ENERGY AND ENVIRONMENT CABINET

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Department for Environmental Protection
Division of Waste Management
Maxey Flats Project
2597 Maxey Flat Rd.
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March 16, 2012

Ms. Pam Scully, SRPM, Kentucky/Tennessee Section
USEPA-Region IV
Sam Nunn Atlantic Federal Center
Tower-11th Floor (Mail Code: 4WD-NSMB)
61 Forsyth Street, SW
Atlanta, GA 30303-8960

Subject: Maxey Flats Project –2011 Annual Report

Dear Ms. Scully;

The Commonwealth of Kentucky is submitting the 2011 Annual Report for the Maxey Flats Project to fulfill the requirements of Section 4.0 of the Performance Verification Standard Plan (PSVP). The report was prepared by the Maxey Flats Section and summarizes information from the period of January 2011 through December 2011.

If you have any questions, please contact me at (606) 783-8680.

Sincerely,

Scott Wilburn, Project Coordinator

e-attachment

cc:
Nicole Barkasi, *de maximis, inc.*
Michelle Miller, USDOE
Shawn Cecil, Superfund Branch, Division of Waste Management
Matt McKinley, Radiation Health Branch, Cabinet for Health and Family Services

MAXEY FLATS PROJECT
ANNUAL REPORT
2011

March 16, 2012

Energy and Environment Cabinet
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Superfund Branch

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List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
BoRP	Balance of Remedial Phase
Commonwealth	Commonwealth of Kentucky
DCSW	Drainage Channels Surface Water
IRP	Initial Remedial Phase
IMP	Interim Maintenance Period
MFP	Maxey Flats Project
O&M	Operation and Maintenance Requirement Summary
PSVP	Performance Standards Verification Plan
PSSW	Perennial Streams Surface Water
REI	Reasonably Exposed Individual
RML	Radioactive Material License
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

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List of Appendices
(Files separate from Main Report included on disc)

1.0 Introduction

The Commonwealth is submitting this report in accordance with Section 4.0 of the PSVP. The report summarizes sampling and maintenance activities listed in the Interim Maintenance Period Work Plans, PSVP, and the O&M.

2.0 Scope of Work

The IMP is ongoing pursuant to the Consent Decree (Civil Action Number 95-58) signed by the USEPA, the Maxey Flats Steering Committee (Settling Private Parties), and the Commonwealth. The Commonwealth is responsible for completion of the 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

3.0 Surface Water Monitoring

All IMP Surface water monitoring locations are evaluated based on tritium sampling results. The 2011 annual tritium averages for all surface water locations yielded results below their specified screening assessment levels. According to the 2007 Five Year Review, page 29, additional radiological analysis will be performed if the tritium annual average exceeds 50% of the ARAR's screening assessment level. No additional radiological analyses were required in 2011. Tritium results for all surface water monitoring appear in Appendix A: Maxey Flats Project Analytical Data 2011; *2011 Maxey Flats Project Tritium Data.xlsx*.

3.1 East Detention Basin

The first point of monitoring surface water runoff from the MFP is at the East Detention Basin (EDB). Sampling is performed at the EDB as a requirement of the RML, not the IMP Work Plan. Sampling occurs 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. A total of 50 samples were collected in 2011 and analyzed for tritium. Results ranged from -0.01 to 2.49 pCi/ml. Figure 3-1 on page 4 provides the IMP Annual Average for Tritium Concentrations for 2004-2011.

The IMP Work Plan requires monitoring of rainfall and flow at the EDB for comparison against 2, 10, 25 and 100 year storm events. MFP rainfall database indicated no 2 year or greater storm events occurred during 2011, therefore no screening comparison of current flow rate versus pre-developed flow rate was necessary.

3.2 Perennial Streams Surface Water

Perennial Streams Surface Water (PSSW) monitoring is conducted at five locations in three streams inside and outside the MFP's boundary. These locations are monitored using sequential samplers that collect a four aliquot daily composite. The PSSW samples are compared to a specific screening level of 20 pCi/ml. A total of 1,795 PSSW samples were collected and analyzed for tritium during 2011 with no anomalous data reported. For 2011, all PSSW locations were below the average annual tritium screening level of 20 pCi/ml; assuring that the 4 mrem/yr IMP specified dose limit has been met. Figure 3-1 on page 4 provides the IMP Annual Average Tritium Concentrations for 2004-2011.

