

FINAL

PROPOSED PLAN
FORMER BURNING FIELD
FORMER SCIOTO ORDNANCE PLANT
MARION, OHIO
(FUDS NO. G05OH0980)



Prepared for:

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Contract No. W912QR-04-D-0036
Task Order No. 0017

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September 2011

TECHNICAL REVIEW CERTIFICATION

Proposed Plan

BURNING FIELD (SOP-M)

FORMER SCIOTO ORDNANCE PLANT

Contract No. W912QR-04-D-0036

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I certify that this submittal has been reviewed in detail and is correct and in conformance with the contract Statement of Work, dated 26 August 2009.



Jackie Doan, CQA, CQM, CEAC, CHMM, Contractor QC Manager 12 Sept 2011
Date



James G. Zody, P.E., Program Manager 12 Sept. 2011
Date

ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
ARAR	applicable or relevant and appropriate requirements
B(a)P	benzo(a)pyrene
CELRL	Corps of Engineers – Louisville District
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COPC	contaminant of potential concern
EE/CA	Engineering Evaluation / Cost Analysis
EQ	Environmental Quality Management, Inc.
EPA	Environmental Protection Agency
ERA	Level I Environmental Risk Assessment
FUDS	Formerly Used Defense Site
ISM	incremental sampling methodology
mg/kg	milligram per kilogram
ng/kg	nanograms per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	No Further Action
NTCRA	Non-Time-Critical Removal Action
PAH	polynuclear aromatic hydrocarbons
ppb	parts per billion
PRG	preliminary remediation goal
RCRA	Resource Conservation and Recovery Act
SOP	Scioto Ordnance Plant
SOP-M	Burning Field
SOP-O	sanitary waste disposal area
SRE	streamlined risk evaluation
TCDD	tetrachlorodibenzo-p-dioxin
TE	toxicity equivalent
TEF	toxicity equivalency factor
TEQ	toxicity equivalent quantity
U.S.	United States
USC	United States Code
USACE	U.S. Army Corps of Engineers

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SECTION 1.0

INTRODUCTION

This document presents the Proposed Plan for the former Burning Field site at the former Scioto Ordnance Plant (SOP), Ohio (FUDS Site Number G05OH0980-03). The purpose of this Proposed Plan is to inform and solicit public input on the preferred alternative. The Proposed Plan reviews the site background, previous site investigation activities, removal actions, confirmatory sampling activities, and ecological and human health risk assessment conducted at the former Burning Field. The Proposed Plan identifies No Further Action (NFA) as the preferred alternative, because the site does not present a current or future unacceptable human health or ecological risk.

The former Burning Field encompassed approximately five acres west of Lucas Road and north of Linn Hipsher Road. The former Burning Field is also referred to as “SOP-M” following an U.S. Army and Ohio Environmental Protection Agency (EPA) agreed acronym system to differentiate areas of concern (AOCs) at the former SOP. Refer to **Figure 1** for the location of SOP-M. Site investigation activities defined two areas at SOP-M that required a removal action to address polynuclear aromatic hydrocarbon (PAH) contamination in shallow soil. Refer to **Figure 2** for these two areas. More details about the former SOP and SOP-M are contained in **Section 2.0**.

As the lead agency, the U.S. Army Corps of Engineers – Louisville District (USACE – CELRL) is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR, Part 300). The Ohio EPA is the support agency for the site, overseeing cleanup activities.

This Proposed Plan was developed to fulfill requirements of CERCLA, the NCP, U.S. EPA *Guidance on Conducting Non-Time Critical Removal Actions Under CERCLA* (OSWER DIR 9360.0-32); and Department of Army Formerly Used Defense Sites (FUDS) Program Policy (ER 200-3-1).

SECTION 2.0

SITE BACKGROUND

2.1 SITE DESCRIPTION

The former SOP was located one mile northeast of Marion, Ohio and comprised roughly 12,500 acres. The former SOP was bordered on the west by the Pennsylvania Railroad right-of-way, on the east by State Route 98, on the south by Fairgrounds Road and the Erie Railroad right-of-way, and on the north by Marseilles-Gallion Road. Construction at the former SOP began in May 1942. Fuses, boosters, 20-millimeter bullets, .50-caliber shells, 65-millimeter shells, 75-millimeter shells, incendiary bombs, and napalm barrel bombs were manufactured. Production ceased with the end of World War II. Present land use includes commercial and light industry, sparsely populated farmlands, and residential property (EQM, 2011).

