW-16)	No Samples Collected	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals VOCs and SVOCs	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals VOCs and SVOCs	Indicator Parameters Appendix IX Parameters
Stream (S-1, S-6, S-19, S-A, S-B, S-C, S-D)	Indicator Parameters Major Cations/Anions[3] + Fluoride	Indicator Parameters Major CationsAnions[3] + Fluoride	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals VOCs and SVOCs	Indicator Parameters Major Cations/Anions[3] + Fluoride Metals VOCs and SVOCs	Indicator Parameters Appendix IX Parameters

Notes:

[1]See Table 2 and 3 for a complete list of parameters

[2]Once every 5 years

[3]Major cations/anions to also include the metals calcium, sodium, magnesium, and potassium to support the trlinear comparison analysis.

NOV 20 2006
OHIO EPA DHWM

Table 2: Resource Conservation and Recovery Act Groundwater Assessment Parameter List

Indicator Parameters	Major Cations/Anions
pH	Alkalinity
Specific Conductance @ 25°	Chloride
Total Organic Carbon (TOC)	Nitrate
Total Organic Halogens (TOX)	Sulfate
Total/Dissolved Metals	Calcium
Aluminum	Copper	Iron
Antimony	Lead	Magnesium
Arsenic	Nickel	Manganese
Barium	Selenium	Potassium
Beryllium	Thallium	Sodium
Cadmium	Vanadium	
Chromium	Zinc	**Miscellaneous**
Cobalt		Fluoride

Organics Suite

Volatile Organic Compounds (VOCs)		Semivolatile Organic Compounds (SVOCs)	
Methylene Chloride (Dichloromethane)	Xylenes (total)	Bis (2-ethylhexyl) phthalate	Meta+Para-Cresols (3/4-Methlyphenol)
2-Butanone (Methyl Ethly Ketone)	Acrolein	p-Chloro-m-Cresol	2,4-Dimethylphenol
2-Hexanone	Acetonitrile	Fluorene	Naphthalene
Styrene	1,4-Dioxane	2,4-Dichlorophenol	Phenol
Acetone	Propionitrile (Ethyl Cyanide)	2,6-Dichlorophenol	Benzoic Acid
4-Methyl-2-Pentanone (MIBK)	1,2-Dichloroethane	2-Picoline	p-Benzoquinone (2,5-Cyclohexadiene-1,4-Dione)
Chloromethane	1,1-Dichloroethane	2,4,5-Trichlorophenol	N-Nitrosomethylethylamine
Chloroform	Isobutanol	2,4,6-Trichlorophenol	Phenanthrene
Chlorobenzene	Trichloroethene	Acetophenone	Acenaphthene
Benzene	Trans-1,2-Dichloroethene	Benzyl Alcohol	Fluoranthene
Toluene	Trichlorofluoromethane	2-Methlnaphalene	Aniline
Ethylbenzene	Dichlorodifluoromethane	o-Cresol (2-Methlyphenol)	1,2-Dichlorobenzene (o-Dichlorobenzene)
			Pyridine

OHIO EPA DHWM
NOV 20 2006

Table 3: 40 CFR 264 Appendix IX Parameter List

Inorganic Parameters	Total Metals		
Cyanide	Antimony	Cobalt	Silver
Sulfide	Arsenic	Copper	Thallium
	Barium	Lead	Tin
	Beryllium	Mercury	Vanadium
	Cadmium	Nickel	Zinc
	Chromium	Selenium	

Organics Suite			
Volatile Organic Compounds (VOCs)			
Acetone	Chloroform	Dichloromethane (Methylene Chloride)	Styrene
Acetonitrile	Chloromethane (Methyl chloride)	Cis-1,3-dichloropropene	1,1,1,2-Tetrachloroethane
Acrolein	3-Chloropropene (Allyl Chloride)	Trans-1,3-dichloropropene	1,1,2,2-Tetrachoroethane
Acrylonitrile	1,2-Dibromo-3-chloropropene (DBCP)	1,4-Dioxane (p-Dioxane)	Tetrachloroethene
Benzene	1,2-Dibromoethane (EDB)	Ethyl benzene	Toluene
Bromodichloromethane	Dibromomethane (Methylene bromide)	Ethyl cyanide (Propipontrile)	1,1,1-Trichloroethane (Methyl chloroform)
Brormoform	Trans-1,4-dichloro-2-butene	Ethyl methacrylate	1,1,2-Trichloroethane
Bromomethane (Methyl bromide)	Dichlorodifluoromethane	2-Hexanone	Trichloroethene
Carbon Disulfide	1,1-Dichloroethane	Iodomethane	Trichlorofluoromethane
Carbon Tetrachloride	1,2-Dichloroethane	Metharcrylonitrile	1,2,3-Trichloropropane
Chlorobenzene	Trans-1,2-dicloroethene	Methyl ethyl ketone (2-Butanone)	Vinyl acetate
Chlorodibromomethane	1,1-Dichloroethene	Methyl methacrylate	Vinyl chloride
Chloroethane (Ethyl Chloride)	1,2-Dichloropropane	Methyl iso butyl ketone (4-methyl-2-pentanone)	Xylenes (o/m/p-Xylene)
2-Chloro-1,3-butadiene (Chloroprene)			
Alcohols			
Isobutanol			

OHIO EPA DHWM
NOV 20 2006

Table 3 (Continued): 40 CFR 264 Appendix IX Parameter List

Organics Suite (Continued)

Semivolatile Organic Compounds (SVOCs)

