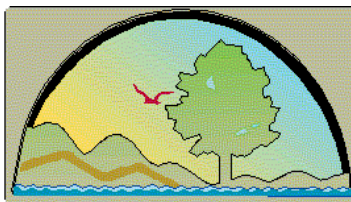


**MAXEY FLATS DISPOSAL SITE
ANNUAL REPORT
2004**

March 21, 2005



Environmental and Public Protection Cabinet
Department for Environmental Protection
Division of Waste Management
Superfund Branch

Maxey Flats Disposal Site
2597 Maxey Flat Road
Hillsboro, KY 41049
606-784-6612

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List of Acronyms

BoRP	Balance of Remedial Phase
Commonwealth	Commonwealth of Kentucky
DCSW	Drainage Channels Surface Water
IRP	Initial Remedial Phase
IMP	Interim Maintenance Period
MFDS	Maxey Flats Disposal Site
O & M	Operation and Maintenance Requirement Summary
PSVP	Performance Standards Verification Plan
PSSW	Perennial Streams Surface Water
RA	Remedial Action
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

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1.0 Introduction

The Maxey Flats Disposal Site (MFDS), located in Fleming County, Kentucky, approximately 10 miles northwest of Morehead, Kentucky, is an inactive low-level radioactive waste site owned by the Commonwealth of Kentucky (Commonwealth).

The Initial Remedial Phase (IRP), Remedial Action (RA) at the MFDS began in 1997 and concluded in June 2003. The U.S. Environmental Protection Agency (USEPA) issued the Certificate of Completion on October 6, 2003.

The Commonwealth is submitting this report in accordance with Section 4.0 of the Performance Verification Standard Plan (PSVP). The report details sampling and maintenance activities listed in the PSVP and the Operation and Maintenance Requirement Summary (O&M).

2.0 Scope of Work

The Interim Maintenance Period (IMP) is ongoing pursuant to the Consent Decree (Civil Action Number 95-58) signed by the U.S. Environmental Protection Agency (USEPA), the Maxey Flats Steering Committee (Settling Private Parties), and the Commonwealth. The Commonwealth is responsible for completion of the Balance of Remedial Phase (BoRP) that includes the Interim Maintenance Period, Final Closure Period and Associated Remedial Activities and Performance Monitoring.

The Interim Maintenance Period Work Plan describes the tasks to be completed including:

- Surface/ground water monitoring
- IRP cap maintenance and replacement
- Trench leachate management and monitoring
- Subsidence monitoring and surveys
- Erosion evaluation
- General site maintenance
- Contaminated liquid and waste disposal
- Data collection, analysis, and reporting
- Site drainage and erosion control features
- Installation of a horizontal flow barrier, if necessary

3.0 Surface Water Monitoring

3.1 East Detention Basin

The first point of monitoring surface water runoff from the Maxey Flats Disposal Site is at the East Detention Basin (EDB). Sampling is performed at the EDB based on storm events of 2.8 inches of rainfall in a 24-hour period. In order for the sequential sampler to collect a storm event sample, the sampler is programmed to collect a sample based on 0.11 inches of rainfall per hour. Appendix A contains a summary of the data obtained during this reporting period. A total of 36 samples were collected and analyzed for tritium. The annual average of tritium passing this point was 0.16 pCi/ml.

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3.2 Perennial Streams Surface Water

Perennial Streams Surface Water (PSSW) monitoring is performed in streams inside and outside the Maxey Flats Disposal Site's boundary. These locations are monitored using sequential samplers that collect a daily composite sample. The sampling data reflected in Appendix B indicates the 4-mrem/yr-dose limit is being met at these locations. Map locations for the PSSW stations are shown in Figure 1.

A total of 1,817 PSSW samples were collected and analyzed for tritium during this period with no anomalous data reported. Charts of the data collected during this period along with a summary of the PSSW data are presented in Appendix B1 and B2 respectively.

Background samples are collected at location 122A. This sampling location is designated as background due to the absence of the influence of site water runoff. The annual average of tritium passing this point was 0.06 pCi/ml.

Sampling locations 106B, 122C, and 103E are stream surface water locations inside the buffer zone boundary and are monitored for a comparison to either the 4-mrem/year-dose limit or a tritium concentration of 20 pCi/ml (the USEPA drinking water standard). The annual averages of tritium passing sampling locations 106B, 122C, and 103E were 4.58 pCi/ml, 1.10 pCi/ml, and 0.91 pCi/ml respectively.

Because of the confluence of three streams, and its location outside of the buffer zone, 102D is designated as the compliance point. Sampling location 102D is monitored for a comparison to either the 4-mrem/year dose limit or a tritium concentration of 20 pCi/ml. The annual average of tritium passing sampling location 102D was 0.78 pCi/ml.