The former Burning Field encompassed approximately five acres west of Lucas Road and north of Linn Hipsher Road (see **Figure 1** for location). The site is currently a privately owned agricultural field. The Burning Field (SOP-M) and a sanitary waste disposal area (SOP-O) located across Lucas Road comprised the official waste disposal area for the former SOP from 1942 through 1943. Details about the operations and practices at the Burning Field are not known.

2.2 SITE INVESTIGATION

A multiple-phase site investigation of SOP-M was conducted that involved the collection and analysis of soil samples (MWH, 2003a and 2005). The site investigation identified PAHs, dioxins/furans, arsenic and iron to be contaminants of potential concern (COPCs). The resultant threats of these COPCs to public health and welfare were determined during completion of a Streamlined Risk Evaluation (SRE) (MWH, 2003a) and the Engineering Evaluation / Cost Analysis (EE/CA) (MWH, 2009). As presented in the EE/CA the threats to human health presented by SOP-M (without any remedial action) are as follows:

- 1) Based on the comparison of surface soil concentrations to risk-based concentrations [i.e., U.S. EPA Region 9 residential soil preliminary remediation goals (PRGs)],

surficial soils including residual waste material would pose a potential adverse risk, if the Site were used for residential development in the future. Predicted risks based on the maximum surface soil concentrations of PAHs were above the 1×10^{-4} (i.e., one in ten thousand or 0.0001) cumulative cancer risk threshold used for evaluating when removal action is likely warranted. The primary risk driver was carcinogenic PAHs detected in surface soil and waste. (MWH, 2009)

- 2) While concentrations of dioxins/furans were detected above the residential soil PRG for 2,3,7,8-TCDD, the cancer risk was much lower than the PAH risks, and below the upper boundary of the cancer risk range (1×10^{-4}). All of the total TEQ dioxin/furan soil concentrations were less than the 1,000 nanograms per kilogram (ng/kg) [i.e., 1 parts per billion (ppb)] Superfund Dioxin Cleanup policy criterion]. (MWH, 2009)
- 3) Arsenic and iron were detected at concentrations greater than their respective residential soil PRGs and background concentrations. However, based on the slight exceedances of the background criteria for these analytes (i.e., within a factor of 2) and the vertical profile of these analytes (the concentration did not decrease with depth like PAHs and dioxins/furans), arsenic and iron were determined to be related to local background conditions, rather than site-related activities. (MWH, 2009)
- 4) There were no suspected public health and welfare threats associated with subsurface soil, surface water or groundwater (MWH, 2003). In 2007 a groundwater demonstration final report concluded with no further action recommendation for all former SOP groundwater sites. In July 2007, the Ohio EPA provided a concurrence letter that read: 'Ohio EPA concurs with the findings and recommendations proposed'.

Threats to the environment at SOP-M were determined during completion of Level 1 Ecological Risk Assessment (ERA) (MWH, 2003b). The Level I ERA determined that no sensitive habitats existed on-site that warranted further ecological evaluation (MWH, 2009).

Using the results of the site investigation activities summarized above, the CELRL had an evaluation of remedial alternative made and documented in the EE/CA (MWH, 2009). The EE/CA determined that a non-time-critical removal action (NTCRA) should be implemented at SOP-M for PAH compounds in shallow soil.

2.3 PREVIOUS REMOVAL ACTIONS

In October and November 2010, a NTCRA was completed at SOP-M. The removal action objective was to protect human health and the environment through the removal of soil contaminated with seven known carcinogenic PAHs [i.e., benzo(a)anthracene,

benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)perylene].

The EE/CA identified that top one foot of soil should be removed in two areas at SOP-M where PAH compounds were previously identified to be present at concentrations exceeded PRGs (MWH, 2009). Excavation was begun at the south end of the larger area using an excavator. As the excavation progressed to the north, it was quickly evident that areas affected by past activities were easily identifiable because the soil was gray to black in color in comparison with the natural brown color (EQM, 2011). Refer to **Appendix A** for photographs. It was determined, with verbal concurrence of CELRL and Ohio EPA, that all discolored soil would be removed, regardless of depth. As the result of this decision, the final excavation ranged in depth from 0.5 to 7 feet below original grade. Because there was no physical evidence of burning at the north SOP-M area, it was excavated to one foot as indicated in the EE/CA.