Sample location 122A serves as the background sample. It is located on Rock Lick Creek up-gradient from site influence. Tritium results for 2011 at this location ranged from -0.25 to 5.71 pCi/ml.

Sample location 106 is located on No Name Branch, a tributary to Rock Lick Creek. Location 106 receives direct influence from drain 144 and exhibits seasonal tritium level fluctuation concurrent with drain 144. Tritium results for 2011 at this location ranged from 0.61 to 10.85 pCi/ml.

Sample location 122C is located on Rock Lick Creek, downstream of 106 and 143 influences. Tritium results for 2011 at this location ranged from 0.17 to 4.60 pCi/ml.

Sample location 103E is located on Drip Springs Creek and receives influence from Drain 107. Tritium results for 2011 at this location ranged from -0.18 to 1.50 pCi/ml.

Sample location 102D is the only PSSW sampler located outside the Buffer Zone. Due to its location below the confluence of three streams and its location outside the Buffer Zone, 102D is designated as the compliance point for site runoff. In addition to the screening level of 20 pCi/ml, this location is also the point for monitoring the Reasonably Exposed Individual (REI) and is compared to a

4 mrem/year dose limit. Tritium results for 2011 at this location ranged from 0.12 to 1.69; the average is well below the action level, assuring that the 4 mrem/yr dose limit has been achieved.

3.3 Drainage Channels Surface Water

Drainage Channels Surface Water (DCSW) monitoring is conducted at three locations inside the MFP's boundary. The three primary drains that produce intermittent flow are monitored and compared to a 25 mrem/year standard and a more restrictive annual 100 pCi/ml screening level. These drains are sampled as a composite by automated samplers that collect a four aliquot daily sample. For 2011, all three drains produced annual averages below the 100 pCi/ml action level, assuring that the REI is less than the 25 mrem/yr IMP standard. A total of 881 samples were collected from the drains for tritium analysis. Figure 3-1 on page 4 provides the IMP Annual Average Tritium Concentrations 2004-2011.

Sample location C107 is located at the base of the West Drain which discharges into Drip Springs Creek. For 2011, this location yielded 180 samples for tritium analysis. Results ranged from 1.78 pCi/ml to 25.22 pCi/ml.

Sample location 143 is located near the base of the South Drain which discharges into Rock Lick Creek. For 2011, this location yielded 344 samples for tritium analysis. Results ranged from -0.54 pCi/ml to 0.29 pCi/ml.

Sample location 144 is located at the base of the East Drain which discharges into No Name Branch. For 2011, this location yielded 357 samples for tritium analysis. Results ranged from 1.35 pCi/ml to 175.41 pCi/ml.

3.4 Sampling Equipment Status

Samples were collected in accordance with the PSVP unless problems occurred beyond control such as freezing lines, washouts, equipment failure, no flow, or power outages.

Maxey Flats Project
Annual Average Tritium Concentration (pCi/mL)
2004-2011

		Perennial Streams Surface Water					Drainage Channels Surface Water		
	EDB	**122A**	**106B**	**122C**	**103E**	**102D**	**C107**	**143**	**144**
2011	0.38	0.06	3.21	0.91	0.37	0.61	8.63	0.03	56.43
2010	0.59	0.06	4.41	1.34	0.49	0.79	10.99	0.06	61.60
2009	0.90	0.07	3.39	0.88	0.36	0.58	5.87	0.10	44.34
2008	0.05	-0.10	3.33	0.87	0.47	0.62	10.42	-0.11	33.76
2007	0.55	0.02	5.24	1.27	0.62	0.93	13.28	0.07	70.03
2006	0.16	0.05	3.41	0.86	0.47	0.62	8.62	0.10	43.35
2005	0.16	0.05	4.23	1.01	0.67	0.79	16.97	0.10	40.03
2004	0.14	0.06	4.55	1.10	0.90	0.78	14.58	0.21	60.66