3.3 Drainage Channels Surface Water

Drainage channels upstream of the perennial streams are monitored using sequential samplers that collect a daily composite sample. These locations are monitored for comparison to a 25-mrem/yr total effective dose equivalent (TEDE).

A total of 1,035 samples were collected and analyzed for tritium during this period with no anomalous data reported. Charts of the data collected during this period along with a summary of the drainage channel surface water data are presented in Appendix C1 and C2 respectively.

Drainage Channels Surface Water (DCSW) monitoring locations are shown in Figure 2. These locations are located in drainage channels upstream of the perennial streams. Included are C107 (West drain), 143 (South drain), and 144 (East drain). The annual averages of tritium passing these sampling locations were 13.57 pCi/ml, 0.21 pCi/ml, 61.32 pCi/ml respectively.

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Figure 1

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Figure 2

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Sample analyses from location C107 indicated an increase in tritium activity during this reporting period. The highest tritium activity detected was 31.55 pCi/ml in March 2004.

January 2004 marked the beginning of the collection of daily composite samples at location 144. The highest tritium activity detected was 218 pCi/ml in April 2004.

The sampling data reflected in Appendix C indicates the 25-mrem/yr-dose limit is being met at these locations.

3.4 Streams Surface Water Data Summary

The analytical results for those points established for compliance monitoring during the IMP demonstrates there is no risk to human health or the environment.

3.5 Sampling Equipment Status

Samples were collected in accordance with the PSVP unless problems occurred beyond site's control such as freezing lines, washouts, no flow, or power outages. Comments are noted in the data summary of Appendix B2 and Appendix C2.

Four samples were missed from sampling location 106 in December 2004 due to a spilt in the sampler's pump tube. The defect could not be seen during a routine visit. During sample collection, an employee noticed some empty sampler containers and began to investigate. The problem was found and repaired the same day.

4.0 Dose Assessment

Tritium via waterborne pathways is the only significant dose contributor identified from the MFDS. A list of the sampling locations with the average activity, and dose assessment is listed in Appendix D. Table 1 is a summary of the annual average dose for each sampling location for 2003 and 2004.

Table 1
Summary of Annual Average Dose (mrem)
All Sampling Locations
2003-2004

Location	Dose 2003 (mrem)	Dose 2004 (mrem)
122A	2.92E-03	2.61E-03
106	2.05E-01	2.10E-01
122C	4.55E-02	5.04E-02
102D	3.09E-02	3.58E-02
103E	2.45E-02	4.16E-02
143	9.94E-03	3.08E-03
144	2.68E+00	2.73E+00
C107	4.31E-01	6.28E-01
EDB	4.71E-03	7.54E-03

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Based on the assumption that all water sampled is available as drinking water, the annual whole-body dose for tritium in mrem/yr is calculated using the following equation:

$$D_{\text{whole body}}(\text{mrem/y}) = C_w \times U_w \times D_w$$

where

C_w = concentration of tritium in water (pCi/L)

U_w = water consumption rate (L/y) = 730L/y for maximally exposed individual

D_w = dose conversion factor (mrem/pCi)

= 6.3×10^{-8} mrem/pCi for tritium for whole body ingestion pathway for an adult

$D_{\text{whole body}}$ = effective dose equivalent (mrem/y) from ingestion of 730 L of potable water with tritium concentration C_w .

5.0 Groundwater Monitoring

Groundwater monitoring locations, referred to as alluvial wells and USGS monitoring wells, are shown in Figure 3 and Figure 4. Charts and a summary of the data collected during this period for the Alluvial Wells are located in Appendix E1 and E2. Charts and a summary of the data collected during this period for the USGS Monitoring Wells are located in Appendix E3 and E4.

5.1 Alluvial Wells

Alluvial well samples for this reporting period were collected as outlined in the PSVP. During this reporting period, a total of 30 samples were collected and analyzed for tritium. The tritium level detected in the alluvial wells varied from 0.00 to 17.12 pCi/ml. Appendix E1 shows the activity of the wells in chart form. A summary of the data obtained from the alluvial wells during this reporting period is presented in Appendix E2.

The monitoring frequency has temporarily been changed to quarterly for AW-1 due to elevated tritium levels. Samples collected from AW-1 in April 2002 indicated an increasing trend and peaked in April 2004 at 17.12 pCi/ml for tritium. With the increase in tritium activity, additional samples were collected in May and June 2004, with reported tritium activity of 15.34 pCi/ml and 15.05 pCi/ml respectively. The sample collected in July 2004 showed a decrease of tritium activity indicated by a result of 9.46 pCi/ml.