A total of 3,011.17 tons of soil were removed and transported to the Crawford County Landfill in Bucyrus, Ohio, a local licensed Resource Conservation and Recovery Act (RCRA) Subtitle D landfill, for disposal as a non-hazardous waste. The NTCRA was completed on November 9, 2010.

SECTION 3.0

SITE CHARACTERISTICS

After the NTCRA was completed, the two areas of SOP-M where excavation occurred were restored by the landowner, Keith Roberts, under a Release of Claims between Mr. Roberts and CELRL. Mr. Roberts recommended two sources of backfill which were tested and test results provided to Ohio EPA and CELRL confirmed that backfill material could be used to fill the excavation. Site restoration (e.g., installation of field tiles, surface contouring, etc.) was completed by the landowner to allow him to prepare his field for future crop rotation.

SECTION 4.0

SUMMARY OF SITE RISKS

Following removal of all visually contaminated soil at SOP-M (including the smaller area to the north), post-removal confirmatory samples were obtained using the incremental sampling methodology (ISM) approach as specified in Ohio EPA Standard Operating Procedure *Multi-Incremental Sampling for Soils and Sediments* (January 2007). Guidance for the number of samples collected was based on the information provided in the Ohio EPA Technical Guidance Compendium entitled, *Difference Between Incremental or Multi-Incremental Sampling and Composite Sampling*, VA30007.09.002 (March 2009).

Determination of the achievement of the removal action objective (i.e., protection of human health and the environment through the removal of soil contaminated with seven known carcinogenic PAHs) was determined using the analytical results evaluated through a two-step process. First, the results were compared to the U.S. EPA Region 9 PRGs for residential soil, which represent a *de minimis* risk (i.e., cancer risk is less than one in a million or 1.0×10^{-6}). If results achieved this condition for all seven carcinogenic PAHs, no further evaluation would be conducted.

If a PRG was exceeded, the second step of evaluation would be conducted using standard human-health risk assessment assumptions to determine carcinogenic risk. The risk calculations would be compared to the Ohio EPA acceptable health criterion of one additional cancer per 100,000 exposed population (1.0×10^{-5}) (**Appendix B**).

4.1 STEP 1 – Comparison with PRGs

The concentrations of benzo(b)fluoranthene, benzo(a)pyrene and dibenz(a,h)anthracene in the post-removal confirmational sampling in the large south area of SOP-M exceeded the respective PRGs in samples ISM-1, ISM-2 and ISM-3 (see **Table 1**). At the small north area of SOP-M (i.e., ISM-AN) the concentrations of all seven carcinogenic PAHs were below the PRGs (see **Table 1**). Therefore it was demonstrated that the removal action at the small north area of SOP-M achieved the removal objective.

4.2 STEP 2 – Risk Assessment

Because some PRGs were exceeded, a human-health risk assessment was prepared. To calculate human-health risk, the arithmetic mean (i.e., average) of the post-removal confirmational sampling laboratory results for each PAH was converted to equivalent concentration of benzo(a)pyrene [B(a)P], the most carcinogenic PAH, using toxicity equivalency factors (TEFs) calculated by the U.S. EPA. The resulting B(a)P toxicity equivalencies [B(a)P TE] were summed to generate a site-wide B(a)P TE (**Table 2**). The B(a)P TE value was used to determine the human-health carcinogenic risk under residential and farm worker scenarios for the ingestion, dermal contact and inhalation (indoor and outdoor) pathways of exposure using the software package *RBCA Tool Kit for Chemical Releases* (version 1.3b) (Groundwater Services, Inc., 2009).

The calculations indicate that the B(a)P TE of the large south area of SOP-M relates to a residential cancer risk of 1.1×10^{-5} (i.e., 1.1 additional cancers per 100,000 exposed population) and a farm worker cancer risk of 1.9×10^{-7} (i.e., 1.9 additional cancers per 10,000,000 exposed population). These risks are within the NCP acceptable risk range defined as 1×10^{-4} to $<1 \times 10^{-6}$.

Following discussions of the results between CELRL and Ohio EPA, it was determined that the removal action had been completed and that the objective had been met with the stipulation that the still minimally contaminated soil is buried beneath clean soil. Further, the site will continue to be used for crop production using a corn and soy bean rotation. Thus, there is no potential residential exposure to the contaminants in soil.