Figure 3-1

4.0 Groundwater Monitoring Wells

Groundwater monitoring at MFP is accomplished using Alluvial and Perimeter Monitoring Wells. The alluvial wells, located in the buffer zone, were installed during the IRP to satisfy the requirements of the SOW. The 16 Perimeter wells are located around the restricted area perimeter. These wells were installed as investigative monitoring points prior to the Consent Decree. Originally over 300 investigative monitoring wells were installed. IRP operations removed all but the remaining sixteen. These wells are maintained for water level monitoring to satisfy the requirements of the IMP Work Plan and sampled to satisfy the contaminant monitoring requirements of the RML. Tritium analyses for all the wells are contained in Appendix A: Maxey Flats Project Analytical Data 2011; *2011 Maxey Flats Project Tritium Data.xlsx*. Water level monitoring for both alluvial and perimeter wells is contained in Appendix B: Maxey Flats Project Well Levels 2011; *2011 MFP Alluvial Well Levels.xlsx and 2011 MFP Perimeter Well Levels.xlsx.*

4.1 Alluvial Wells

Alluvial well samples for 2011 were collected as outlined in the PSVP and the 2007 US EPA Five Year Review. Five wells were sampled in 2011: AW-6, 10, and 12 are sampled on an annual basis and AW-1 and 7 are sampled on a quarterly basis. During this reporting period, a total of 11 alluvial well samples were collected and analyzed for tritium, yielding results typical of historic range.

For 2011, AW-7 yielded the highest tritium analysis; 5.69 pCi/ml. Comparison of this analysis to 50% of the 20 pCi/ml ARAR screening assessment level indicated that all action levels for additional radiological analysis were met.

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.

4.1 Perimeter Monitoring Wells

Sixteen monitoring wells referred to as Perimeter Monitoring Wells are located along the west perimeter fence with the exception of one well located within the restricted area north of the burial trenches and EMC bunker. Well water levels are collected from these monitoring wells quarterly for comparison to historical data. This comparison indicates that the water levels within these wells are either typical of historic data or declining. This data can be compared to historic well data at:

> http://waterdata.usgs.gov/ky/nwis/inventory?county_cd=21069&format=station_list&sort_key=station_nm&group_key=NONE&list_of_search_criteria=county_cd

The 2011 tritium results for the Perimeter wells were typical of historical data and trends. Contamination monitoring of the Perimeter Monitoring Wells is a requirement of the RML, not the IMP Work Plan.

5.0 Data Management

A data package is prepared for each group of samples analyzed on site. The data package contains the tritium instruments' QC charts (efficiency and background), chain of custody forms, raw data sheets, and data reduction sheets. Data is reviewed and validated by Denuke, Inc., a third party contractor that specializes in radiation services. Following data validation, the data is entered into the site's database and transmitted to USEPA, USDOE, *de maximis, inc*. and the Commonwealth. These packets are available on site for review. Analytical results are contained in the electronic file, Appendix A: Maxey Flats Project Analytical Data 2011; *2011 Maxey Flats Project Tritium Data.xlsx*

6.0 Rainfall Data

Presently, there are three rain gauge locations associated with the MFP: the East Detention Basin (EDB), sampling location 102D, and the main office. The official annual rainfall data is obtained primarily from the EDB rain gauge. This rain gauge was chosen because of its conjunction with the sampler at the EDB. Rainfall data from an alternate rain gauge, maintained at the main office, may be used to determine official rainfall totals if the EDB rain gauge is non-functional. A total of 54.24 inches of rainfall was measured at the EDB gauge during 2011. This is compared to an annual average precipitation of 47.33 inches (NOAA, National Climatic Data Center; Farmers, Kentucky). Annual precipitation data appears in Appendix C: Maxey Flats Project Precipitation 2011; *2011 MFP Daily Rainfall.xlsx.*

7.0 Initial Remedial Phase Cap Maintenance

7.1 Geomembrane Liner and Boots

The liner covering the trench cap and the sump boots were inspected monthly as part of the monthly inspection, and a comprehensive visual and air lancing inspection was completed in May as part of the annual inspection. During 2011, a total of 44 repairs were made to the liner and boots. A total of 408 repairs have been made from 2004-2011. The repair map appears in Appendix D: Maxey Flats Project IRP Cap 2011; *2011 MFP Liner Repair Map.pdf.*