Ancenaphthene	3,3'-Dichlorobenzidine	2-Naphthylamine	4-Chloro-3-Methylphenol
Acenaththylene	Diethylphthalate	3-Nitroaniline (m-Nitroaniline)	2-Chlorophenol
Acetophenone	Dimethoate	2-Nitroaniline (o-Nitroaniline)	2-Methylphenol (o-Cresol)
2-Acetylaminofluorene	p-(Dimethylamino)azobenzene	4-Nitroaniline (p-Nitroaniline)	4-Methylphenol (p-Cresol)
4-Aminobiphenyl	7,12-Dimethylbenz(a)anthracene	Nitrobenzene	2,4-Dichlorophenol
Aniline	3,3'-Dimethylbenzidine	N-Nitrosodi-n-butylamine	2,6-Dichlorophenol
Anthracene	α,α-Dimethlyphenethylamine	N-Nitrosodiethylamine	2,4-Dimethylphenol
Benzo(a)anthracene	Dimethylphthalate	N-Nitrosomethylamine	4,6-Dinitro-o-cresol
Benzo(b)fluoranthene	1,3-Dinitrobenzene (m-Dinitrobenzene)	N-Nitrosodiphenylamine	2,4-Dintrophenol
Benzo(k)fluoranthene	2,4-Dinitrotoluene	N-Nitrosomethylethylamine	3-Methylphenol (m-Cresol)
Benzo(g,h,i)perylene	2,6-Dinitrotoluene	N-Nitrosomorpholine	2-Nitrophenol (o-Nitrophenol)
Benzo(a)pyrene	Di-n-octylphthalate	N-Nitrosopiperidine	4-Nitrophenol (p-Nitrophenol)
Benzyl alcohol	Diphenylamine	N-Nitrosopyrrolidine	Pentachlorophenol
Bis(2-chloroethoxy)methane	Di-n-propylnitrosoamine	4-Nitroquinoline-1-oxide	Phenol
Bis(2-chloroethyl)ether	Ethyl methanesulfonate	5-Nitro-o-toluidine	2,3,4,6-Tetrachlorophenol
Bis(2-chloro-1-methylethyl)ether	Fluoranthene	Pentachlorobenzene	2,4,5-Trichlorophenol
Bis(2-ethylhexyl)phthalate	Fluorene	Pentachloroethane	2,4,6-Trichlorophenol
4-Bromodiphenyl ether	Hexachlorobenzene	Pentachloronitrobenzene	Aramite
Butylbenzlphthalate	Hexachlorobutadiene	Phenacetin	Disulfoton
4-Chloroaniline (p-Chloroaniline)	Hexachlorocyclopentadiene	Phenathrene	Famphur
Chlorobenzilate	Hexachloroethane	2-Picoline	Isodrin
2-Chloronaphthalene	Hexachlorophene	Pyrene	Isophorone
4-Chlorophenyl-phenyl ether	Hexachloropropene	Pyridine	Isosafrole
Chrysene	Indeno(1,2,3-cd)pyrene	1,2,4,5-Tetrachlorobenzene	Kepone
Diallate	2-Methylnapththalene	1,2,4-Trichlorobenzene	Parathion
Dibenz(a,h)anthracene	Methapyrilene	Thionazin	Methyl Parathion
Dibenzofuran	3-Methylcholanthrene	o,o,o-Triethylphosphorothioate	Phorate
Di-n-butylphthalate	Methyl methanesulfonate	sym-(1,3,5)-Trinitrobenzene	Pronamide
1,2-Dichlorobenzene (o-Dichlorobenzene)	Naphthalene	o-Toluidine	Safrole
1,3-Dichlorobenzene (m-Dichlorobenzene)	1,4-Naphthoquinone	p-Phenylenediamine	Tetraethyl dithiopyrophosphate (Sulfotepp)
1,4-Dichlorobenzene (p-Dichlorobenzene)	1-Naphthylamine	2-sec-butyl-4,6-Dinitrophenol (Dinoseb)	

OHIO EPA DHWM
NOV 20 2006

Table 3 (Continued): 40 CFR 264 Appendix IX Parameter List

Organics Suite (Continued)	
Organochlorine Pesticides	**Dioxin/Furan Compounds**
Alpha-BHC	2,3,7,8-TCDD
Beta-BHC	1,2,3,7,8-Pentachlorodibenzodioxin
Delta-BHC	1,2,3,4,7,8-Hexachlorodibenzodioxin
Gamma-BHC (Lindane)	1,2,3,6,7,8-Hexachlorodibenzodioxin
Hepachlor	1,2,3,7,8,9-Hexachlorodibenzodioxin
Aldrin	1,2,3,4,6,7,8-Heptachlorodibenzodioxin
Heptachlor epoxide	1,2,3,4,6,7,8,9-OCDD
Endosulfan I	2,3,7,8-Tetrachlorodibenzofuran
Dieldrin	1,2,3,7,8-Pentachlorodibenzofuran
4,4'-DDE	2,3,4,7,8-Pentachlorodibenzofuran
Endrin	1,2,3,4,7,8-Hexachlorodibenzofuran
Endosulfan II	1,2,3,6,7,8-Hexachlorodibenzofuran
4,4'-DDD	2,3,4,6,7,8-Hexachlorodibenzofuran
Endosulfan sulfate	1,2,3,7,8,9-Hexachlorodibenzofuran
4,4'-DDT	1,2,3,4,6,7,8-Heptachlorodibenzofuran
Methoxychlor	1,2,3,4,7,8,9-Heptachlorodibenzofuran
Endrin Aldehyde	1,2,4,6,7,8,9-OCDF
Chlordane	
Toxaphene	**Chlorinated Herbicides**
Arochlor 1016	2,4-D
Arochlor 1221	Silvex (2,4,5,-TP)
Arochlor 1232	2,4,5-T
Arochlor 1242	
Arochlor 1248	
Arochlor 1254	
Arochlor 1260	

OHIO EPA DHWM

NOV 20 2006

Table 4 - 1st Quarter 2005 Ground Water Exceedances

Primary Standards	Standard	U-4	U-5	UJ-8	UK-9	UM-15	U-16	U-17	U-18		
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		
Arsenic (dissolved)	0.01	0.032				0.03			0.044		
Arsenic (total)	0.01	0.03				0.036	0.011		0.038		
Barium (total)	2							2.1			
Benzene	0.005							0.044			
Naphthalene	0.00182							0.016			
Secondary Standards	**Standard**	**U-4**	**U-5**	**UJ-8**	**UK-9**	**UM-15**	**U-16**	**U-17**			
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
Chloride	250	330	670			2000		3200			
Sulfate	250	420	280	430		790	420				
Iron (dissolved)	0.3	40	42	0.45		180	32	110	9.42		
Iron (total)	0.3	39	41	0.52		190	53	160	11.7		
Manganese (dissolved)	0.05	2.1	1.8	0.42		5.4	2.1	2.1	0.249		
Manganese (total)	0.05	2	1.7	0.41		5.4	2	3	0.277		
Secondary Standards	**Standard**	**W-1**	**W-2**	**W-3**	**W-4**	**W-5**	**W-6**	**W-8**	**W-15**	**W-16**	**W-18**
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Chloride	250	650		3800	1500	5100	3800	590	1000	930	
Sulfate	250	1300	1300		630	440	640			1100	
Iron (dissolved)	0.3		3.2		30	47	22			7.3	
Iron (total)	0.3	0.32	3.3	2.8	30	49	21			7.3	
Manganese (dissolved)	0.05	0.092	1.2	17	4.6	3.8	0.92		0.052	0.6	
Manganese (total)	0.05	0.1	1.1	14	4.6	3.7	0.85			0.58	

[1]Standards are Maximum Contaminant Levels with the exception of Naphthalene which is the Single Chemical Cleanup Number for Ground Water from the State of Ohio Division of Hazardous Waste Management Closure Plan Review Guidance For RCRA Facilities.