The concentration of tritium in AW-7 has shown a decreasing trend since the December 2001 (24.60 pCi/ml) sampling. The samples collected in April, July and October 2004 indicated tritium concentrations of 10.28 pCi/ml, 9.45 pCi/ml and 5.90 pCi/ml respectively.

Access to the alluvium within the buffer zone is controlled by the Commonwealth, therefore the alluvial wells are not considered a drinking water source and do not represent a potential radiological dose to the public.

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**Insert Figure 3
(PDF)**

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Insert Figure 4
(PDF)

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During the mowing of the buffer zone area in August, AW-5 was hit by the contractor performing the service. The lock on the cap of the well casing was broken, and two of the four bollards (well protectors) were loosened. Two bollards were removed to free the mower from the well area and prevent any additional damage to the well. Site personnel reset the bollards in concrete and installed a new lock.

5.2 USGS Monitoring Wells

Sixteen monitoring wells around the perimeter of the site are monitored using automatic monitoring devices to record the liquid level measurement. Of these sixteen wells, four wells were selected for sampling on a semi-annual basis.

Charts of the liquid level and a summary of liquid level data are presented in Appendix E3 and E4 respectively. A summary of the sampling data obtained from the USGS monitoring wells during this reporting period is presented in Table 2. The tritium activity ranged from 6,663 pCi/ml at N2B to 638,029 pCi/ml at UE-2.

Table 2
 USGS Monitoring Well Tritium Data
 2004

Well ID	4/13/2004			10/26-27/2004		
	Ground Level to Bottom (ft)	Ground Level to Liquid (ft)	Tritium Activity (pCi/ml)	Ground Level to Bottom (ft)	Ground Level to Liquid (ft)	Tritium Activity (pCi/ml)
N2B	12.40	11.64	6,663 +/- 5	12.40	12.02	337,029 +/- 37
UE-2	18.50	17.33	638,029 +/- 50	18.50	17.07	502,260 +/- 32
UF-2	17.30	13.57	213,624 +/- 29	17.30	13.34	249,707 +/- 32
UF-10a		29.99	34,135 +/-12		30.23	39,157 +/- 13
UK-1	15.70	13.81	313,902 +/- 35	15.70	13.56	453,865 +/- 43

6.0 Data Management

A data package is prepared for each group of samples analyzed on site. The data package contains the instrument's QC charts (efficiency and background), chain of custody form(s), raw data sheet, and data reduction sheet. Data is reviewed and validated through on-site procedures. An employee of the Commonwealth whose normal duties are not involved with the Maxey Flats Disposal Site validates the data monthly. Following validation, the data is entered into the site's database and transmitted to USEPA, USDOE, *de maximis inc.*, and the Commonwealth.

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6.1 Data Reporting

Sampling data for the IMP was reported in accordance with the PSVP. The following indicates the month and the date the data was sent via e-mail to all parties.

Month	Date Sent	Month	Date Sent
January	2/18/04	July	8/26/04
February	3/10/04	August	9/27/04
March	4/22/04	September	11/03/04
April	5/17/04	October	11/18/04
May	6/16/04	November	12/14/04
June	7/21/04	December	01/18/05

The Semi-annual report was submitted to EPA and *de maximis, inc.* on August 3, 2003.

7.0 Rainfall Data

Presently there are three rain gauges on site: East Detention Basin, UF-37, and the main office. The annual rainfall data presented in Appendix F was obtained from the rain gauge located at the East Detention Basin. This data was chosen because the gauge is used in conjunction with the sampler at the East Detention Basin. A total of 50.32 inches of rainfall was measured at this gauge during the year 2004.

8.0 Initial Remedial Phase Cap Maintenance

8.1 Geo-membrane liner and boots

The annual inspection of the geo-membrane liner covering the trench cap began in April 2004 and was completed in June 2004. Air lancing of the field seams and visual inspection of the factory seams were conducted as required in O&M, Sections 3.1.1, Geo-membrane Liner Maintenance and 3.1.2, Geo-membrane Liner Boots. A list of the defects found during the annual inspection and throughout the reporting period is located in Table 3. Geo-membrane Liner Repair Locations; Figure 5, shows the locations of defective areas where repairs were made to the geo-membrane liner during this period.

The trench sump boots were inspected during the monthly liner inspections and during the downloading of the trench sump liquid level measurements. During this period there were no signs of any defects at the sump boots.

A summary of the repairs made to the geo-membrane liner for 2004 is presented in Appendix G along with the repair and quality assurance forms. Other routine inspections performed during this period are presented in Appendix H. These inspections indicated the geo-membrane liner was functioning as designed and meeting performance standards.