4.3 OTHER RISKS

As indicated in **Section 2.2** of this Proposed Plan, SOP-M did not present an unacceptable groundwater or ecological risk.

SECTION 5.0

REMEDIAL ACTION OBJECTIVES

The remedial objective for SOP-M is protection of human health and the environment as defined by human health and ecological risk-based criteria. Both pre-removal action and post-removal action (i.e., NTCRA) sampling demonstrate that both human health and the environment are protected as described below.

As presented in **Section 4.0**, CELRL has demonstrated that the Ohio EPA Technical Compendium goal of 1.0×10^{-5} is achieved under a farm worker scenario. Specifically, the final risk estimate for SOP-M for exposure of a farm worker to surface and subsurface soil is 1.9×10^{-7} . Additionally, CELRL has demonstrated that post removal risk at former SOP-M is within the acceptable risk range defined by NCP (i.e., 1.0×10^{-4} to 1.0×10^{-6} cancer risk). Further, the final risk estimate for exposure under a un-restricted-use residential scenario (i.e., 1.1×10^{-5}) is minimally greater than the Ohio EPA human health risk based goal of 1.0×10^{-5} . It is noted that this risk assumes that the residual contamination is present at the surface, which is not the case. Clean (i.e., PAH conditions do not present an unacceptable human health risk) soil was placed at SOP-M after the NTCRA was completed (EQM, 2011).

SECTION 6.0

PREFERRED ACTION

It is the CELRL judgment that no additional actions are necessary at SOP-M to protect public health and welfare and the environment. The response action described in this Proposed Plan for SOP-M is No Further Action (NFA), which includes no further environmental investigation or remediation.

The No Further Action alternative has been evaluated for overall effectiveness, implementability, and costs. The effectiveness evaluation considers protectiveness and the ability of the alternative to achieve applicable or relevant and appropriate requirements (ARARs). With regard to protectiveness, protection of the public health and the protection of the environment all are considered. When evaluating implementability, the technical feasibility of the alternative, availability of the necessary resources to support the alternative and the administrative feasibility are considered. The balancing criteria of State acceptance and community acceptance also are evaluated. The detailed analysis is intended to provide decision makers with sufficient information to adequately compare alternatives, select an appropriate remedy for the site, and demonstrate satisfaction of remedy selection requirements in the eventual Decision Document.

The No Further Action alternative follows implementation of the NTCRA that has been demonstrated by sampling and laboratory analytical results to thoroughly provide protection of human health and the environment as residual levels of carcinogenic PAHs in soil at former SOP-M are within the acceptable risk range defined by NCP (i.e., 1.0×10^{-4} to 1.0×10^{-6} cancer risk). Further, the final risk estimate for exposure under a un-restricted-use residential scenario (i.e., 1.1×10^{-5}) is minimally greater than the Ohio EPA human health risk based goal of 1.0×10^{-5} .

The No Further Action alternative provides for protection of human health and the environment as targeted source/waste materials exceeding PRGs have been removed from the site to achieve the applicable future property use standards, thus mitigating unacceptable risks formerly posed by site contaminant source materials and contaminated soils.

The No Further Action alternative offers no additional measures for compliance with ARARs because the site no longer presents an unacceptable risk.

Respective to long-term effectiveness and permanence, the No Further Action alternative presents acceptable risk to the environment because site soil analytical data demonstrate that residuum does not pose a risk to human health and the environment. Further, groundwater was not determined to be adversely affected at former SOP-M. The SRE demonstrated no impacts to ecologically significant resources. Remaining PAHs have been demonstrated via human health risk assessment to be within acceptable limits and pose no unacceptable risk such that no unacceptable risk of contaminant migration or future impacts are considered likely.

Respective to reduction of toxicity, mobility or volume, the No Further Action alternative does not directly affect contaminant toxicity, mobility or volume; however, past removal actions (i.e., NTCRA) resulted in significant reduction in the volume of contaminants present.

There is no evaluation of short-term effectiveness associated with the No Further Action alternative as not form of remediation, additional evaluations or continued monitoring are considered as part of this alternative.

There is no evaluation of implementability or cost associated with the No Further Action alternative as no active form of remediation, additional evaluations or continued monitoring are considered part of this alternative.