NOV 20 2006
OHIO EPA DHWM

Table 5 - 2nd Quarter 2005 Ground Water Exceedances

Primary Standards	Standard[1]	U-4	U-5	UJ-8	UK-9	UM-15	U-16	U-17	U-18		
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		
Arsenic (dissolved)	0.01	0.021				0.038	0.015				
Arsenic (total)	0.01	0.022				0.047	0.017		0.051		
Benzene	0.005							0.033			
Secondary Standards											
Chloride	250	310	690			1800		2900	260		
Sulfate	250	380		460		720	520		440		
Iron (dissolved)	0.3	36	42	0.66		140	72	150	5.5		
Iron (total)	0.3	42	38	0.66		180	81	150	93		
Manganese (dissolved)	0.05	1.4	1.8	0.51		4.5	2.3	2.8	0.29		
Manganese (total)	0.05	1.5	1.6	0.46		4.9	2.4	2.8	1.4		

Secondary Standards	Standard	W-1	W-2	W-3	W-4	W-5	W-6	W-8	W-15	W-16	W-18
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Chloride	250			6200	1400	4900	2800	710	1100	710	
Sulfate	250	1400	1300		590	410	500			1200	
Iron (dissolved)	0.3	0.35	2.7	20	18	70	15			15	
Iron (total)	0.3	0.41	3	33	18	68	24			16	
Manganese (dissolved)	0.05	0.084	0.95	8.7	4.2	3.4	0.91		0.053	0.62	
Manganese (total)	0.05	0.087	0.97	13	4.1	3.2	0.91		0.056	0.62	

Primary Standards	Standard	F-3	F-6	F-16	LW-3	LW-6	LW-16				
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L				
Barium (dissolved)	2		2.5								
Barium (total)	2		2.5								
Secondary Standards											
Chloride	250	1400	1800				1100				
Iron (dissolved)	0.3	1.8									
Iron (total)	0.3	1.4	0.31								
Manganese (dissolved)	0.05	1.1									
Manganese (total)	0.05	1.1									

[1]Standards are Maximum Contaminant Levels with the exception of Naphthalene which is the Single Chemical Cleanup Number for Ground Water from the State of Ohio Division of Hazardous Waste Management Closure Plan Review Guidance For RCRA Facilities.

NOV 20 2006
OHIO EPA-DHWM

Table 6 - 3rd Quarter 2005 Ground Water Exceedances

Primary Standards	Standard	U-4	U-5	UJ-8	UK-9	UM-15	U-16	U-17	U-18		
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		
Arsenic (dissolved)	0.01	0.15				0.028	0.026				
Arsenic (total)	0.01	0.26				0.028	0.019		0.012		
Benzene	0.005							0.022			
Secondary Standards											
Chloride	250	300	850			1600		2500			
Sulfate	250	510		430	300	640	410				
Iron (dissolved)	0.3	62	40	2.6		100	110	100			
Iron (total)	0.3	73	42	2.6		120	82	120	27		
Manganese (dissolved)	0.05	1.6	1.9	1.3	0.46	3.6	3.6	2.3			
Manganese (total)	0.05	1.6	1.9	1.2		3.7	3.8	2.5	0.53		

Secondary Standards	Standard	W-1	W-2	W-3	W-4	W-5	W-6	W-8	W-15	W-16	W-18
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Chloride	250	2000		6500	1400	4600	3200	430	1100	830	
Sulfate	250	650	1300		630	420	800			980	
Iron (dissolved)	0.3		2.1	30	18	45	28			8.2	
Iron (total)	0.3	0.31	2.9	37	17	46	28	2		8.3	
Manganese (dissolved)	0.05	0.11	0.94	11	4.3	3.5	1.1	0.2	0.052	0.56	
Manganese (total)	0.05	0.12	1	9.8	4.3	3.4	1.1	0.2	0.052	0.56	

Primary Standards	Standard	F-3	F-6	F-16	LW-3	LW-6	LW-16				
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L				
Barium (dissolved)	2		2.5								
Barium (total)	2		2.4								
Secondary Standards	**Standard**	**F-3**	**F-6**	**F-16**	**LW-3**	**LW-6**	**LW-16**				
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L				
Chloride	250	1600	1800				1200				
Iron (dissolved)	0.3	2.1									
Iron (total)	0.3	2.1					2.2				
Manganese (dissolved)	0.05	1.1									
Manganese (total)	0.05	1.1									

[1]Standards are Maximum Contaminant Levels with the exception of Naphthalene which is the Single Chemical Cleanup Number for Ground Water from the State of Ohio Division of Hazardous Waste Management Closure Plan Review Guidance For RCRA Facilities.

OHIO EPA DHWM
NOV 20 2006

Table 7 - 4th Quarter 2005 Ground Water Exceedances										
Primary Standards	**Standard**	**U-4**	**U-5**	**UJ-8**	**UK-9**	**UM-15**	**U-16**	**U-17**	**U-18**	
	mg/L	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	
Arsenic (dissolved)	0.01	0.057				0.03	0.015			
Arsenic (total)	0.01	0.1				0.033	0.012		0.012	
Benzene	0.005							0.024		
Secondary Standards	**Standard**	**U-4**	**U-5**	**UJ-8**	**UK-9**	**UM-15**	**U-16**	**U-17**	**U-18**	
	mg/L	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	
Chloride	250	260	970			1400		2100		
Sulfate	250	1100		470	280	580	510			
Iron (dissolved)	0.3	110	44	0.64		120	66	24		
Iron (total)	0.3	110	46	0.73	0.34	110	65	60	30	
Manganese (dissolved)	0.05	4.4	2	0.64	0.098	3.8	2.4	1		
Manganese (total)	0.05	4.3	2.1	0.64	0.24	3.6	2.4	1.6	0.69	
Primary Standards	**Standard**	**W-1**	**W-2**	**W-3**	**W-4**	**W-5**	**W-6**	**W-8**	**W-15**	**W-16**
	mg/L	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
None										
Secondary Standards	**Standard**	**W-1**	**W-2**	**W-3**	**W-4**	**W-5**	**W-6**	**W-8**	**W-15**	**W-16**
	mg/L	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
Chloride	250	430		5700	1300	4400	3100	480	1200	780
Sulfate	250	1300	1200		640	420	650			930
Iron (dissolved)	0.3		3.1	7.8	21	40	17			5.4
Iron (total)	0.3		3.1	11	21	45	18			5.9
Manganese (dissolved)	0.05	0.089	1.2	6.4	4.5	3.5	0.83			0.54
Manganese (total)	0.05	0.087	1.1	6.5	4.4	3.6	0.84			0.54

[1]Standards are Maximum Contaminant Levels with the exception of Naphthalene which is the Single Chemical Cleanup Number for Ground Water from the State of Ohio Division of Hazardous Waste Management Closure Plan Review Guidance For RCRA Facilities.