Repairs to the liner were much more difficult to complete in 2011 than previous years. This is likely due to the more rapid aging of the geomembrane as a result of the exposed installation of the IRP cap. The effects of full UV exposure and the expected process of oxidation has made it difficult to bond new patching material to the existing geomembrane. This was evident in the QA program that yielded nearly a 50% fail rate of repairs, as compared to <10% in previous years. Deterioration of the welds has been widely observed since 2006.

7.2 Headwall Maintenance

Headwall maintenance includes four headwalls and associated items along the North Channel, the northeast corner piping, geomembrane liner battens, and the liquid collection system.

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

7.3 Subsidence Monitoring and Repair

Subsidence inspections were conducted monthly in accordance with the O&M, Section 3.3.3, Subsidence Monitoring. No areas warranted subsidence repair during 2011. Areas near trenches 15, 21, 36, 37, and 46 are being visually monitored monthly for subsidence qualification. A total of four subsidence repairs have been made since the 2003 Certification of Completion. Appendix D: Maxey Flats Project IRP Cap 2011; *2011 MFP Subsidence Tracking Form 2003-2011.xlsx* contains the subsidence repair tracking form for the years prior to 2011.

Estes Land Surveying performed the annual engineering subsidence survey of the trench cap in June 2011. Elevations were obtained for the 28 subsidence control points established during the remedial work and six additional points established in 2008. The measured variations between the 2010 and 2011 subsidence control points ranged from +0.29 feet to -0.08 feet. The variations between the 2004 (baseline) and the 2011 subsidence control points ranged from -0.02 feet to -0.41 feet. No particular area of significant subsidence was indicated. The report provided by Estes Land Surveying is available in Appendix D: Maxey Flats Project IRP Cap 2011; *2011 MFP Subsidence Measurements Estes Surveying.pdf.*

7.4 Diversion Berms

The diversion berms were inspected twice a month as required by the O&M. Excluding possible liner repairs, all were found to be in satisfactory condition.

7.5 Anchor Trenches

The anchor trenches were inspected twice a month as required by the O&M. A significant hole was located during the 2008 annual inspection on LP 363 between the restricted area fence and the north perimeter channel. This hole has not been permanently patched. There is an excessive amount of moisture in the soil which renders the welding process ineffective. Due to the location, the inability to effectively patch this hole does not impact the protectiveness of the liner to prevent infiltration that would affect trench liquid levels.

7.6 Drainage Channels

All drainage channels were inspected during 2011 as required by the O&M. Maintenance within the drains included control of weeds and vegetation in the Articulating Block mats and gabions. This was accomplished by spraying the areas with weed killer and/or manually removing the vegetation.

7.7 Articulating Concrete Block Mat (AB Mat) System

The AB mat system was inspected monthly as required by the O&M. Buildup of sediment within the AB mats has been observed, but appears to have minimal impact on reducing the velocity of water flowing to the EDB. This buildup of sediment should be expected as this is an inherent design feature of AB mats. The sediment buildup does not appear to impact the EDB's ability to control flow. In various locations the cable linking the blocks is showing signs of stress; this has been observed for several years and will continue to be monitored. One section of blocks in the east drainage channel on LP-191EX is eroding at an accelerated rate but has not impacted performance.

7.8 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 geomembrane liner or boots around the tank extensions.

7.9 Inspections

A total of 95 inspections were performed in 2011. Excluding the item discussed in Section 7.5, no unsatisfactory notations were recorded that presented a persistent problem. All unsatisfactory items either received actions to return them to satisfactory status or were designated for monitoring.

7.10 Equipment Status

All liner repair equipment remains in good working condition.