SECTION 7.0

COMMUNITY PARTICIPATION

The No Further Action alternative will be evaluated for State acceptance and Community acceptance following completion of the public comment period for this Proposed Plan. It is noted that Ohio EPA's and the public's comments supported the NTCRA which was implemented in conformance with the EE/CA, Remedial Action Work Plan and Action Memorandum. Ohio EPA concurrence on the EE/CA was received on February 20, 2009. The Public Comment Period on the EE/CA ended on May 28, 2009, with no comments received. The AM was signed by CELRL on August 24, 2010 and by the Ohio EPA on August 30, 2010.

Now that the NTCRA has been successfully completed, NFA remains based on successful achievement of the site remedial objective.

The risk assessment was completed using technical methods based on U.S. EPA guidance. Ohio EPA concurred with the Remedial Action Completion Report (EQ, 2011) finalized April 29, 2011.. The State and Community acceptance CERCLA criterion will be fully evaluated by the U.S. Army following receipt of comments from the Ohio EPA and the public submitted during the public comment period.

Upon agreement of the Ohio EPA, this Proposed Plan will be placed in the SOP Administrative Record located at the Marion County Library (455 E. Church Street, Marion, Ohio 43302). Public comments on the Proposed Plan will be solicited through a notice placed in the *Marion Star*. A 30-day comment period will be provided.

SECTION 8.0

REFERENCES

Environmental Quality Management, Inc., 2010a. *Remedial Action Work Plan, Burning Field (SOP-M) and Incendiary Fuel Disposal Area (SOP-Z), Former Scioto Ordnance Plant, Marion, Ohio.*

Environmental Quality Management, Inc. 2010b. *Action Memorandum, Burning Field (SOP-M) and Incendiary Fuel Disposal Area (SOP-Z), Former Scioto Ordnance Plant, Marion, Ohio.*

Environmental Quality Management, Inc. 2011. *Remedial Action Completion Report, Burning Field (SOP-M) and Incendiary Fuel Disposal Area (SOP-Z), Former Scioto Ordnance Plant, Marion, Ohio.*

Groundwater Services, Inc., 2009. *RBCA Tool Kit for Chemical Releases (version 1.3b).*

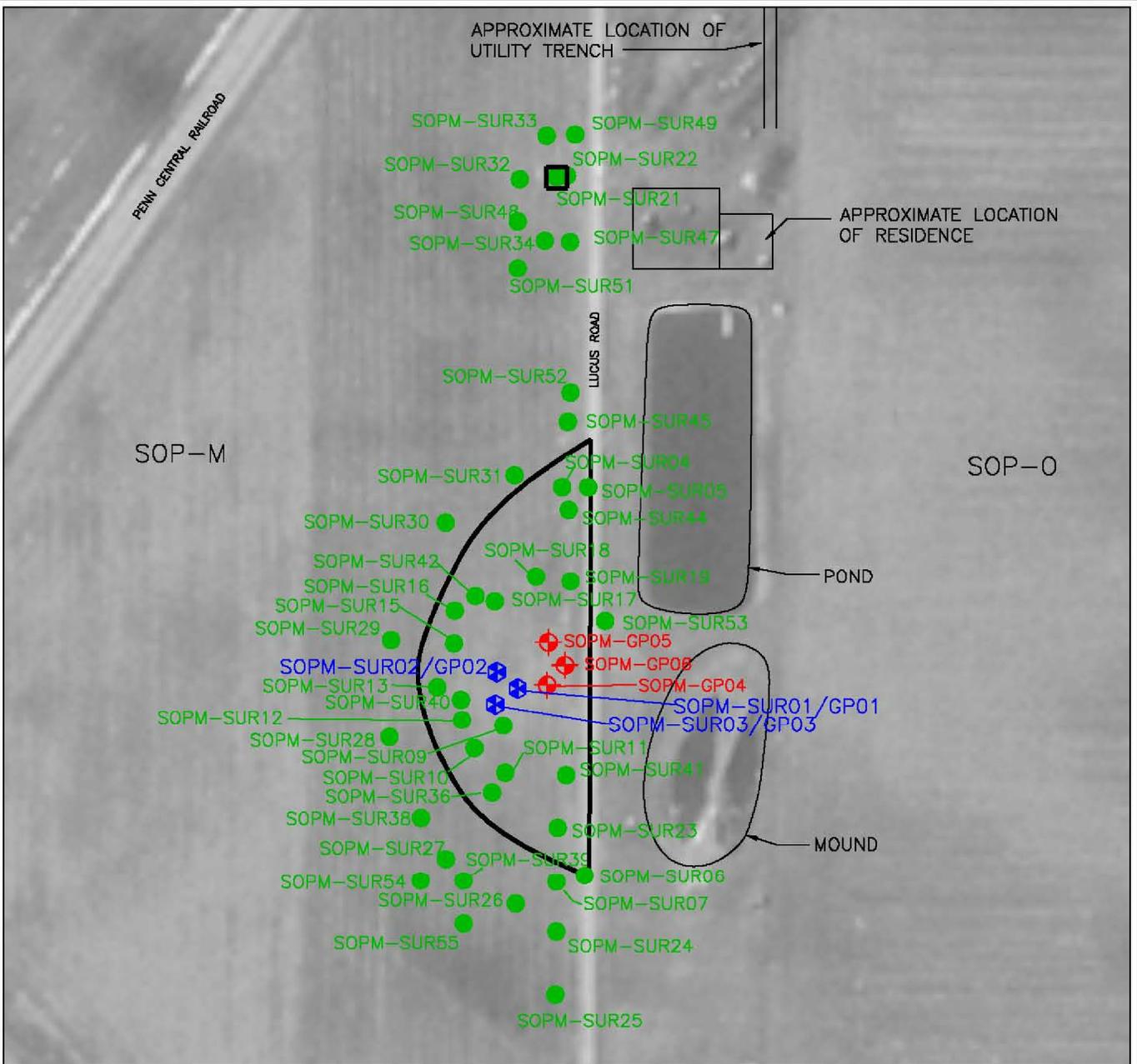
MWH, 2003a. *Site Inspection Report for the Burning Field (SOP-M).*