OHIO EPA DHWM
NOV 20 2006

Table 8 - Cells 1 & 2 Soil Sampling Data

Analyte	C1A 20-24	C1A 32-36	C1B 28-32	C1B 28-32 (Reanalysis)	C1B 36-40	C2A 28-32	C2A 32-38	C2B 20-24	C2B 28-31	Highest Value	Direct Contact
Volatiles	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Acetone	ND	39.0	150.0	NA	23.0	ND	ND	ND	ND	150	48,700,000
Benzene	ND	2.0	ND	NA	ND	ND	120	ND	ND	120	6,310
2-Butanone	ND	18.0	48.0	NA	7.1	ND	ND	ND	ND	48	23,200,000
Ethylbenzene	ND	97.0	4.6	NA	10.0	ND	6,000	ND	ND	6,000	150,000
4-Methyl-2-pentanone (MIBK)	ND	5.8	18.0	NA	ND	ND	ND	ND	ND	18	5,010,000
Toluene	ND	210.0	21.0	NA	29.0	ND	990	ND	ND	990	271,000
o-Xylene	ND	150.0	6.2	NA	14.0	ND	8,200	ND	ND	8,200	154,000
m,p-Xylenes	ND	380.0	13.0	NA	40.0	ND	14,000	ND	ND	14,000	106,000
TICs											
1,3,5-trimethyl benzene	ND	39.0		NA	11.0	ND		ND	ND	39	17,900
1,2,4-trimethyl benzene	ND	99.0		NA	27.0	ND		ND	ND	99	22,100
2,6-dimethyl-Octane							4,600	ND	ND	4,600	NL
3-methyl-Nonane							2,200	ND	ND	2,200	NL
Octanal	ND	43.0	ND	NA	ND	ND		ND	ND	43	NL
Decane							51,000	ND	ND	51,000	NL
4-metyl-Decane							2,800	ND	ND	2,800	NL
3-methyl-Decane							3,900	ND	ND	3,900	NL
Indene							62,000	ND	ND	62,000	NL
1,2,3,4-t-1,3-Cyclopentadiene							5,000	ND	ND	5,000	NL
2,3-dihydro-5-methyl-1H-Indene							2,400	ND	ND	2,400	NL
Dodecane							1,300	ND	ND	1,300	NL
1-Phenyl-1-butene							3,200	ND	ND	3,200	NL
propyl-Benzene							1,900	ND	ND	1,900	35,900
Highest Unknown TIC & Total Unknowns	ND	120 (24)	29 (5)	ug/kg	16 (9)	ND	51000 (18)	ND	ND	51000 (18)	NL

Direct Contact Numbers are from the State of Ohio Division of Hazardous Waste Management Closure Plan Review Guidance For RCRA Facilities June 2005
NA - not analyzed ND - not detected at reporting limit NL - no listing

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NOV 20 2006

Table 8 - Cells 1 & 2 Soil Sampling Data (continued)

Analyte	C1A 20-24	C1A 32-36	C1B 28-32	C1B 28-32 (Reanalysis)	C1B 36-40	C2A 28-32	C2A 32-38	C2B 20-24	C2B 28-31	Highest Value	Direct Contact
Semi Volatiles	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Acenaphthene	ND	ND	ND	ND	ND	ND	37	ND	ND	37	42,000
Anthracene	ND	ND	21	ND	ND	12	ND	ND	ND	21	2,560
Benzo(a)anthracene	ND	ND	49	42	17	24	13	14	24	49	5,120
Benzo(a)pyrene	ND	ND	30	29	12	16	9	ND	7	30	512
Benzo(b)fluoranthene	ND	ND	25	26	8	21	10	ND	13	26	3,690
Benzo(ghi)perylene	ND	ND	51	28	ND	34	ND	ND	20	51	NL
bis(2-Ethylhexyl)phthalate	ND	41,000	ND	42	36	ND	ND	ND	ND	41,000	202,000
Butyl benzyl phthalate	ND	3,300	ND	ND	12	ND	ND	ND	ND	3,300	310,000
Chrysene	13	530	44	46	13	39	18	16	35	530	1,270
Dibenzofuran	23	ND	ND	ND	ND	61	47	20	74	74	35,900
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	90	ND	ND	90	190,000
2,4-Dimethylphenol	ND	1,400	ND	ND	15	ND	ND	ND	ND	1,400	990,000
Di-n-octyl phthalate	ND	3,100	ND	36	ND	ND	ND	ND	ND	3,100	24,000
Fluoranthene	ND	1,200	120	110	30	35	19	25	25	1,200	44,100
Fluorene	ND	330	ND	ND	ND	ND	19	ND	ND	330	54,800
Indeno(1,2,3-cd)pyrene	ND	ND	42	34	ND	9	ND	ND	ND	42	153
2-Methylnaphthalene	71	1,300	ND	ND	10	190	770	61	160	1,300	190,000
Naphthalene	38	3,700	ND	ND	33	160	2,800	31	75	3,700	69,000
Phenanthrene	58	2,400	100	74	29	140	120	67	170	2,400	NL
Phenol	ND	1,200	ND	ND	ND	ND	ND	ND	ND	1,200	13,000,000
Pyrene	15	1,100	110	90	29	65	27	27	43	1,100	28,400
TICs											
2-Pentanaone, 4-hydroxy-4-methy	3,500	ND	5,000	6,300	2,700	3,300	3,100	3,800	3,300	6,300	NL
Capaene	ND	ND	ND	ND	ND	ND	ND	190	ND	190	NL
2,2,4,4-tetram Pentanoic acid	ND	ND	1,800	ND	ND	ND	ND	ND	ND	1,800	NL
2-ethyl Hexanoic acid	ND	ND	ND	ND	350	ND	ND	ND	ND	350	NL
Indene	ND	ND	ND	ND	ND	ND	8,500	ND	ND	8,500	NL
1-methyl Naphthalene	ND	ND	ND	ND	ND	160	180	48	180	180	121,000
Hexadecane	ND	ND	ND	ND	ND	140	ND	ND	ND	140	NL
Biphenyl	ND	ND	ND	ND	ND	57	180	ND	190	190	NL
Highest Unknown TIC & Total Unknowns	110 (9)	150,000 (23)	4,300 (21)	1,800 (22)	420 (21)	360 (21)	2,100 (15)	260 (11)	320 (22)	150,000.0	NL

Direct Contact Numbers are from the State of Ohio Division of Hazardous Waste Management Closure Plan Review Guidance For RCRA Facilities June 2005
NA - not analyzed ND - not detected at reporting limit NL - no listing

Table 8- Cells 1 & 2 Soil Sampling Data (continued)