8.0 Trench Leachate Management and Monitoring

Trench sump liquid level measurements were obtained in accordance with the PSVP, Section 2.3, Sump Measurement, and the 2007 US EPA Five Year Review. The purpose of collection and evaluation of the trench sump leachate levels is to detect recharge conditions that may require leachate management. One tool to evaluate this has been a potentiometric surface map that utilizes water levels from the trench sumps and perimeter wells. During the IMP, this map has been determined to be inconclusive. In December 2011, the MFP submitted a tech change requesting discontinuation of the potentiometric surface map. This Tech Change appears in Appendix E: Maxey Flats Project Trench Sump Information 2011; *2011 MFP Tech Chg Req to USEPA.pdf.*

A comparison of the trench leachate level baseline to the manual measurements collected in October 2011 indicates little change in site wide freeboard. The average loss of freeboard for all sumps is 1.29%. Three sumps have a greater

than 10% loss of freeboard. Sumps 7-4, 46-1, and 46-2 have a freeboard percentage loss of 71%, 17%, and 13% respectively.

An updated leachate management engineering evaluation of Sump 7-4 was submitted to US EPA in March 2011. This evaluation appears in Appendix E: Maxey Flats Project Trench Sump Information 2011; *2011 MFP Trench 7-4 Leachate Management Plan.pdf.* The result of the evaluation is to continue quarterly monitoring of the sump until it stabilizes at or near pre-pump level. If the sump exceeds pre-pump level by six inches, a leachate management plan will be developed. As of October 2011, the liquid level within 7-4 was in excess of pre-pump level by 0.03 feet.

In addition to the previously mentioned documents, Appendix E: Maxey Flats Project Trench Sump Information 2011 contains individual sump Freeboard Tables, Leachate Levels, and Bottom Measurements.

9.0 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 Contaminate Liquids and Section 3.3, Waste Burial.

For 2011, zero gallons of the estimated thirty-four gallons of liquid removed from beneath the trench cap liner required management during this reporting period. No solid waste was disposed of on-site during this reporting period. Solid and liquid waste generated from laboratory, radiological activities and site maintenance is temporarily stored in a secured area.

Appendix F: Maxey Flats Project Compliance Information 2011, contains the Annual Low Level Radioactive Waste Report submitted to the Cabinet for Health and Family Services, Radiation Health Branch (RHB); *2011 MFP LLW Report.pdf*.

10.0 Erosion Monitoring

Erosion monitoring consists of obtaining semi-annual elevation measurements and observations of the east drainage channel. The Maxey Flats Project staff completed the 2011 semi-annual erosion measurements in May and December using the USGS methodology. In addition, Estes Land Surveying was contracted to complete erosion monitoring of the east drain using IMP Methodology and to produce a drain profile. Estes Land Surveying conducted erosion measurements in June and November 2011. The IMP Methodology cross-sections and tables for the 2010-2011 east drain erosion measurements (USGS Methodology) and the

calculated areas are presented in the electronic files; *MFP 2011 East Drain Erosion USGS Monuments.xlsx* and *MFP 2011 East Drain Shaw Monuments.pdf* located in Appendix G: Maxey Flats Project Drainage Channel Erosion Monitoring 2011.

Both visual inspection and erosion measurements of the east drainage channel revealed evidence of substantial hillside erosion in 2011. This resulted in major changes to the drain floor from both natural causes and drain maintenance. April 2011 was widely documented by local news sources to be the wettest April on record for Kentucky and also the second wettest year on record. The near record high rainfalls of 2011 and 2010 are obvious contributors to the observed erosion in the east drain.

Evidence of mass earth movement in the east drain was first detected during the April visual inspection that revealed a slump on the south bank that exceeded 100 feet horizontally and 50 feet vertically. The slump impacted flow between cross sections 5.5 and 6.0, and restricted flow to a three foot wide channel. In August, this slump was excavated from the drain floor, which impacted cross sections 5.0 and 5.5. In addition, the slump impacted cross section 6.0 by displacing monument S6A by 1.26 feet horizontally and 0.40 feet vertically. Mass movement of the slump also narrowed the drain width of cross section 6.5 by 1.5 feet.

The rains of 2011 also likely contributed to multiple trees falling from the steep east drain slopes into the drain floor making access difficult and dangerous. In October these timbers were removed from the drain floor and banks. Removal of these timbers altered the drain floor due to equipment access and the dragging of the timbers from the drain. This activity impacted cross sections 6.75, 6.5, 6.0, 5.5, and 5.0.