MWH, 2003b. *Level I Ecological Assessment Report for the Magazine Area (SOP-A), Burning Field (SOP-M), and Incendiary Fuel Disposal Area (SOP-Z).*

MWH, 2005. *Site Inspection Report for SOP-D, SOP-E, SOP-F, SOP-H SOP-G SOP-J, SOP-L, SOP-V, SOP-AC, and SOP-AL, Former Scioto Ordnance Plant, Marion, Ohio.*

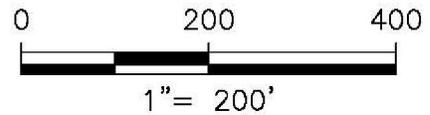
MWH, 2009. *Engineering Evaluation/Cost Analysis Final Report for the Burning Field (SOP-M) and the Incendiary Fuel Disposal Area (SOP-Z).*

FIGURES



LEGEND:

- SOP-M SURFACE SOIL SAMPLE LOCATION
- ◆ SOP-M BORING SAMPLE LOCATION
- ◆ SOP-M SURFACE SOIL SAMPLE/BORING LOCATION
- APPROXIMATE EXTENT OF PAH CONTAMINATED SOIL



BASEMAP SOURCE:
 USGS 1994 SATELLITE IMAGES OBTAINED
 FROM THE MICROSOFT TERRASERVER
 DATABASE.

FORMER SOP
 MARION, OHIO

APPROXIMATE EXTENT OF PAH CONTAMINATED SOILS
 BURNING FIELD (SOP-M)

FIGURE 2

TABLES

TABLE 1. POST-NTCRA CONFIRMATIONAL SAMPLE RESULTS - SOP-M

Analyte	Project Action Limits (mg/kg)	Large South Area				North Area
		ISM-1	ISM-2	ISM-3	ISM-3 (Dup)	ISM-AN
Benz(a)anthracene	0.62	0.34	0.52	0.61	0.3	0.0084
Benzo(b)fluoranthene	0.62	0.53	0.75	0.79	0.45	0.012
Benzo(k)fluoranthene	0.38	0.19	0.33	0.37	0.18	0.0039 U
Benzo(a)pyrene	0.062	0.35	0.53	0.59	0.3	0.008
Chrysene	3.8	0.37	0.6	0.66	0.35	0.012
Dibenz(a,h)anthracene	0.062	0.076	0.12	0.12	0.066	0.0039 U
Indeno(1,2,3-cd)pyrene	0.62	0.25	0.38	0.39	0.21	0.0039 U
Naphthalene (1)	1.7	0.017	0.03	0.016	0.013	0.0039 U

Results in mg/kg

Bold = Exceeds Project Action Limit (U.S. EPA Region 9 PRG)