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TABLE 3
Liner Defects Reported
2004

Liner Panel #	Description	Repair Date
NW corner of LP 98	Field seam, approximately 1 inch	5/17/04
NE corner of LP 137	Field seam, six inches	5/17/04
10 ft south of NW corner LP 192	Field seam, ½ inch	5/17/04
5 ft south of NE corner LP 180	Field seam, 1 inch	5/17/04
8 ft south of NE corner LP 180	Field seam, 1 inch	5/17/04
5 ft W of NE corner LP 387*	Field seam, 24 inches	5/17/04
NE corner of LP 151	Field seam, 5 inches	5/17/04
Middle of north edge, LP 190	Field seam, 10 inches	5/17/04
North end of panhandle, LP 299	Field seam, 1 inch	5/17/04
10 ft W of NE corner, LP 278	Field seam, 1 inch	5/17/04
SW corner LP 34	Field seam, 3 inches	5/17/04
NE corner, LP 344	Field seam, 2 inches	5/24/04
NE corner, LP 341	Field seam, ½ inch	5/24/04
NE corner, LP 341	Field seam, ½ inch; second defect in area	5/24/04
NE corner, LP 378	Field seam, 1 inch	5/24/04
Middle of N edge, LP 237	Filed seam, ½ inch	5/24/04
3 ft from SE corner, LP 206	4 inch cut in liner	5/24/04
3 ft NE of SW corner, LP 343	Bad weld	5/24/04
Middle LP 29, anchor trench	Bad weld	5/24/04
8 ft from LP 1-20 field seam	5 inch tear, outside edge	6/29/04
Center of LP 66	3 inch cut	6/29/04
3 ft N of defect 062904-3;	7 inch cut to release water under liner	6/29/04
Outer edge LP 249 EX		
2 ft north of defect 062904-4	5 inch cut to release water under liner	6/29/04
Outer edge of LP 249 EX		
15 ft from N edge of	1 inch cut to release water under liner	6/29/04
LP 363/348 field seam		
15 ft from AB Mats along	6 inch cut to release water under liner	6/29/04
LP 281/289 field seam		
1 ft from outer edge, 6 ft from	½ inch sampling port	6/30/04
south edge, LP 240EX		

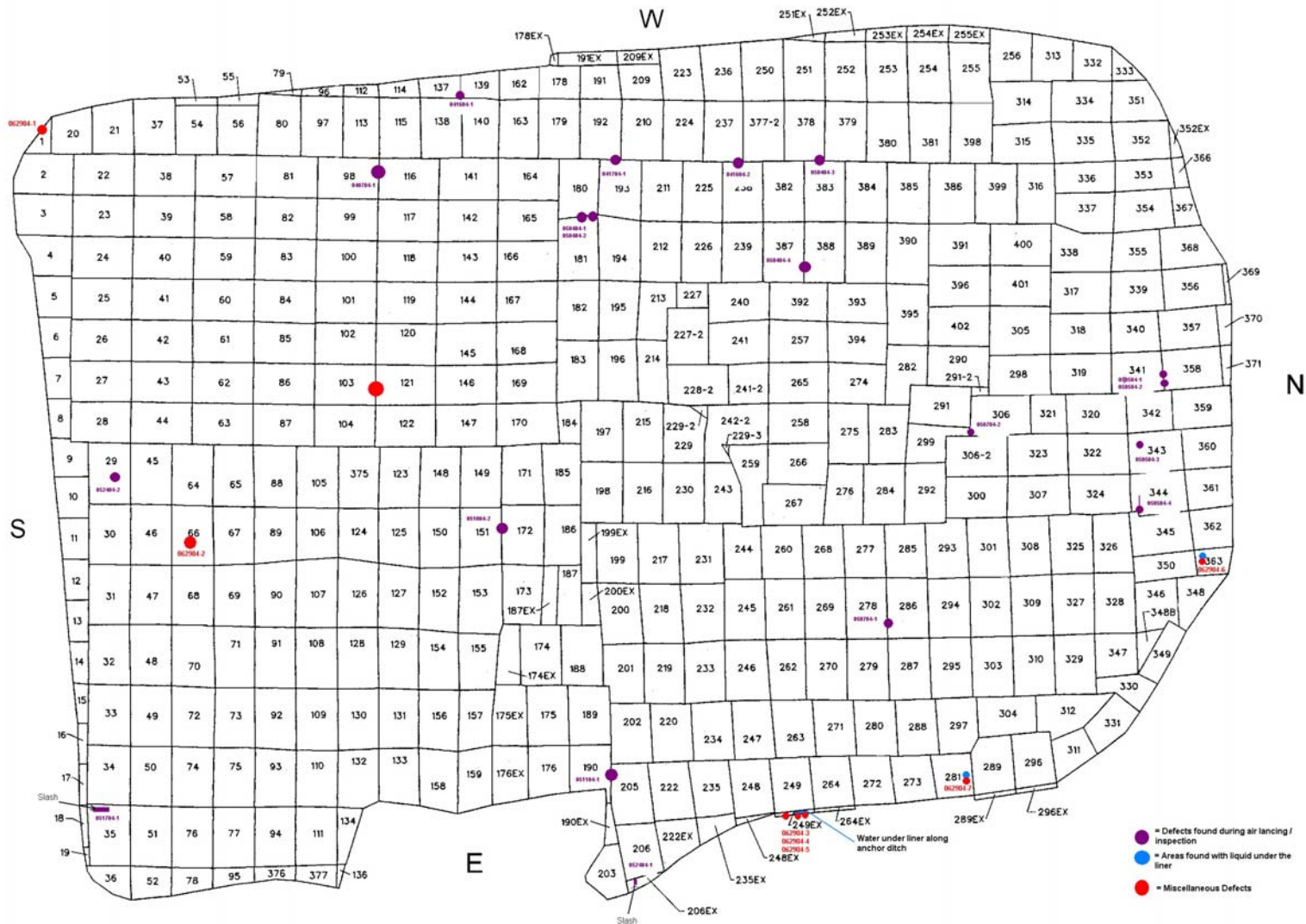
* This defect was leistered on 5/4/04.
 Leistering is a temporary method of joining liner material prior to permanent repair.