Analyte	C1A 20 -24	C1A 32-36	C1B 28-32	C1B 28-32 (Reanalysis)	C1B 36-40	C2A 28-32	C2A 32-36	C2B 20-24	C2B 28-31	Highest Value	Direct Contact
PCBs	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Aroclor 1248	ND	31	ND	NA	ND	ND	ND	ND	ND	31	855
Aroclor 1260	30	ND	ND	NA	ND	ND	ND	ND	ND	30	2,060
Metals	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	10,200	2,410	2,670	NA	1,060	9,870	7,960	7,790	9,350	10,200	19,900
Antimony	ND	33.10	ND	NA	ND	ND	ND	ND	ND	33.10	30.70
Arsenic	5.20	7.70	ND	NA	ND	9.90	2.40	7.30	3.90	9.90	3.87
Barium	95.30	2,720.00	15.80	NA	12.40	82.20	69.80	81.70	134.00	2,720.00	5,170.00
Beyllium	1.30	0.54	0.75	NA	0.34	1.50	1.20	1.70	1.60	1.70	111.00
Cadmium	0.43	6.50	2.20	NA	0.72	0.23	0.12	0.30	0.30	6.50	63.50
Calcium	41,200	88,700	54,000	NA	31,400	2,310	1,780	2,280	3,080	88,700	NL
Chromium	18.60	1,920.00	110.00	NA	73.60	19.50	16.60	15.80	18.50	1,920.00	210.00
Cobalt	14.00	9.00	12.80	NA	5.70	13.90	12.70	12.10	14.60	14.60	1,370.00
Copper	65.00	253.00	92.20	NA	45.10	28.30	18.30	36.90	25.00	253.00	2,860.00
Cyanide	ND	1.10	0.94	NA	0.38	ND	ND	ND	ND	1.10	1,540.00
Iron	25,700	132,000	374,000	NA	174,000	29,200	19,500	42,900	30,600	374,000	23,100
Lead	27.20	11,200.00	27.90	NA	12.00	17.20	17.60	18.70	36.00	11,200.00	245.00
Magnesium	10,300	1,190	894	NA	313	4,840	4,120	3,630	5,060	10,300	NL
Manganese	537	338	1,480	NA	500	624	216	780	1,930	1,930	7,600
Mercury	0.02	0.65	0.12	NA	0.04	0.02	0.02	0.02	0.02	0.65	3.13
Nickel	25.30	989.00	76.90	NA	38.80	28.20	22.70	24.90	26.80	989.00	1,420.00
Potassium	1,340	316	127	NA	60	1,440	984	904	1,270	1,440	NL
Selenium	0.88	5.10	13.80	NA	6.40	0.98	0.73	1.50	0.92	13.80	387.00
Silver	0.07	0.40	0.28	NA	0.15	ND	ND	0.05	0.06	0.40	365.00
Sodium	115	1,080	1,230	NA	380	154	152	624	183	1,230	NL
Sulfide	ND	202	179	NA	48	ND	799	ND	ND	799	NL
Vanadium	22.20	19.80	45.30	NA	18.60	18.60	12.70	17.00	18.20	45.30	633.00
Zinc	126.00	9,690.00	3,670.00	NA	677.00	93.40	80.70	140.00	90.00	9,690.00	23,100.00

Direct Contact Numbers are from the State of Ohio Division of Hazardous Waste Management Closure Plan Review Guidance For RCRA Facilities June 2005

NA - not analyzed ND - not detected at reporting limit NL - no listing

NOV 20 2006
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Table 9 - Perimeter Soil Sampling Data							
Analyte	PB-1A 5-10	PB-1B 5-10	PB-2 5-10	PB-3 5-10	PB-4 5-10	Highest Value	Direct Contact
Volatiles	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
None (all values non-detect)	-	-	-	-	-	-	-
Semi Volatiles	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Benzo(a)anthracene	ND	ND	ND	27	ND	27	5,120
Benzo(a)pyrene	ND	ND	ND	12	ND	12	512
Benzo(ghi)perylene	21	21	ND	27	ND	27	NL
Chrysene	ND	ND	ND	35	ND	35	512,000
Dibenzofuran	37	37	ND	83	12	83	190,000
Fluoranthene	ND	ND	ND	25	ND	25	1,900,000
2-Methylnaphthalene	110	110	21	210	40	210	190,000
Naphthalene	110	110	ND	78	22	110	69,900
Phenanthrene	45	45	21	210	35	210	NL
Pyrene	ND	ND	ND	39	ND	39	1,420,000
TICs	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
2-Pentanaone, 4-hydroxy-4-methy	20,000	24,000	4,800	4,700	7,500	24,000	NL
4-hydroxy-4-methyl-2-Pentanone	ND	79	ND	ND	ND	79	NL
1,3-dimethyl-Benzene	72	ND	ND	ND	ND	72	NL
1-methyl Naphthalene	62	64	15	230	32	230	116,000
Biphenyl	38	31	ND	170	ND	170	NL
Highest Unknown TIC & Total Unknowns	110 (2)	1600 (5)	91 (1)	680 (22)	190 (5)	1,600	NL
PCBs	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
None (all values non-detect)	-	-	-	-	-	-	-
Metals	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	9,430	11,500	8,770	6,670	6,800	11,500	19,900
Antimony	ND	ND	ND	ND	ND	ND	30.70
Arsenic	1.20	12.70	10.20	4.20	4.20	12.70	3.87
Barium	53.10	41.00	114.00	429.00	127.00	429.00	5,170
Beryllium	0.98	1.30	0.88	1.40	1.60	1.60	111
Cadmium	ND	0.15	ND	ND	ND	0.15	63.50
Calcium	1,740	2,300	1,510	2,640	2,690	2,690	-
Chromium	17.10	20.30	14.30	16.50	13.10	20.30	210
Cobalt	10.10	11.80	11.10	14.80	8.00	14.80	1,370
Copper	28.00	41.30	26.50	33.60	36.80	41.30	2,860
Iron	20,800	24,400	23,600	17,700	12,500	24,400	23,100
Lead	12.80	16.00	16.30	8.10	12.90	16.30	245
Magnesium	5,010	6,380	3,180	1,570	1,640	6,380	-
Manganese	295	277	1,090	139	101	1,090	7,600
Mercury	0.01	0.01	0.02	0.06	0.02	0.06	3.13
Nickel	23.70	26.80	24.90	29.20	23.20	29.20	1,420
Potassium	1,080	1,380	1,340	1,940	2,180	2,180	-
Selenium	1.20	1.60	1.40	1.00	0.77	1.60	387
Sodium	77.90	105.00	72.00	102.00	101.00	105.00	-
Thallium	ND	0.61	ND	ND	ND	0.61	6.24
Vanadium	12.90	16.40	17.00	20.30	20.00	20.30	633
Zinc	73.70	85.70	71.40	35.50	31.20	85.70	23,100

Direct Contact Numbers are from the State of Ohio Division of Hazardous Waste Management Closure Plan Review Guidance For RCRA Facilities June 2005

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NOV 20 2006

Table 10 - Comparison of Arsenic Background Data to Perimeter Results

1996 Background Study Data Background Remediation Standard (BRS)	
Background Sample	**Arsenic Level**
HA-1B	6.3
HA-2B	7.8
HA-3B	3.8
HA-4B	5.9
HA-5B	7.2
HA-6B	5.1
HA-7B	3.75[1]
HA-8B	5.7
HA-9B	7.8
HA-10B	5.9
HA-11B	6.9
HA-12B	4.7
HAB-A-N	8.7
HAB-A-S	6.1
HAB-A-E	6.7
HAB-A-W	13
HAB-B-N	4.1
HAB-B-S	6.8
HAB-B-E	5.3
HAB-B-W	5.2
HAB-C-N	8.4
HAB-C-S	6.5
HAB-C-E	5.7
HAB-C-W	12
Background Mean	**6.64**
Background Standard Deviation	**2.24**
BRS[2]	**11.13**

2005 Perimeter Study Data	
Sample	**Arsenic Level**
PB-1A 5-10	1.20
PB-1B 5-10	12.70
PB-2 5-10	10.20
PB-3 5-10	4.20
PB-4 5-10	4.20
Sample Mean	**6.50**
Sample Standard Deviation	**4.76**
95 % Upper Confidence Limit Background Comparison	
BRS	11.13
Sample Mean	6.5
t value	2.13
SD	4.76
Study Size	5
Degrees of Freedom	4
Sample Value[3]	**11.03**

Conclusion:
Sample Value (11.03) is less than Background Remediation Standard (11.13) and is considered remediated.