(1) = Not a carcinogenic PAH

U = Below reporting limit

**TABLE 2. HUMAN-HEALTH CANCER RISK CALCULATIONS
LARGE SOUTH AREA OF SOP-M**

Analyte	ISM-1, mg/kg	ISM-2, mg/kg	ISM-3, mg/kg	ISM-3 (Dup), mg/kg	Average, mg/kg	TEF, unitless	B(a)P TE, mg/kg	
Benz(a)anthracene	0.34	0.52	0.61	0.3	0.443	0.1	0.044	
Benzo(b)fluoranthene	0.53	0.75	0.79	0.45	0.630	0.1	0.063	
Benzo(k)fluoranthene	0.19	0.33	0.37	0.18	0.268	0.1	0.027	
Benzo(a)pyrene	0.35	0.53	0.59	0.3	0.443	1.0	0.443	
Chrysene	0.37	0.6	0.66	0.35	0.495	0.01	0.005	
Dibenz(a,h)anthracene	0.076	0.12	0.12	0.066	0.096	0.1	0.010	
Indeno(1,2,3-cd)pyrene	0.25	0.38	0.39	0.21	0.308	0.1	0.031	
TOTAL								0.622
Cancer Risk - Residential (1)								1.1E-05
Cancer Risk - Farm Worker (1)								1.9E-07

Notes:

TEF = Benzo(a)pyrene Toxicity Equivalency Factor

B(a)P TE = Benzo(a)pyrene Toxicity Equivalent

(1) = Pathways of exposure include ingestion, indoor and outdoor inhalation and dermal contact. Risk calculated using B(a)P TE concentration (0.622 mg/kg).

APPENDIX A
NTCRA PHOTOGRAPHS



Photo 1. Native Soil



Photo 2. Excavated Soil Showing Indication of Past Burning



Photo 3. In Place Burned Soil



Photo 4. Burned Soil Over Unaffected Native Soil

APPENDIX B

**OHIO EPA –HUMAN HEALTH
CUMULATIVE CARCINOGENIC RISK AND
NON-CARCINOGENIC HAZARD GOALS**

Ohio EPA
Division of Emergency and Remedial Response
Assessment, Cleanup & Reuse Section, Remedial Response Program

TECHNICAL DECISION COMPENDIUM

Title: Human Health Cumulative Carcinogenic Risk and Non-carcinogenic Hazard Goals for the DERR Remedial Response Program

Date: 21 August 2009

Key Words: Risk goal, hazard goal, excess lifetime cancer risk, cumulative risk, remediation goals, hazard index

Purpose: The purpose of this decision document is to identify the human health cumulative excess lifetime cancer risk goal and the non-cancer hazard goal for the Remedial Response Program and the Federal Facilities Section of the Division of Emergency and Remedial Response (DERR).

Background: To date, the DERR Remedial Response program has utilized the acceptable exposure level, or "risk goal", defined within the National Contingency Plan (NCP) for site enforcement and cleanup decisions. The NCP defines the acceptable excess upper lifetime cancer risk as generally a range between 1E-6 and 1E-4, with a point of departure of 1E-6 for determining remediation goals. For non-carcinogens, the cumulative hazard index (HI) should not exceed 1.

Many Divisions and Programs within Ohio EPA are currently operating using a fixed human health risk goal, rather than the risk range provided in the NCP. The Division of Hazardous Waste Management and the Division of Surface Water have adopted a fixed carcinogenic risk goal of 1E-5. In addition, the DERR Voluntary Action Program (VAP) has a carcinogenic risk goal for the development of generic numerical standards of 1E-5 and a non-cancer hazard index of 1 for all land uses. The use of a risk range for the cumulative carcinogenic risk goal by DERR Remedial Response has caused some confusion among internal and external stakeholders, and has contributed to some delays in the cleanup of sites.

Decision: The DERR Remedial Response program has adopted a human health cumulative excess lifetime carcinogenic risk goal of 1E-5 and a cumulative non-cancer hazard goal equal to a hazard index (HI) of 1, for all receptors and land uses. These goals are to be used as both the level of acceptable excess cancer risk or non-cancer hazard and for the development of remediation goals for a site.

The defined risk and hazard goals should be applied as a *goal*, recognizing the need to retain flexibility during the evaluation and selection of remedial alternatives.

Rationale: The adoption of a single risk goal will help ensure consistency in site evaluation, remedy selection, and site cleanup, and is within the NCP acceptable risk range.

Contact: Brian Tucker, Central Office, 614-644-3120