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Figure 5 - Geo-membrane Liner Repair Locations



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8.2 Headwall Maintenance

Headwall maintenance includes the four headwalls and associated items along the North Channel and the NE corner piping, geo-membrane liner batten, and the liquid collection system.

During this reporting period debris/leaves were removed multiple times from the trash grate and restricting plate of the upstream headwall of the NE Corner piping. Removal of the leaves/debris will be a continuous maintenance issue for the site.

Liquid was detected under the liner at Headwall A (the western-most headwall in the North Channel) twice during this reporting period. Samples were collected and analyzed in July and August with tritium activities of 4.11 pCi/ml and 3.54 pCi/ml respectively. The liquid was pumped from the headwall and released to the grassy area along the north side of the channel. An estimated 300 gallons were removed in July and 100 gallons in August. Investigations were conducted to locate the source of the liquid, but none was found. Inspections of this area for the remainder of the year has indicated no further liquid accumulation.

8.3 Subsidence Monitoring and Repair

Subsidence inspections were conducted monthly in accordance with the O&M, Section 3.3.3, Subsidence Monitoring. No noticeable subsidence of the trench area was observed during this reporting period.

Curd Surveying, Inc. was on site during April 2004 performing the annual engineering survey of the trench cap. Elevations were obtained for the twenty-eight locations established during the remedial work. In view of the fact that no elevation measurements were obtained when the points were established, no comparison can be made for this report. A topographic map generated by the remedial contractor shows the location of each subsidence survey point, however the precise elevation cannot be determined. Table 4 shows the measurements obtained by Curd Surveying, Inc. that will be the baseline data used for comparison in the future.

8.4 Diversion Berms

The diversion berms were inspected twice a month as required by the O&M. All were found to be in satisfactory condition.

No liquid was detected under the geo-membrane liner at the diversion berms.

8.5 Anchor Trenches

The anchor trenches were inspected twice a month as required by the O&M. As a result of the annual inspection, one anchor trench liner repair was required. The repair was completed May 24, 2005.

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Table 4
SUBSIDENCE SURVEY
 Maxey Flats Disposal Site

Control Point		Apr-04 Elevation	Control Point		Apr-04 Elevation
1	N 276,929 E 2,194,385	1061.82	15	N 277,013 E 2,194,941	1060.65
2	N 277,051 E 2,194,501	1064.53	16	N 277,074 E 2,194,986	1058.84
3	N 277,065 E 2,194,625	1064.72	17	N 276,568 E 2,194,955	1054.77
4	N 277,143 E 2,194,673	1063.9	18	N 276,487 E 2,195,026	1050.9
5	N 277,284 E 2,194,459	1058.81	19	N 277,177 E 2,195,335	1047.4
6	N 277,281 E 2,194,621	1063.65	20	N 277,146 E 2,195,406	1045.59
7	N 277,413 E 2,194,725	1061.72	21	N 277,114 E 2,195,484	1042.68
8	N 277,478 E 2,194,627	1059.75	22	N 277,085 E 2,195,540	1039.28
9	N 277,543 E 2,194,690	1060.73	23	N 277,270 E 2,195,510	1049.75
10	N 276,728 E 2,194,626	1057.06	24	N 277,431 E 2,195,485	1053.08
11	N 276,829 E 2,194,704	1060.61	25	N 277,384 E 2,195,561	1052.27
12	N 276,883 E 2,194,844	1062.31	26	N 277,346 E 2,195,645	1048.32
13	N 276,965 E 2,194,697	1063.64	27	N 277,320 E 2,195,694	1045.39
14	N 276,976 E 2,194,798	1063.55	28	N 277,675 E 2,195,462	1059.72