[1] Value is the average between the sample value 3.9 and duplicate value 3.6 (3.9 + 3.6)/2 = 3.75
[2] BRS = Background Mean + (2 x Background Standard Deviation)
[3] Sample Value = Sample Mean + t value x (Sample Standard Deviation/Background Standard Deviation)

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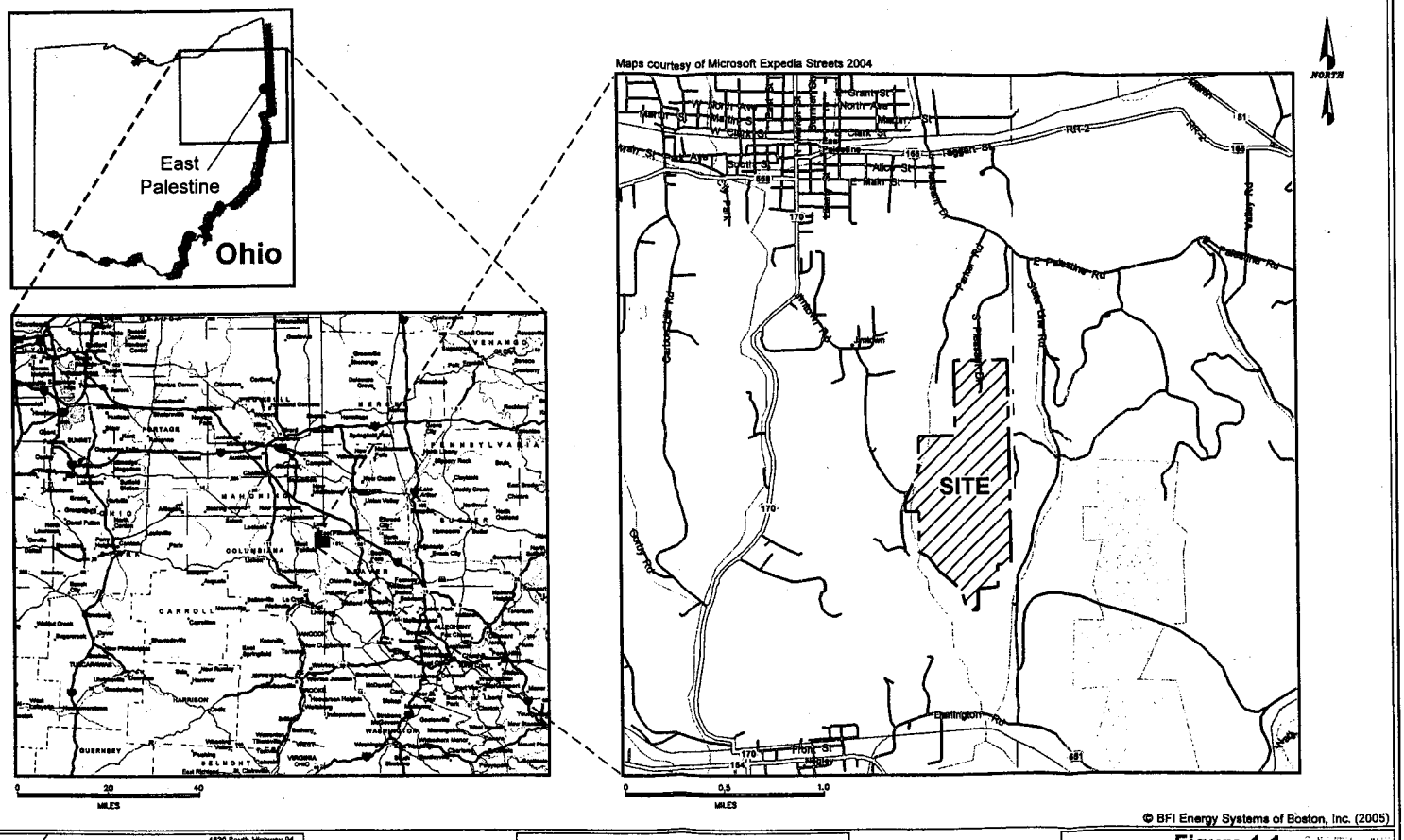
NOV 20 2006



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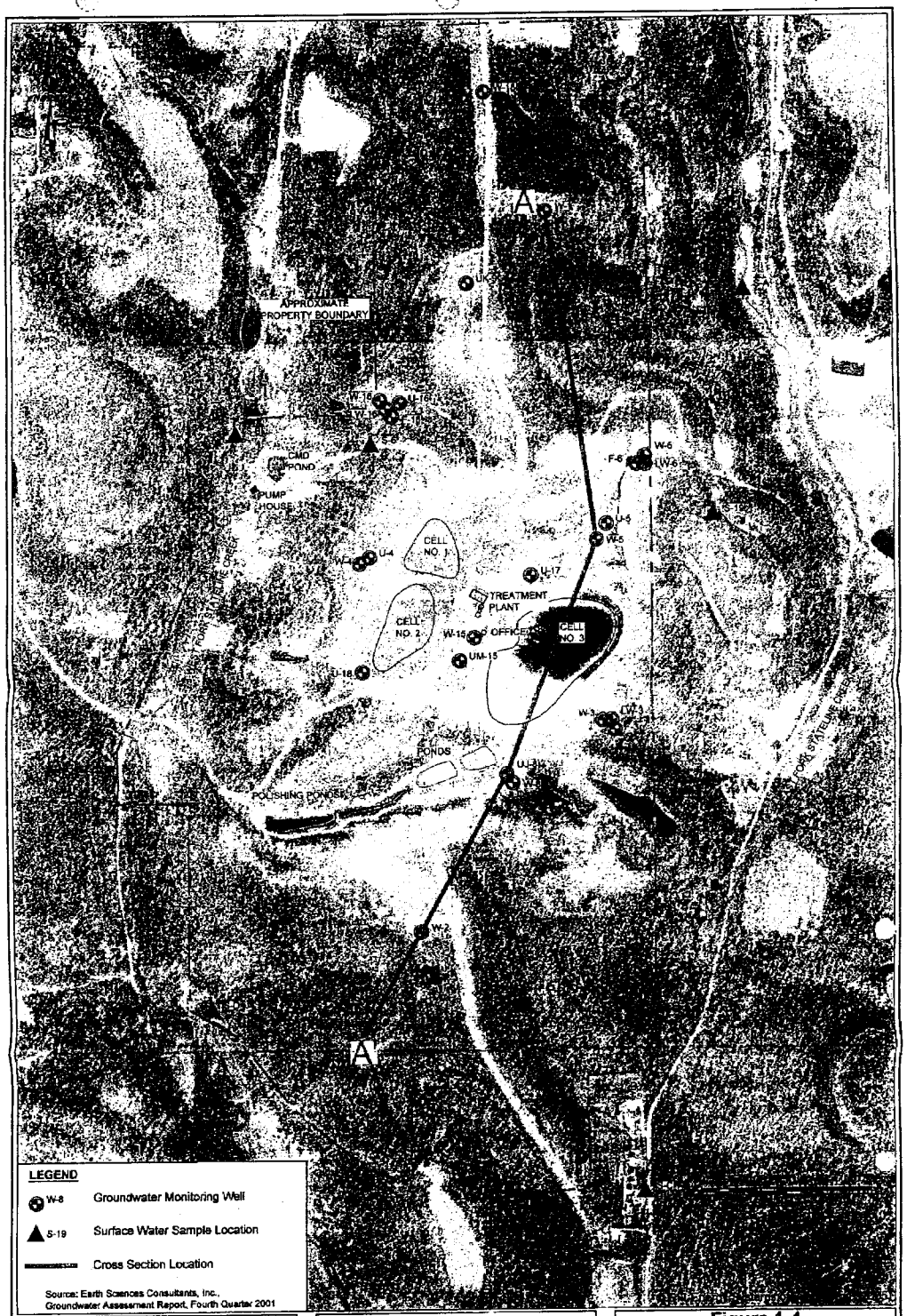
Ecological Services, Inc. Site
East Palestine, Ohio