The result from the slump and east drain maintenance translated to the establishment of new baselines starting with the fall 2011 measurements for cross sections 5.0, 5.5, 6.0, 6.5, and 6.75. In addition, cross section 3.5 was re-established during the spring 2011 measurement due to drain repairs occurring during the summer of 2010 and a field measurement error in the fall of 2010. Consequently, the statistical evaluation of the east drain required for the 2012 five-year review will not have adequate data for evaluation of these five cross sections.

Seasonal visual erosion monitoring of the south and west drainage channels revealed a mud/rock slide in the south drain. The slide is located in the upper section of the drain on the east bank. The slide appears to be the result of steep side slope slides, and no evidence was observed that would indicate the IRP southeast cap contributed to the slide. No evidence of water erosion or mud/rock slides was evident in the west drain.

11.0 IMP Work Plan Revisions, Changes and Correspondence

Revisions and changes to the IMP Work Plan are required to be submitted in writing to USEPA for approval. Technical Change 10 requesting discontinuation of the potentiometric map as a method to evaluate trench leachate level was submitted in December 2011. This Tech Change appears in Appendix E: Maxey Flats Project Trench Sump Information 2011; *2011 MFP Tech Change Req to USEPA.pdf*.

An updated leachate management engineering evaluation of Sump 7-4 was submitted to US EPA in March 2011. This update appears in Appendix E: Maxey Flats Project Trench Sump Information 2011; *2011 MFP Trench 7-4 Leachate Management Plan.pdf.*

12.0 Custodial Care Activities

12.1 Vegetation

All vegetation was maintained below required height limits to allow for leachate monitoring.

12.2 Building and Grounds Maintenance

In addition to the established buildings receiving routine maintenance, extensive repairs were completed on the main office building roof to prevent leaking.

One major maintenance project was completed during 2011 as a result of April flood damage; a hillside slump within the east drain was removed due to impeded flow and access. Multiple fallen timbers were also removed from the east drain, as they restricted access. For specifics see Appendix H: Maxey Flats Project Non-IMP Information; *Maxey Flats Project Monthly Reports 2011.pdf.*

12.3 Security Fence

The security fence surrounding the site remains in satisfactory condition with minor maintenance required.

12.4 Roadway Maintenance

Routine maintenance was performed on all facility owned roadways. In addition, the county road that intersects the buffer zone providing access to multiple MFP monitoring locations had a culvert damaged during spring flooding. Since this road is primarily used for MFP purposes and due to extensive road damage to more populated roads within Fleming County, Fleming County Road Department requested MFP's assistance in the culvert repair. The county agreed to purchase a

new culvert and MFP agreed to complete the installation. The installation was completed in the fall and the new, larger culvert should eliminate washout issues and routine repairs in the future.

13.0 Cathodic Protection

Operation of the cathodic protection system has been checked monthly with all readings documented within the accepted range. A Cathodic Protection Engineer completed an annual evaluation of the system in July. Verification appears in Appendix I: Maxey Flats Project Cathodic Protection Inspection 2011; *2011 MFP Cathodic Protection Evaluation.pdf.*

14.0 Non IMP-Work Plan Activities and Developments

The purpose of this document is to summarize completion of the tasks required by the IMP Work Plan for the calendar year. But these are not the only activities and developments relevant to the MFP. Some of the major Non IMP Work Plan activities and developments include:

During September, the MFP office was approached by Jerry Gibbs, the administrator of 40 acres of land that borders the MFP original site boundary and buffer zone. Mr. Gibbs presented an offer to sell the property to the Commonwealth below market value. The MFP requested the Commonwealth Finance Cabinet purchase the property. The Commonwealth Finance Cabinet has appropriated funds for the purchase and is currently conducting the necessary appraisal and survey. It is anticipated this land will be purchased during 2012.