Survey conducted by Curd Surveying, Engineering & Land Consulting, Inc., Morehead, Kentucky

No baseline measurements were obtained during the site's remediation.
 April 2004 data is being used as Baseline Measurements.

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8.6 Drainage Channels

All drainage channels were inspected during this period as required by the O&M. Control of weeds and vegetation in the Articulating Block mats and at the gabions was performed by spraying the areas with weed killer and/or manually removing the vegetation.

8.7 Articulating Concrete Block Mat (AB mat) System

The AB mat system was inspected monthly as required by the O&M.

South Channel Articulating Block Mats

A rain event occurring in June 2004 caused minor movement to the articulating blocks (AB mats) in the South Channel. Realignment of the AB mats was made by site personnel on June 10, 2004.

A rain event on July 12, 2004 caused major movement of the AB mats in the South Channel. The damage caused by this incident was beyond the scope of site resources. The Commonwealth notified the U.S. Environmental Protection Agency and *de maximis, inc.* of the occurrence in July 2004. In accordance with the Consent Decree, the contractor was responsible for making the repairs.

Following an evaluation of the disturbance of the AB mats by David Schaad of Marshall, Miller & Associates in August 2004, conference calls were scheduled to discuss the action to be taken. During the conference call on October 13, 2004, the Commonwealth and USEPA were notified that a workplan was being prepared by SHAW (the former lead contractor for site remediation) to make the necessary repairs.

The Commonwealth agreed to handle the task of radiological health and safety as it related to training, oversight, and access. A radiological safety training class was held on November 8, 2004 for workers that would be entering the restricted area. Mobilization also began on November 8, 2004 with a projected completion date of November 24, 2004.

The first task was to remove organic material and debris from the existing, smaller-sized cc45 AB Mats.

The connecting cable clamps were then removed to allow realignment and replacement. A 200-ton crane was mobilized on November 9, 2004 for this task. The six cc45 (8 ft x 16 ft) AB mats at the end of the south channel were replaced with twelve larger-sized cc70 (4 ft x 16 ft) AB mats. Nine other cc45 AB mats that were damaged beyond usability were also replaced. Following this procedure, the stainless steel clamps were reinstalled.

Following the realignment/replacement of the AB Mats, a bonding agent was applied. Prior to placing the cementitious fill material, five rows of 3/16 inch diameter stainless

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steel cable were laced through the cc45 AB mats. Cementitious material was then placed in the void spaces of the individual AB mat blocks.

After the cementitious fill material was allowed to cure, cc70 AB mats were staggered atop the cc45 AB mats for further flow control. Finally, the cc70 AB mats were secured using turnbuckles and cable clamps as required.

Photo 1 shows the AB mats in the South Channel following the rain event in July 2004. Photo 2 shows AB Mats being lifted for realignment. As mats were lifted, debris was removed from under each mat. Photo 3 shows a new cc45 mat being installed to replace a damaged cc45 mat.

The work on the AB Mats in the South Channel was completed on November 18, 2004.

8.8 Former Leachate Storage Facility Area

The covered area of the former leachate storage facility was found to be in satisfactory condition. The area shows no signs of subsidence or any damage to the geo-membrane liner or boots around the tank extensions.

8.9 Inspections

A total of 97 inspections were performed during the period of January 2004 through December 2004. All items inspected were found to be in satisfactory condition and meeting performance standards. Appendix H contains all inspection forms completed during this period.

8.10 Equipment Status

All liner repair equipment remains in good working condition. Quality control (QC) checks of the liner welding equipment are conducted prior to making repairs to the geo-membrane liner. Following the completion of liner repairs, the equipment is cleaned and placed in storage.