Figure 1-1
Site Location Map

NOV 2



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Ecological Services, Inc. Site
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Figure 1-4
Monitoring Location Map

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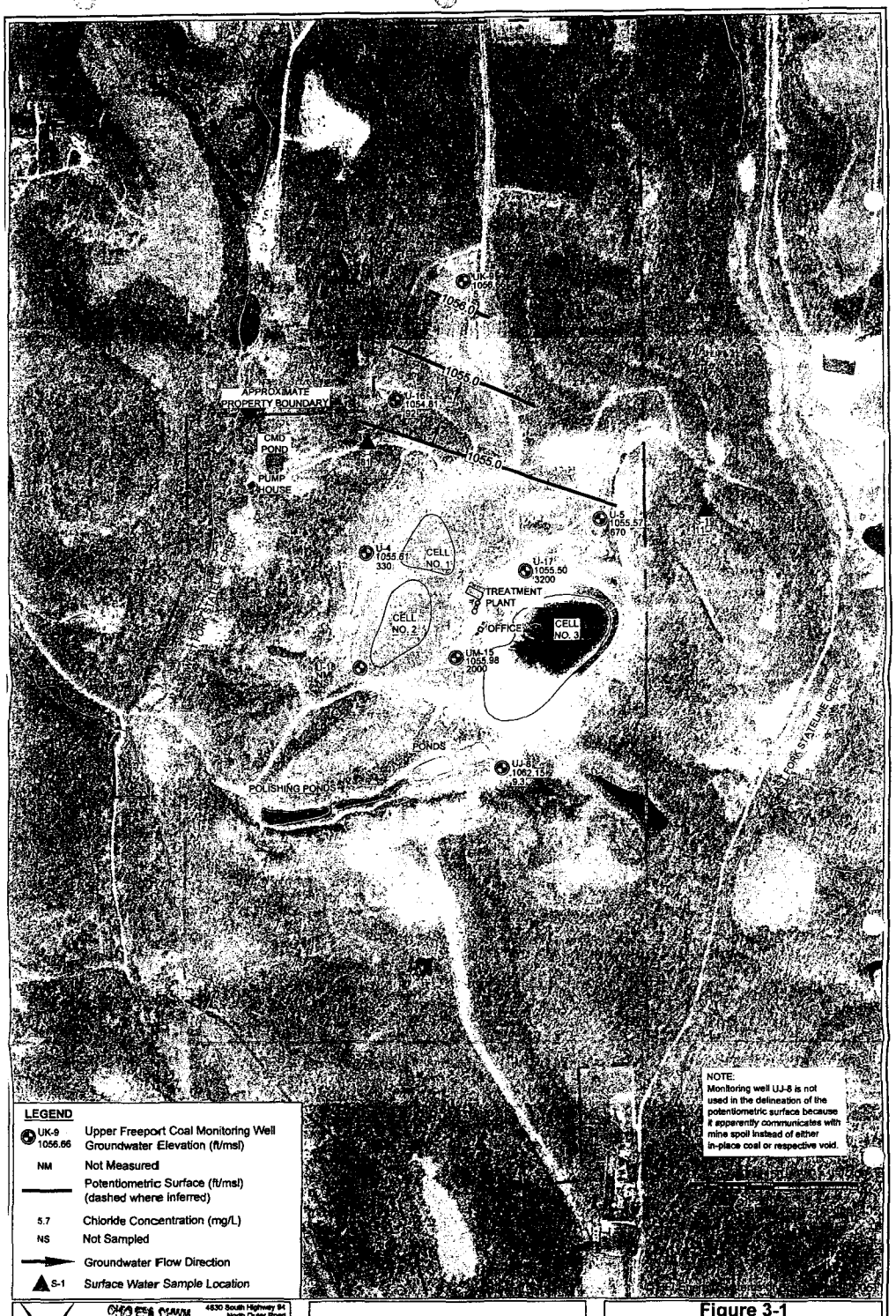

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Figure 3-1
Potentiometric Surface Map
Upper Freeport Coal
First Quarter 2005

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Figure 3-5
Potentiometric Surface Map
and Chloride Concentration
Butler Sandstone/Lower Freeport Coal
First Quarter 2005