Since receiving a letter from US EPA in January 2008 recommending the KY Division of Waste Management explore entry of the MFP into the FCP, the DWM, in consultation with the RHB, has evaluated entry criteria. The DWM has determined that trench stabilization has been achieved at the facility but initially the RHB (radiological regulatory authority for the MFP) disagreed based on hydrogeology and engineering concerns. To effectively address RHB's concerns for entry into FCP, the DWM funded a cap and trench stabilization study conducted by Kenvirons, Inc., Lexington, KY. This study supported the DWM's opinion that MFP meets FCP criteria. This study is located in Appendix H: Maxey Flats Project Non-IMP Information; *2011 MFP Settlement Crit Re-Eval and Final Cap.pdf.* As directed by cabinet commissioners, the RHB and DWM conducted a series of meetings to reach a consensus. The outcome of these meetings yielded approval from RHB for entry into FCP provided the Commonwealth takes extra measures to prevent horizontal recharge and install additional monitoring wells. In December 2011, the Cabinet for Environmental Protection submitted a proposal to the Division of Finance requesting funding necessary for completion of FCP.

Appendix H contains the Maxey Flats Project monthly reports file, *2011 MFP Monthly Reports.pdf*. These reports are generated for the purpose of keeping the Commonwealth's Superfund Branch informed of ongoing IMP, RML and administrative activities. The reports also contain further details about the topics discussed in this report.

15.0 Conclusion

The data presented in this document supports the opinion of the Commonwealth and the US EPA that the remedy is performing as designed. The data additionally supports that the ARARs (listed below), as defined in Section II of the Statement of Work to the Consent Decree, are being achieved:

1. Prevent or mitigate the continued release of hazardous substances, pollutants and contaminants from the Site to underlying bedrock formations and ground water aquifers;
2. Prevent or mitigate the continued release of hazardous substances, pollutants and contaminants from the Site to surface water bodies and sediments;
3. Reduce the risks to human health associated with direct contact with hazardous substances, pollutants or contaminants within the Site;
4. Eliminate or reduce the risks to human health from inhalation of hazardous substances, pollutants or contaminants from the site;
5. Eliminate or minimize the threat posed to human health and the environment from current and potential migration of hazardous substances from the Site in the surface water, ground water and subsurface and surface soil and rock;
6. Minimize the infiltration of rainwater and ground water into the trench areas and migration from the trenches;
7. Allow natural stabilization of the Site to provide a foundation for a final cap over the trench disposal area that will require minimal care maintenance over the long term;
8. Minimize the mobility of trench contaminants by extracting trench leachate to the extent practicable and by solidifying the leachate in earth phase (with subsections not listed).

ARARs 1 and 2 were mitigated by source reduction through trench dewatering activities and interim cap placement during the IRP. Due to the lack of a bottom liner, it is impossible to completely prevent continued release of contaminants from the trench area; a fact known during remedy selection. Surface Water Data contained in Appendix A indicates tritium is maintained substantially below radiological action levels and specific dose limits.

ARARs 3 and 4 were accomplished by the demolition of inadequate waste storage buildings, evaporator facility and disposal of said waste and sump reduction during the IRP. Historical air monitoring reviewed during the IRP concluded that no inhalation threat is associated with MFP.

ARAR 5 was accomplished by purchase of a Buffer Zone and associated deed restrictions. Alluvial Well and Surface Water Analytical Data in Appendix A indicates tritium is being maintained below radiological action levels and specific dose limits.

ARAR 6 was accomplished by placement of the interim cap. The supporting trench freeboard data is included in Appendix E.

Achievement of ARAR 7 is currently being monitored by IMP Work Plan. Stabilization indicators including trench sump freeboard stability, annual subsidence surveys indicating minimal settlement, and subsidence repairs being few and minor support the position that stabilization is complete and movement into the FCP is warranted. Additional historic knowledge of MFP subsidence and industry standards indicate the majority of subsidence has already occurred.

ARAR 8 was fully accomplished during the IRP. IMP inspections to monitor the performance of ARAR's 8 effectiveness indicate compliance.

ARARs 9, 10 and 11 were addressed during IRP and are monitored, inspected and maintained during the IMP to verify achievement.

This concludes the textual outlining of the IMP activities at the Maxey Flats Project for 2011. If you would like to receive copies of inspections or deliverables not included in this report, please contact the MFP office.