9.0 Trench Leachate Management and Monitoring

Trench sump liquid level measurements were obtained in accordance with the PSVP, Section 2.3, Sump Measurement. The purpose for collection and evaluation of the trench sump leachate levels are to:

- Detect recharge conditions that may require leachate management
- Provide data for future evaluation of the horizontal flow barriers

An electronic water level monitoring device collects daily water level measurements of the trench sumps and stores the data via data loggers prior to electronic downloading. The data loggers are programmed to obtain a liquid level measurement once per day. Of the 83 trench sumps, 77 trench sumps have automatic monitoring devices. The remaining six sumps do not have automatic monitoring devices because they are either dry or have insufficient liquid for the automatic monitoring devices to function properly.

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Photo 1
AB mats in South Channel
following major rain event.
Photo by Jeff Stamper.



Photo 2
AB mats in Southeast channel
being lifted for realignment
Photo by T. Stewart

Photo 3
New cc45 mat being installed
Photo by T. Stewart

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A manual level measurement of all trench sumps' leachate was performed during October of this reporting period. The manual measurements verify readings obtained from the electronic water level monitoring device automatic monitoring devices. The necessary adjustments were made to the data loggers to correlate the manual measurements with the readings obtained from the data loggers.

Charts and a summary of the liquid level measurements for all 83 trench sumps are found in Appendix I1 and I2, respectively. The freeboard calculation for each trench sump is shown by their respective graph.

10.0 Contaminated Liquid and Solid Waste

Contaminated liquid and waste generated on site will be disposed of in accordance with the IMP Work Plan; Section 3.2, Treatment of Other Contaminated Liquids, and Section 3.3, Waste Burial.

No liquid removed from the trench cap area required storage in the on-site liquid storage tank during this reporting period. No solid waste was disposed on site during this reporting period. Limited laboratory waste was generated through normal work at the site.

11.0 Erosion Monitoring

Erosion monitoring consists of obtaining elevation measurements and observations of the east drainage channel. The U.S. Geological Survey monitored the East Main Drainage Channel twice during this reporting period. Locations of the erosion monuments are shown in Figure 6. Charts of the erosion measurements obtained during this period are found in Appendix J1. The erosion measurements are found in Appendix J2. A summary of the area for each cross section at the East Drain is presented in Appendix J3. Photographic depictions of the marker locations are included on this compact disc under the file labeled "USGS Erosion Marker 2004".

There were no major water erosion or mud/rock slides evident in the channel during this reporting period.

Inspections of the south and west channels were completed in the spring and fall, with minimal erosion observed.

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Figure 6

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12.0 IMP Work Plan Revisions, Changes and Correspondence

Revisions and changes to the IMP Work Plan are required to be in writing and submitted to USEPA for approval. During this reporting period, three revisions or changes for the inspection forms were submitted.

- Change the heading for the Daily/Weekly Inspection to allow for individual performing the inspection to initial and remove severe weather requirement from inspection since it is a daily inspection.
- Remove severe weather requirements from quarterly, semi-annual, and annual inspections.
- Change severe weather condition from 1.5 inches of rain to 2.8 inches to be consistent with the PSVP. A storm event is listed as 2.8 inches in a twenty-four hour period.

Change request forms were sent to USEPA March 22, 2004 and a copy sent to *de maximis inc.*

13.0 Custodial Care Activities

13.1 Vegetation

Vegetation covering the areas that were disturbed during the remedial activities is slowly being established. These areas were maintained by reseeding, fertilizing, and mowing.

Seven low areas located in the north borrow area were repaired by Shearer and Thompson Farm Supply. These areas were filled with topsoil, seeded, fertilized, and covered with mulch.

13.2 Building Maintenance

Routine maintenance was conducted for all on site buildings. No major modifications or repairs were necessary during this reporting period.

13.3 Security Fence

The security fence surrounding the site remains in satisfactory condition with minor maintenance required. The gates and locking mechanisms were checked and maintenance was performed as indicated by the O&M plan. During a training exercise conducted by the Kentucky Department of Forestry on February 25, 2004, a 20 foot section of the fence was damaged by a falling tree. No breach of security occurred during the period of the damage until repairs were made. Materials were ordered for the necessary repairs, and repairs were completed in the early part of March 2004.

Story Tree Service, a local contractor, was hired to remove approximately 50 trees from the west side of the site. Trees removed posed a potential threat to the perimeter fence and/or the geo-membrane liner. To avoid any erosion concerns, the stumps were left intact. Work was completed by December 27, 2004.

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13.4 Roadway Maintenance

The perimeter road around the site remains in good condition.

14.0 Cathodic Protection

The cathodic protection for the underground waste disposal tank was checked monthly. All readings were within the accepted range according to the operating instructions. Table 5 shows the recordings by date of the DC voltage and Amperage.