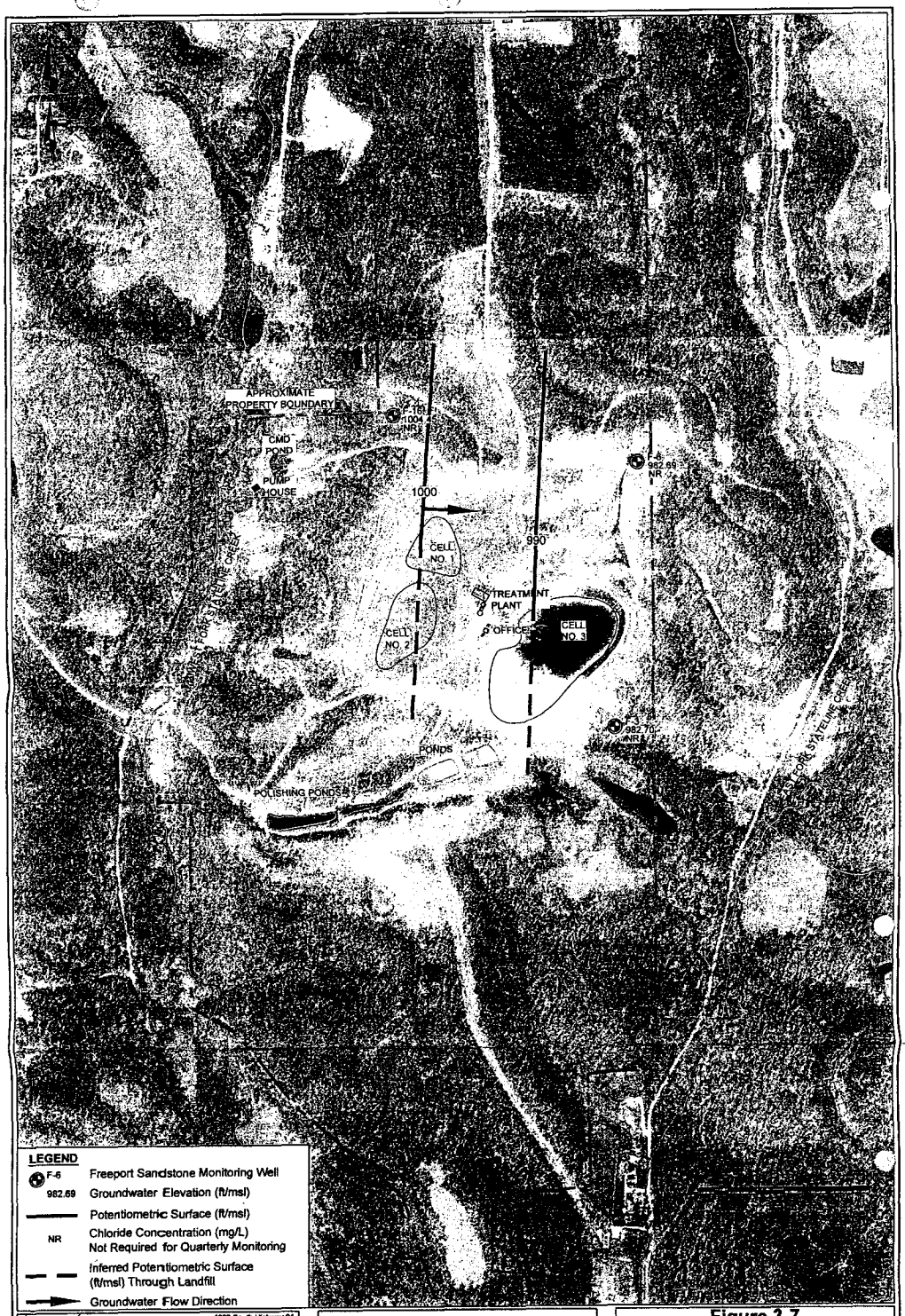

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Figure 3-7
Potentiometric Surface Map
Freeport Sandstone
First Quarter 2005

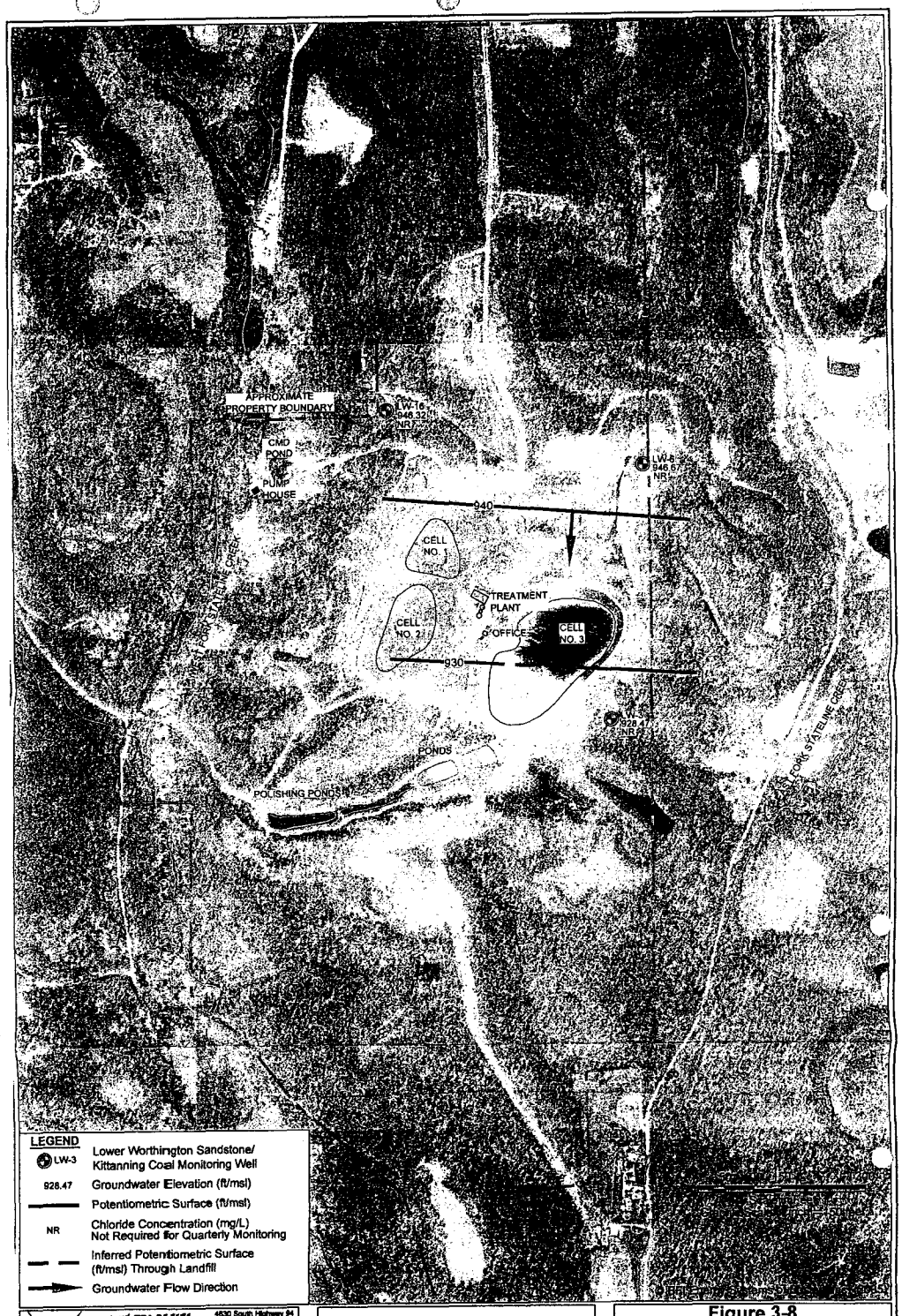

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Figure 3-8
Potentiometric Surface Map
Lower Worthington Sandstone/Kittanning
Coal Horizon - First Quarter 2005