Sam Vessel, Corrosion Technical Services, was on site in April 2004 to perform the annual inspection of the Cathodic Protection System. The system was working as designed. A certification form was issued to the Commonwealth and is included as Figure 7.

To have qualified staff onsite, arrangements were made for Tom Stewart, site employee to receive Cathodic Protection Systems training. Tom was certified on April 29, 2004 by Specialized Environmental Equipment, Inc.

15.0 Conclusion

This concludes the textual outlining of the maintenance activities at the Maxey Flats Disposal site for 2004. The remainder of the document consists of: data, charts, and summaries, liner inspection and repair forms, and other graphical materials aforementioned.

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Table 5
Cathodic Protection Readings
2004

Date	Reading (DC volts)	Reading (DC Amps)	Reading By:
January	7.0	1.90	Roger Brown
February	7.0	1.80	Jeff Stamper
March	7.0	1.80	Jeff Stamper
April	6.0	1.80	Jeff Stamper
May	6.0	1.80	Jeff Stamper
June	6.0	1.80	Jeff Stamper
July	6.0	1.80	Jeff Stamper
August	6.0	1.80	Jeff Stamper
September	6.0	1.80	Jeff Stamper
October	6.5	2.00	Roger Brown
November	6.5	1.90	Roger Brown
December	6.5	1.80	Roger Brown

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Insert Figure 7
(PDF)
Cathodic Protection Certificate

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APPENDIX A

**EAST DETENTION BASIN
DATA CHARTS AND SUMMARY
2004**

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APPENDIX A1

**EAST DETENTION BASIN
DATA CHARTS
2004**

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2004

APPENDIX A2

**EAST DETENTION BASIN
DATA SUMMARY
2004**

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2004

APPENDIX B

**PERENNIAL STREAMS SURFACE WATER
DATA CHARTS AND SUMMARY
2004**

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2004

APPENDIX B1

**PERENNIAL STREAMS SURFACE WATER
DATA CHARTS
2004**

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Maxey Flats Disposal Site
2004

APPENDIX B2

**PERENNIAL STREAMS SURFACE WATER
DATA SUMMARY
2004**

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2004

APPENDIX C

**DRAINAGE CHANNEL SURFACE WATER
DATA CHARTS AND SUMMARY
2004**

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2004

APPENDIX C1

**DRAINAGE CHANNEL SURFACE WATER
DATA CHARTS
2004**

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Maxey Flats Disposal Site
2004

APPENDIX C2

**DRAINAGE CHANNEL SURFACE WATER
DATA SUMMARY
2004**

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APPENDIX D
DOSE ASSESSMENT
2004

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APPENDIX E

GOUNDWATER MONITORING
(ALLUVIAL AND USGS MONITORING WELLS)
DATA CHARTS AND SUMMARY
2004

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2004

APPENDIX E1

ALLUVIAL WELLS
DATA CHARTS
2004

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2004

APPENDIX E2

**ALLUVIAL WELLS
DATA SUMMARY
2004**

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APPENDIX E3

**USGS MONITORING WELLS
LIQUID LEVEL CHARTS
2004**

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APPENDIX E4

**USGS MONITORING WELLS
LIQUID LEVEL SUMMARY
2004**

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APPENDIX F

MAXEY FLATS DISPOSAL SITE
RAINFALL DATA
2004

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APPENDIX G

MAXEY FLATS DISPOSAL SITE
INITIAL REMEDIAL PHASE CAP MAINTENANCE
LINER REPAIRS
2004

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APPENDIX H

MAXEY FLATS DISPOSAL SITE
INITIAL REMEDIAL PHASE CAP MAINTENANCE
INSPECTION FORMS
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2004

APPENDIX I

MAXEY FLATS DISPOSAL SITE
TRENCH LEACHATE MANAGEMENT
2004

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APPENDIX I1

MAXEY FLATS DISPOSAL SITE
TRENCH SUMP LIQUID LEVEL CHARTS
2004

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APPENDIX I2

**MAXEY FLATS DISPOSAL SITE
LEACHATE LEVEL MEASUREMENTS
2004**

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APPENDIX J

MAXEY FLATS DISPOSAL SITE
EAST DRAIN – EROSION MONITORING
2004

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Maxey Flats Disposal Site
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APPENDIX J1

**EAST DRAIN – EROSION MONITORING
CROSS-SECTION CHARTS
2004**

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Maxey Flats Disposal Site
2004

APPENDIX J2

**EAST DRAIN – EROSION MONITORING
CROSS-SECTION DATA SUMMARY
2004**

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Maxey Flats Disposal Site
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APPENDIX J3

**EAST DRAIN – EROSION MONITORING
CROSS-SECTION AREAS
2004**